The voice appropriation controversy in the context of Canadian cultural practices.

Kelly A. Bondy-Cusinato

University of Windsor

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THE VOICE APPROPRIATION CONTROVERSY
IN THE CONTEXT OF
CANADIAN CULTURAL PRACTICES

by

Kelly Bondy Cusinato

A Thesis Submitted to
the Faculty of Graduate Studies and Research
through the Department of Communication Studies
in Partial Fulfillment of the Requirements
for the Degree of Master of Arts
at the University of Windsor

Windsor, Ontario, Canada
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ABSTRACT

THE VOICE APPROPRIATION CONTROVERSY IN THE CONTEXT OF CANADIAN CULTURAL PRACTICES

by

Kelly Bondy Cusinato

'Voice appropriation' or 'cultural appropriation' can be described broadly as the practice by authors, painters, film makers, and other artists of depicting characters, themes, or 'voices' from cultures not their own, often with first person intimacy and the implied authority of someone on the 'inside'. This thesis offers a comprehensive examination of the complex issue of voice appropriation. It thereby provides a corrective to simplistic accounts found in the Canadian press.

After defining voice appropriation and situating the practice in a broad historical context, this thesis identifies a number of the most common voice appropriation arguments. These arguments are arranged into a typology based on similar themes, and then compared and analyzed in terms of their rhetorical type and ethical strength. Rhetorical theory, argumentation theory and ethical analysis are consecutively applied in this study as tools to increase our understanding and appreciation of voice
appropriation in all of its philosophical, rhetorical and moral complexity.
DEDICATION

To my husband Dean for always believing in me and reminding me of the importance of believing in myself.
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Special thanks...

To Dr. Stanley Cunningham for his wisdom, advice, understanding and support.

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To my parents and grandparents for supporting my every endeavor.

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>iv</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>vi</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>vii</td>
</tr>
<tr>
<td>PREFACE: INITIAL STATEMENT OF THE PROBLEM</td>
<td>1</td>
</tr>
<tr>
<td>CHAPTER 1: HISTORICAL OVERVIEW</td>
<td>12</td>
</tr>
<tr>
<td>I. General History of the Practice</td>
<td></td>
</tr>
<tr>
<td>of Voice Appropriation</td>
<td></td>
</tr>
<tr>
<td>i. Gender Appropriation</td>
<td>12</td>
</tr>
<tr>
<td>ii. Race Appropriation</td>
<td>13</td>
</tr>
<tr>
<td>iii. William Styron's The Confessions of Nat Turner</td>
<td>19</td>
</tr>
<tr>
<td>II. Summary</td>
<td>23</td>
</tr>
<tr>
<td>CHAPTER 2: DEFINING VOICE APPROPRIATION IN CANADA</td>
<td>33</td>
</tr>
<tr>
<td>I. Voice Appropriation as a Function of Publishing Guidelines and Cultural Committees</td>
<td>36</td>
</tr>
<tr>
<td>i. Voice Appropriation and The Women's Press</td>
<td>37</td>
</tr>
<tr>
<td>ii. Pressure on the Writers' Union</td>
<td>40</td>
</tr>
<tr>
<td>iii. Toronto Arts Council and Cultural Equity</td>
<td>45</td>
</tr>
<tr>
<td>iv. Writing Thru [sic] Race Conference</td>
<td>48</td>
</tr>
<tr>
<td>II. Voice Appropriation as a Function of Historical Processes</td>
<td></td>
</tr>
<tr>
<td>i. Access</td>
<td>53</td>
</tr>
<tr>
<td>ii. Funding</td>
<td>56</td>
</tr>
<tr>
<td>iii. Publishing</td>
<td>62</td>
</tr>
<tr>
<td>iv. Policy</td>
<td>66</td>
</tr>
<tr>
<td>CHAPTER 3: METHODS TO STUDY VOICE APPROPRIATION</td>
<td>75</td>
</tr>
<tr>
<td>I. Introduction</td>
<td>75</td>
</tr>
<tr>
<td>II. The Three-fold Stages of Rhetorical Inquiry</td>
<td>77</td>
</tr>
<tr>
<td>i. Rhetorical Theory</td>
<td>77</td>
</tr>
<tr>
<td>ii. Narrativity</td>
<td>79</td>
</tr>
<tr>
<td>iii. Argumentation Theory</td>
<td>85</td>
</tr>
<tr>
<td>iv. Ethical Theory</td>
<td>92</td>
</tr>
</tbody>
</table>
CHAPTER 4: A RHETORICAL ANALYSIS OF VOICE APPROPRIATION

I. Introduction

II. Classification in Claudia Mills's Authenticity Thesis

III. Moving Beyond Mills's Schema
i. Arguments from Epistemic Quality and Authority
   a. Argument from Accuracy
   b. Argument from Cultural Authority
   c. Argument from Alternate Knowledge
   d. Argument from Narrative Creativity

ii. Ethically-Based Arguments
   a. Argument from Freedom
   b. Argument from Rights/Access
   c. Argument from Ownership
   d. Argument from Opportunity
   e. Argument from Racism (Reverse-racism)
   f. Argument from Equality
   g. Argument from Solidarity
   h. Argument from Political Effectivity and Moral Responsibility

IV. Meta-Arguments
   i. Argument from Political Correctness
   ii. Argument from Diversion
   ii. Argument from Absurdity

V. Argument from Aesthetic Value or Commercial Appeal

VI. Analysis of Arguments

VII. Conclusion

CHAPTER 5: A THREE-TIERED APPROACH TO ETHICS

I. Access and the Right to Communication

II. John Rawls's Veil of Ignorance

III. An Ethic of Care

IV. Conclusion

CHAPTER 6: FINAL REMARKS

I. Conclusion
II. Further Research

ENDNOTES

BIBLIOGRAPHY

VITA AUCTORIS
PREFACE

INITIAL STATEMENT OF THE PROBLEM

In the Winter of 1989, the Women's Press of Canada, a Toronto-based, feminist publishing house, rejected three stories for an anthology of short fiction, Imagining Women, on the grounds that the authors used characters and voices from races and cultures not their own. According to the Women's Press, these practices constituted a form of racism and violated its recently issued policy guidelines which stated that the Women's Press "will avoid publishing manuscripts in which the protagonist's experience in the world, by virtue of race or ethnicity, is substantially removed from that of the writer" (Women's Press, "Guidelines for Submissions", 1988-1990).

A few years later, in March of 1992, the Concordia University Women's Centre refused to display two paintings of African North American women because they depicted the women in a "stereotypical" manner, carrying baskets of fruit on their heads (Hurst 1992, 11[H]). Of special relevance is the fact that the artist, Lyne Robichaud, who created these paintings was not a member of the African Canadian community (Montreal Gazette, 18 April 1992, 8[E]).
Shortly after that, during the 1994 Canadian Juno awards, Canadian First Nations people were confronted with the possibility that Canada's first Juno for Aboriginal music might be won by a white woman pretending to be Aboriginal. The Juno category was for best music of Aboriginal Canadian recording, a category that stipulates only that the music be Aboriginal (whether traditional or modern), not the nominee (Taylor 1994, 6[C]).

"Red Sky", as the nominee called herself, was the young female singer nominated in this category for "The Prayer Song" from her album "Red Sky Rising". Red Sky identified herself to the Canadian press and public as the daughter of Chief Dan George. Although Chief George had died in 1981, his son Leonard claimed Red Sky was not his sister and that she had appropriated a sacred First Nations prayer song associated with the George family. Apparently, Red Sky had learned the song a few years earlier while in Vancouver when she befriended the George family, and then went ahead and recorded the song as her own. The George family, in effect, accused Red Sky of stealing the song (even though the word "steal" is not explicitly used in the newspaper account), since she had never met Chief George and certainly had not received permission to record the song. As it turned out, Red Sky was not Aboriginal at all. In fact, she is a non-Aboriginal singer named
Nancy Nash. As for her claim that she is Chief George's daughter, Nash told the press the Chief had been her father in a "past life" (Taylor 1994, 6[C]).

These are but three examples of a larger controversy that is growing in Canadian arts and writing circles, a controversy that constitutes the focus of this thesis. The controversy is commonly referred to as the 'cultural appropriation' or 'voice appropriation' debate.² Today, and certainly in Canada, the controversy revolves mainly around the voice appropriation of First Nations or Aboriginal peoples, and to a lesser extent around African North American voice appropriation. Although journals and the mainstream press³ have defined cultural (voice) appropriation in various ways, it can be described broadly as the practice of authors, painters, film makers, and other artists depicting characters, themes, or 'voices' from cultures or races not their own, often with first-person intimacy and the implied authority of someone on the 'inside'. The issue encompasses both fictional and non-fictional works. In virtually all cases in which it is a problem, the voice appropriated is that of an oppressed minority or subordinate group (Brand 1993, Browning 1991, Mills 1994).⁴

Recent Canadian instances of cultural appropriation in the arts include the controversy surrounding W.P.
Kinsella's supposedly comic portrayal of a fictionalized version of the actual Hobbema Indian band (Godfrey 1992, 1[C]) and the recent "squabble" over the claim that Emily Carr's paintings of the Pacific coastal wilderness and its abandoned Aboriginal villages represent the 'appropriation' of the "imagery of First Nations peoples" (Mays 1994, 15[C]). In addition, some African Canadian women have been vocalizing their anger at Katerina Thorsen's recent collection of paintings. In these paintings, which depict highly sexualized images of Black Canadian women, with larger-than-life breasts, Thorsen gives her interpretation of Black women (Browning 1992). What angers many opponents most about Thorsen's work, is that she is a white, North Vancouver artist defining the images of and reinforcing the stereotypes some Canadians have about African Canadian women.

The practice of 'appropriating' the voice of another is not new. One of the oldest forms of appropriation, is that of male writers using the female voice in the first person to tell a story (Taylor 1981, 1). Today, it is commonplace to view films and read novels which are written by persons of a culture or race different from those they depict. For example, few of the many films depicting indigenous ways of life have actually been written or directed by members of these cultures. Most of these films have chosen
not to employ indigenous actors and actresses to play the roles and have instead opted for white actors and actresses dressed in traditional Aboriginal garb, with made-up faces. Some of the most famous examples of films such as these are **They Died With Their Boots On** (1941), **Broken Arrow** (1950), and **Cheyenne Autumn** (1964), in which white actors (Anthony Quinn, Jeff Chandler, and Ricardo Montalban) dress up and play Aboriginal chiefs. In the epic, **They Died With Their Boots On**, the director, Raoul Walsh, did not employ real Sioux Aboriginals to play the parts. Instead, he used hundreds of Filipino extras and some Caucasians to play Aboriginal People (Nash and Ross 1985, 3354). Another example of the appropriation of Aboriginal characters in films is the appropriation of Inuit characters. Most noteworthy is Anthony Quinn's role as "Inuk" in **The Savage Innocents** (1960). In this film, Quinn hunts and fishes "Eskimo style" for the audience, while his voice is dubbed into what film critics called "pidgin English" (Nash and Ross 1985, 2749). The various media reports discussed in this thesis will clearly indicate that voice appropriation is still alive and flourishing in the 1990s.

Since the label of 'appropriation' is most often applied to works created by persons of a more dominant group about persons of a minority or subordinate group⁵ the issue of cultural appropriation presupposes a social
context where artists' voices from both group levels (minority and dominant) are not equally heard. Thus, when the dominant voices tell the stories of or about the subordinate culture (e.g. African-Americans, Aboriginal peoples, or women), a growing number of artists and academics claim that the dominant artists are "stealing" an important cultural artifact from them (Dawes 1993, 10, Lutz 1993, 247). Even when "stealing" is not explicitly charged, the connotation is generally there and the implication is unmistakable. The connotation of trespassing is also at work (Keeshig-Tobias 1990, 7[A]). Today, certainly in the Canadian mainstream press, cultural appropriation has taken on a high profile; and Stuart Blackley (Blackley 1993, 52) contends that cultural appropriation has been attacked more viciously in the voice appropriation debate than gender appropriation since race usually differentiates people in society more severely than gender. Thus, while chapter one will briefly mention the history of gender appropriation, the primary focus of this thesis will be the cultural (racial) appropriation of voice in North America with special emphasis on Canada.

Since the cultural appropriation claim can be inflated to such an extreme (wherein the only acceptable narratives to write about or otherwise depict would be autobiographies), some artists and commentators
in their counter-arguments, have made chilling reference to the book burning in the 1930s by the Nazis and imagery of "thought police" (Young 1992, 6[B]). Critics, such as Kathryn Young (1992), argue the ensuing debate over cultural appropriation has even included references to "racism", a term being employed by opponents on both sides of the controversy (Young 1992, 6[B]). Others argue that waving the "red flag of censorship" so early in the debate simply ends discussion of an important issue about respecting the heritage and culture of others (Thomas 1992, 36[C]).

Amidst the various claims and counter-claims made about appropriation, the mainstream press in Canada has been quick to transform the issue into a debate about censorship. In this transformation, the deeper issue of race and voice appropriation tend to be eclipsed. According to the mainstream media's account, there are those, on the one hand, who think that cultural appropriation should be regulated because they believe that language is a conveyer of culture-"that it carries the ideas by which a nation defines itself as a people" (Keeshig-Tobias 1990, 7[A]). These critics argue that stories are more than mere entertainment; that they influence and illustrate how a people, a culture, think. Many Aboriginal artists contend that it is ironic that so many white artists are fascinated by Aboriginal Peoples' stories and
experiences, and yet not so long ago the Canadian government basically outlawed Aboriginal language and culture in their racial assimilation attempts. These artists claim that Aboriginal People need justice and equality not only in land claims and education issues, but also in publishing, copyrighting, the film industry and the arts in general (Keeshig-Tobias 1990, 7[A]). Too often, however, and as chapter two will illustrate, the private marketplace tends to publish the more established and dominant voices, and ignores minority voices. Furthermore, some commentators claim that many of the works done by white artists about other cultures have served only to perpetuate stereotypes or, at best, to speak patronizingly on behalf of the less powerful groups rather than letting these groups speak for themselves (Hutchinson 1992, 8[A]).

On the other side of the argument, according to the mainstream media, are those who oppose anything that harnesses freedom of expression. These artists and commentators often exaggerate the issue to an extreme in order to prove their point. For example, commentator Linda Hurst (1992) equates recent interpretations of censorship equivalent to "[t]hou shalt not appropriate the culture/voice/experience of others - if you haven't lived it, you can't write it/film it/paint it" (Hurst 1992, 1[H]). Others who are against the condemnation of this supposed cultural
appropriation argue that putting oneself in another's shoes creates better understanding in our multicultural society and is consistent with artistic freedom. In other words, these spokespersons claim there is more than one way of 'knowing' and experiencing (Cameron 1990, 67). They quickly link any discussion of the issue of appropriation with censorship (Paris 1992, Giangrande 1990, Enright 1992). Censorship for these spokespersons is defined as "literature sanitized so it does not offend anyone" (Greer 1992, 22). Some spokespersons even claim that "those who seek to censor others seek nothing less than to impose their own ideological visions on the imaginations of others" (Greer 1992, 22).

Framing the debate in such a dichotomous manner and with special emphasis upon censorship is both deceptive and confusing because it eclipses important factors such as racism, misrepresentation, stereotyping, funding, access, right to communicate, opportunity, copyright violation, and the whole issue of ownership of one's cultural heritage and experiences. The very notion of property being extended to include experience and artistic/intellectual work is problematic and complex just by itself; and yet this issue is only one dimension of the perplexing voice appropriation debate. Accordingly, this thesis plans to demonstrate that the voice appropriation debate is far more complex
than much of the mainstream press has shown it to be. For instance, this thesis will show that there are identifiable 'types' of arguments being employed on both sides of the debate, and that some of the arguments exhibited by both sides of the debate are really less convincing than they might seem at first glance. This thesis also wrestles with the deeper ethical components of appropriating the voice of another and the representations that result from such appropriations.

While Chapter Three deals with methodology more thoroughly, a preliminary indication about the methods and approaches employed in this thesis can be offered at this time. Using an historical approach, Chapter One and Two will broadly place the problem by exploring the evolution of both gender and racial (cultural) appropriation within the genres of art and literature. Due to time constraints, the practice of gender appropriation by white male writers will be examined only briefly in terms of its relationship to the practice of cultural (racial) appropriation. The lengthy history of gender appropriation in art and literature lends some clarity to the issue of cultural (racial) appropriation. Chapter One of this thesis broadly reviews the general practice of appropriating the voice of another; Chapter Two more specifically maps the history of the practice and the controversy in a distinctly Canadian context. Chapters One and
Two, then, situate and define voice appropriation within an historical context. Following this, Chapter Three will briefly outline how this thesis will apply elements of rhetorical theory, argumentation theory, and ethical theory in its examination of the production of cultural texts and their use. Chapter Four, which investigates the structure of the claims and counter-claims that have surfaced in the Canadian debate, attempts to secure greater clarity by situating these various claims and counter-claims within a taxonomy of arguments. Since the issue of cultural appropriation is immediately ethical because of the language in which it is often formulated (theft, freedom), the penultimate chapter examines its moral import. Specifically, this chapter will explore voice appropriation within the context of such familiar communication values as access to communication and the right to communicate. It will extend that treatment with special application to John Rawls's "veil of ignorance" strategy, along with Carol Gilligan's (1982) and Nel Noddings's (1984) theories of an "ethic of care" in order to identify the role of justice and caring within the voice appropriation controversy. Lastly, the final chapter of the thesis reviews a number of general discoveries and suggests what may be the best approach to securing greater harmony vis-a-vis this kind of cultural conflict.
CHAPTER 1

I. HISTORICAL OVERVIEW: GENERAL HISTORY OF THE PRACTICE OF VOICE APPROPRIATION

The current voice appropriation controversy is not without precedent. In fact, there exists a fairly lengthy history within the arts of what is now called 'gender appropriation.' Gender appropriation occurs when an author or artist, usually male, takes on the gender of the opposite sex in order to tell a story or create a character. In addition to gender appropriation, there is evidence of a history of racial or cultural appropriation. A review of the literature pertaining to the voice appropriation debate indicates that there is a continuous history of the practice of 'appropriating' the voice of another in fiction and non-fiction works. In North America alone, historical examples include the nineteenth century theatrical practice of "blackface minstrel shows" where, according to author Eric Lott (1993), "white men caricatured blacks for sport and profit" (Lott 1993, 3). Significantly, the title of Lott's book refers to this practice as "theft". Even earlier in this history, however, there is evidence of the male appropriation of female voices such as Samuel
Richardson's *Clarissa* and Charles Dickens's character, Esther Summerson, the female child depicted in *Bleak House*. Much later in time, James Joyce also appropriated the female voice in his characterization of Molly Bloom in *Ulysses* (Taylor 1981, 1). More recently, William Styron's book *The Confessions of Nat Turner* (1967) deserves special consideration as a paradigm case of cultural (race) appropriation, using first-person identity to recapitulate the personal experiences of an African American slave. While this section does not intend to offer a comprehensive history of the practice of voice appropriation, the few examples of appropriation given provide clear evidence that voice (cultural) appropriation existed long before *The Globe and Mail* reported on the controversy.

i. Gender Appropriation: Male Authors' Appropriation of the Female Voice

According to Virginia Woolf (1979 reprint), prior to the nineteenth century, literature often consisted mostly of soliloquies, not dialogues. In many of these soliloquies, Woolf contends that "the man is to be heard talking to himself and for the most part about himself" (Woolf 1979, 65). Although Woolf admits women were frequently represented, she maintains that these
portraits are pure sexual distortions:

it is becoming daily more evident that Lady Macbeth, Cordelia, Ophelia, Clarissa, Dora, Diana, Helen and the rest are by no means what they pretend to be. Some are plainly men in disguise; others represent what men would like to be, or are conscious of not being; or again they embody that dissatisfaction and despair which afflict most people when they reflect upon the sorry condition of the human race (Woolf 1979, 65).

Despite her somewhat overstated claim, which focuses mainly on the works of Shakespear and Dickens, Woolf's comments illustrate that there is some evidence, at certain points in the history of fiction, of male novelists taking on or 'appropriating' the voice of a women for a significant portion of the novel, and/ or using the first person to tell a woman's story. According to literary critic Anne Robinson Taylor, in Male Novelists and their Female Voices: Literary Masquerade (1981), this narrative practice, which Taylor refers to as a "literary masquerade", is more common in French and British literature than in Russian or American literature (Taylor 1981, 1). In her critique of the "literary masquerade", Taylor quotes Oscar Wilde, who stated that: "Man is least himself when he talks in his own person" (Taylor 1981, 2). Based on the claim that one can learn more about an author in his/her disguise than one can from his/ her autobiography, Taylor investigates the male appropriation of the female voice in these famous pieces of literature.

According to Taylor, Samuel Richardson's love for masquerade began early in life. Richardson was a printer by trade but his writing career began at only thirteen years of age when
he was asked by neighbourhood women to write their love letters for them (Taylor 1981, 58). In his fifties, Richardson finally wrote his first novel, *Pamela*. Not surprisingly to Taylor, the story was written from the perspective of a little servant girl. Later on, Richardson wrote *Clarissa*, a novel described by Taylor as full of "struggle and tension" as expressed through the "gut" of a woman (Taylor 1981, 65). In *Clarissa*, Richardson attempts, through Clarissa's eyes, to create a woman's most intimate feelings of being watched and imprisoned as Clarissa suffers through a variety of sexual violations (Taylor 1981, 65). It is apparent in Taylor's outspoken commentary that part of the outrage she feels over the appropriation of the woman's voice in literature is the arrogance and pretense with which many male authors depict the most intimate female experiences.

Similar to Richardson in certain aspects, Charles Dickens created many female characters in his career. Writing mostly during the late eighteen hundreds, Dickens's female characters ranged from "good" to "bad", with many based on Victorian stereotypes. One of Dickens's less towering characters was Esther Summerson, the female character and narrator in Dickens's *Bleak House*. In *Bleak House*, Dickens alternates third-person present-tense narration with a first-person past-tense by Esther Summerson (Bentley, Slater, and Burgis 1988, 25). In Taylor's opinion, Esther Summerson is a character whose weakness owes much to the constricting effects of female stereotypes which dominated much of the male-authored, nineteenth century literature. Taylor, moreover, contends that Dickens's male
characters were created as polar opposites to his female character. While his male characters tell the story as if in control of the world around them, his female character (Esther Summerson) offers an alternative view of that world in which weakness and vulnerability dominate. For example, Taylor quotes two introductory passages from Dickens's novel that illustrate how differently his male and female characters convey themselves. At the beginning of *David Copperfield*, David, one of Dickens's male characters, introduces himself to the reader with unmistakable authority:

> Whether I shall turn out to be the hero of my own life, or whether that station will be held by anyone else, these pages must show. To begin my life with the beginning of my life, I record that I was born (as I have been informed and believe) on a Friday, at twelve o'clock at night (Dickens 1977, 49).

Taylor contrasts David's grand introduction, in which he begins by "questioning his own potential heroism" with Esther's "wearying and inveterate self-apology" (Taylor 1981, 131). Esther introduces herself to the reader by stating: "I have a great deal of difficulty in beginning to write my portion of these pages, for I know I am not clever. I always knew that" (Dickens 1977, 17). Taylor, generalizing from select portions of Dickens' novels, contends that these alternate introductions illustrate that unlike his male characters (David and Pip from *Great Expectations*), Dickens's female character (Esther) cannot support the "weight of her own world" (Taylor 1981, 131).

According to Taylor, despite the fact that Esther was one of Dickens's weaker characters and that Dickens never wrote
another sustained narrative in the female voice after Esther, Esther remains an important character in the Dickens collection. Taylor argues that Esther was Dickens's "way of exploring what growing up would be like as a woman, what residing in the feminine consciousness would involve" (Taylor 1981, 132). Taylor's critique of Dickens's female character illustrates that it is not the practice of appropriating the voice of a woman she opposes, for she argues such "literary masquerades" are an essential part of the creative process. What Taylor does object to is the often inaccurate and simplistic portrayals that resulted when male authors attempted to create a distinctly female perspective. Thus, Taylor's criticism is both noteworthy and convincing at times mostly because it directed less at the fact that male authors took on such projects, and more at the fact that the resulting characters were simply not convincing as 'real' women.

Unlike Richardson and Dickens, James Joyce's most famous female character does not occupy a lengthy or central space in his novel. Nevertheless, despite Molly Bloom being given relatively small space in Joyce's immense novel, Ulysses, she remains the female voice best known in this piece of work (Taylor 1981, 189). Taylor argues that Joyce's Irish Catholic background pervades his work since "[t]hroughout his fiction floats the image of the ideal spiritualized woman" (Taylor 1981, 193). As his fiction develops though, Taylor claims that "the idealized woman is replaced by motherly, sexual women with whom all sorts of male debasements are possible" (Taylor 1981, 193).
Taylor maintains that her concern with all of these male authors' works is the element of falsification present in them, "the revelations these so-called women actually make about their authors, the extent to which they are versions of their creators in skirts" (Taylor 1981, 3). Male stereotypes of women were inevitably created and sustained in many of these literary works since male authors often relied on excessive marks of politeness to indicate a "good" woman. Furthermore, Taylor argues that there was a tendency by some of these male authors (Charles Dickens and James Joyce) to reduce women to their bodies alone by depicting their women characters shallowly, as often being obsessed with men and sex. Taylor illustrates how the male author's lack of knowledge about women and their experiences can result in superficial portrayals and unconvincing female characters. Taylor believes other male authors (although she cites no specific contemporary examples), from the past and present, often use the female mask to emphasize the relative powerlessness of women, their vulnerability and weaknesses (Taylor 1981, 17). In support of her arguments, Taylor claims that James Joyce himself, describes Molly Bloom in a one-dimensional way, as a woman whose every thought is related to her obsession with sex and sexuality (Taylor 1981, 17). Taylor maintains that Joyce's narrow characterization of Bloom, as a sexual object, lacks conviction and strength because it neglects the intellectual, emotional, and spiritual complexity most women posses.

Despite her criticisms of the accuracy of many male authors'
portrayals of women, Taylor in effect, links the appropriation of the voice of another in literary works with the elements of play and exploration, and argues that these elements are central to storytelling. Taylor argues that traditionally, women were seen as having fewer emotional constraints than men. This was appealing to many male authors who felt that writing in the voice of a woman would allow them to take advantage of the wider emotional range available to women (Taylor 1981, 6). As a result, Taylor labels the practice of male authors appropriating the voice of women, a form of "masquerade". Specifically, Taylor argues that "[m]asquerade is a form of play, and adopting a female voice seems to have been play of a challenging, pleasurable sort" (Taylor 1981, 3). Again, it is worth noting that the weight of Taylor's disapproval lies more on the side of falsification than it does on the method of voice appropriation itself.

ii. Race Appropriation: Blackface Minstrelsy as "Love and Theft"

Just as male authors engaged in "gender masquerades", adopting the voices of women to tell their stories, other examples from the past illustrate that white, mostly Southern cultures similarly found it appealing and challenging to engage in "race masquerades". Instead of taking on the voice and persona of a woman to tell a story or enact a scene, white, mostly male actors masqueraded as Black Americans, singing and
dancing in a "stereotypical" manner. Eric Lott in his authoritative *Love and Theft: Blackface Minstrelsy and the American Working Class* (1993) describes this nineteenth century theatrical practice of "blackface minstrelsy" as being organized around the "explicit 'borrowing' of black cultural materials for white dissemination" in which white males dressed in ragged "Negro" costumes, with darkened faces made up in greasepaint or burnt cork, danced, sang and played instruments on stage (Lott 1993, 3-5). The effect of these "blackface" minstrel shows, Lott argues, was the distortion of racial tensions by portraying slavery as amusing and acceptable. Despite this distortion, the minstrel troupes became such a popular form of nineteenth century theatrical practice that even American presidents, such as Lincoln, were entertained by them (Lott 1993, 4). The white man's fantasies about the Old South shaped the white actors' "re-inventions" of Black North American culture as a whole, and the "cultural commodity of blackness" was born (Lott 1993, 3).

In fact, Lott argues (although he could be overstating this point) that "without the minstrel show" there would have been "no" works of fiction such as *Uncle Tom's Cabin* (1852), *Adventures of Huckleberry Finn* (1884), and Norman Mailer's *White Negro* (1957) (Lott 1993, 5). While the early minstrel shows likely influenced later depictions of Black culture, it is questionable whether these later works can be said to exist only because of the minstrel show. Still, Lott argues that famous non-fiction works such as John Howard Griffin's *Black
Like Me (1961) would likely not exist (Lott 1993, 5).

It is more evident that the popular Amos and Andy radio show which ran from the late 1920s to the early 1950s had its roots in the earlier Blackface minstrel shows. Freeman F. Gosden and Charles J. Correll, the white men who created and played Amos and Andy, developed the characters from an earlier traveling Blackface show they did in Chicago (Dunning 1976, 31). Amos Jones and Andrew H. Brown were played as Harlem Blacks who owned the Fresh Air Taxi Company. The characters were depicted as polar opposites, with Amos being the straight, church-going, family man, and Andy the perfect fool who chased women, smoked "stogies" and was of very low intelligence (Dunning 1976, 32). Gosden and Correll continued their song-joke routine using Black American dialect, until their radio show became one of the highest rated programs in 1931 (Dunning 1976, 31). The Amos and Andy show continued to influence America's perception of Black culture, and even evolved into a short-lived television show in the 1950s. In 1954, due to both the general decline of radio and a series of protests against the show launched by the National Association for the Advancement of Coloured People (NAACP), the Amos and Andy radio show was canceled (Dunning 1976, 35).

In light of the previous examples of the appropriation of the African American race (culture),
Lott interprets Blackface performance as the first formal, public acknowledgment by whites of Black culture. The aspects of "appropriation", "theft" if you will, in the case of Blackface minstrelsy are apparent since images and stereotypes of Black culture were enacted by white actors, for commercial profit. In order to perfect their stage images, many white performers regularly visited plantations to observe Black Americans in their daily activities and some even hired African American men to teach them Black folk songs (Lott 1993, 59). Many nineteenth century audience members actually believed they were watching authentic Black American performers and saw the stage images as accurate representations of African American culture (Lott 1993, 20). Furthermore, Lott remarks that there is a certain paradox inherent in the Blackface minstrel shows:

The minstrel show was, on the one hand, a socially approved context of institutionalized control; and, on the other, it continually acknowledged and absorbed black culture even while defending white America against it (Lott 1993, 40).

Inherent in the controversy about the practice of Blackface minstrelsy is the same issue that exists today in the practice of appropriating the "voice" of another. On one side, at issue is the exploitation and stereotyping of a culture and a people when the image-maker is not a member of that culture. On the
other side of the debate, is the acknowledgment that beneath these performances there often exists a benign desire by outsiders to explore and celebrate another culture. Unfortunately, it was more acceptable to nineteenth century audiences to watch whites with made-up faces "celebrate" Black American culture than to actually have African American actors depict their own culture.

iii. William Styron's *The Confessions of Nat Turner*: A Paradigm Case of Appropriation in the First Person

Closer in time, William Styron's book, *The Confessions of Nat Turner* (1967), deserves special consideration as a paradigm case of voice appropriation in a semi-fictional (semi-historical) novel. Using first person identity, Styron, a white, Southern-born author, wrote a novel from the perspective of Nat Turner, the African American slave who led a brutal insurrection in Southampton County, Virginia in 1831. In the introduction to his novel, Styron tells his readers that where there was factual evidence of Nat Turner and the insurrection he "rarely departed from the known facts", but in areas where there is little knowledge in regard to Nat or his motivations, Styron says he allowed himself "the utmost freedom of
imagination in reconstructing events" (Styron 1967, xi). From here, Styron proceeds to write in the first person, thus becoming Nat Turner himself as a literary device. Styron's critics focused on this common literary device, claiming that a white, Southern author could never "know" how a "Negro" slave would feel or think (Kaiser 1970, 96). Thus, a spirited debate erupted over the ethics or appropriateness of Styron's use of the 'voice' of Nat Turner, especially in a novel based partly on actual historical events.

The criticisms of Styron's novel and some rejoinders are evident in two separate volumes of commentary: William Styron's Confessions of Nat Turner: A Critical Handbook (Friedman and Malin, 1970), (hereinafter referred to as the Friedman volume), and William Styron's Nat Turner: Ten Black Writers Respond (Clarke, 1968), (hereinafter referred to as the Clarke volume).

In the Clarke volume, ten African American commentators voice varying degrees of discontent with Styron's account of Nat Turner. Collectively, the ten contributors to the Clarke volume maintain that Styron's distortion of Nat Turner was deliberate (Clarke 1968, viii).

African American critic, Alvin F. Poussant stands out as one of the strongest critics of Styron's novel. Poussant does not object to a novelist using his imagination to write a work of fiction. What does
disturb Poussant is the fact that Styron is a white Southern man, raised in a racist society who has difficulty freeing himself from his own false perceptions (Poussant 1968, 17). Because of Styron's own white, Southern identity, Poussant argues that he cannot truly place himself inside the psyche of a Black slave. Poussant believes Styron, intentionally or not, projects typical white stereotypes about Black Americans in his fiction. Styron's account perpetuates a stereotypical belief that Black people rebel because of an "unfulfilled psychological need to be white" (Poussant 1968, 20).

Poussant believes Styron "effectively emasculates Nat through his images and selections of what 'truths' to tell" (Poussant 1968, 21). Examples of this emasculation include Styron's description of Nat as an "awkward soldier" who was unable to kill his oppressors and who vomited at the sight of blood during the murders. In criticism of Styron's novel, Poussant contends that "Styron was an unwitting victim of his own unconscious racism for which he alone cannot be held fully accountable" (Poussant 1968, 22). There is a moral deficit to all this: Poussant goes on to argue that authors such as Styron must accept responsibility for whatever part their book plays in perpetuating racist myths in our predominantly white society. This is especially the case, according to
Pouissant, when the book is as widely publicized as Styron's was because of the potential psychological impact the book could have on the North American public (Pouissant 1968, 18).

Furthermore, Pouissant maintains that another impropriety has to do with the perspective of those who reviewed the novel for mainstream magazines. Most of the critics who were asked to review the book and who raved about Styron's ability to "crawl" into the mind and body of a Black American slave were white (Pouissant 1968, 24). This amplifies the offense of a white Southern author writing a book from the perspective of an African American slave because only white critics and scholars were called upon to judge whether Styron had actually managed to penetrate deeply enough into a Black man's psyche. Thus, the distinctly Black American 'voice' was essentially silenced twice over in Pouissant's opinion.

There are others, however, who disagree with some of Pouissant's views. For example, literary critic John A. Williams does not believe the right to explore and depict the lives and thoughts of African American people is the "private domain" of Black American writers (Williams 1968, 45). According to Williams, the lives and struggles of Black Americans are often only brought into mainstream public awareness through the works of popular white writers or artists. This is because
often times their works are more acceptable to the nation at large than are similar works by African American or African Canadian artists and writers (Williams 1968, 46). Even so, Williams still takes issue with some of Styron's choices. For instance, one flaw according to Williams is that only the Negro characters in Styron's novel use the real "earthy", derogatory, swear words. Although Williams is somewhat less convincing in this particular argument, he contends that the irony inherent in Styron's choice of words is that these particular swear words that Styron puts into the mouths of the Black Americans in his novel are four-letter, Anglo-Saxon words unlikely to have been used by nineteenth century slaves (Williams 1968, 49). Williams also agrees with Poussant that Styron's Southern biases came through in his novel. Williams concludes that "[i]n short, I find the characters to be not the creation of an artist, but the creation of an artist who has never forgotten he is also a southerner" (Williams 1968, 48).

Additional negative evaluations came from critic Mike Thelwell who contends that Styron' book has many factual inaccuracies and perpetuates white stereotypes. For example, Styron inaccurately puts forth the recurring theme in his novel that the entire insurrection failed because of lack of Black American support, yet in Nat's original confesssion there is
no evidence of Nat doubting the support of his followers. Thelwell also maintains that the content of Styron's book is dangerous because people have given it more credit than it deserves as an historically accurate account because it confuses fact and fiction. The events that occur in the book are accepted as the "truth" by much of the public simply because Styron tells his readers that they are "historical." The public is being seriously misled, according to Thelwell, if they regard Styron's novel as revealing the true essence of Black slavery (Thelwell 1968, 79). Thus, he continues, Styron's book is important not for its accuracy regarding slavery (because it is not that accurate), but because it exemplifies the "persistence of white Southern myths, racial stereotypes and literary cliches even in the best intentioned and most enlightened minds" (Thelwell 1968, 91).

One more significant commentary from the Clarke volume is that made by historian, Herbert Aptheker. Offering a distinctively historical assessment of the novel, Aptheker maintains that there are many discrepancies between Styron's account and the actual history of Nat Turner. Styron omitted important aspects of Nat's history including the fact that he fled from one of his early owners in the mid 1820s and then returned later due to religious qualms and was ridiculed by many of his Black American peers for this (Aptheker
1970, 89). This fact also occupies an extensive portion of Nat's original confession to lawyer/reporter Thomas Gray; and yet for some reason Styron chose to omit this testament from his novel. Aside from a few other complaints Aptheker has about minor historical discrepancies, he does admit that when Styron directly quotes from the original confession, he does so accurately. Unfortunately, Aptheker concludes, Styron is factually inaccurate in at least one area when he portrays Will (a friend and member of the insurgent group who completes the murderous acts Nat has begun but cannot bring himself to finish) as a mad, brutal, monstrous killer. In fact, Nat only refers to Will in the original confession by saying that he knew he could trust Will because Will had told him "freedom was as valuable to him as it is to any man" (Aptheker 1970, 91). Aptheker argues that this context is important because portraying Will the way Styron does suppresses the real motive for the murders (mainly that of being an oppressed and degraded slave). The most significant historical inaccuracy in Styron's account, according to Aptheker, is his claim that Nat's insurrection was the only "effective and sustained revolt in the annals of American slavery" (Styron 1967, author's note). This is simply not true. Aptheker reminds us that there is evidence of many insurrections in early America on the part of slaves from 1691 in
Virginia to 1864 in Mississippi (Aptheker 1970, 92).

In contrast to the many negative commentaries in the Clarke volume directed at Styron's endeavor, there are a substantial number of positive reviews compiled in the Friedman volume. At the time of the book's release in 1967, most critics featured in the Friedman volume agreed that it was a respectable fictional work. Commentator C. Vann Woodward writing in *The New Republic* called the novel "[t]he most profound fictional treatment of slavery in our literature" (Friedman and Malin 1970, 72). Raymond A. Sokolov of *Newsweek* said the book was "[o]ne of those novels that is an act of revelation to a whole society" (Friedman and Malin 1970, 73). According to critic Louis D. Rubin Jr., Styron had dealt with interracial issues in his other novels but never had he attempted to tell a story about and by a Black American. Styron was not satisfied until he tried to become Nat Turner himself. Rubin claims Styron really gets to the root of Nat's hatred of the whites, but that he is also careful not to portray these feelings as "an inherent racial characteristic" (Rubin 1970, 77). Rather, according to Rubin, Styron makes it clear to his readers that "[s]ocial conditions, not heredity and biology, set him apart", that "[t]he walls of separateness are man-made" (Rubin 1970, 77).

Accordingly, Rubin contends that Styron's account
is a very wise book in the sense that it is knowledgeable about the institution of slavery and Styron himself did as much research as possible before writing the book. In Rubin's mind, Styron effectively portrays the horror of slavery for Nat. He is considered less than a man by the whites and he is constrained from any real human contact with them. When Styron speaks through Nat about some masters being nicer than others he usually qualifies Nat's thoughts or words by adding that even the nicest whites patronized the Black American slaves (Rubin 1970, 80). Moreover, Rubin disagrees with the critics who claim Styron was falsifying history by using language unlikely to be used by nineteenth-century slaves. Instead, Rubin contends that this type of language serves two purposes. First, by having Nat speak his thoughts in what some critics call the language of a white twentieth-century intellectual, Styron introduced readers to the other side of Nat Turner--the intelligent side that the whites of the time did not see. Secondly, this type of language is, for the twentieth-century reader, much easier to understand and identify with than the fractured English which was probably characteristic of nineteenth-century, uneducated slaves (Rubin 1970, 86).

Shaun O'Connell, an English teacher and reviewer for The Nation (1967), thinks that Styron vividly
captured the cruel and oppressive world of a Black American slave in his novel (Friedman and Malin 1970, 99). Styron's success, however, is moot since critic, Ernest Kaiser, argues that reviewers such as O'Connell reveal how little they know about Black slave history when they make comments like that. Kaiser insists that it is extremely difficult to create Black American characters in historical fictions, even for Black writers let alone white, Southern ones (Kaiser 1970, 92). Significantly, Kaiser's comments allude to the difficulty of creating characters outside one's own race or culture, not to the impossibility of such an endeavor.

According to critic Raymond A. Sokolov, even though Nat Turner's actual revolt may have failed (because it did not liberate Black Americans but only resulted in greater oppression and segregation because of increasing fear among whites) the "voice" Styron creates in Nat "speaks across great barriers of time and race" (Sokolov 1970, 45). Sokolov explicitly refers to Styron's narrative "voice" as his "big gamble", for if that voice had failed him, the book would have been a disaster, "a melodrama clotted with pretension" (Sokolov 1970, 45). Styron succeeds in making the reader think just as he/she is convinced, a brilliant slave must have thought. In defending Styron's use of first-person narration, then, Sokolov argues that
Styron did not emasculate or minimize Nat's character. He urges us to see that Styron is an artist, not an activist and that for artists "history, no matter how extreme its events, is incomplete without the act of the imagination that releases the deepest imports of its energies" (Sokolov 1970, 50).

II. SUMMARY

In conclusion, then, this chapter's coverage of the history and evolution of gender and race (cultural) appropriation illustrates that there is ample historical evidence in North American and abroad of the practice of voice appropriation. In particular, Styron's The Confessions of Nat Turner and its critics highlight the voice appropriation controversy with particular application to the contemporary and historical use of African American images and voices. In such a practice, authors and entertainers of a dominant culture borrow and sometimes, exploit images, identities, language, and behavior of another, non-dominant culture, often with the intimacy of first-person narration. While 'voice appropriation' is the contemporary expression used to describe this phenomenon, critics have also used other words such as "borrowing", "sharing", "stealing", and "theft" when discussing
the controversy. A number of these descriptors ("stealing", "theft") express explicit moral criticism, while in others ("sharing, "borrowing"), the moral connotation is less evident.

The history of voice appropriation, and the remainder of this thesis demonstrates that the voice appropriation debate comprises a number of recurrent themes, often expressed in the form of claims and counter-claims most of which are epistemic in focus. Those who argue that the practice of appropriating the voice of another is problematic claim: i) that voice appropriation, by placing a writer or artist within another culture, with such intimacy and compelling verisimilitude, commits an act of trespassing or usurpation; ii) that appropriation traffics in facile images or stereotypes which greatly falsify conditions within the non-dominant cultures; iii) that appropriation trivializes and minimizes serious inequities; iv) and that dominant-culture artists are incapable of truthfully re-presenting non-dominant cultural realities. Among the counter-claims one also encounters certain patterns: v) that voice appropriation, by crossing cultural boundaries, is a defensible tool of instruction; vi) that there is more than one way of 'knowing'--one does not have to be born into a culture/identity to understand or accurately depict that culture/identity; vii) that
cases such as, say, Styron's *The Confession of Nat Turner*, are sufficiently truthful as historic portraits; viii) and that the true art of storytelling or recreating through visual images lies in an artist's ability to step outside his/ her own skin and imagine life as another.
DEFINING VOICE APPROPRIATION IN CANADA

Despite the lengthy history of the practice of appropriating the 'voice' of another to tell a story, sing a song, or paint a picture, the current debate surrounding the ethics or 'appropriateness' of voice appropriation is still relatively new in Canada. Although it is difficult to specify the precise point in recent history when the voice appropriation debate entered the public forum, Canadian daily newspapers and academic journals suggest that the current public controversy over the issue began in the late 1980s. This chapter, then, will trace the voice appropriation debate in Canada from and during its development, beginning in the late 1980s to the present time. The venues within which this historical development and definition took place are the cultural, literary, and funding bodies that do much to define Canada's cultural landscape. Through all of this, the broader idea of access, a minority culture's right to self-expression and even the right to communicate, figure as recurrent themes.
I. VOICE APPROPRIATION AS A FUNCTION OF PUBLISHING GUIDELINES AND CULTURAL COMMITTEES

i. Voice Appropriation and The Women's Press (Canada)

The earliest and most salient public controversy in Canada was sparked when the Women's Press, a feminist publishing house in Toronto, rejected three stories for an anthology of short fiction, Imagining Women, on the grounds that the writers were not members of the non-dominant cultural groups they portrayed. To support their decision, the Women's Press invoked their "Guidelines for Submission", revised in the late 1980s. The guidelines state that the Women's Press publishing policy precludes the house from publishing writing

a) which adopts stereotypes by using generalizations or oversimplifications about a particular group of people

b) in which a writer appropriates the form and substance of a culture which is oppressed by her own

c) in which a writer from a dominant group writes from the point of view of a protagonist (main character) from a non-dominant group; for example, a heterosexual woman writing a novel where the main character is a lesbian

d) in which the analysis includes women of Colour as a supplement to a text, rather than incorporating women of Colour into the research, analysis, content and structure (Women's Press, "Guidelines for Submissions" 1988-1990 [Hereinafter referred to as "Guidelines"]).

37
Consistent with these guidelines, the Women's Press explicitly states that it is "actively seeking" material by and about: First Nations women, women of Colour, women with disabilities, working class and poor women, lesbians, and bisexual women ("Guidelines"). Furthermore, since the Women's Press perceives feminism as a liberation movement that must include all women, it opposes all systems of oppression that women face today. Included in these systems of oppression are racism, anti-semitism, ethnocentrism, classism, heterosexism, ableism, and ageism ("Guidelines").

According to Canadian writer Marlene Nourbese Philip (1990), when the debate began following the Women's Press decision to reject the short stories, racism was the principal concern that the Women's Press and other artists were experiencing over the practice of appropriating the voice of another. However, the mainstream media quickly translated that dominant concern into an issue of censorship. "Censorship of white writers; censorship of the imagination; censorship by publishers. Censorship in all its myriad forms became, in fact, the privileged discourse" (Philip 1990, 209). Philip views censorship as the "cultural and political barometer which a society uses to measure its freedoms" (Philip 1990, 209). The issue of racism has never captured the degree of attention that
censorship has enjoyed in Canada. In fact, Philip argues that racism has never been as "privileged a discourse as censorship" and she cites two recent examples as proof that the free speech/anti-censorship argument commands precedence over racism. These examples include the University of Western Ontario professor Philip Rushton's theories of racial superiority, and a public lecture at University of Toronto in 1987 by Glen Babb, the South African consul (Philip 1990, 210). In both cases, the issue of racism was swiftly eclipsed by the free speech debate. Philip believes that the failure on the part of the Canadian public to understand and admit how pervasive racism really is represents a disturbing attitude. She maintains that ".at the heart of this attitude lies a paradox: the ideology and practice of racism has as old a tradition as that of the rights of man" (Philip 1990, 210). Furthermore, Philip contends that racism manifests itself in such crucial areas as funding, publishing, distribution, and critical reception (Philip 1990, 214).

Despite the incomplete manner in which the media framed the appropriation debate and the Women's Press Guidelines, the Women's Press insists that they have a major commitment to ensuring that publishing is accessible to groups of women who have not been published in the past, as well as to supporting the
works of new (unpublished) writers. Initially, then, the voice appropriation issue was never intended to highlight the aspect of white writers and their rights, although that is the way the debate has since evolved. Since the Women's Press decision, the mainstream media and many Canadian writers/artists continue to debate whether white women writers or white writers in general ought or ought not to use the 'voice' of the 'Other' in their works. Unfortunately, Philip argues, there is little or no discussion about how to enable more Black and Aboriginal women to get into print without having to establish more publishing houses dedicated to publishing works by minority authors (Philip 1990, 213). In short, Philip's comments lead us to believe that the issue of access to publishing by minorities has been largely eclipsed in the Canadian context by the shift in focus to censorship.

ii. Pressure on The Writers' Union of Canada

Following the debate among Canadian writers that resulted from the Women's Press decision, the Writers' Union of Canada felt pressured at its Annual General Meeting in 1989 to make some form of public statement about the appropriation issue. Subsequently, it passed a motion condemning the failure of the Canadian Charter
to protect freedom of expression and the prevention of far-reaching intrusions into the critical privacy of the writing process (Philip 1990, 216). Philip interprets the Union's statement as exemplifying a "tawdry display of white, male privilege" (Philip 1990, 216). Debate continued privately among Canadian writers inside and outside the Writers' Union over the next few years, and soon a number of academic journals were publishing substantive articles on voice appropriation (See Brand (1993) and Hoy (1993)).

Three years later, in 1992, the voice appropriation debate exploded again in the mainstream media and in academic journals following a refusal by the Concordia University Women's Centre to display two paintings of Black women. The reasons given were that the paintings depicted the women in a "stereotypical" manner, carrying baskets of fruit on their heads. Someone pointed out that the artist who created the paintings, Lyne Robichaud, is not a member of the Black community (Toronto Star, 11 April 1992, 11[H]). Very quickly, academic journals and the mainstream media dedicated considerable attention to the voice appropriation controversy, although not always explicitly using the term 'appropriation'. For example, the April 1994 issue of University Affairs featured an article discussing political correctness titled, "How Far is Too Far?". In the article, author Tim
Lougheed argues that:

'[f]or many professors, a recent segment on a CBC Prime Time News documentary was proof that the quest for political correctness had gone too far. In that documentary, a professor recounted how a group of lesbian feminist students prevented him from discussing a lesbian feminist poet in his class because he was not himself a lesbian feminist (Lougheed 1994, 7).

The Canadian Journal of Native Studies has also published articles investigating the history and ethics of the voice appropriation debate. In one of these articles, Hartmut Lutz (1990) argues that intellectual and cultural appropriation is part of a larger process of displacement of Aboriginal peoples.

The debate became so heated in Canada that the Canada Council, the body that awards grants to artists, received formal recommendations from its Advisory Committee on Racial Equality. (Calgary Herald, 2 May 1992, 6[B]). After its own two-year study, the Advisory Committee on Racial Equality had recommended that the Canada Council adopt the following criteria in awarding grants where appropriation was at stake:

the differing needs of communities, the need for written permission in certain instances, the need to maintain respect for cultural tradition, the importance of training background for artists working in cultural traditions other than their own (Calgary Herald, 2 May 1992, 6[B]).

While 'voice appropriation' is not explicitly used in the document, it is clear that the issue is front and center.
Canada Council, however, rejected the recommendations. Its head, Joyce Zeman, remarked that "cultural appropriation is a serious issue but formal guidelines are not the solution" (Globe and Mail, 8 April 1994, 2[A]). Zeman reassured angry artists that "there have never been and will not be limits imposed on artistic imagination or freedom of expression" (Calgary Herald, 2 May 1992, 6[B]). To this day, no guidelines effectively operate within the council's deliberations and so the Council's juries are free, as they have been in the past, to award grants based solely on the merit of the application.

Zeman's decision to reject the Advisory Committee's proposal sparked an internal division within the Writers' Union of Canada. This rift became so intense that verbal shouting matches and nasty accusations in writing became commonplace at Union meetings and in Writers' Confidential, the Union's private newsletter. The debate was "apparently resolved" at the Union's Annual 1992 general meeting when it was decided that writers should be free to write on any issue, in any voice, as long as they do so with sensitivity (Ross 1994, 1[C]).

The apparent resolution was short lived. Soon after, heated debate erupted once again when June Callwood, a well known journalist, biographer, author, and founding member of the Writers' Union of Canada,
delivered the Margret Lawrence Memorial Lecture at the annual general meeting of the Writers' Union.

In her speech Callwood said:

We will not survive if we do not find the common ground. The style of raw accusations which prevails now...diverts energy and focus from the real issues of our times, which are poverty, violence and the suffering of children (Ross 1994, 1[C]).

During the winter of 1993/1994, well after this speech, Callwood resigned from the Union after a sequence of charges from other writers that she was 'racist'.

Since then, at least two other Union members have also resigned over the controversy surrounding the voice appropriation debate. The Union continues to struggle with the question of whether a white writer may presume to tell the stories of, or use the voice of, other cultures and races.

As with the Canada Council, the Writers' Union of Canada affirmed the freedom of imagination and the freedom of expression of all writers at its 1992 Annual General Meeting in Ottawa. At the same time, the Union is also sharply critical of what it calls "cultural misappropriation." Cultural misappropriation, it says is the "taking--from a culture that is not one's own--intellectual property, cultural expressions and artifacts, history and ways of knowledge, and profiting at the expense of the people of that culture" (Annual General Meeting Report 1992). Thus, while theft or
stealing are not explicitly charged, the terms 'taking' and 'misappropriation' make it quite apparent that unethical behavior is at stake. Indeed, the Union's policy statement stresses concern that cultural misappropriation contributes to the "exploitation and misrepresentation of cultures and the silencing of their peoples" (Annual General Meeting Report 1992). Despite the Union's recognition of cultural misappropriation, the Union stressed that such an acknowledgment should not be construed as an endorsement of censorship or an attempt to encourage racial or ethnic segregation (Annual General Meeting Report 1992).

iii. The Toronto Arts Council and Cultural Equity

In an attempt to deal with the growing appropriation controversy and the tough questions posed by many minority artists about equality (or lack thereof) in gaining access to grants and funds in Canada, the Toronto Arts Council, one of the largest arts councils in Canada, addressed the issue of cultural equity in 1993 (Chapman 1993, 5). Cultural equity can be defined broadly as power-sharing policies that assist Aboriginal artists and artists of Colour in creating and distributing their productions alongside, not separate from, "mainstream" art. The equity
initiative inherent in the Toronto Arts Council's 1993 policy statement stipulates that all artists have equal access to grants and granting decisions. The goal of various cultural equity strategies implemented by the Toronto Arts Council, such as "The Fresh Arts Program", designed for Aboriginal and Black Canadian youths and for "Native Women in the Arts", is to make resources and distribution systems available to all people (Saujani, 1994). This also entails increasing the number of Aboriginals and people of Colour employed on the boards that represent various racial and ethnic groups.

The Toronto Arts Council began to make these changes in an attempt to redress the discrepancy between the Council's own representatives and the cultural and ethnic diversity within the Toronto community. This restructuring process began in early 1992 with initiatives to various 'minority' artists to define cultural equity in an open dialogue. After soliciting public opinion, the Toronto Arts Council undertook a study on the barriers to access. The study was conducted in the form of open discussions at numerous public meetings in local galleries in Toronto. This type of forum gave Aboriginal artists and artists of Colour a chance to speak freely about the problems they face. Subsequently, by the end of 1992, many changes had been made at the Toronto Arts Council.
In fact, by 1992 one quarter of the Toronto Arts Council board were people of Colour, equipped with voting and decision-making power (Saujani 1994). Council members now feel positive about the restructuring, and claim there is no tokenism involved. They also believe that the Council receives distinctive perspectives from these minority representatives that they never got before.

Despite the positive sentiments now expressed by the Toronto Arts Council members and many previously marginalized Canadian artists, many Canadians still oppose such cultural equity initiatives. Two common objections to cultural equity as a policy, continue to surface in the Canadian debate. The first objection is that spreading money around to accommodate people who did not get this money in the past lowers artistic standards. The second objection states that giving special consideration to specific groups encourages these groups to remain in specific racial/ethnic "ghettos" (Saujani 1994; Bissoondath 1994; Lau 1994). Other opponents of cultural equity policies, such as Toronto Star arts critic, Christopher Hume, argue that cultural equity is a suspicious term and that it is dangerous to encourage people to represent themselves primarily by their race, ethnicity, or sexual orientation. Hume thinks that the Toronto Arts Council's initiatives will only reinforce the "cultural
ghettos" it set out to correct. In addition, Hume and other writers have questioned how money specifically set aside for a particular group of people is supposed to make these people feel equal to everyone else. On the contrary, such a procedure may only make them feel different, alienated, and segregated (Saujani 1994). Most opponents of cultural equity policies (not unlike opponents of affirmative action programs) feel that there is ample opportunity within the existing structures, and that people must simply search harder for these opportunities. Writer Neil Bissoondath, in particular, has been an outspoken minority-critic of special treatment. Bissoondath's position is particularly clear in his recent book, *Selling Illusions* (1994) (see below, pp.70-71).

iv. "Writing Thru [sic] Race Conference"

The most recent excitement in the voice appropriation debate began in early 1994, when "Writing Thru Race", a conference organized by a sub-committee of the Writers' Union' of Canada, the Racial Minority Writers' Committee, was scheduled to take place in July 1994 in Vancouver. The controversy erupted when Reform Party MP Jan Brown proclaimed that if public money (a $22,500 grant from Canada's Department of
Heritage) was to subsidize or pay for that event, it should not exclude key segments of the Canadian population--white writers. After Brown's announcement, writers Robert Fulford and Pierre Burton were repeatedly shown on Canadian television news denouncing the publicly funded conference. In response to Fulford's critical comments about public funds being spent on a closed conference, Roy Miki, coordinator of the "Writing Thru Race" conference and chairperson of the Racial Minority Writers' Committee argued that the conference was consistent with Canada's official multiculturalism policy. Miki claimed multiculturalism is a "federal policy made official by the Multiculturalism Act of 1988" and that the minority writers' conference was an attempt to publicly acknowledge the cultural and ethnic pluralism of Canadian society (Miki 1994, 23[A]). Miki denounced Fulford and his criticisms by maintaining that "while our contemporary world is undergoing radical changes right before our very eyes, columnists like Mr. Fulford, who should know better, want everyone to return to the comfort of a monolithic Canadian 'identity'" (Miki 1994, 23[A]).

Shortly after the squabble between various writers over the "Writing Thru Race" conference and evidently in response to Brown's and Fulford's complaints, Michel Dupuy, Minister of Canada's Department of Heritage,
canceled the $22,500 grant offered to the "Writing Thru Race" conference (Globe and Mail, 4 July 1994, 1[C]).

Vocal segments of the Canadian public and many white writers were outraged at the conference, as was Brown, since the workshops offered at the conference were open only to non-white writers. Indeed, the conference itself was open to only 150 First Nation writers and writers of Colour. Excited by the controversy, the mainstream media quickly circulated whatever information they could obtain about the conference or the debate surrounding it, despite the fact that in the past there have been other closed conferences and workshops in Canada for visual artists and filmmakers of Colour or First Nation identity. Although some of these closed conferences in the past may have generated local controversy, none ever attracted this degree of national coverage. In a Globe and Mail editorial, Michael Valpy voiced his disapproval of the "Writing Thru Race" conference by accusing the Writers' Union of Canada of "advocating racial and cultural censorship under the sham intellectual doctrine of voice appropriation and organizing a racially segregated conference paid for with public funds" (Valpy 1994, 2[A]). Similarly, in a speech at the University of Toronto, Fulford stated his frustration with the entire issue of voice appropriation and political
correctness, claiming "Canadians don't want to be disturbed by confrontation, unpleasant truths, direct statements, unpopular ideas, or challenges...[b]ut keeping a lid on disturbing thoughts supresses free inquiry, speech and discussion" (Fulford 1994, 24).

Roy Miki and William Deverell, organizers of the conference, cited section 15(2) of the Canadian Charter of Rights and Freedoms as proof that there is nothing wrong with public funds being allocated to events for a minority segment of society. Deverell, quoted in the Globe and Mail, called the conference an opportunity for non-white writers to "share their problems in the comfort of their own numbers without the eyes and ears of Big White Brother to mute their voice, or indeed, their anger" (Globe and Mail, 8 April 1994, 2[A]). Miki believes the conference attracted a great deal of attention because "it's about language, writing, literature, which people perceive as being the very core of their cultural identity. It's a much more threatening area than the visual arts" (Globe and Mail, 16 April 1994, 1[E]).

As a result of public outcry and largely negative media coverage, the conference was, in the end, funded through private donations from unions and writers such as Margret Atwood and Robert Munsch. Additional funds were contributed by the Canada Council, the Ontario Arts Council, the City of Vancouver, and the British
Columbia Ministry of Small Business (Globe and Mail, 4 July 1994, 1[C]). Ironically, despite the volume of public attention the conference received prior to the meeting date, when the actual conference did take place in July 1994 the mainstream media and the Canadian public virtually ignored it. There was very little coverage, for instance, in the Globe and Mail. It appears that once white writers and certain segments of the Canadian population who opposed the conference were reassured that Heritage Ministry funds were not financing such an "exclusionary" conference, they and the mainstream media were not really all that concerned with what "minority" writers discussed behind closed doors. This lack of follow-up coverage may indicate an atmosphere of indifference that often exists in certain segments of the Canadian population when it comes to minority issues. It appears that the media only deemed the conference 'newsworthy' when opponents of the conference were angry about Heritage funds being used to facilitate the conference. Similarly, when Canadians were reassured taxpayers' money would not be spent on this conference, the fact that minority writers felt a need to meet behind closed doors in the first place and the subsequent discussion were apparently of little concern to the media or the general public.
II. VOICE APPROPRIATION AS A FUNCTION OF HISTORICAL PROCESSES: ACCESS, FUNDING, PUBLISHING, AND POLICY IN CANADA

i. Access

According to a number of artists and academics in Canada speaking out against the practice of cultural appropriation, there exists a long history of inequality in this country. This includes the Canadian government's policies of institutionalized racism aimed at First Nations people, African Canadians, and Chinese immigrants. Such policies, some commentators argue, have worked to encourage the dominant culture to steal, share, borrow or appropriate from minority cultures. Quoting Fuse Magazine's 1992 "Call for Submissions" for its 1993 issue dedicated to cultural appropriation, Rozena Maart (1993) states that the call mentions that the term 'cultural appropriation' has become one of the most "contentious terms used in/ for examining the exercise of social power in the realms of culture and creativity" (Maart 1993, 45). Following the widespread response to the call for submissions, Fuse Magazine produced a double-issue edition in the summer of 1993 dedicated solely to the cultural appropriation debate. The issue gave Canadian artists, most of them
members of minority groups, a chance to explain to the Canadian public why they see voice appropriation as such a sensitive issue, and to make suggestions about what can be done to resolve the growing controversy.

According to Kwame Dawes (1993), an English professor at South Carolina University, cultural appropriation involves much more than the question of whether a person "different from myself because of sex, race, sexual orientation or history" can "effectively write about my experience in a way that I can connect with" (Dawes 1993, 9). As a writer himself, Dawes allows that he and other writers must conclude this is possible. However, Dawes differentiates between "exploitative readings" of anothers' experiences and "readings that emerge out of dialogue and honest interaction founded on common humanity" (Dawes 1993, 9). The problem with approaching the cultural appropriation controversy from the dimension of honest interaction and dialogue, according to Dawes, is that it presupposes an "even playing field" in Canada, which simply does not exist. Instead, Dawes maintains Canadian society is "marred by significant inequities which have, for years, led to the exclusion of 'minorities' and communities not regarded as belonging to the 'mainstream' of the society from telling their own stories" (Dawes 1993, 9).
Furthermore, Dawes continues, art is essentially a commodity that exists within a larger political and ideological environment. Art is not separate from culture, nor does it transcend it. In Dawes' mind, "[a]rt is money, art is power, art defines effectively" (Dawes 1993, 10). While not all people would agree with Dawes's definition of art, Dawes contends that cultural appropriation can be seen as the injustice it is only if Canadians first accept that white artists have essentially dominated the arts for too long, and that their positions in the arts are the result of political and cultural will, not just artistic ability (Dawes 1993, 10). Accepting these 'realities' not only legitimizes non-white artists' plea to tell their own stories, but also suggests that important changes in the methods of funding and the composition of the institutions that support the arts financially must be made. Dawes argues that non-white artists should be "encouraged, aided, supported and funded such that they can tell their own stories" (Dawes 1993, 10). At the same time, white artists should be scrutinized by funding agencies and discouraged from engaging in projects that will result in the perpetuation of negative stereotypes of non-white cultures (Dawes 1993, 10). According to Dawes, accountability on the side of white artists in Canada has been minimal, largely because white artists have enjoyed both the necessary
funding and power. Dawes declares that Canadian artists and the general public must acknowledge that "art is inextricably linked to funding, and that funding is a deeply political issue which requires highly politicized artists to challenge it. One day we may be able to leave the artists to do their art, but this is not the day" (Dawes 1993, 15). Dawes, that is, sees clearly that here and now, voice appropriation is closely allied to the crucial availability of funding.

ii. Funding

If access means anything, then, it means being able to secure funding and to command a reasonable return (revenue) from one's efforts. Richard Fung (1993), a Toronto-based video producer and writer, envisions the movement to oppose cultural appropriation as essentially a "strategy to redress historically established inequities by raising questions about who controls and benefits from cultural resources" (Fung 1993, 18). Because of the urgency in Canada (and elsewhere) to preserve Aboriginal culture, much of the cultural appropriation debate has focused heavily on Aboriginal People (Fung 1993, 20). For example, cultural appropriation commentator, Stuart Blackley
arguably insists that within the voice appropriation debate, race is a more crucial "difference" than gender or sexual preference since white women, white gays and white lesbians, despite their distinctiveness, are still part of the mainstream (Blackley 1993, 52). Because both this debate and the very act of appropriating the 'voice' of another affects Aboriginals and African Canadians/ Americans the most, Blackley contends that these are the people who must set the parameters of the debate over the appropriation of their culture, just as women must for issues of abortion and rape. In short, Blackley reserves the role of defining appropriation to the oppressed minorities themselves. He maintains that "[t]his stops no one from freely speaking, from having an opinion. But authority must be acknowledged to those whose culture or bodies are the very battle grounds on which the debates are played out" (Blackley 1993, 52). In tandem with Blackley's claims about the advantages white culture has enjoyed in Canadian society, Fung refers to the widespread and generally accepted practice of 'appropriation of sounds' in the music industry. For example, Keith Richards of the Rolling Stones, in a recent Globe and Mail article cheerfully admitted that he lifted many of his guitar "licks" from Chuck Berry. Other musicians have not been as gracious and honest about the origins of their music according to Toronto
Arts reporter Elizabeth Renzetti (Renzetti 1995, 1[C]). Despite the fact that much of contemporary music includes layers and layers of appropriation, Fung argues this does not alter the fact that, "in a context characterized by both racism and the commodification of culture, it is primarily white men who have controlled and benefited from the musical forms developed by non-white and Third World practitioners" (Fung 1993, 21).

Some commentators (e.g. Rozena Maart) go further than Fung, alleging that because of white domination in our society, voice appropriation is a one-way street: Only Aboriginal people and people of Colour are the favourite targets of appropriation by others but are themselves incapable of appropriating. While some would contest viewing voice appropriation as solely a minority group phenomenon, Maart insists that Aboriginals and African North Americans cannot appropriate from others simply because they do not have "possession or control of prevailing power structures--the institutionalized, structural or systematic components of white domination" (Maart 1993, 48). Thus, voice appropriation is yet another mirror to confront us with the enormous inequities in economic and social power. Kwame Dawes (1993) proposes that funding agencies and policy-making structures be reconstructed, allowing non-white artists to be included
in the "artistic mainstream" (Dawes 1993, 10). Such a restructuring process must also include a redefining of what constitutes the 'mainstream'. This entails moving away from the notion that "anything must be either white or acceptable to whites" in order to constitute the mainstream culture (Dawes 1993, 10). Furthermore, Dawes argues, only when this restructuring takes place, will it be possible to "conceive of a situation in which artistic value operates side by side with cultural and political awareness in the judging and funding of projects within this society" (Dawes 1993, 12).

In his perspicuous article, "Working through Cultural Appropriation" (1993), Richard Fung delineates the core philosophical components of the voice appropriation issue. Fung's analysis of voice appropriation is so comprehensive it has implications extending far beyond the funding dimension of the debate. His comments have particular relevance to this section of the thesis since he supplies a striking and profound philosophical justification for his position on funding. Among the many controversial dimensions of the voice appropriation debate, Fung alleges that the most confusing feature is nothing less than the "contradictory reality of using the voice, sound, image, dance, or stories of another" since this reality can represent "sharing or exploitation, mutual
learning or silencing, collaboration or unfair gain, and, more often than not, both aspects simultaneously" (Fung 1993, 21). Fung, moreover, voices some of the most pressing philosophical difficulties that must be addressed in the voice appropriation debate. First, how does one define the "Other" and where does one draw the lines around "otherness". Second, who is in a position to speak for a community, race, sex, or culture, and who has the authority to decide whether something is appropriate or not? (Fung 1993, 21). Although it is unlikely a country as diverse as Canada will ever come to a consensus on these questions, it is crucial that those concerned with the appropriation debate address the fact that the boundaries dividing "'allowable' appropriations from 'unallowable' appropriations are not always obvious" (Fung 1993, 21). With specific reference to funding in Canada, Fung concludes that:

It seems the integrity of the independent jury system is a two way street: if one should not direct jury members to incorporate appropriation as a criterion for evaluation, one should not direct them to ignore it. Literature is judged 'good' and 'interesting' on more than punctuation, sentence structure and the skilled use of adjectives (Fung 1993, 24).

Consistent with Fung's remarks on defining and evaluating voice appropriation, Canadian writer Dionne Brand contends that cultural appropriation cannot be addressed outside of a social and historical context.
According to Brand, notions of voice, representation, theme, style, and imagination have specific historical locations, and it takes rigorous examination to find these origins. What is not productive in the voice appropriation debate, Brand argues, is "liberal assumptions of universal subjectivity or downright denial of such locations" (Brand 1993, 15). In her article, Brand proceeds to define and expand the notion of cultural appropriation in terms of its ethical and dialectical implications:

[c]ultural appropriation is not a personal accusation, it is a critical category. It looks at the location of the text, and the author, in the world at given historical moments. These moments are moments of gendering, rac(ing) and classmaking, 'othering', moments rooted in colonial conquest, slavery and economic exploitation; it investigates the positionings of the author within/ without the text, and within the interaction of the text with colonial discourse, etc.; it challenges the author's anonymity, it questions the author's 'interests' in the text... (Brand 1993, 18).

In short, Brand situates and thus redefines cultural appropriation by proposing that imagery, images, representations, and the imagination are deeply rooted in an historical dialectic within which moments of alienation--abuse, if you will--are apparent. With Brand's definition, cultural appropriation itself becomes an hermeneutic category through which we investigate and interpret the relationships between texts and their authors.
iii. Publishing

In the area of Canadian publishing, the appropriation of 'voice' also includes what Susan Crean calls the "appropriation of space". "We [white writers] have most of the space--there are only so many books that get published" (Crean 1992, 29). While minority writers Evelyn Lau and Neil Bissoondath (1994) disagree that arts and literature are finite resources, Crean insists that the political answer to the appropriation problem revolves around access. She argues that two levels of access are involved here: first, programs to assist previously marginalized writers must be available and accessible; and second, publishing grants must also be available (Crean 1992, 29). Crean sees that the issue is not just one of only Aboriginal people writing about Aboriginals. Rather she believes that there should be a more equal "mixing back and forth" in terms of creative ideas and funding decisions (Crean 1992, 29). Access to publishing is even more difficult at larger Canadian publishing houses because the big publishers often prefer to publish novels by recognized authors (e.g. W.P. Kinsella) writing about Aboriginal culture, rather than publish a book by an unknown or less popular Aboriginal author. Whether this choice represents racism as some claim (Brand 1993) or simply profit-motivated decisions made by publishers remains
a function of one's personal position within the voice appropriation debate. Furthermore, those Aboriginal authors who have been widely published, such as Lee Maracle, have done so through small, independent presses or through Aboriginal and feminist presses (Young-Ing 1993, 26). In fact, Young-Ing points out that in its Fall 1992 catalogue, one of Western Canada's largest publishing houses listed only five titles about Aboriginal peoples, all of them written by non-Aboriginal authors (Young-Ing 1993, 26). No titles by Aboriginal authors were listed.

Restrictive access within the dominant culture has prompted interesting initiatives in the Aboriginal sector. In order to combat the discrimination practiced (intentionally or not) by the mainstream Canadian publishing houses, Aboriginal peoples have initiated their own publishing ventures. Two of the largest Aboriginal publishing houses in Canada are Pemmican Publications and Theytus Books, both founded in 1980 (Young-Ing 1993, 26). Pemmican Publications, a Metis publishing house in Winnipeg, is committed to publishing books depicting Metis and Native cultures in a positive manner. Theytus Books is the first publisher in Canada to establish itself under First Nations ownership and control. Theytus Books employs only Aboriginal peoples, publishes only Aboriginal authors and, as of 1993, had already published over forty titles (Young-Ing
1993, 27).

Self-controlled publishing, then, appears to be the best solution to Aboriginal writers' lack of publishing success with the larger, non-Aboriginal publishing houses in Canada simply because it gives Aboriginal writers access to publishing. Young-Ing also believes that it fosters the growth of an Aboriginal audience and empowers Aboriginal communities through financial and administrative control. With these publishing houses, Young-Ing believes that Aboriginal writers have begun to repair some of the damage done by centuries of stereotypical images of Aboriginal people created and perpetuated by white writers and artists.

Curiously, the cultural appropriation debate has focused mainly on fiction, despite evidence that there exists an even larger problem with non-fiction. Just as Aboriginal people have been plagued for centuries by authors "appropriating", "stealing" and often distorting the stories of others, Aboriginals (and to a lesser extent African North Americans) continue to face an ever increasing number of self-appointed academic "experts" who write about them and their cultures, with little consultation with Aboriginal communities (Crean 1992, 28). In recent years there appears to have been an increase on Canadian university campuses in the number of non-Aboriginal academics
writing and teaching about Aboriginal cultures. Young-Ing argues that while their intentions may be laudable, the problem many Aboriginal people have with these self-appointed experts is that many of these academics do not "promote the Aboriginal Voice nor do they speak for Aboriginal peoples' unique perspectives on the issues" (Young-Ing 1993, 24). Furthermore, Young-Ing argues that "by creating a recognized school of experts, who are a relatively 'low risk' to publishers, and by saturating the market with books about Aboriginal peoples, this wave of academic writing has the effect of ultimately blocking out the Aboriginal Voice" (Young-Ing 1993, 24). This concern about appropriation in the research and academic sectors has also been attracting some attention within anthropology (Clifford 1988, 220).

The issue of access, then, cuts across several categories of cultural expression. Indeed, in one of the rare analytic articles written by a Canadian academic about the voice appropriation controversy, philosopher Thomas Hurka, over five years ago urged non-minority artists and writers to move with extreme caution and sensitivity in this contested area (Hurka 1989, 8[A]). Hurka's words are no less applicable to the realm of scholarship.
iv. Policy

Despite the high profile given to voice appropriation by the media and the angry demands from some minority artists and other commentators to stop "stealing" and to start "respecting" cultures not their own, few Canadian funding agencies have given the issue little more than passing consideration. In terms of official guidelines, recommendations, or policy statements, the Canada Council's Advisory Committee on Racial Equity (1992) was one of the first to take direct action. As already mentioned (p.42), following its own two year study of the cultural appropriation controversy, the Advisory Committee recommended that the Canada Council consider the following:

the differing needs of communities, the need for written permission in certain instances, the need to maintain respect for cultural tradition, the importance of training background for artists working in cultural traditions other than their own (Calgary Herald, 2 May, 1992).

The Canada Council however, rejected the Advisory Committee's recommendation and instead affirmed the supremacy of freedom of expression and imagination (Calgary Herald, 2 May, 1992).

Recent government committees, mandated to investigate the problems faced by contemporary Aboriginal peoples in Canada, have now begun to address the concerns Aboriginal people have about cultural
appropriation. Most significantly, the Royal Commission on Aboriginal Peoples, created in 1991, included a section entitled "Cultural issues of concern to Aboriginal peoples" in its 1992 final report. In this report, improving cultural awareness among Aboriginal peoples and non-Aboriginal peoples in Canada is a dominant theme. More pertinent to the issue at hand is the fact that the Report mentions members of a women's coalition in Winnipeg who, acting as intervenors, described research they were conducting on how a United States program to protect the interests of Aboriginal artists, by requiring "tests of authenticity", would affect Canadian Aboriginal artists. The U.S. legislation they were referring to would allow only Aboriginal artists to market their cultural artifacts (Cassidy 1992, 16). Furthermore, in British Columbia, another group of representatives urged that the Commission consider previous Aboriginal art and songs be given copyright protection in order to arrest "appropriation" by non-Aboriginal people (Cassidy 1992, 16).

In an attempt to convince the Commission of the need for increased Aboriginal involvement in the arts, Mr. Kim Bell, Founder and President of the Canadian Native Arts Foundation, called for research into the economic potential of Aboriginal cultural industries. Bell also argued for greater representation of
Aboriginal people in the arts, stating that Aboriginal peoples remain almost totally excluded from Canada's cultural industries— the third largest industry in Canada.

In response to its 1992 report, the Royal Commission on Aboriginal Peoples published an "Integrated Research Plan" (July 1993) which includes ethical guidelines for its own funded research projects involving and/or depicting Aboriginal peoples. According to the Commission, these guidelines were developed to ensure that "in all research sponsored by the Royal Commission on Aboriginal Peoples, appropriate respect is given to the cultures, languages, knowledge and values of Aboriginal peoples, and to the standards used by Aboriginal peoples to legitimate knowledge" (Royal Commission on Aboriginal Peoples, 1993, 37). The guidelines refer to the majority of past research concerning Aboriginals as being carried out "outside" of the Aboriginal community, by non-Aboriginals. Specifically, the guidelines state that "Aboriginal peoples have had almost no opportunity to correct misinformation or to challenge ethnocentric and racist interpretations" (Royal Commission on Aboriginal Peoples, 1993, 37). As a response to these injustices in the areas of research on Aboriginal peoples, the Commission's ethical guidelines direct researchers to: i) establish "authenticity" of orally
transmitted knowledge by applying "the means of validating knowledge" in the particular traditions under study; ii) obtain "informed consent" from all persons and groups participating in the research; iii) enable community representatives to participate in the "planning, execution and evaluation of research results" (Royal Commission on Aboriginal Peoples, 1993, 38, 39).

A few years prior to the Royal Commission on Aboriginal Peoples, the province of Quebec had already conducted its own cultural inquiry into the status of Aboriginal people in the arts. In 1990, The Government of Quebec released its Departmental Policy on Aboriginal Cultural Development. The Quebec policy stipulates four very broad principal directives:

a) to encourage Aboriginal people to take greater charge of their own cultural development;

b) to actively support Aboriginal people in preserving and promoting their heritage;

c) to encourage each Aboriginal nation's affirmation of its cultural identity in the fields of arts and literature;

d) to promote creativity among Aboriginal artists, dissemination of their works and recognition of their professional status (Province of Quebec, Departmental Policy on Aboriginal Peoples 1990, 192).

In order to support these general orientations, the ministry outlined a number of specific orientations. To promote accessibility to funding, these more specific
directives included inviting Aboriginal people to sit on selection committees reviewing projects submitted by their communities; introducing provisions into financial assistance programs which would ensure respect for Aboriginal culture and its characteristics; and translating all ministry policies and programs into the appropriate Aboriginal languages (Province of Quebec, Departmental Policy on Aboriginal Peoples 1990, 192).

Apart from these few and encouraging instances of government bodies and committees interested in the issue of cultural appropriation, government involvement is at best incipient. Proscriptions against cultural appropriation have never materialized as policy in any artistic funding agency and are not likely to do so. According to Richard Fung (1993) there are a number of reasons funding agencies in Canada have either avoided making direct statements on the issue of appropriation or have rejected the kinds of recommendations proposed to them by other committees as did the Canada Council with the Advisory Committee's recommendations. Fung believes that besides the fear of public outrage that would likely result from a proscription against cultural appropriation, the most significant reason for the absence of such interventions in policy is the fact that Aboriginal and other non-white artists are "rarely given the opportunity
to articulate such demands" (Fung 1993, 24). Fung contends that

[w]hen First Nations artists have said 'don't take our stories; don't steal our images,' their objects of address have been other artists not funding agencies. Their proscriptions against appropriation have been made in a moral and ethical, not a regulatory arena. Moral and ethical directives don't easily translate into bureaucratic language of guidelines and forms (Fung 1993, 24).

It appears, too, that there is some resistance to government intervention within the minority cultures themselves. Neil Bissoondath, a Montreal writer and novelist who has become one of the most prominent and outspoken critics of proscriptions against cultural appropriation, links the appropriation debate with a larger problem in Canada: official multiculturalism. Bissoondath, born in Trinidad and emigrating to Canada at eighteen, and other opponents of multiculturalism, argue that such a policy has essentially robbed the country of common values and heritage (Makin 1994, 4[A]). Bissoondath alleges that ever since 1971, when Canada's multicultural policy evolved under Prime Minister Trudeau, people have been "encouraged to hide behind ethnic walls" (Makin 1994, A4). Furthermore, Bissoondath is opposed to federal grants being given to ethnic communities to support their cultural traditions and languages. According to Bissoondath, any group, determined enough, can finance its own lobbying and cultural events, as did immigrants in
the past (e.g. Italians, Germans), without such financial assistance. More specifically, in his recent book *Selling Illusions* (1994), Bissoondath alleges that

[...] multiculturalism, with all its festivals and its celebrations, has done--and can do--nothing to foster a factual and clear-minded vision of our neighbours. Depending on stereotype, ensuring that ethnic groups will preserve their distinctiveness in a gentle and insidious form of cultural apartheid, multiculturalism has done little more than lead an already divided country down the path to further social divisiveness (Bissoondath 1994, 90).

Bissoondath is one of only a few non-white spokespersons in the cultural appropriation debate who has openly expressed opposition to proscriptions against cultural appropriation--constraints that might result in the harnessing of the free imagination. In his own works, Bissoondath has created narratives from the perspectives of women, men, adolescents, adults, African North Americans, whites, and Asians. In addition, his stories are set in a wide range of locations including Canada, the Caribbean, Central America, and Japan (Garrod 1986, 35). Bissoondath has been no less vocal in the public media, claiming that he and all writers have the right to write in the voice of cultures and genders not their own; and that the ability to take on different characters and speak in different "voices" is part of the creative process of writing. As to those who argue that voice
appropriation represents a form of racism and theft, Bissoondath responds by maintaining that "[t]heir message is one of negation and division, seeking to erect 'multicultural', apartheid-like walls around the ghettos of ethnic and cultural communities. They are loud—but this does not mean they are right" (Bissoondath 1994, 185).

* * *

Canada, with its official policy of multiculturalism and structures dedicated thereto, provides a lively context within which to situate, define and understand voice appropriation. Very quickly it becomes apparent that voice appropriation must not be perceived or approached simplistically in terms of censorship or the right to unfettered communication. Rather it needs to be investigated in a more comprehensive and historical context which does justice both to its organizational and procedural features as well as to its philosophical complexity. Indeed, as Fung argues, cultural appropriation is so complex as to encompass an unavoidable contradiction; and, at the same time, it is attended by profound questions about boundaries, authority and appropriateness. This too is why Brand situates "cultural appropriation"
as something even more than an injustice rooted in historical dialectic but also as an hermeneutic category through which we investigate and interpret the relationships between certain kinds of texts and their authors.

In Canada, some of these relationships express themselves less abstractly as issues of access, broadly conceived, and in such things as funding procedures and policies. Other perhaps more apparent tangible realizations of these relationships between cultural texts and their authors are such developments as the resolutions of committee structures and arts councils, publishing guidelines and policies, publishing houses and their publication records. The most current determinations to spell out relationships between cultural texts and their authors are the guidelines issued by the Royal Commission on Aboriginal Peoples and the counter-arguments of Neil Bissoondath directed against special treatment for minority writers and artists. Ironically, this pairing at approximately the same time, of the most recent high-profile statements in the debate reflects the inherent contradiction already diagnosed by Fung. Even so, the work of defining voice appropriation requires further understanding of both its rhetorical and ethical dimensions.
CHAPTER 3

METHODS TO STUDY VOICE APPROPRIATION

I. Introduction

This thesis combines historical, rhetorical and ethical approaches in examining cultural texts and their use. Chapter two has already used an historical approach in identifying the problem. The principal approaches and types of theories employed in the remainder of this thesis include rhetorical theory, argumentation theory, and ethical evaluation. Furthermore, the method of rhetorical analysis used in this thesis begins by situating the production of cultural texts (of minorities) within the broader human enterprise of narrativity. Narratives, in the form of parables, myths, and legends often serve as vehicles of moral instruction for a group of people—a culture. Because stories often define and instruct a culture (about its history and norms), those who create and relay such stories, the story-tellers, occupy an unique power position within communities. Thus, if the story-tellers or creators of cultural texts are from a cultural group other than the one they portray, many commentators consider the power to define the host
culture as being foreign, oppressive and distorting. Canadian writer Janisse Browning (1991) argues for African-Canadians that "[a]ny representation of ourselves and our cultural experiences done by an outsider would be from a comparatively superficial perspective" (Browning 1991, 33).

Based on the theory-categories of rhetorical theory and ethics, the principal investigative steps taken in the remainder of this thesis are as follows:

i) rhetorical analysis comprising the following: general theoretical remarks upon the instructive, epistemological and ethical value of (a) rhetoric (b) narrativity (c) argumentation including the analysis of language use. There is special emphasis on argumentation theory, since a major goal in this thesis is to disclose the types of arguments that have surfaced in the voice appropriation debate.

ii) a three-step ethical evaluation, culminating in the application of, some contemporary feminist ethical theory, as the appropriate underpinning for an evaluation of appropriation discourse.

In the application of rhetorical theory and ethical evaluation to the study of cultural texts and their use, the various claims and counter-claims that have surfaced in the voice appropriation debate, as depicted in Canadian journals and newspapers, will serve as the materials for this study. While ethical analysis is normally distinguished from rhetorical study, it is worth pointing out that both narrative accounts and many of the voice appropriation arguments are intimately connected with ethical properties. Indeed,
narratives are a conventional form of ethical instruction. Accordingly, without ethical review, an examination of the voice appropriation phenomenon would remain incomplete.

II. THE THREE-FOLD STAGES OF RHETORICAL INQUIRY

i. RHETORICAL THEORY

As is evident from its 2500-year history, rhetorical theory undertakes to identify the use of language forms with special attention to their persuasive appeal. Rhetorical analysis, as author Gerard Hauser (1986) points out, examines the "dynamics that occur within the boundaries of a message and the options available to performers (rhetors) for managing these dynamics in desired ways" (Hauser 1986, 2). Authors Bernard Brock and Robert Scott (1980) define rhetoric as "the human effort to induce cooperation through the use of symbols" (Brock and Scott 1980, 16). In short, rhetoric can be considered both a specific form of communication and communication in general since nearly all communication has elements of persuasion and technique.

Rhetoric, then, is the art or expression of speech
or discourse. It is not a thing by itself, but instead a skill, art, or system of communicating through the spoken or written word. The system or art of rhetoric comprises the elements of composition, organization, style, and persuasion. According to Webster's Dictionary (1986), rhetoric includes four broad areas: i) the study of principles and rules of composition as formulated by ancient critics (Aristotle); ii) the art or practice of writing or speaking as a means of communication or persuasion; iii) the skill or effective use of speech—eloquence of language; iv) verbal communication or discourse—speech itself.

In Communication and Knowledge (1986), authors Richard Cherwitz and James Hikins define rhetoric more broadly than anyone yet as "description of reality through language" (Cherwitz and Hikins 1986, 67). This definition mirrors the ubiquitous role that rhetoric plays in human thought and inquiry, and includes rhetoric exercised in both oral and written mediums. These authors also believe that rhetoric, along with "persuasive potential, is an integral part of nearly all verbal activity" since a person engages in rhetoric each time he/she implies or asserts reality as is as he/she says it is (Cherwitz and Hikins 1986, 64). In bracketing the persuasion effect, then, Cherwitz and Hikins accord rhetoric an enormous scope. What is most striking is their claim that rhetoric
is indispensable to the process of knowledge and self-knowledge. Rhetorical discourse describes reality through language and in doing so makes relations conspicuous to selves. "We do not argue that rhetoric is a 'way' of knowing distinct from other ways...Rather, we contend that all ways of knowing are inherently rhetorical" (Cherwitz and Hikins 1986, 92). Cherwitz and Hikins represent the culmination of an accelerating tendency in recent years among rhetoricians to bring together the study of communication and epistemology. This ambitious synthesis, then, provides a rhetorical theory base or background to the work of appreciating cultural narratives as a key to understanding ourselves and the human condition.

ii. NARRATIVITY

After a broad overview of the relevance of rhetorical theory to voice appropriation, the second stage of rhetorical analysis moves on to examine the production of cultural texts (of minorities) within the distinctively human enterprise of narrativity (engaging in narrative discourse). In the Autumn 1985 edition of the *Journal of Communication*, a series of articles by various authors were compiled under the general title of "Homo Narrans: Story-Telling in Mass
Culture and Everyday Life". The articles signal a renewed interest in narrativity already evident in the early 1980s. In his introduction, editor George Gerbner underscores the importance of stories and story-telling in human lives when he recalls Plato's remark that those who tell the stories also rule society (Gerbner 1985, 73).

In line with Gerbner, Walter Fisher (1987) writes of the critical function of stories and he quotes ethicist Alasdair MacIntyre to underscore his point: "[m]an is in his actions and practices, as well as in his fictions, essentially a storytelling animal" (Fisher 1987, 58). As storytelling animals, we perceive, understand, and explain our experiences (our lives) in terms of narrative logic (beginning, middle, end). Fisher contends that narration is a distinctively human enterprise and includes the "symbolic actions--words and/or deeds--that have sequence and meaning for those who live, create, or interpret them" (Fisher 1987, 58). In investigating what he calls the "narrative paradigm", Fisher is concerned with the role stories play in human discourse and how stories themselves operate as a paradigmatic model of human communication. He maintains that the essential postulates of the narrative paradigm include the acceptance that humans are storytellers and that rationality itself is determined by the nature of
persons as narrative beings. The nature of persons as narrative beings includes human beings' inherent awareness of narrative probability, what constitutes a story, their ability to test narrative fidelity and to compare the stories they "experience" with the stories they "know to be true in their lives" (Fisher 1985, 75). Storytellers are the "experts" and their audiences function as active participants in the formation of meaning in the story, rather than as detached observers/listeners (McGee and Nelson 1985, 143). Many social scientists now agree that the social reality of human beings is constructed and experienced largely through various modes of story-telling (Gerbner 1985, 73). According to Ernest Bormann (1985), socially shared narratives or shared "fantasies" provide group members with "comprehensible forms for explaining their past and thinking about their future—a basis for communication and group consciousness" (Bormann 1985, 128).

Thus, shared narratives function as the foundational core of meaning and interpretation within communities. In terms of the voice appropriation controversy, narrativity is both retrospective and prospective. It is retrospective in as much as it helps us to see why so much feeling has associated itself with voice appropriation. It is prospective in that it provides an additional rhetorical base or
platform on which to build the further rhetorical structure of argumentation and ethical evaluation. Human beings, Fisher argues, engage in a constant process of "recounting" and "accounting for". Recounting is largely descriptive and enumerative, taking the form of histories, biographies, or autobiographies. Accounting for, on the other hand, supplies the interpretive component, including theoretical explanations and/or arguments. Recounting can be expressed in various forms, including poetry, dramas, and novels. Fisher maintains that regardless of the form they may take, recounting and accounting for add up to the "stories we tell ourselves and each other to establish a meaningful life-world" (Fisher 1987, 62). The enterprise of story-telling and narration is one with a long history: Fisher declares that "[h]istory records no community, uncivilized or civilized, without key storytakers/ storytellers, whether sanctioned by God, a 'gift', heritage, power, intelligence, or election" (Fisher 1987, 67).

Narrativity has immediate relevance for voice appropriation. It is precisely "how" these key storytellers in modern society have been sanctioned (or believe themselves to be sanctioned) which is in dispute in the voice appropriation debate. The critical and still unanswered question of who has the "right" to tell the stories of others remains at the core of
many of the arguments surfacing in the voice appropriation debate. According to professor Gail Guthrie Valaskakis (1993) of Concordia University, the voice appropriation debate is indicative of the fact that we, as a society, remain "caught in the nexus between competing narratives, between what some call the narrative and the counter-narrative, in trying to find ways to express and act upon the cultural and political reality of difference" (Valaskakis 1993, 285). Valaskakis contends that while stories have always been recognized as "windows on who we are, what we experience, and how we understand and enact ourselves and others", few seem to understand that stories are much more than "a window on identity" (Valaskakis 1993, 285). Stories, that is, not only reflect who we are, but they also, in part, define who we are. Valaskakis argues that for First Nations people in particular, stories represent crucial teachings, prayers and songs, critical to Aboriginal ways of life and thinking. Valaskakis contends, it is precisely the spiritual power of narrative, as "teaching, prayer, song experienced through collective heritage which makes stories so valued and so important in Indian country" (Valaskakis 1993, 286). Stories instruct their listeners about what it means to be Aboriginal from generation to generation. Furthermore, Valaskakis, along with Stuart Hall (1985, 1986), envisions
representations and cultural narratives as central sites of cultural struggle (Valaskakis 1993, 286).

Other commentators on the appropriation debate have also focused on the importance of narratives. Marwan Hassan (1993), a Nlaka'pamux woman, for example, speaks of the "appropriation of narratives". Hassan alleges that the "master narratives" in today's society are predominately male, European, white and heterosexual (Hassan 1993, 29). According to Hassan, although these narratives remain in an abstract form, depicted in the power relations that exist in society, people are nevertheless "transported" and "contained" by such narratives (Hassan 1993, 30). Hassan cautions us that numerical superiority, whether sanctioned by duration or census figures, does not necessarily indicate a superior narrative.

With specific reference to the appropriation of First Nations' narratives, Ardith Walkem (1993) argues that not only is story-telling a constant creative process that places us in the world and keeps us connected, but also that when someone else tells your stories and speaks with your voice, your voice is "silenced" (Walkem 1993, 31). Walkem declares that "[u]nderstanding the power of story within First Nations culture means also recognizing that simple changes [in re-telling], far from being a simple stretch of the imagination represent a political act of
interference" (Walkem 1993, 32). Walkem warns that due to the critical role stories/narratives play in human lives, the appropriation of other people's narratives (especially those of First Nations people) necessarily involves issues of identity and authenticity. For example, Walkem argues, in the minds of many "Euroamericans" the image of First Nations people has been "frozen in history", with films and books depicting their people often solely in terms of traditional dress and festivals. This makes it possible for people to identify only with images of First Nations people from the past, without reflecting on the social impact these images have on the present (Walkem 1993, 32).

iii. ARGUMENTATION THEORY

Although argumentation can be considered a sub-category of the larger topic of rhetoric, argumentation is given its own section in this chapter in order to further explain and describe its role within rhetorical analysis. Consistent with this very broad conception of rhetoric-as-epistemic put forth by authors Cherwitz and Hikins, authors Van Bemeren, R. Grootendorst, and T. Kruiger (1984) situate argumentation as an important part of everyday,
personal, human experience and communication (Van Eemeren, Grootendorst, and Kruiger 1984, 1). According to these authors, all people advance arguments in defense of assertions and/or actions. Argumentation, then, can be defined as:

...a social, intellectual, verbal activity serving to justify or refute an opinion, consisting of a constellation of statements and directed towards obtaining the approbation of an audience (Van Eemeren, Grootendorst, and Kruiger 1984, 7).

Joseph Wenzel in "Rhetoric and Argumentation: An Introduction" (1993) reinforces the instructive role of argument analysis. He claims that argumentation at its best is "a process whereby problems are brought to attention and analyzed, interested parties become more knowledgeable and more critical about relevant facts and values, and solutions are hammered out on the anvil of controversy" (Wenzel 1993, 1). Unlike logic, which is mainly concerned with standards of validity, Wenzel adds that rhetoric is especially concerned with the "verbal artistry used to create arguments" (Wenzel 1990, 12). Rhetorical theory and argumentation, then, are concerned with particular forms of language usage. Argumentation, then, based on Webster's Dictionary (1986), is essentially the act of forming reasons, making inductions, drawing conclusions and applying them to a discussion. Accordingly, special attention has to be directed to the language employed in the voice appropriation.
controversy which uses terms such as "theft" (Blackley 1993, Hurka 1989), "stealing" (Dawes 1993, Keeshig-Tobias 1990), "robbery" (Dawes 1993), and "exploitation" (Fung 1993).

Since it is also a main goal of this thesis to examine the arguments that have surfaced in the voice appropriation debate, aspects of rhetorical theory and argumentation theory are utilized in order to develop and identify a taxonomy of the main arguments in the debate. Although the actual analysis of the various arguments and their positioning within a taxonomy will be conducted in Chapter Four, it is worth adding a preliminary statement here about this process with special emphasis upon the values embedded within argument discourse. According to Walker and Sillars (1990), Perelman's Theory of Values, which emphasizes the centrality of values to public discourse, defines the purpose of argument in public argument as eliciting or increasing the "adherence of the members of the audience to theses that are presented for their consent" (Perelman 1982, 9). Since the majority of claims and counter-claims made in the voice appropriation debate have been publicized in the print and broadcast media, and since a likely goal of those who are putting forth arguments in the debate is to elicit or increase the adherence of the members of the audience to the theses they present, the voice appropriation controversy can
also be considered a public argument in Perelam's terms.

In analyzing and categorizing the specific arguments in the voice appropriation debate, arguments are arranged in a taxonomy based on common denominators. Arguments are situated in the same 'category' if, for example, the arguments are based on similar values (e.g. freedom, solidarity); if arguments employ similar metaphors, analogies (e.g. property); if arguments draw upon common examples or justifications; and/or if arguments rely on similar lines of reasoning and logic (e.g. argument from consequences). Theoretical support for the method of classification of arguments into "types" as developed and utilized in this thesis, can be found in two sources: Claudia Mills's recent typology and Richard Weaver's interpretation and application of rhetorical theory.

Since the ability to situate an argument within a broader taxonomy also increases our understanding of that argument, this thesis applies and develops a primary framework put forth by Claudia Mills in her article, "Multiculturalism and Cultural Authenticity" (1994). In this piece, Mills proposes an analysis of what she calls, the "authenticity thesis", a thesis that "maintains that individuals representing the experiences of group A should (generally or even always) be members of group A" (Mills 1993, 1). By using Mills' primary classification system as a template or framework
on which to build, and by developing additional categories of arguments, this thesis attempts to increase understanding of the complex voice appropriation controversy.

Writing mostly in the 1950s and 1960s, Weaver provides a class which brings us more closely in line with the ethical mode of analysis. Weaver believed that rhetoric expressed the underlying values of its users (Foss, Foss, and Trapp 1985, 58). Two works which best reflect Weaver's views on rhetoric include: The Ethics of Rhetoric (1953) and Language is Sermonic (1970). Weaver proposes that there are types of arguments which reveal much about the person using them. There is a connection, that is, between the source of argument and the philosophical position of the rhetor. To Weaver, arguments are a means for interpreting reality and the goal of rhetoric is to persuade others to see the world as the rhetor sees it. More specific to the present thesis, Weaver claims that these "sources" or "types" of arguments can be "ranked" or "ordered" according to their ethical worth (Foss, Foss, and Trapp 1985, 59). Weaver also believed that from an ethical point of view, certain ways of arguing are better (more convincing, effective) than others. Weaver identified four broad types of arguments: Genus and Definition; Similitude; Cause and Effect; and Authority and Testimony. These four
types of arguments are ranked by Weaver in terms of their ethical value, worth, and effectiveness. Arguments by Genus and Definition rely on the presupposition that there exists classes which are "determinate" and therefore "predictable" (Foss, Foss, and Trapp 1985, 59). In arguments by Genus, the rhetor refers to the subject of debate and its class. The class is already established and accepted in the audience's mind and thus no definition of the class is needed. Argument by Definition is similar to argument by genus except that the class must be established anew or defined in the course of the argument. Weaver judged Arguments by Genus and Definition to be more ethical types of arguments than the others because they involve interpreting a subject by defining its fundamental and unchanging (or generally agreed upon) properties (Foss, Foss, and Trapp 1985, 59). Argument by Similitude interprets the subject of debate by relating it, in terms of similarity or dissimilarity, to other things that the audience is more familiar with. This type of argument includes analogy, metaphor, figuration, comparison, and contrast. Argument by Cause and Effect attempts to predict the results of particular actions in terms of cause and effect. This type of argument, according to Weaver, is less ethical and convincing than the previous types because it allows the present circumstances to over-ride
all other circumstances (Foss, Foss, and Trapp 1985, 61). Lastly, according to Weaver, is Argument by Authority and Testimony. This argument type is often considered least ethical because, unlike the first three argument types, it relies on observer's status or expertise when evaluating statements or claims, instead of relying on direct observation and concrete evidence. The strength of such arguments is determined by the competence and integrity of the witness or expert (Foss, Foss, and Trapp 1985, 62). Again, for the purposes of this thesis, the value of Weaver's theory lies less in these specific argument types and more in his general method of classifying arguments.

In sum, Weaver's rhetorical theory of argumentation has at least three specific applications for the present thesis. First, Weaver's classification of arguments supports the general method of classifying arguments as an approach to understanding this area of discourse. Second, Weaver's evaluation of certain arguments types as more or less ethical (or convincing) than others assists us in understanding how some voice appropriation arguments are really less convincing than they may appear at first glance. Thirdly, Weaver's taxonomy provides yet another bridge between the rhetorical and ethical dimensions of the voice appropriation debate.
iv. ETHICAL THEORY

The section on narrativity underscores the profound moral and spiritual dimensions of cultural discourse. The penultimate chapter of this thesis will examine the ethical and social dimension of the voice appropriation debate, culminating in the application of a feminist moral theory. Since the issue of voice appropriation, when framed as it is in terms of "theft" and speech "freedom", is unavoidably an ethical issue; and since, as Aristotle (Johnstone 1980, 18) and others have indicated, rhetorical practices (including narrativity) are inherently of ethical significance, it follows that a discussion of voice appropriation would be incomplete, certainly fragmentary, without the application of suitable ethical theory. The intimate relationship between rhetorical practices and ethics, for example, is acknowledged most recently by Ann Gill in *Rhetoric and Human Understanding* (1994). Gill argues that:

Rhetoric, whether seen as the art of persuasion or the means whereby knowledge is created, implies an ethic, for rhetorical choices have results that can affect other human beings in profound ways (Gill 1994, 52).

Accordingly, Chapter Five will supply the theoretical underpinning for an ethical evaluation of the voice appropriation debate. The argument unfolds
in three stages. The first stage employs access theory as it pertains to the right to communicate and access to communication mediums. This level of analysis offers a more juridical tone since it refers to an individual's rights and freedoms. However, since the freedom to communicate, communication rights and access issues apply generally to individuals in both minority and dominant cultures, the argument from "right to communicate" is too indeterminate. The second stage of ethical analysis uses John Rawls's "veil of ignorance" theory, a justice strategy from which one can evaluate voice appropriation. At this stage, the ethical distinction between the minority and dominant culture claims becomes more focused. Rawls's decision-making strategy (which involves the imaginary shedding of all social distinctions within a context of negotiation) tends to favour the weaker party in a dispute by requiring decision makers to evaluate the situation from a 'blind' vantage point (without knowledge of future social position and individual strength within that situation). Lastly, offering a more nurturing tone, an "ethic of care", as proposed initially by Carol Gilligan (1982) and Nel Noddings (1984) will be explored in terms of its contribution and place in the voice appropriation debate. An "ethic of care" is an empathic approach to morality, an orientation to moral problems wherein persons see
themselves in relation to, and make moral decisions based on, their "connectedness" to others. Instead of considering only one's own position, rights and role, decision makers experience themselves as part of a network of relationships (Noddings 1984, 43). This approach is especially appropriate in evaluating the position of vulnerable communities who claim to be wounded and weakened by cultural theft.

Individually, any one of these three ethical approaches might seem inadequate to address the complex issues surrounding voice appropriation. In combination, however, these strategies offer a comprehensive and compelling methodological approach from which we can better evaluate the voice appropriation controversy.
CHAPTER 4

A RHETORICAL ANALYSIS OF VOICE APPROPRIATION

I. INTRODUCTION

The voice appropriation controversy is frequently reduced to a simplistic contest between voice appropriation complaintants and free-speech defenders in which points are scored but no clear winner emerges--as long as it is viewed abstractly as a contest between competing rights. In point of fact, voice appropriation discourse is a skein of different rhetorical thrusts and counter-thrusts in which a combination of historical, social and qualitative considerations suggest that minority complaints have a stronger moral case.

This chapter analyzes and arranges the various claims and counter-claims made by artists, academics, and journalists over the past few years in order to construct a typology of arguments in the voice appropriation controversy. Elements of rhetorical theory, argumentation, and ethical evaluation figure into this typology as a combined method of analysis of voice appropriation arguments. Indeed, this classification of arguments by "types" is a crucial step in achieving clarity and understanding about the discourse involved and its ethical dimension.

There appear to be 17 specific forms of arguments
after reviewing the debate as depicted in Canadian academic journals, magazines and newspapers over the past five years. These 17 argument types, in turn, can be grouped into three principal classes. While arguments are identified in terms of their rhetorical type and structure in this chapter, these arguments will also be assessed with an eye to their relative strengths and weaknesses. Furthermore, this chapter will also attend to the way language is used in certain kinds of appropriation arguments. While the arguments and principal classes identified in this chapter do not necessarily represent an exhaustive account of the voice appropriation controversy, they certainly come close to that in that they represent the most common and recurrent themes in the debate and their relative frequency.

II. CLASSIFICATION IN CLAUDIA MILLS'S "AUTHENTICITY THESIS"

In her 1994 article, "Multiculturalism and Cultural Authenticity", Claudia Mills records four versions of what she calls the "authenticity thesis"—the thesis that "maintains that individuals representing the experiences of group A should (generally or even always) be members of group A" (Mills 1994, 1). Mills, a
philosopher, is the first and, until 1995, the only person to examine and classify the arguments underlying voice appropriation. Her schema is worthy of our attention both for its originality and for the quality of its analysis.

Mills claims there are essentially four arguments in the "authenticity thesis." The first of these, the "Argument from Opportunity", asserts that where a member of group B is selected for (or chooses) a job discussing or representing group A's experiences, some A group member is simultaneously rejected for the position in question. Thus the argument focuses on the loss of employment opportunities for group A members. In the narrow version of this argument, Mills believes a member of a "victim group" (e.g. Blacks, Aboriginals) must be the one violated, for they are the ones who have suffered limited opportunities in the past or elsewhere. In the broader version of this argument, group A members could be members from any group (e.g. women, seniors), regardless of their history or status, and not necessarily one that is victimized. Skill, ability, and talent do not appear to factor into this argument type.

A second and related claim in the authenticity thesis is what Mills calls the "Argument from Ownership." Here, the experiences and cultural artifacts of group A are considered in some way to
be the 'property' of that group. Therefore, outsiders who attempt to represent the experiences of group A are guilty of a type of "plagiarism, of profiting from stories that are not one's own" (Mills 1994, 3).  
According to Mills, there are two problems with this argument. One concerns the concept of ownership itself: It is questionable whether broad intangibles such as spirituality, culture, and themes can be 'owned' by anyone. If they can be owned, in what sense of ownership? In reference to this concern, Mills claims a distinction can be made between sharing and trafficking. Unfortunately, she offers no definition of these terms, nor does she elaborate on their distinctiveness. The other difficulty is that this argument seems to carry much less weight if outsiders represent the group respectfully and conscientiously rather than merely opportunistically (Mills 1994, 3). Latent in this argument is the concern that one's stories and experiences will be misrepresented or distorted by the outsider.

This latter concern graduates into Mills's third statement of the authenticity thesis: the "Argument from Accuracy." Here the emphasis is epistemic, since this argument asserts that representations of group A will be the most accurate when they are produced by members of group A. Mills is at pains to point out that the argument does not claim that group A
members are the only ones who can represent group A experiences, but rather that group A portrayals will be more authentic and accurate than those of outsiders. A possible weakness with this argument, according to Mills, is that sometimes group A members fail to see something about themselves that outsiders can easily recognize.

The final claim in the authenticity thesis, the "Argument from Solidarity", proposes that group A audience members have a need for materials about their own culture, made by people from the same culture; and that such representations foster a sense of community among group A. According to Mills, the problem with this argument is that group solidarity is usually most important for victim groups, and thus the argument would only apply in certain circumstances (Mills 1994, 4). It may not apply, for example, in the case of groups who have not been victimized (e.g. recent Irish emigres).

At first glance, Mills's typology is remarkable for its originality and for the quality of its analysis and assessment of some of the most common arguments depicted in the voice appropriation debate. However, our literature review indicates that her account now appears fragmentary and incomplete --depicting only some of the anti-appropriation arguments. This becomes more evident in the Canadian context. Thus, while
Mills's typology is useful as a starting point in this thesis, its principal limitation is that it reflects only minority group arguments. This thesis, however, undertakes a more comprehensive analysis of voice appropriation discourse by also attending to arguments used against the claims typically presented by minority groups. Thus, in addition to Mills's four arguments, this chapter discloses 13 more arguments common in the voice appropriation debate. The resultant classification scheme or typology offered in this chapter situates some 17 arguments within three broad divisions or categories within which ethical concepts dominate.

III. MOVING BEYOND MILLS'S SCHEMA

i. Arguments from Epistemic Quality and Epistemic Authority

The 17 arguments fall into three broad genres or groupings: arguments stressing epistemic qualities; arguments with an ethical base; and meta-arguments. There is also a fourth, more specialized genre of argument (p.127) which has emerged more explicitly from this writer's discussions with her committee members. The arguments in the first of these groupings assert that certain people or groups possess a special
quality or authority that certifies them to be the designated 'knowers' in a particular subject area. Arguments contained in this category claim that 'we', in group A, are the ones (or, sometimes, the only ones) who 'know' and can 'know' about group A experiences. These epistemically phrased arguments include: Claudia Mills's Argument from Accuracy and three additional types: the Argument from Cultural Authority, the Argument from Knowledge, and the Argument from Narrative Creativity. Since this last argument type rests upon the mentalistic concepts of creativity and imagination it lends itself to inclusion in the epistemic category.

a. Argument from Accuracy


Claudia Mills's Argument from Accuracy, which asserts that being a member of a particular group is an "epistemological requirement for knowledge" about that group (Mills 1994, 4), is probably the most popular argument invoked in the voice appropriation debate. Though this version of the argument might appear to be a priori, Mills argues that it is not. It is not
a normative one but rather an empirical argument. The Argument from Accuracy, that is, does not necessarily claim that only members of group A have the right to depict group A; it simply claims that representations done by group A members about group A experiences will tend to be more accurate than those done by group B. It assumes that direct experience is related to accurate portrayals. The argument also assumes accuracy of the representation can be measured empirically (by observation or experiment). At its simplest level, Mills argues that this argument gains support through common-sense appeals to the need for first-hand experience of one's subject. Basically, the Argument from Accuracy claims that "it takes one to know one" (Mills 1994, 4). In addition to its common-sense appeal, this argument is flexible in that it can be applied to different kinds of appropriation because it does not require what Mills calls a "victim group" (a group of people who have been disadvantaged or neglected in the past or at present). Thus, according to Mills, Argument from Accuracy can be invoked by both dominant and victim groups since the argument claims only that insiders' knowledge is best and usually most accurate.

It is worth noting that some commentators (Browning 1991) would disagree with Mills's claim that this argument can be used by both victim groups and dominant
groups. They argue more restrictively and exclusively that victim groups have suffered experiences in ways that the dominant group is incapable of truly understanding since the latter have not directly experienced such events (Browning 1991, 33). As reflected in the writings of Browning, this stronger version makes group membership a necessary condition of accurate cultural representations.

b. Argument from Cultural Authority


Argument from Cultural Authority begins with the point that because of status, position, and/ or opportunity, a few members of group B might be considered 'experts' on the cultures (experiences) of group A. Furthermore, because the public perceives these people as 'experts' or 'authorities' on the subject, even when members of group A produce their own accounts, group A members will not receive due attention or recognition. The contested issue then becomes how we decide who is the 'authority' on a particular subject and who ought to be able to represent that subject. According to commentator Janisse Browning, this argument is intimately connected to
the issue of "culturally defined self-representation" or self-determination (Browning 1991, 34). Speaking for Black women, Browning argues that

[t]hose who are unfamiliar with our pain and the nature of our racially- and culturally-influenced ways of seeing and experiencing life should tend their own gardens before they jump into hoeing ours. They might be cultivating weeds instead of flowers without even knowing it" (Browning 1991, 35).

Similarly, commentator Richard Hill (1992), a Cree, argues that his anger against the act of appropriation results not from the fact that the images created by outsiders are often racist or mis-representative, but rather because these images, developed by outside 'experts' seem to "dominate discourse and become the central notions about us" (Hill 1992, 13). Hill also believes that "one reason many First Nations peoples have refused to be identified as 'Indian' artists is because 'Indian art' has previously been defined almost entirely by White writers of art theory and history" (Hill 1992, 22). In short, the authority to define (i.e. to know) one's self and culture is not really sharable: It belongs to a (minority) culture's own artists and spokespersons—or ought to. Membership is the mother of both accuracy and authority.
c. Argument from Alternate Knowledge


This argument type favours appropriation since it asserts that there are more ways of knowing than by direct, firsthand experience. Whereas the Argument from Accuracy (both weaker and inclusive forms) and the Argument from Authority make cultural immersion a privileged form of knowledge, there is a class of competing arguments which appeals to alternate knowledge. In fact, Anne Cameron in *Language In Her Eye* (1990) argues that as long as one makes an honest attempt to find out what it is like as the "Other", one does not need direct, personal experience in order to know. Furthermore, writer Carol Shields claims that we want and need the stories of others (Shields 1990, 257). Shields and other writers advocate that there are many ways to know and experience life, and that a good writer will always find a new way to approach the subject. According to writer Robert Enright (1992), for example, it is the imagination that gives people insight into events not directly experienced.

Thus, the Argument from Alternate Knowledge supports or can be used to support the act of appropriating the voice of another based on the belief
that there is no single, 'authentic' way to see the world: There are multiple ways to experience the same phenomenon. One commentator, Varadharajan (1991), argues that there has been a "false collapsing of epistemology and appropriation" in the ensuing voice appropriation debate, and that "to know is not always to violate" (Varadharajan 1991). Knowing, or the desire to know about the experiences of others can be healthy and genuine. Finally, with some sarcasm, commentator Erna Paris (1992) sums up this more liberal approach by dismissing the concerns over authenticity of voice "as though truthfulness of vision were the unique prerogative of people with insider knowledge" (Paris 1992, 16[A]).

To summarize, the class of epistemic arguments comprises two competing ideologies: arguments for a position of special status of knowledge through cultural immersion, and arguments allowing for perfectly valid alternative knowledge or talents (e.g. imagination). Clearly, each serves as a constraint upon the other.

d. Argument from Narrative Creativity

(Bissoondath 1992; Cummings 1992; Giangrande 1990; Ross 1991; Rule 1990)).

Within the category of epistemic authority, where
knowledge or ways of knowing dominate, a final class of arguments focuses on the aesthetic and/or narrative quality in producing cultural texts. These stress mentalistic features of imagination and creativity, and generally favour or justify the appropriation side of the contest. These arguments draw attention to the point of view of the narrator in claiming that the ability to write in the voice of another is a crucial part of the creative process. Commentator Joan Thomas believes that the "imaginative act of writing is one of our best ways of transcending the barriers of age, race, class, and gender" (Thomas 1992, 36[C]). Similarly, the outspoken Neil Bissoondath argues that writing in the voice of another is an "act of discovery"—a "demystification of the other" (Bissoondath 1992, 22). Carrying the Argument from Narrative Creativity further, writer Jane Rule (1990) claims that the ability to create a range of characters is one of the "requirements" for a writer of fiction (Rule 1990, 226). Other commentators (Cummings 1992, Giangrande 1990) go so far as to link the voice appropriation controversy with the "crisis of the imagination" (Cummings 1992, 18[A]) and with "putting 'No Trespassing' signs in our psychic landscape" (Giangrande 1990, 18[A]).

In sum, a number of writers defend appropriation-style behavior as a perfectly valid form
of artistic exercise even though they may not explicitly defend appropriation itself.

ii. Ethically-Based Arguments

A noticeable portion of the appropriation debate comprises arguments phrased in the language of morality. Though not unrelated to epistemic qualities (e.g. truth, accuracy), the arguments now turn on preferred ethical states (such as freedom, equity and responsibility) or on unethical practices such as theft and racism. These kinds of arguments, because of their moral weight, carry additional persuasive force.

a. Argument from Freedom


This argument type is grounded in the belief that freedom of expression and/or speech is paramount, and that it tolerates little or no opposition even at the price of the others' sensitivities. It is probably the most common argument on the side of appropriation. Some commentators, such as Neil Bissoondath who supports the Argument from Freedom, link artistic freedom with
"freedom to offend" (Bissoondath 1992, 22). Those who use Argument from Freedom in the voice appropriation controversy often include powerful analogies and emotional images and language in their explanations. For example, references are often made to past instances of censorship and to overt violations of freedom of expression, such as book burning by the Nazis in the 1930s. Images of the "thought police" have also been invoked by some commentators (Young 1992, 6[B]). Canadian writer Robert Fulford entered the voice appropriation debate by arguing that freedom of expression is one of our society's most "cherished orthodoxies" (Fulford 1994, 25). From Fulford's comment and those made by others it becomes clear that Argument from Freedom gains most of its mileage from positioning itself in opposition to any restrictions upon artistic freedom, including telling artists who they may and may not depict.

b. Argument from Rights/Access


In the context of voice appropriation, freedom of expression (freedom to communicate, speech freedom) frequently particularizes itself in the language of
rights and access. One's freedom, either from a majority or minority perspective, expresses itself as the right to create narratives, images etc. So both sides of the voice appropriation debate use the argument from rights. Within the minority perspective, however, the right to create images and narratives is seen as meaningless unless it also entails access to media as well as to a set of conditions (e.g. funding) which empower the minority artist to exercise those rights. Accordingly, in this context the Argument from Rights/Access characterizes minority claims. Where Argument from Rights supports unrestricted expression, Argument from Rights/Access laments the price of such unrestricted freedoms. The Argument from Rights/Access stresses the need that minority artists have for access to media outlets, resources and even a developed sense of self. This argument type claims that the "right" to use the voice of another has been bought at the high price of "silencing of the other" (Philip 1989, 212). Furthermore, advocates of Argument from Rights/Access believe that a right is meaningless, and even dangerous, if it exists without a correlative duty. Minorities argue that access to media and publishing is crucial since access, or lack thereof, is distributed unequally throughout Canadian society. Thus, while every Canadian citizen may, in theory, have the 'right' to write/create in any voice,
in reality only privileged groups and persons can actually exercise this right. Marlene Nourbese Philip (1990), another Canadian writer, argues that without the ability to write/create in one's own voice (due to lack of resources or access), the supposed 'right' to do so is meaningless. Furthermore, Philip claims that white writers tend to focus on their right to use the voice of others, but neglect minority writers' right to have access to publishing houses and to have their work adequately acknowledged. One right without the other is "unfair" and "undemocratic" (Philip 1990, 217). Consonant with Philip's comments, both Janisse Browning and Lorretta Todd describe cultural appropriation as the "inverse of cultural autonomy", and add that cultural autonomy is necessary for liberation (Browning 1991, 31).

Argument from Rights/Access in the mouths of minority groups, then, acts as a counter-argument to Argument from Freedom. Both Argument from Freedom and Argument from Rights/Access invoke similar themes of rights, freedoms, and access, yet each argument operates at a different level. The Argument from Freedom operates at a very generalized level. The Argument from Rights/Access, on the other hand, is grounded in the needs and empowering conditions of much smaller, vulnerable and victimized groups. One is tempted to argue that both have logical force, but
that the Argument from Rights/Access is, at least ethically, on firmer ground since it considers both rights and enabling conditions of those in a position of greater need.

A major problem with Argument from Rights/Access is that the argument overlooks commercial realities. The argument often ignores the crucial commercial factor present in nearly all art work today. The concept of access, in this argument type, is based on the assumption that there exists a finite and constant market, and that if writer B were not published, writer A would be. The arts, unlike other 'products' (gasoline, milk) cannot be viewed as a finite system of commodities. Furthermore, many artists would argue that in terms of publishing and funding, the underlying idea is more 'survival of the fittest' or the best rather, than access for all, regardless of their ability and creativity. Evelyn Lau, one of the more outspoken artists on this topic, and a 'minority' artist herself, resents this forced "awareness of colour differences in writers" and contends that publishers do not discriminate against writers of colour--that it is not "any easier for a talented white writer than for a talented writer of colour" (Lau 1994, 3[D]). In fact, while Lau agrees that "[i]t is hard to publish and find an audience", she insists "writers share this difficulty equally" (Lau 1994, 3[D]). In tandem with
Lau, 'minority' writer, Neil Bissoondath (1994) argues that the "difficulties of getting published, and published effectively with good production, good distribution, wide notices-is one shared by every writer and would-be writer in the country, regardless of colour or ethnicity" (Bissoondath 1994, 165). More significantly, in terms of the weaknesses of Argument from Access, Bissoondath questions when "tokenism" stops being "tokenism?" He wonders "[h]ow many 'minority' writers must be published before the accusation is retired?" (Bissoondath 1994, 165).

c. Argument from Ownership


In the Argument from Ownership, a category of argument already identified by Claudia Mills (1994), the claim is made that group A's narratives and images are the "property" of group A. When this cultural 'property' is taken by others, some groups argue a "plagiarism of sorts"--a profiting from others' stories--transpires (Mills 1994, 3). Stories and experiences are construed as commodities that can be "stolen", "appropriated" and "exploited" (Dawes 1993,
10, 14; Keeshig-Tobias 1990, 7[A]; Lutz 1993, 247). Embedded in the ownership argument is the concern minority groups have about outsiders acting "opportunistically" and as a result, misrepresenting or distorting their stories and experiences (Mills 1994, 4). Issues of "copyright", "robbery", and "expropriation" also attach to Argument from Ownership when cultural experiences and histories are construed as the exclusive property of one particular group (Dawes 1993, 10, 14; Lott 1993, 19).

The most problematic aspect of Argument from Ownership is the question of ownership itself: Can spirituality, culture, themes, and plots ever be 'owned' by anyone or any group? Is ownership a misleading metaphor? Analogously to the Argument from Accuracy, which claims 'we already know' or 'know best', Argument from Ownership is even more an a priori argument since it claims in absolutist tones, that its members own its narratives by virtue of membership in the group.

Another version of Argument from Ownership is Argument from Displacement which signifies those arguments which address in greater latitude the displacement of a group of people (usually Aboriginal peoples)--an entire culture and history. Thus, in this version, appropriation is understood as part of the larger process of dislocation of a culture. Hartmut Lutz (1990) puts it this way:
In looking at the appropriation of Native cultures by non-Natives, and considering how very little, as a rule, non-Natives in North America tend to know about the indigenous cultures of the continent, it seems obvious that something like a collective displacement of the process of colonization, dispossession, partial genocide and continued cultural ethnocide has and is taking place (Lutz 1990, 174).

Lutz considers appropriation to be "ahistorical" because the history of Native/non-Native relations is ignored: it simply does not figure in the "agenda" of appropriation discourse (Lutz 1990, 173). Lutz is obviously referring to the sad history of abuse, oppression and genocide that Native peoples (in terms of their language, culture and land) have faced at the hands of the white man. In agreement with Lutz, Canadian writer and poet Dionne Brand (1993) claims that notions of "voice, representations, theme, style, imagination" are charged with historical dislocations that often pass by unexamined, completely ignored by the larger society. Brand insists that these historical dislocations and contexts, and their impact on the present, must be rigorously examined when considering the issue of voice appropriation (Brand 1993, 15).
d. Argument from Opportunity


Argument from Opportunity, one of the four argument types diagnosed by Claudia Mills (1994), is conceptually allied to the Argument from Ownership. It maintains that where a B-group member (a member of the dominant group) is selected for a job that involves discussing, teaching or otherwise representing A-group (minority group) experiences, some group A member has been simultaneously rejected for the position, resulting in loss of an important opportunity for that group A member (Mills 1994, 2). Mills believes that this argument is only effective if group A is a "victim group"--a group which has in the past and/or continues to suffer from lost opportunities and discrimination. Thus, the strength of this argument, according to Mills, depends on the value we assign to equal opportunity (Mills 1994, 2). Argument from Opportunity is also relevant to Affirmative Action programs and hiring quotas that many Canadian organizations have chosen to or been forced to implement.
e. Argument from Racism (Reverse-Racism)


Argument from Racism (Reverse-Racism) is an argument type invoked by both those who believe appropriating the voice of another is morally wrong and by those who believe that putting oneself in the 'shoes' of others creates better understanding. In order to distinguish between the two versions of this argument, the work done by the two will be treated as claim and counterclaim, or Argument from Racism versus Argument from Reverse-Racism.

Argument from Racism, in its strongest form, claims that telling another's story, no matter how it is done, is "in itself racist" (Black and Morris 1993, 20). There appears to be an element of social determinism at work here since the argument refuses to consider the quality or accuracy of the representation and provides no boundaries for the definition of racism. It simply makes one sweeping generalization: Only if you are born into a particular race/class, may you represent that race/class. Should you represent those outside your race/class, you are labeled a racist. According to Roy Miki, writer and organizer of The "Writing Thru Race" conference held in Vancouver in
1994, despite all of Canada's other differences (age, gender, nationality), Canada's one common ground is our shared "racism" (Miki 1994, 23[A]). Similarly, Dionne Brand argues that formal culture in Canada is organized around "whiteness" and the false assumptions of "white racial superiority" (Brand 1993, 17).

Based upon these premises, one might question whether a "minority" writer would be considered a racist if he/she were to depict a "majority" person? While no author specifically responds to this paradox, the questions appears to have a built in dimension for minority members due to their shared oppression and discrimination: the focus of voice appropriation and the desire to be heard revolves only around themselves and their group, not the majority. Both Janisse Browning (1991) and Marlene Nourbese Philip (1990) imply that because of the power dynamics between majority and minority members, appropriation of voice (by the minority members) is simply a non-issue. How could a minority take way from a majority when the majority member already has a clear advantage? Moreover, Philip, in effect, dismisses this question by claiming that "once an oppressed group is finally able to attain the means of making its voice heard...it is far less concerned in rendering audible the voice of its oppressors, and infinitely more interested in making public the group's own reality" (Philip 1990, 118)
In response to Argument from Racism, Argument from Reverse-Racism is often invoked by those who support the act of appropriating the voice of another; and, as the sub-title indicates, it too employs the powerful charge of racism. Argument from Reverse-Racism claims that the idea that only members of a race can write about or otherwise depict that race is "based on false and even racist assumptions about the differences between groups" (Thomas 1992, 36[C]). Advocates of this view argue that other factors such as age and gender influence experience just as much as ethnicity. Furthermore, charges of cultural appropriation draw "inappropriate and regressive attention to race and ethnicity" (Thomas 1992, 36[C]). One commentator (Alexis 1995) disputes Brands's argument from racism, claiming that he resents the connotation made by Brand that "white" is a "synonym for racist" (Alexis 1995, 19[C]). In reference to the 1994 Vancouver conference "Writing Thru Race" to which only minority writers had access, commentator Val Ross (1994, 15[C]) reports that many white writers alleged "reverse-racism" since only white writers were excluded from the conference.
f. Argument from Equality


The Argument from Equality is essentially a response or counter-argument to Argument from Opportunity, since it proposes that those who are truly talented will get published eventually, regardless of their race or ethnic background. Despite its connection to Argument from Opportunity, Argument from Equality remains situated in this section of the thesis because of its ethical slant—it assumes all people ought to be treated equally in a given society. Evelyn Lau, a non-white writer, champions this argument when she states that when it comes to publishing and artistic exposure, colour and race matter less than talent and perseverance (Lau 1994, 3[D]). Lau believes that all artists face the same difficulty of finding a receptive audience and getting their work published. Arts critic, Christopher Hume, agrees with Lau when he argues that there exists plenty of opportunity for minority artists within the present publishing houses and media structures. Furthermore, Hume claims that telling one group of people that special funds will be set aside for them because of past injustices will only make that group feel different and alienated. Equality would be better served if we allowed "nature
to take its course" (Hume 1994, Ideas on Stereo).

The Argument from Negative Multiculturalism can be classified as a variant of Argument from Equality. The Argument from Negative Multiculturalism, articulated best by its most forceful spokesperson, Trinidad-born writer Neil Bissoondath, claims that multiculturalism is protectionist: it encourages people to "hide behind ethnic walls" (Makin 1994, 4[A]). Bissoondath insists that not everyone wants to be constantly associated with their ethnic origins, and that some people even resent such links (Bissoondath 1994; Makin 1994, 4[A]). Critics of Canada's 1971 multiculturalism policy and its special treatment for minority artists, argue that multiculturalism has "robbed the country of common values and an accepted heritage" (Makin 1994, 4[A]). Along with Bissoondath and other critics of multiculturalism, Evelyn Lau is "suspicious" of multiculturalism's influence on the arts; and she believes closed conferences like the "Writing Thru Race" conference, which multiculturalism encourages, are unlikely to create opportunities for anyone (Lau 1994, 3[D]).
g. Argument from Solidarity

(Black and Morris 1993; Cernetig 1994; Dawes 1993; Maclear 1993; Mills 1994; Valaskakis 1993; Valpy 1994;).

According to Claudia Mills (1994), who first identified it, the focus of Argument from Solidarity is the cultural health or integrity of the minority group. Argument from Solidarity claims that group-A (minority group) members have an interest in and a need for material about their own lives and culture in order to foster a sense of community (Mills 1994, 4). "Group solidarity" Mills argues, is most important for victim groups. Accordingly, the Argument from Solidarity appears to be an a posteriori argument since it proposes a goal--fostering solidarity among minority cultures. A variant of this argument is found in articles and commentaries dealing with the 1994 Vancouver conference "Writing Thru Race". It comprises comments made by William Deverell (vice chairperson of the conference) and by other organizers of the closed conference who claim that the conference provided an opportunity for non-white writers to "share their problems in the comfort of their own numbers without the eyes and ears of Big White Brother to mute their voices or, indeed, their anger" (Valpy 1994, 2[A]). Argument from Solidarity was further exemplified when many participants in the "Writing Thru Race" conference
identified strategy meetings such as the closed conference itself, as a special form of 'voice'.

h. Argument from Political Effectivity and Moral Responsibility

Argument from Political Effectivity and Moral Responsibility is articulated most clearly (and maybe even solely) by author Linda Alcoff (1991) in her article, "The Problem of Speaking for Others". In this article, Alcoff explores both the practical and moral dimensions of speaking for others. Alcoff insists that the proper response to the voice appropriation controversy should not be a total retreat from such a practice. While she agrees that we need to encourage more receptive listening on the part of privileged groups, a retreat from speaking for others in all instances may result merely in a "retreat into a narcissistic yuppy lifestyle in which a privileged person takes no responsibility for her society whatsoever" (Alcoff 1991, 17). In other words, Alcoff argues, such a retreat from speaking for others is irresponsible and significantly undercuts the possibility of what she calls "political effectivity" (Alcoff 1991, 17).

Political effectivity, according to Alcoff, enters
the appropriation controversy by questioning whether speaking for others is at all effective: does it serve a purpose; does it have an intended effect? Alcoff believes that the possibility of speaking for others in terms of helping or empowering others, bears crucially on the possibility of political effectivity because "[b]oth collective action and coalitions would seem to require the possibility of speaking for" (Alcoff 1991, 11). She is convinced that there are instances where the practice of speaking for others has been "politically efficacious in advancing the needs of those spoken for" (e.g. fund raising for a cause, publicity, and government pressure) (Alcoff 1991, 18).

In addition to speaking for others being politically effective in certain instances, Alcoff argues that privileged persons may also have a moral obligation to speak out on behalf of those less advantaged. Retreating from speaking for others as a response to the contemporary political climate, or in other words, declaring that "I speak only for myself", has the "sole effect of allowing me to avoid responsibility and accountability for my effects on others; it cannot literally erase those effects" (Alcoff 1991, 20). Thus, in claiming we will speak only for ourselves, we take no responsibility for being "true" to the needs and experiences of others (Alcoff 1991, 22). Alcoff is convincing when she concludes that
"surely it is both morally and politically objectionable
to structure one's actions around the desire to avoid
criticism, especially if this outweighs other questions
of effectivity" (Alcoff 1991, 22). The moral tenor
of the argument is unmistakable when Alcoff stresses
the individual's responsibility to others. For that
reason, this argument is situated within the containing
category of ethics.

IV. META-ARGUMENTS

There are three voice appropriation arguments
which figure as meta-arguments because they present
themselves not so much as one of the positions within
the debate, but rather as commentaries about the larger
controversy itself. Structurally, then, the arguments
pose themselves outside the debate. All three of these
meta-arguments reflect the sentiment that the
appropriation debate is unworthy of the degree of media
and public attention it has received, and that the
debate itself has been greatly inflated. The category
of meta-arguments comprise the Argument from Political
Correctness; the Argument from Diversion; and the
Argument from Absurdity. Even though the meta-arguments
are essentially dismissive of the issue, they tend
to favour the side which allows voice appropriation.
i. Argument from Political Correctness

Simply stated, this argument claims that voice appropriation has only become an issue in the media and in artistic circles because of the current atmosphere of 'political correctness'. This argument perceives the voice appropriation controversy as a reflection of the political and economic conditions in Canada at present. While the CBC continues to suffer from budget cuts and Canadian media outlets fight to stay alive in the shadow of larger, more financially stable American companies, there is pressure to reduce popular sentiments of frustration and economic hardship to the discourse of victimization. Neil Bissoondath summarizes this victimization discourse and the voice appropriation debate itself by arguing (somewhat sarcastically) that:

the writer who dares to explore the territory deemed not his or her own becomes a thief, open to charges of racism, sexism, imperialism from people who object to being portrayed in ways other than they would portray themselves--and self-portraits, let us face it, tend to be free of blemishes (Bissoondath 1994, 167).

In reference to this argument type, commentator John Bentley Mays has been the most outspoken. His position, more rhetorical than logically developed, is that:

appropriation...is, of course, a key buzzword in the bash-a-honky rhetoric now popular among 'minorities'
and others who have decided history has given them a raw deal" (Mays 1994, 15[C]). Thus, the Argument from Political Correctness dismisses the entire voice appropriation debate by relegating voice appropriation to a cluster of popular political and social slogans.

ii. Argument from Diversion


Argument from Diversion is articulated best by writer June Callwood, who argues that the voice appropriation controversy itself deflects us from the real issues and away from consensus:

[w]e will not survive if we do not find the common ground. The style of raw accusations which prevails now...diverts energy and focus from the real issues of our times, which are poverty, violence and the suffering of children (Ross 1994, 1[C]).

The argument is simple in outline since it claims only that too much time and energy is being wasted on the appropriation debate--time and energy which could be pooled together and expended on more crucial social issues. Writer Carol Shields (1990) extends Argument from Diversion one step further when she adds that "[a] lot of energy has been lost in the name of
authenticity; we fear far too much that critical charge--'it doesn't ring true'--and worry too little that it may not ring at all" (Shields 1990, 257).

iii. Argument from Absurdity


The last of the meta-arguments simply dismisses the entire voice appropriation issue by labeling it "absurd". Philosopher Sidney Hook claims the voice appropriation issue, especially when it enters the realm of scholarship, indicates nothing more than a "sophisticated revival of the old folk fantasy"--that "only like can understand like" (Hook 1989, 31). Hook's argument is itself structured in classic "reduction to the absurd" form: when he claims that arguing against voice appropriation is analogous to arguing that "men cannot be good gynecologists, that only women with children can understand and administer family law, that only fat physicians can study obesity and hungry ones the physiology of starvation" (Hook 1989, 32). Hook, then, joins others (Ross 1991; Phillips 1991) in rejecting 'authenticity of voice' as an absurd requirement since it violates the basic tenants of creative and effective writing. Caryl Phillips, himself
a writer of Colour, also considers the question of voice appropriation to be an "absurdity" and claims he pays little attention to the entire debate (Ross 1991, 1[C]). But Phillips then moves on to make a much more interesting point when he remarks that James Baldwin, the celebrated Black American writer, was much closer to the truth when he argued that "the true novel of American racism will be written from the point of view of a white member of a lynch mob" (Ross 1991, 1[C]). Phillips, whose recent novel Cambridge is told through the voice of a 19th century slave-owning Englishwoman, claims that what people are forgetting in the voice appropriation debate is that "[t]he novelist is not there to judge his characters but to give them life" (Phillips 1991, 1[C]).

V. Argument from Aesthetic Value or Commercial Appeal

This final argument is placed in a genre of its own since, unlike the other argument types, it is based on the commercial appeal (profit potential) of works of art. It emerged more clearly and explicitly during this writer's discussions with her committee members. While Argument from Aesthetic Quality is both similar to Argument from Equality in many ways and represents a less published argument in the mainstream media,
it remains a valid argument: an argument that often surfaces when voice appropriation is discussed in casual conversation. Argument from Aesthetic Quality or Commercial Appeal contends simply that the most creative, determined and marketable artists will eventually succeed--that public tastes and consumption are really the deciding factor in terms of publishing and success. In short, this argument acknowledges marketplace preferences as something that may and does encourage voice appropriation and may discourage minority artifacts.

Oddly enough, the two fiercest advocates of this argument are Evelyn Lau (1994) and Neil Bissoondath (1994), both non-white writers who have succeeded in the Candian market. This argument type also criticizes the other argument types and the voice appropriation controversy itself, for ignoring the critical question of artistic ability--good artists as opposed to poor artists. Evelyn Lau (1994) argues that skin colour and ethnicity are not what publishers and curators are concerned with; that artistic ability and the commercial potential (marketability) of the work itself is of greater importance. Lau claims that writers' "individual styles, the clarity of their observations, the beauty of their sentences" are of greater importance to her and that she "would not have thought that a writer would want it any other way" (Lau 1994, 3[D]).
In her mind, Lau argues, it has always seemed that "those who were truly talented would eventually be successful regardless of their backgrounds" (Lau 1994, 3[D]). In summarizing this argument, Neil Bissoondath, in his book, *Selling Illusions* (1994) claims that:

[t]here is much good writing being produced, and there is even more bad writing. Publishers will not turn down the chance to make money. They do their best to seek out and promote good work, but they too are human, with all the failings of other humans. It is at best ungenerous to label their fallibility as racism, or to accuse them of tokenism when they try to draw attention to their track record of publishing 'minority' writers and their plans for future projects (Bissoondath 1994, 155).

VI. ANALYSIS OF ARGUMENTS

Claudia Mills's 1994 typology constitutes a theoretical precedent for the method of classification of voice appropriation arguments. In that work, Mills (1994) attempts to understand through the identification of four basic argument types and their classification the claim that individuals representing and/or discussing the experiences of group A ought to be members of group A, rather than group B. This chapter, by expanding that taxonomy, has disclosed much more about the voice appropriation debate. Equally relevant to the method of analysis used in this thesis, moreover, is Weaver's insistence that arguments are a means for
interpreting reality and that sources or types of arguments can be "ranked" or "ordered" according to their ethical worth (Foss, Foss, and Trapp 1985, 59). Indeed, Weaver believes that from an ethical point of view, certain ways of arguing are better (stronger) than others. Consistent with Weaver, this thesis also considers certain voice appropriation arguments to command greater force because of their combined ethical strength and logic.

Consider for example, the meta-arguments Argument from Diversion, Political Correctness and Absurdity. They do, indeed, have some truth (i.e. they may indeed divert attention from ground-level issues), but they do not really have enough force to invalidate many of the arguments on the minority side, let alone all the arguments on either side, or the entire debate itself. Besides, even if the debate does deflect, that is only one possible consequence: There are other equally or more valuable competing consequences that flow from the debate (e.g., public awareness, increased sensitivity, increased funding and board-representation, etc.) that could be offered in its defense. The argument from Political Correctness, because it relies so much on a derisive label or epithet, reads more as a cynical dismissal than a compellingly structured counter-argument. Similarly, Sydney Hook's reductio ad absurdum signified in his claim that to argue against
voice appropriation is analogous to arguing that "men cannot be good gynecologists..." (Hook 1989, 32), is unconvincing for at least two reasons. First, it relies upon some strained analogies because in many or most cases being an x is not obviously a necessary condition to understand x. It may be necessary in the case of creating minority narratives, more so than in the case of other endeavors. Second, it ignores or abstracts from an important social reality: the profound sense of dispossession and outrage among certain minorities, their artists and spokespersons.

Certain competing arguments in the voice appropriation debate tend to neutralize one another, or limit the effectiveness of each other, for one of two reasons: (a) the values or principles are double-edged, or (b) because the alternative values or forces on one side are sufficiently weighty to limit the effectiveness of opposing arguments. Argument from Narrativity for example, can be invoked by either side of the voice appropriation debate depending on how one frames narrativity. On the one hand, Argument from Narrativity is most commonly used in the voice appropriation debate to bolster the creative spirit of writing. This version of Argument from Narrativity holds that the ability (and freedom) to write in the voice of another central to the creative process of writing. On the other hand, Argument from Narrativity
can be formulated to resemble and support Argument from Ownership if the power of stories to define and reinforce a culture is stressed more than the creative element. In either situation, Argument from Narrativity is based on a shared vision of the important position stories and narrative accounts occupy in our daily lives. Whether narratives are seen as a vehicle to empowerment or as a bridge to understanding, they remain central to our conception of human beings as essentially "storytelling animals" (Fisher 1987, 58).

The Argument from Freedom and the Argument from Rights/Access work to constrain one another. Argument from Freedom asserts that freedom of speech and expression is paramount (Valpy 1994, Conlogue 1993). In a more particularized form, however, Argument from Rights, reduces this claim by arguing that rights are dangerous and even meaningless if there exists no correlative duty or if the right to use the voice of another comes at the cost of silencing the other (Philip 1990, 212).

The rhetoric in Racism/ Reverse Racism arguments is especially instructive because each side, by appealing to the same double-edged category of racism, seeks to defuse much of the other's fire power. Thus, it can be said that in effect, these two 'race' arguments (Argument from Racism and Argument from Reverse-Racism) cancel one another out. While Argument
from Racism claims (in its extreme) that telling another's story, no matter how it is done, "is in itself racist" (Black and Morris 1993, 20). Argument from Reverse-Racism insists that the entire idea that only members of a particular race/ culture can know or depict that race/ culture is also based on "racist" assumptions about the differences between groups (Thomas 1992, 36[C]).

While Arguments from Freedom (to create or narrate) are limited by minorities' rights or claims, argument from Alternate Knowledge limits or constrains the power of the arguments from Accuracy and Cultural Authority since others outside the group may be able to acquire the necessary knowledge, accuracy, authority etc. to represent others. Argument from Equality and Argument from Aesthetic Values/ Commercial Appeal limit Argument from Opportunity by arguing that those who are truly talented will get published and/or recognized regardless of their race or ethnicity. When Argument from Equality and Argument from Aesthetic Quality/ Commercial Appeal are voiced by minority writers (e.g. Bissoondath, Lau) they carry even greater authority.

The power of argument is also enhanced by word choice. Each side of the debate uses heavyweight ethical (e.g. 'theft') and emotional language (e.g. 'censorship') to demonize the other side and thereby reinforce its own position. Most noteworthy for its
instrumental use of language is Argument from Ownership (and related claims) which often invoke terms such as "theft", "stealing", "robbery", "copyright", "plagiarism", "property", "possession", "monopolization", "silencing", "displacement", "exploitation", and "appropriation" (See Blackley 1993, Browning 1991, Dawes 1993, Fung 1993, Hassan 1993, Hill 1992, Hoy 1993, Lutz 1990, Maclear 1993, Mart 1993, Mills 1994, Valaskakis 1993, Walkem 1993). Framing voice appropriation in this manner immediately extends the debate and the arguments themselves to a higher, ethical dimension. Similarly, arguments predicated on freedom, rights and (reverse) racism also use powerful terms and metaphors to convey their messages. Versions of Argument from Freedom are often characterized by highly emotional references to the "thought police", "book burning" by the Nazis in the 1930s, putting "No Trespassing" signs on our "psychic landscape", "Orwellian society", "censorship", and violations of society's most sacred freedoms of "speech" and "expression" (Fulford 1994, Giangrande 1990, Hurst 1992, Paris 1992, Young 1992). In addition, the word "racism" appears many times in the voice appropriation controversy, both as a powerful accusation and as a dismissive counter-accusation. Spokespersons for minority groups have accused white writers and artists of being racist in attempting to portray experiences
not their own (Black and Morris 1992, 20) without bothering to distinguish between the purpose and intentions of a well motivated writer and those that prompt other less equivocal forms of racist behavior. Other commentators respond, claiming that in today's political climate, the white race suffers from reverse-racism (Ross, 1994, 15[C]). In a less extreme manner, Argument from Rights/Access also takes advantage of the effective use of morally loaded terms such as "obligation", "duty", "neglect", and "abuse" (Philip 1990, 212, 217).

Some voice appropriation arguments clearly reinforce others. For example, it is evident from chapter two, which reviews the Canadian publishing situation, that Opportunity and Displacement arguments support and extend the Ownership argument since it can be argued that jobs, wages, sales and profits are lost by minorities. When mediated through the critical-theory concept of commodification, the phenomenon of historical dispossession seems all the more incontestable. The argument from Solidarity also seems to reinforce or supplement opportunity, displacement and ownership claims. On a related note, Linda Alcoff's article (1991) which advocates that speaking for others is both politically effective and a personal responsibility we all share, provides a philosophical, altruistic underpinning for many or
most of the arguments in defense of voice appropriation, albeit a much more sensitive and socially beneficial form of voice appropriation. It is conceivable, however, that some minority spokespersons might interpret her offer as patronizing.

The epistemic arguments (Accuracy, Cultural Authority and Alternate Knowledge) seem to command special authority. There is a sense that life within a minority or oppressed culture gives its members an intimate understanding of that culture, a knowledge through acquaintance. It is reflected, for instance, in another important part of any culture: the expertise every speaker acquires in learning a mother tongue. One can approximate unaccented idiomatic skill from outside the culture, perhaps even master it, but flawless accuracy is less likely, certainly more difficult to come by.

Such acquaintance-based cultural knowledge cannot presume, absolutely, to be exclusive since others can master it in principle; nor is it necessarily total or even sufficient. One can, for example, have an intimate knowledge of one's family, tribe or culture without clearly grasping their dysfunctional or unhealthy side. Indeed, an outsider might see that sort of thing more clearly. But that sort of knowledge is of a more abstract or interpretive kind: in the mind of the outsider it is 'knowledge about', not the
direct kind of 'knowledge of' that figures in culture and communication. An experiential knowledge of one's culture, then, nearly always constitutes an epistemic and cultural authority that outsiders rarely match. The sorry history of Black-face minstrelsy and Aboriginal representations in commercial films, for instance, offer a strong case that voice appropriation often as not gets it wrong and, in the process, inflicts damage on communities. By the same token, if we think of voice as a communicative practice anchored in a culture's or tribe's knowledge of, then the Ownership argument gains credibility since insiders have something outsiders do not.

Still, Argument from Ownership remains difficult to justify despite its popularity because it considers intangible or transcendent aspects of our society (myths, legends, stories, and experience) to be the tangible 'property' (finite resources) of one particular group (culture). As some commentators have noticed, the claim of "theft" often associated with voice appropriation (as if experiences and ideas can be owned) has effectively placed appropriation "in the overheated phrase book along with assimilation and cultural genocide" (Enright 1992, 5). Mills also concedes the problem of validating such an ownership claim. "It is not clear", Mills argues, "that stories, or spirituality, or, in its totality, a culture, are the
kinds of things that can be owned" (Mills 1994, 3). While it is generally agreed that "sentences, paragraphs and pages" can be copyrighted, Mills questions whether "plots, themes, or truths" can ever be (Mills 1994, 3). Mills further qualifies the Argument from Ownership when she states that "my retelling of your stories or my imitation of your rituals does not violate your right or opportunity to perform them as well (Mills 1994, 3). On the other hand, the social phenomenon of commodification does serve to enhance the force of Argument from Ownership (i.e. the desire to 'appropriate' the experiences of others may be rooted in one's reduction of these stories to more mere commercial appeal).

In spite of their combined strength, the arguments situated under the epistemic category share a core problem: the assumed one-dimensional or unitary definition of people by a single category (i.e. race or ethnicity), when in fact, each person can be identified or classified in many ways. Nearly all of the epistemic arguments favour the view of minorities and define such groups in terms of narrow categories of race or ethnicity--ignoring the many other ways people define themselves (e.g. age, gender, financial status, profession). Both Neil Bissoondath and Evelyn Lau (1994) resent the fact that multiculturalism in general, and the voice appropriation controversy in
particular, segregates people into racial and ethnic categories that emphasize the differences between people and not the similarities. Lau insists that she has never wanted more opportunities based on the colour of her skin that would "separate" her from the "equally struggling white male writer next door" (Lau 1994, 3[D]). Bissoondath is similarly offended by certain minority groups' requests to be treated differently than the average Caucasian person, and by Canada's desire to initiate programs that encourage such segregation and racism. He claims that "[o]n a personal level, as a member of those targeted racial minorities, I can think of few things more demeaning to me than to be offered an advantage because of my skin colour...no matter what I have struggled to achieve, I am still being judged on the colour of my skin" (Bissoondath 1994, 95). In tandem with Lau and Bissoondath, Robert Fulford argues that both multiculturalism and voice appropriation, by over-emphasizing the "rights" of the "group", promote a disturbing "vision of each of us as the member of a racially designated cluster" (Fulford 1994, 1[C]).

In short, the most troublesome aspect of the otherwise convincing group of epistemic arguments is their individual and collective failure to recognize the complexity of each person. If one believes, as
some of the epistemic arguments assume, that only 'members' know, or know best the life and experiences of a particular group, than one must ask how we define membership--and, are people ever only members of one group? For example, an artist of colour may argue that only people of colour should represent people of colour and their experiences. But what if that same artist was a woman and a senior citizen. How would she define herself and which group membership (race, age, gender) more thoroughly encompasses who she really is. Would all women of colour (despite differences in age, profession, education) agree that their race defines their identity more so than the other factors. It is these types of questions that many of the epistemic arguments (particularly those advocating the minority position) fail to consider; and, as a result, they are limited. The possibility and existence of diversity within the same ethnic, racial or gender group needs to be addressed by any epistemic arguments that assume a unitary definition of people.
VII. CONCLUSION

In developing and extending Claudia Mills's (1994) primary classification of anti-appropriation arguments, and in identifying more than a dozen additional argument types beyond those in Mills's original taxonomy, this chapter amplifies our understanding of the complexity of the voice appropriation controversy. It also enables us to identify and evaluate the ethical weight of these arguments. While freedom of expression and creativity, at a very abstract level, might seem to neutralize much of the minorities' case, the fact remains that there is an accumulation of historical imbalance and a combination of epistemic and ethical considerations which give minority complaints a clear edge. Indeed, the collection of the ethically-based arguments coupled with the basic moral outrage many Canadians have expressed, clearly underscores the moral dimension of the entire controversy. This underlying moral dimension of voice appropriation will be explored further in chapter five, which offers a three-fold ethical approach to voice appropriation, culminating in a moral perspective developed by feminist ethicists Carol Gilligan (1982) and Nel Noddings (1984).
CHAPTER 5

A THREE-TIERED APPROACH TO THE ETHICS OF VOICE APPROPRIATION

In the voice appropriation debate, the need for and importance of freedom of expression (freedom to communicate, speech freedom) advocated by both sides tends to particularize itself into the language of rights and access. Thus, ethical theory unavoidably has its place in the voice appropriation debate precisely because of the way proponents and opponents of voice appropriation frame their arguments (i.e. in terms of rights, freedoms and (in)equality; and because of the language used in certain argument types (e.g. 'theft', 'stealing' and 'distortion'). Ethics, as this chapter will illustrate, provide yet another mode of discourse in which to discuss the communication claims of oppressed or "wounded" cultures--the very cultures that voice appropriation affects the most. Accordingly, this chapter sets out another approach to moral choice by offering a sketch of three stages of consideration from which voice appropriation can be addressed: first, in terms of rights and access; second, from a model of justice which includes John Rawls's "veil of ignorance" theory (1971); and lastly,
in terms of the moral development theories developed by a number of feminist ethicists including Carol Gilligan (1982) and Nel Noddings (1984). The purpose of this chapter is to suggest moral approaches to a cultural conflict already framed in ethical terms. It does not, however, pretend to supply an exhaustive commentary, but only a more adequate framework from which to assess this complex phenomenon.

I. ACCESS AND THE RIGHT TO COMMUNICATE

In a recent article reviewing the participation of Aboriginal and other minorities in Canada's cultural development, Fil Fraser (1994) acknowledges dramatic growth and impact in this whole area of cultural and artistic activity. At the same time, however, he also acknowledges "a dearth of research into cultural industries" (Fraser 1994, 477) within these Aboriginal and minority sectors. In his concluding remarks, Fraser itemizes a number of pressing research needs, most of which have an unmistakable economic, organizational, and professional bent (Fraser 1994, 490-491). While Fraser's commentary is directly relevant to voice appropriation, surprisingly, he does not mention voice appropriation or cultural appropriation specifically.

While it may be (and, indeed, has been) initially
tempting to frame the voice appropriation conflict in terms of political categories of suppression such as censorship, domination and hegemony, and also more neutrally in terms of economics and organizational development, a much deeper theoretical motif winds itself throughout the rhetoric, structures and practices which punctuate the voice appropriation landscape: the right to communicate. Ironically, both sides in this conflict can lay claim to this imperative whose formulation is at least as old as Article #19 of the 1948 Universal Declaration of Human Rights which champions the right to communicate "regardless of frontiers" (e.g., cultures). More often than not, the right to communicate expresses itself within larger and more secure cultures, as freedom of speech and freedom of the press. A generation ago, however, Herbert I. Schiller argued compellingly that in practice such freedoms, unalloyed to qualitative concerns (and constraints), can inflict considerable harm:

Freedoms that are formally impressive may be substantially oppressive when they reinforce prevailing inequities while claiming to be providing generalized opportunity for all (Schiller 1976, 45). Within a growing awareness of cultural domination at both the international and domestic levels, what began to emerge more than a generation ago was an understanding that the right to communicate was not exhausted in either speakers' rights, abstractly
conceived, or in mass circulation of messages. Rather, a more perspicuous understanding of the right to communicate involved as well the rights of the audiences, the relationship to the media of the less privileged and smaller communities, individuals, and the non-professionals. In short, the right to communicate entails access.

Well before the public emergence of the voice appropriation controversy in Canada, some of these concerns had already been made explicit in a number of UNESCO-sponsored reports in the 1970s and early 1980s, notably in Berrigan (1977) and Fisher (1982). Berrigan, for example, was among the first to recognize that democratization of the media would not ensue without "access by the non-professional to media channels, and participation by the non-professional in the planning, management and administration of the media process" (Berrigan 1977, 16). There is certainly latitude in this notion, and Berrigan pointed out that the concept of access extends to several levels of the communication process: policy-making, selection (of information and programming options), production (e.g. tools, management and technical assistance) and response (i.e. the right of audiences to respond and criticize). It is significant, too, that in unpacking the concept of access, Berrigan lists access to policy first--significant, but not surprising since often
the relationship that one holds in relation to policy greatly determines one's relationship to power. The elements of that power are evident when Berrigan spells out some of what he means by policy access:

access to media policy-making--the right of the individual to take part in decisions about subjects covered; access to the power of the media--the right to use them to influence others...to present a case; access to an audience; access to information...about the realities of the world, about alternative social forms, about inequalities and injustices; access to education; access to a choice of programme material; access to production...access to media tools--the right to participation in the making of programmes...access to media producers, to planners and to management...access to skilled production and technical help, to support...(Berrigan 1977, 18, 19).

It is apparent that discussions of access at this time were primarily motivated by a concern with electronic and broadcast media. Even so, the idea of access has apparent relevance to media in general, as well as to the whole issue of cultural appropriation. Aboriginal and African-American communities, for example, have complained that historically they have had little control over the production and dissemination of their own cultural images. (The role of Aboriginals in commercial films is a case in point). Many Aboriginal and African Canadian spokespersons (Browning 1991, Dawes 1993) insist that in order to regain their own voice they now require greater access to policy making, funding, publication and film production. More specifically, Richard Hill (1992) argues that
even in the "allegedly liberated world of art", we need to ask ourselves the following kinds of questions:


Accordingly, the right to communicate, more precisely "access", serves as a useful theoretical overlay to help us situate, define and understand voice appropriation in Canada.

The comments of Canadian writer Marlene Nourbese Philip (1990), some of which have been mentioned earlier in this thesis have specific relevance in terms of access and the right to communicate. Philip argues that voice appropriation exemplifies Canada's sorry history of oppression (e.g. Native reserves, residential schools) "in the network of institutions and organizations that reinforce each other in the articulation of systematic racism" (Philip 1990, 214). Indeed, she insists that the reality of voice appropriation is distorted when the public media--using what she calls the "privileged discourse" of our capitalist society--translate it into a debate about the censorship of white writers and their imagination instead of seeing it for she claims it is: racism. In voice appropriation, the ability to use the voice
of another usually realizes itself when the oppressor uses the voice of the oppressed. The price, of course, is that the subordinate culture is silenced, unable to speak in its own voice. While it, like any group, still has the right to speak in its own voice, that right is only nominal without the ability to do so—that is, without access to the conditions that would enable it to voice its own narratives. Philip, therefore, sees access not simply as part of an abstractly formulated right, but, as with Berrigan, in politico-economic terms as a network of opportunities which enable the artist and writer to speak from within their own culture to their own culture. The opportunities which constitute access are such concrete benefits as educational and financial resources, as well as something as personal as an artists' confidence in the validity of his/her own beliefs and experiences (Philip 1990, 213). Any discussion, then, of censorship and of possible restrictions upon white writers is misleading: what Aboriginal and artists of Colour need is "equal access to all the resources society has to offer" (Philip 1990, 216). Without that much, the offensiveness of cultural appropriation continues in the minds of many minority artists.

The accounts of Berrigan and Philip combine to provide an interpretive theoretical framework: voice appropriation in Canada can and should be studied not
merely as a pretext for free speech/censorship debates, but more importantly as a cultural phenomenon which arises from a denial of access to cultural production and which can really only be remedied by providing such access. This thesis has already examined selected recent events in the Canadian landscape which exemplify both limits on access and attempts to improve or restore access conditions.

While access and right to communicate are key concepts, the "right to communicate" represents a rather abstract, idealist response to voice appropriation. Access is a more particularized response in terms of enabling conditions. Access for all is appealing in theory, but in practice it too has its limitations. There are some harsh realities that simply cannot be ignored. Access, for example, is conditioned (or limited) by at least two factors. First, access is conditioned by certain marketplace realities such as talent and audience tastes. One of the key problems with the access argument is that it neglects to address the question of artistic ability, production values and audience preferences. One could argue convincingly that producers and publishers care little about an artist's ethnicity or race and much more about viewer demand and potential profit. Some works are simply more appealing to the public and therefore more commercially viable than other works. Indeed,
minorities themselves have become accustomed to majority works. As noted earlier (p.118-119), minority artists Evelyn Lau (1994) and Neil Bissoondath (1994) argue that those who are truly talented do get published eventually, regardless of the colour of their skin.

Second, while the concept of access was popular in the early 1980s, it seems to have evolved in recent years into a more technical or production-oriented concept: access in terms of alternative media or community-operated media. Recent examples of this dimension of access into alternative and local media include *The Barefoot Channel* (1990) and UNESCO Reports such as "Alternative Media: Linking Global and Local" (1993). Sources such as these suggest that access, meaning cultural identity and the right to communicate, popular ten years ago, has evolved into the language of alternative media that is, media owned and/or operated by the non-professionals and the community. Not surprisingly, of course, community television or alternative media are still perceived as a significant force in building "sustainable cultural identities" (Goldberg 1990, 65). Now, with the exception of Philip (1990), nearly all the literature in the last decade that deals with access and right to communicate, does so in the more technical idiom of alternative media and community channels. In other words, the 1970s-1980s concept of access has since shed its original ethical
emphasize upon rights and claims, and moved on to a more practical and realistic preoccupation with means and strategies: that is, the technology and organizational requirements of local and small-scale alternative media arrangements. That also means, however, that the concept of access as a more developed theory and response to, say, cultural disparity has also become, at this point, a more limited response to an inherently ethical situation than it once promised to be. Since issues of justice and injustice lie very close to the surface in the appropriation debate, and since that part of the cultural disparity is not addressable without some reference to technology and alternative media arrangements, a more direct approach in terms of justice theory may take us another step further. John Rawls's strategy for negotiating just dispositions offers us something more in this direction.

II. JOHN RAWLS'S VEIL OF IGNORANCE

In his epic work *A Theory of Justice* (1971), John Rawls offers a model of justice (136-142) that can be adopted and utilized in response to voice appropriation. It is Rawls's veil of ignorance theory (a component of his larger theory of justice) that is particularly relevant to the voice appropriation
controversy. Rawls believes that two basic principles lie at the heart of any just society:

First: each person is to have an equal right to the most extensive basic liberty compatible with similar liberty for others. Second: social and economic inequalities are to be arranged so that they are both (a) reasonably expected to be everyone's advantage, and (b) attached to positions and offices open to all (Rawls 1971, 60).

Rawls believes the way to arrive at just social rules is to begin with an initial situation characterized by fairness. The "original position" is the phrase Rawls uses to characterize this situation. Rawls's veil of ignorance theory challenges the agent to approach moral situations in terms of procedural justice--a reasoning procedure which discourages agents from making decisions or selecting principles suited only to their own particular circumstances. Approaching situations and making moral decisions from behind a hypothetical "veil of ignorance" is Rawls's method for ensuring the principles that one agrees to act upon are fair to everyone. When one is behind the veil, one sheds all social distinctions: the agent does not know his/her place in society in terms of class, position and social status. The actor therefore, does not know if societal rewards (success/fortune) will accrue as a result of his/her abilities, intelligence, strength or social position. This hypothetical ignorance of one's societal position is
magnified behind the veil to a point where even one's heritage and generation are unknown as are the economic/political situation and the level of civilization of the culture (Rawls 1971, 137). As a result of not knowing who one is and where one might emerge within a given society, Rawls believes that an individual would, out of necessity, choose principles whose consequences he/she is prepared to live with, regardless of what position in society he/she may hold. Furthermore, Rawls believes that the veil of ignorance assures that all people, at any given time, would choose the same principles of justice: "[i]t makes no difference when one takes up this viewpoint, or who does so: the restrictions must be such that the same principles are always chosen" (Rawls 1971, 139). Because the parties behind the veil have no basis for bargaining in the usual sense (since no one knows his/her assets and position in society), it is assumed people will make moral decisions that either tend to protect the less privileged or treat all persons as fairly as possible. In short, Rawls argues that "[i]f the original position is to yield agreements that are just, the parties must be fairly situated and treated equally as moral persons" (Rawls 1971, 141). Thus, the veil of ignorance is a useful strategy or technique that enables the development of a preferred (public) conception of justice that represents a genuine
reconciliation and integration of competing interests.

Rawls's justice strategy has direct relevance to appropriation. If all artists and writers were to make decisions behind the veil of ignorance, about who they represent in their works and how they do so, and if policy makers and agencies were to adopt corresponding stances, there would be a tendency to protect access and the voice of minority writers since people would not be sure of their future position in society (i.e. whether they would emerge as a member of a minority group or not). Thus, Rawls's theory provides a kind of model which lends itself to practical application. It offers too, a theory that applies to decision-makers and the decisions they make in terms of funding cultural production.

There are, however, noticeable ethical limitations to Rawls's theory. While his theory of justice may work well in the ideal or hypothetical conditions in which it was formulated, this theory is more difficult to implement in everyday life. Rawls assumes a moderate level of virtue and good will among human beings—that all individuals operating from behind the veil are already fair-minded persons with the desire and the courage to live by the rules and principles that a society has agreed to uphold. In fact, Rawls envisions a society that recognizes, more or less unanimously, a set of agreed upon principles and rules and which
acts in accordance with them. He assumes, that is, that all people desire social cooperation and foresee its benefits (Rawls 1971, 4).

According to critic Louis Katzner (1980), Rawls's theory is problematic in that Rawls does not stay true to his own notion of purely procedural justice. Rawls claims that the principles chosen from behind the veil, in the original position, are principles of pure procedural justice. Katzner argues that "[t]his means that following these principles will necessarily result in a just distribution of social goods because there is no independent criterion by which to access this distribution" (Katzner 1980, 61). Thus, Rawls's theory assumes that we somehow develop substantive principles of justice from behind the veil and then structure society accordingly. To the question, 'what if someone in society claims the social goods he/she ended up with are unjust or unfair?' Rawls responds--inadequately according to Katzner--that the distribution of goods resulting from the principles will be just "whatever it happens to be, at least so long as it is within a certain range" (Rawls 1971, 85). But Katzner believes that Rawls, in qualifying his position in this manner, never clarifies what this "range" means and thus, Rawls in effect, compromises his principles of pure procedural justice.

Furthermore, Katzner argues that there is another
problem with Rawls theory, more pressing than the aforementioned issue of pure procedural justice.

Katzner draws attention to a key problem with Rawls's theory:

"even if it can be shown that the two principles of justice necessarily follow from the original position, one might still ask: why should I accept those principles which can be deduced from the original position? And to the answer, 'Because the original position is the fair situation or choice', you have not answered the question, 'why should I be fair?'" (Katzner 1980, 65).

Without an answer to this critical question, Katzner seems right when he claims that Rawls's theory remains incomplete.

"Lastly, in Rawls's theory, the quality of intention is less than satisfactory since persons may make decisions from behind the veil (and that benefit the weak party) out of nothing more than self-regarding interests. Each can be looking out for his/her own interests, since one does not know where those interests lie. One protects oneself only by assuming he/she might be at a disadvantage in society. Katzner also sees this self-interested aspect of Rawls's theory as problematic. "The choice in the original position", Katzner contends, "is based upon individual self-interest; hence it is not necessary to assume that the parties will subordinate their interests to those of others, nor even that they will consider the interests of others along with their own" (Katzner
1980, 65). Without a healthy other-regarding commitment in agents, Rawls's justice strategy does not seem firm enough to respect and protect the vulnerable party.

Since Rawls's theory is based most heavily on self-interest, his theory is defective in terms of a genuine concern for others---and yet this concern for others is a key component in responding more thoroughly to the voice appropriation controversy. It is not clear that Rawls's theory could or would protect the wounded cultures that speak out in the voice appropriation debate. Thus, while Rawls's theory may, in mediating between the two sides of the voice appropriation debate, tend to ensure the protection of the weaker party (minority interests), it does so only because majority members make decisions from a position motivated by self-interest, not because of a genuine concern for others. While Rawls's theory attempts to address the problem of fairly distributing the goods and opportunities of a given society, the theory alone fails to bring the qualities of ethical sensitivity and caring that we seek to the voice appropriation controversy. It is for this reason that we need to look to a contemporary feminist approach to ethics for its element of caring for others.
III. AN ETHIC OF CARE

In 1982, ethicist Carol Gilligan published *In A Different Voice*, a compilation of the results of numerous studies she conducted on how people talk about morality and themselves and how they make moral decisions. Throughout her studies, Gilligan noticed one consistent finding: Women exhibited a "different voice"---a voice not characterized by gender but rather by theme (Gilligan 1982, 2). While Gilligan cautions that this different voice is not an absolute, she does believe women perceive, understand and describe the world in a different manner than men, and that this perspective is worth listening to in our moral deliberations.

Gilligan began studying women and their approach to moral problems in response to Lawrence Kolberg's moral theories of development which are specifically geared towards males. Gilligan argues that Kolberg put forth theories of moral development which reflect a male way of reasoning since the same traits that traditionally defined the "goodness" of women (caring and sensitivity to the needs of others) are those that appear to make them "deficient" in Kolberg's theory of moral development (Gilligan 1982, 18). In studying women and their lives, Gilligan found that the majority of moral problems women face arise from conflicting
responsibilities. Men, on the other hand, often face moral problems arising more within a system of competing rights. In order to resolve their moral problems (consisting of competing rights and claims), most men rely upon modes of thinking that are formal and abstract. Women, because their moral problems arise most often from competing responsibilities, require a mode of thinking that is contextual and narrative. It is precisely these different modes of thinking, according to Gilligan, that suggest women's weakened development within the constraints of Kolberg's system (Gilligan 1982, 19). According to Gilligan, women situate moral problems within a context of compassion, in terms of conflicts between the self and others. Moreover, she argues that "[i]t is precisely this dilemma--the conflict between compassion and autonomy, between virtue and power--which the feminine voice struggles to resolve in its effort to reclaim the self and to solve the moral problem in such a way that no one is hurt" (Gilligan 1982, 71).

Combining the research of Gilligan and others (Noddings, Nunner-Winkler, Code) it becomes apparent that an ethic of care is motivated by a series of characteristics typical of women, but not exclusive to them. While most men follow what feminist ethicists call the "justice orientation", women often follow an "ethic of care" in making moral decisions. The
justice orientation characteristic of men reflects the expression of an "autonomous, individuated, independent self where moral judgments follow principles defining rights and duties" (Nunner-Winkler 1993, 143). The specific circumstances and potential costs are often not given due consideration in this mode of reasoning. In contrast to the justice orientation, an ethic of care and responsibility operates when the self is experienced as part of relationships--as a "connected self" (Nunner-Winkler 1993, 143). Here, moral judgments consider the specific details of concrete situations and there is a desire to minimize the overall harm done. An ethic of care, then, rooted in experience is essentially a relational perspective, a life-like narrative, if you will, that tackles moral problems in terms of one's connectedness to others.

In tandem with Gilligan and other feminist ethicists (Joan Tronto 1989, Rita Manning 1992, Claudia Card 1988) Nel Noddings (1984) also contributes to the development of an ethic of care. Noddings believes that women not only solve moral problems by situating themselves as near as possible in concrete situations and assuming personal responsibility for their decisions, but that women actually define themselves in terms of others (Noddings 1984, 8). Like Gilligan, Noddings cautions that the ethic of care she and other feminist ethicists propose is built on caring--a
characteristic common in women but not exclusive to women. Such a characteristic can be and is found in men. In order to define more clearly what care means in this context, Noddings explains that "[i]n a related sense, I care for someone if I have regard for his views and interests" (Noddings 1984, 9). Most importantly, though, Noddings argues that caring for entails responsibility to (another). When one cares for another person one must consider his/her way of life, needs, desires--and try to apprehend the reality of the other. Noddings believes that when we truly care for another we see the other's reality as a "possibility" for us. When we import an ethic of care into our moral reasoning, we actually make decisions by imagining ourselves and our needs as if we were in the position of the other (the one we care for). As a result, we act to "eliminate the intolerable, to reduce the pain, to fill the need, to actualize the dream" (Noddings 1984, 14). Therefore, according to Noddings, caring involves great empathy-actually stepping out of one's own personal frame of reference and into the other's. The most appealing thing proscribed by the ethic of care that Noddings and others articulate, is that such an ethic does not offer a set of knowledge claims to be tested or agreed upon. Instead, an ethic of care should be thought of more experientially as an "invitation to see things from
an alternative perspective" (Noddings 1984, 32). Noddings warns that caring should not be construed as dependency. In an ethic of care, the person (or group) cared for remains free to be more (rather than less) him/herself within the caring relationship (Noddings 1984, 73).

The ethic of care proposed by these ethicists has not been free from criticism. Some authors (e.g. Bill Puka) argue that feminist analysis fails to distinguish women's "nurturing strengths" from her "socialized servile weaknesses" (Puka 1993, 215). What angers authors such as Bill Puka is that the idea of a separate "female" ethic is sexist in itself and it risks turning "victimization into virtue by merely saying it is so" (Puka 1993, 215). Puka believes this ethic is an ethic of "victimization"--a pitfall for oppressed groups (women, minorities). In response to Puka's concerns, feminist ethicist Claudia Card (1988) contends that while these two different orientations to moral reasoning (the justice and the care perspectives) exist, they may represent more the responses of the "oppressed" and the "oppressor" than those of man and women exclusively (Card 1988, 128). The language of an ethic of care often describes the reality of abuse--covering both the care-giver's own feelings of manipulation and abuse and the feelings of unreciprocated caring (Card 1988, 129). While
incorporating caring into the decision-making process has the potential to lead to more informed, sensitive decisions, some critics warn that it may also trap the already oppressed in their positions. In situations of domestic violence, for example, Card contends that women are too often incapable (unwilling) to escape the abusive situation because of their perceived obligation to care for; their loyalty; and their responsiveness to the other (Card 1988, 129). In spite of this, Card insists that the least controversial aspect of an ethic of care and one that everyone should agree with is that "responsiveness, connection, and appreciation of context are as necessary to good moral thinking as abstract reasoning, autonomy, and concern for equality" (Card 1988, 126).

The shared dynamics between oppressed and wounded groups (cultures) and an ethic of care make the theories offered by feminist ethicists so relevant to voice appropriation. The appeal to an ethic of care is especially suitable to respond to and represent the needs and predicaments of wounded cultures (minority cultures). It seems apparent, too, that the appeal to justice and fairness (predicated upon motives of self-interest) is not enough—that a more authentic care must also be included when sorting through the ethics or appropriateness of voice appropriation. When a group perceives itself as culturally deprived
and oppressed (as do the majority of those who are arguing against voice appropriation), it means that its members have very likely been wounded or damaged in some way. According to Card, this damage or oppression is at least enough to merit some additional "care" and a "careful appreciation in addressing their viewpoints" (Card 1988, 130). Even more specific to the voice appropriation controversy are the comments of ethicists Joan Poliner Shapiro and Carroll Smith-Rosenberg (1989) who argue that the real value of the "other voice" advocated by Gilligan, Noddings and others is that it represents the "voice of the marginal and the disempowered; the voice of those who abjure the values of competition and success and hold those of cooperation and caring" (Poliner Shapiro and Smith-Rosenberg 1989, 199). The larger problem, according to these authors, is that injustice, care and concern for others rarely receive the attention in North American systems of ethical reasoning and discourse that justice, rights and laws receive.

An ethic of care then, is not intended to be a problem solving mechanism. Rather, it is added at this point as another tier offering us a more enlightened perspective from which we can address voice appropriation. "Care" represents a possible attitude of approach, not a solution to the appropriation controversy. Mindful of the argument types based on
accuracy, ownership, solidarity, opportunity and access/rights voiced mostly by minorities, it is highly likely that most oppressed groups would agree that an ethic of care is a step in the right direction—the direction of someday resolving the voice appropriation controversy or at least accepting the importance and validity of its own spokespersons' claims and counter-claims. More often than not, it is such things as consultation, acceptance and respect that minority writers (Fung, Dawes, Blackley) are really seeking—more so than some form of abstract proscription (let alone censorship) against voice appropriation. For example, Stuart Blackley, urges that:

artists of colour must set the parameters of the debate over the appropriation of their culture, as women must for the issues of abortion and rape. This stops no one from freely speaking, from having an opinion...But authority must be acknowledged to those whose culture or bodies are the very battle grounds on which the debates are played out (Blackley 1993, 52).

Kwame Dawes is another who believes that the recent activities of Canadian funding agencies, publishers and administrative bodies (Royal Commission on Aboriginal Peoples, Theytus Books and Pemmican Press, The Womens' Press and the Toronto Arts Council) represent a positive shift in philosophy, one that
ensures minority artists and their "voices" are treated with "intelligence, sensitivity and respect" (Dawes 1993, 8). Such comments are evidence that an ethic of care can hold a prominent and important place in the voice appropriation controversy since they envision the same kind of sensitivity, empathy and concern for others that an ethic of care urges, and that minority artists are calling on the majority writers to develop and exercise.

Moreover, an ethic of care seems to surface explicitly in at least two specific areas of the voice appropriation controversy. First, it is no coincidence that many minority writers' comments and arguments within the voice appropriation debate (which emphasize the importance of sensitivity, caring and respect for the stories and experiences of others) resemble the pleas women have made throughout the women's liberation movement. The language and arguments of feminist ethicists working from an ethic of care perspective embody the same types of claims and counter-claims articulated by the minority artists in the voice appropriation debate. Feminist ethicists, working to change what they perceive as a white, male-dominated system of moral reasoning, share the same aspirations and have experienced similar inequalities as Aboriginal artists and artists of Colour. Both groups of people have faced or continue to face oppressive and
discriminatory societal barriers. Furthermore, not only do both groups advocate what feminist ethicists call the "care ethic", but both groups want to tell their own stories, define their own reality, and speak in their own voices. Just as many minority artists ask for the dominant culture's respect and appreciation of their needs and experiences, "care" ethicists ask those who support the masculine way of moral reasoning to incorporate an ethic of care into their decision-making process.

Second, both groups acknowledge affectivity. Ethicist, Virginia Held, for example, sees no need or use for separating reason and emotions when making moral judgments or decisions. Instead, Held argues that "[c]aring, empathy, feeling for others, being sensitive to each other's feelings--all may be better guides to what morality requires in actual contexts than abstract rules of reason and rational calculation" (Held 1993, 52). Held even envisions a society ruled by feminist ethics: a vision which many of the minority artists mentioned in the voice appropriation might also subscribe to, at least in theory. Held believes that there are different levels of caring between one's self and one's family, and between one's self and one's society. In Held's imagined "feminist society", even distant social relationships "will not be characterized by indifference to the well-being of others, or an
absence of trust, as they are in many non-feminist conceptions" (Held 1993, 223). Reasoning and making decisions based on an ethic of care would likely be more contextual and narrative--taking the time to assess how one's decisions will affect others (Held 1993, 169).

This type of ethical reasoning and decision making, I submit, is precisely what is needed to respond more adequately to the serious claims and counter-claims of voice appropriation. Compared to access theory and at least one modern version of justice theory, it harmonizes more adequately with the commentaries and suggestions offered by minority writers themselves (e.g. Fung, Dawes and Blackley).

IV. CONCLUSION

This chapter proposes that an ethic of care deserves special study in the voice appropriation controversy. Not only does it offer a fresh perspective from which the claims of minority and majority writers can be evaluated, but it also leads us to consider the importance of being connected to others--of perceiving ourselves not as individuals protected by abstract rules of justice and liberty, but as diverse human beings whose cultural decisions and narrative
actions have profound effects on others—and who, like it or not, have to learn to live with one another.

The three-fold approach discussed in this chapter progressively leads us through stages of improved understanding of the complexity of voice appropriation and its ethical components. The chapter began with a discussion of access and the more generalized right to communicate. At that point, where access fades into dealing mostly with the logistics involved in the distribution of social and cultural goods within society, we are still left with the ethical question of fair distribution of such goods and opportunities. Here, Rawls's theory of justice, and in particular his "veil of ignorance" strategy offers decision-makers a unique perspective from which to consider the restitution of what some commentators believe to be "stolen" social and cultural goods and opportunities.

Finally, and in light of the limitations of Rawls's theory which is based mostly on self-interest in terms of decision-making, an ethic of care is imported into the voice appropriation discussion bringing us beyond the "pure justice" perspective concerned with allotment and portions. Since voice appropriation essentially deals with a living cultural community as opposed to competing individual rights, an ethic of care offers a expanded view from which one can adequately consider the needs and concerns of 'voiceless' cultures.
While the moral approach offered in this chapter remains at times, just as abstract and rooted in language as the voice appropriation debate itself, the three-tiered approach is intended to amplify the discussion and extend our vision of the appropriation phenomenon. This moral approach is not meant to supply concrete answers or resolve the debate, but instead introduce the reader to another kind of appeal or perspective from which the voice appropriation controversy and its complexity can be understood.
CHAPTER 6

FINAL REMARKS

I. CONCLUSION

Canada is a country already well acquainted with the struggle for cultural identity and self-determination. In the face of ever increasing American media domination, Canada continues to struggle (e.g., through Canadian content quotas and the efforts of the NFB) to maintain and express its own national and regional cultural identities. Ironically, then, the domestic strife within the community of Canadian writers and artists over voice appropriation parallels Canada's larger international struggle to resist cultural and economic domination by the United States. These general concerns over the act and consequences of appropriation (misrepresentation, stereotypes, loss of accuracy and revenues) are not isolated or confined to one discipline. Anthropologists are now questioning the methods traditionally used in their field to gather and assemble the material world of the 'Other'. Some anthropologists have asked members of their field to consider: "what criteria validate authentic cultures or artistic products?" and in turn, "what moral and
political criteria justify good, responsible, and systematic collecting practices?" (Clifford 1988, 221). Perplexing questions such as voice appropriation do not lend themselves to simple or immediate answers, but instead require careful examination of the historical, rhetorical and ethical issues involved.

The label of 'appropriation' is by no means an arbitrarily chosen word used by some minorities to describe their frustration with the actions of certain dominant artists. In the voice appropriation debate, the word 'appropriation' commonly connotes a negative meaning: to take without permission. Otherwise commentators could just as well have used words such as 'borrowing' and 'sharing' to describe this social phenomenon. Furthermore, the term 'appropriation', as it has evolved over the past decade in art and literary circles and as it is used in this thesis, is most often applied to works produced by persons of a dominant group which in turn uses, imitates or incorporates themes and images which derive from a minority or subordinate culture. Appropriation, in this context, presupposes a social environment wherein artists' voices from both group levels (minority and majority) are not equally heard. Voice appropriation, then, culminates as a controversial socio-political phenomenon wherein the dominant voices often tell the stories of or about the subordinate culture (e.g.
African-Americans, Aboriginal peoples, or women). In fact, the voice appropriation controversy has become so heated in the Canadian context at least, that some artists and academics equate appropriation with "stealing" "trespassing" and "exploitation" (Dawes 1993; Lutz 1993; Keeshig-Tobias 1990). The voice appropriation claim becomes even more controversial when it is inflated to such extremes wherein the only acceptable narratives left to write about or otherwise depict would be autobiographies. When voice appropriation is framed in this extreme manner, other artists and commentators make references in their counter-arguments to the book burning in the 1930s by the Nazis and to imagery of the "thought police" (Young 1992, 6[B]). Emotionally charged terms such as 'racism' and 'censorship' have also been evoked on both sides of the voice appropriation debate.

While the mainstream media in Canada have been quick to transform the voice appropriation debate into a conflict about speech freedoms and censorship, this thesis demonstrates that the conflict is much more complex. Furthermore, framing the debate in such a simplistic manner is both deceptive and confusing because it eclipses important factors such as racism, misrepresentation, stereotyping, funding, access, right to communicate, opportunity, bureaucratic responses, copyright violation, as well as the whole issue of
what it means 'to own' one's cultural heritage and experiences. The notion of property being extended to include experience and artistic/intellectual work is highly problematic, and yet this is an enduring theme in the voice appropriation controversy.

As a first step in understanding voice appropriation, this thesis began by broadly situating the issue in an historical context by exploring some examples of what is claimed to be gender and racial appropriation within the genres of art and literature. The next chapter situated a more recent version of the voice appropriation debate in the Canadian context and in such a way as to disclose several kinds of organizational responses within private and government sectors.

This historical situating of the voice appropriation controversy discloses that there are a number of recurrent themes, often expressed in the form of claims and counter-claims. On the one hand, those who argue that the practice of "appropriating" the voice of another is unacceptable claim that: i) voice appropriation, by placing a writer or an artist within another culture, with such intimacy and compelling verisimilitude, commits an act of trespassing or usurpation; ii) "appropriation" traffics in facile images or stereotypes which greatly falsify conditions within the non-dominant cultures; iii) appropriation
trivializes and minimizes serious inequities; iv) dominant-culture artists are incapable of truthfully representing minority cultural realities; v) profits and employment opportunities are lost by minority artists when majority artists depict cultures not their own.

Several recurrent argument types are offered in response: vi) voice appropriation, by crossing cultural boundaries, is a defensible tool of instruction; vii) there is more than one way of 'knowing'—one does not have to 'be' from a minority in order to understand; viii) imagining the experiences of others is a key component in artistic endeavors and in human communication; ix) the true art of storytelling or re-creating through visual images lies in artists' or writers' ability to step outside their own skin and imagine life as another; x) while an insider may, by virtue of direct experience, portray key events of his/her culture more authentically, there is room for more than one account in the consumer market. Authenticity does not guarantee accuracy; and sometimes outsiders can see things more clearly than those on the inside.

Throughout this exchange, the broader ideas of access, the right to communicate, and a minority culture's right to self-expression also figure as recurrent motifs. The confusion that colours much
of the voice appropriation debate is exemplified in the seemingly contradictory claims made within the Writers' Union of Canada. While the Writers' Union agreed with the Canada Council by affirming the freedom of imagination and the freedom of expression of all writers at its 1992 Annual General Meeting, it also was sharply critical of what it calls "cultural misappropriation". Thus, while the first part of its statement seems to permit or condone appropriation, the second part takes exception. What remains unclear despite the Union's attempt to define 'cultural misappropriation' is how this term differs from 'appropriation'. Does the Union mean to say that there are 'good' and 'bad' ways to 'appropriate' from another? The Union's unclear (possibly contradictory) policy statement appears to acknowledge the concern that cultural misappropriation contributes to the exploitation and misrepresentation of minority cultures. Still, the Union offers no direction in terms of judging what constitutes 'misappropriation' as opposed to say 'defensible appropriation'; nor does it offer suggestions for dealing with such potentially exploitive works.

Indeed, it seems that voice appropriation unavoidably involves several kinds of contradiction as already noted by Canadian producer Richard Fung. Fung gets to the heart of the voice appropriation
paradox when he alleges that there exists a "contradictory reality of using the voice, sound, image, dance, or stories of another" since this reality may represent "sharing or exploitation, mutual learning or silencing, collaboration or unfair gain, and more often than not, both aspects simultaneously" (Fung 1993, 21). Voice appropriation, then, raises some profound questions about boundaries, authority and appropriateness. There are also several pressing philosophical dimensions to voice appropriation that deserve consideration. These philosophical dimensions include the difficulty (or impossibility) of clearly defining what constitutes the "Other" and where one draws the lines of "otherness". There is also the question of 'who is in the position to define and speak for others (whether this 'other' is a member of one's own culture or not)?' And, what are we to do about in-group differences? How do we decide which characteristics (age, race, gender, etc.) best define who we are? How do we reconcile the testimony of those who say that special treatment for minorities is needed with those (e.g. Bissoondath 1994) who argue otherwise? Lastly, one must question whether it is wise, in terms of social development, for Canadians to continue down a path that emphasizes our 'differences' and ignores our 'sameness'.

Because of its complexity, then, voice
appropriation must not be perceived or approached simplistically in terms of censorship or the right to unfettered communication. Rather it needs to be investigated in a much more comprehensive and historical context which does justice both to its organizational and procedural features as well as to its rhetorical and philosophical complexity.

By applying a three-fold methodological approach that merges rhetorical theory, argument analysis and theoretically grounded ethical evaluation to the voice appropriation debate, and by identifying more than a dozen additional argument types beyond those in Claudia Mills's (1994) primary classification of anti-appropriation arguments, this thesis supplies a scope and combined perspective not yet provided within the existing literature. While many of the individual arguments voiced by aggrieved minority spokespersons might be limited, even weakened by counter-claims, the collection of arguments adduced on the side of minorities adds up to a strong case. While freedom of expression and artistic creativity might appear to neutralize much of the minorities' case, the fact remains— as earlier chapters demonstrate—that there has been an accumulation of historical imbalance and a combination of epistemic and ethical considerations which cannot be ignored, and which, I believe, give the minority complaints a clear moral edge. In short,
this thesis's examination of voice appropriation within a sequence of historical, rhetorical and ethical perspectives means that the study of this Canadian cultural phenomenon has now attained a degree of comprehensiveness and adequacy not yet evident in the existing literature.

Still, a practical question remains: Can anything be done both to assuage minority grievances, and to educe harmony from within this conflict? Chapter five, I believe, offers a series of theoretically grounded moral reflections which invite us to respond helpfully and caringly to that part of the appropriation phenomenon which minorities experience as dispossession. Here, organizational responses are more likely to succeed than individual intentions. Regulations and proscriptions against voice appropriation, however, are both impractical, if not impossible, to enforce and an obvious violation of speech freedoms. Heightened ethical awareness and moral resolutions may help to convince some individuals within the majority community to move with increased sensitivity and circumspection should they choose to work on minority themes and narratives. It would be naive, however, to expect wholesale compliance from artists and commercial interests. Probably the most effective corrective, then, is for arts councils and funding bodies to acknowledge cultural inequities, and to frame their
decisions accordingly. Recent Canadian history indicates that this is the most likely avenue for improvement. The Toronto Arts Council's recent efforts to redress the discrepancy between the Council's own representatives and the cultural and ethnic diversity within the Toronto community are a palpable step towards resolving some of the tensions at the surface of the appropriation debate. Similarly, the ethical guidelines produced by the Royal Commission on Aboriginal Peoples (1993) encouraging artists to consult and cooperate with the cultural and ethnic communities represented in their works signals a conscious effort within formal policy-shaping structures to address appropriation issues. Quebec too, has implemented directives with respect to protection and preservation of Aboriginal cultures. These kinds of organizational responses seem to be much more practical and effective than the isolated responses of individuals. Were the press to report at least some of these developments, the resulting public discussions would be better informed and less simplistic.

Finally, the voice appropriation conflict is a real irritant in our multicultural nation, and while it has not attracted a great deal of press attention in 1995, it is not yet something that has run its course. It is an instructive flashpoint because it also serves to underscore the issues of power relations,
access and opportunity which characterize Canada's cultural mosaic. It illustrates as well the kinds of adjustments that have to be made in the name of communitarian growth. As such, the voice appropriation issue needs to be understood as part of our domestic conversation. That understanding, I have tried to show, is poorly served when the appropriation debate is reduced to a contest between speech freedom and censorship. It is much better served when appropriation discourse is viewed more adequately in its historical, rhetorical and ethical complexity.

II. FURTHER RESEARCH

Voice appropriation is a complex and politically-charged topic that can be approached and studied in many different ways. While this thesis represents an exercise in analyzing the debate or controversy surrounding a certain kind of cultural exchange between dominant and minority cultures, it is not intended to be an exhaustive or final study of voice appropriation. In fact, in writing this thesis it became apparent that there are numerous levels of conversation pertaining to voice appropriation worth investigating. Other important areas of study include analyses of some of the real situations minority groups
are experiencing in the publishing industry. Such a study would include publishing statistics, surveys of gallery collections and information about the demographic characteristics of grant recipients. Other possible areas of study include more specific applications of voice appropriation. For example, a study of voice appropriation's place within specific genres of art (film, stage performance). Voice appropriation could also be studied in terms of policy and educational considerations, including an investigation what policies are in place to assist and educate minority artists; their effectiveness; and what further considerations are needed in the areas of educational content, training and the Canadian broadcasting and publishing industries.
ENDNOTES

1 In this chapter and throughout this thesis, less contemporary terms such as "Native", "Black", "Eskimo", and/or "Negro" will be employed only when referring directly to a commentary/article written by another author, or when directly quoting from an author who used this type of language. In those places where I am expressing my own thoughts and words, more contemporary terms such as "Aboriginal", "First Nations", "Metis", "Inuit", "People of Colour", "African American", "African Canadian", "Black American/Canadian", and/or "African North American" will be used.

2 Throughout this thesis, the terms "cultural appropriation" and "voice appropriation" will be used synonymously unless otherwise indicated in the text. In the context of this thesis, both cultural appropriation and voice appropriation will be interpreted to mean "to take possession of or make use of exclusively for oneself, often without permission" (The American Heritage Dictionary 1971, 64). Specifically, these terms will be used in reference to various forms of artistic works and/or cultural texts (novels, paintings, films, short stories, music, lyrics, and narratives). Often times, the intimacy of first-person narration characterizes such 'appropriated' cultural texts.

3 For the purposes of this thesis, the mainstream press is defined as the popular Canadian daily newspapers. These include first and foremost, the Globe and Mail. Other dailies include the Montreal Gazette, Winnipeg Free Press, Toronto Star, and any other Canadian dailies.

4 The issue investigated in this thesis is contiguous to, but not the same as that featured in the David Brown (1990) thesis. In his thesis, Brown compared the values depicted in Canadian films about Aboriginal culture directed by Aboriginals to those directed by non-Aboriginals and found that native-directed films provided more support for "humanistic" values than for "material" values or unclassified values (Brown 1990, vi).

5 In this thesis, minority or subordinate groups are defined as those groups in society which have suffered or continue to suffer from widespread discrimination (as a group). Claudia Mills (1994) refers to these groups as "victim groups".
The "cultural appropriation claim" is defined in this thesis as the claim that appropriating the voice/culture of another is both morally wrong and an unfair and harmful practice. This claim against the practice of voice/cultural appropriation in the arts will be discussed within this thesis in terms of its more and less extreme variations.

Eric Lott (1993) entitles his book "Love and Theft" because of the white minstrel performers' attempts to repress through ridicule and exploitation of Black culture, the real fascination many whites had with the Black male physique in particular, and Black culture, in general. Lott argues that it was "cross-racial desire" experienced by the whites coupled with their fascination and self-protective ridicule with respect to Black people and their cultural practices, and that made Blackface minstrelsy "less a sign of absolute white power and control than of panic, anxiety, terror, and pleasure" (Lott 1993, 6). In sum, Lott contends that the dominant, white culture's exploitation and appropriation of Black cultural practices represents both white society's fear of and fascination with "Otherness" in general, and "Blackness" in particular.

While there is also a sad history of insensitive depictions of Aboriginal cultures in Canada, especially in the film and documentary genres, this should not be confused with the voice appropriation phenomenon which usually involves a person from the dominant culture (often a white male) assuming or wearing the identity of another.

A shouting match with writers of Colour outside a P.E.N. (Poets, playwrights, essayists, editors, and novelists) meeting in 1989 is considered by some commentators to be one of a series of conflicts Callwood had with other writers over the voice appropriation issue; conflicts which led to her ultimate resignation from the Writers' Union in the winter of 1993/94.

Another example of person's (exploiting) profiting from cultural traditions not their own includes the criticism surrounding a non-native Miss America contestant who performed a "buckskin-clad dance" in a preliminary competition. Some American Indians publicly condemned her behavior calling it an "insult", especially since this contestant is a "blue-eyed blond from Brookings, South Dakota" (Chicago Times 1994, 31).
11 Culture can be defined broadly as the "varied array of values, beliefs, customs, conventions, habits and practices characteristic of a particular society or historical period" (Thompson 1990, 123).

12 According to the American Heritage Dictionary, sharing means to "participate in, use, or experience in common" (Morris 1971, 1191). Trafficking, on the other hand, means the "commercial exchange of goods" (Morris 1971, 1361).
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194


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VITA AUCTORIS

Kelly Bondy Cusinato was born in 1970 in Windsor, Ontario, Canada. She completed her Honours Bachelor of Arts in Communication Studies in 1993 and is currently completing the requirements for the degree of Master of Arts in Communication Studies at the University of Windsor and will graduate in June 1996. Kelly presently resides in Windsor, Ontario with her husband Dean.
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THE INTERNET AND CANADA'S FINANCIAL SERVICES SECTOR

by

Ted Dodds

A Thesis
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APPROVED BY:

M Prince

Dr. Michael Prince, Advisor
Faculty of Business

Dr. Andrew Templer
Faculty of Business

Dr. Richard Lewis
Communication Studies
ABSTRACT

This thesis is an investigation into the potential impact of the Internet on sustainable competitive advantage in Canada's financial sector. The Canadian banking industry and payments system are often perceived as conservative, safe entities. By contrast, the Internet has been characterized as a dynamic and insecure environment for commerce. Exploratory research results are reported to suggest if and how these worlds will come together in the near future to provide financial service firms with new opportunities for differentiation, cost reduction and enhanced customer service.

The thesis concludes by suggesting that early movers have achieved differentiation from their competitors by means of deploying unique services to their customers over the Internet. This advantage will be short-lived if the early movers do not continue to innovate. Overall, the Internet is viewed as a beneficial technology for the financial services industry. However, its open nature means that once all Canadian banks reach the same degree of Internet service delivery, the technology will not longer be a source of differentiation. Instead, it will become a new marketing and distribution channel. The real source of enduring competitive advantage will be driven by the banking services themselves.
DEDICATION

This thesis is lovingly dedicated to my beautiful family, whose patience and understanding through many a dreary winter week-end made my small accomplishment possible. To my wife, best friend and soul mate, Loretta, my deepest and most sincere thanks for the sacrifices entailed in four long years of study leading up to and including this thesis. To my remarkably empathic sons, Colin and Tyler, my thanks for occasionally breaking up a day spent at the computer with little interruptions in the form of jokes, stories and questions that took me briefly away from the narrow focus this type of project requires. We really are a team, and all of the members of our family team had a share in what is contained in these pages.
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# TABLE OF CONTENTS

## 1. OVERVIEW OF THESIS

1.1 Introduction ................................................. 1

1.2 Purpose of the Research ................................. 2

1.3 Approach to Research ................................ 4

1.4 Summary of Findings and Conclusions .......... 5

1.5 Structure of the Thesis ............................. 5

## 2. ELECTRONIC COMMERCE AND THE WORLD WIDE WEB

2.1 Introduction ................................................. 7

2.2 What Business is Doing on the Internet ......... 7

2.3 Information Security ................................. 16

2.4 Concerns About Privacy .......................... 18

2.5 Summary ................................................... 19

## 3. INTERNET PAYMENTS

3.1 The Internet and Canada’s Financial Sector - A Clash of Cultures .................. 20

3.2 The Canadian Payments System ................. 22

3.3 The Canadian Payments Association ............. 24

3.4 The Evolution of Virtual Payments ............. 26

3.5 Digital Banking and Payments ................. 29

3.6 Summary ................................................... 32
4. REVIEW OF THE LITERATURE

4.1 Introduction

4.2 Information Technology Innovation

4.3 IT and Competitive Advantage - The Industrial-organization Perspective

4.4 IT and Competitive Advantage - The Resource-based Perspective

4.5 Information Technology and the Value Chain

4.6 Summary

5. METHODOLOGY

5.1 The Research Questions

5.2 Description of Research Method

5.3 Limitations

5.4 Framework for Analysis

6. FINDINGS

6.1 Introduction

6.2 List of Participants - Canadian

6.3 List of Participants - Non-Canadian

6.4 Importance of Information Technology to the Firm

6.5 Importance of the Internet to the Firm

6.6 Internet Payments

6.7 Porter's Model of Beneficial Technologies

6.7.1 Model Element 1 - The technological change lowers cost or improves differentiation and it is sustainable
6.7.2 Sustainability Factor 1: Source of Technological Change 82
6.7.3 Sustainability Factor 2 - Internal R&D Spending 82
6.7.4 Sustainability Factor 3 - Internal Technical Skills 83
6.7.5 Sustainability Factor 4 - Rate of Technological Diffusion 85
6.7.6 Model Element 2 - Cost or Differentiation advantages even if technology imitable 85
6.7.7 Model Element 3 - How Firms Protect Their Advantage 85
6.7.8 Model Element 4 - Technological Change Improves Overall Industry Structure 86

6.8 Summary 88

7. DISCUSSION AND CONCLUSIONS 89

7.1 Introductory Comments 89

7.2 The Importance of Information Technology to the Firm 91

7.3 The Importance of the Internet to the Firm 92

7.4 Internet Payments 95

7.5 The Internet as a Beneficial Technology 96

7.8 Opportunities for Further Research 98

7.9 Summary 99

APPENDIX A - A BRIEF HISTORY OF THE INTERNET AND WORLD WIDE WEB 101

APPENDIX B - SUMMARY OF FINANCIAL-SERVICES WEB SITES 103

APPENDIX C - THE INTERVIEW FORM 115

APPENDIX D - GLOSSARY OF TERMS 123

BIBLIOGRAPHY 129
LIST OF TABLES

TABLE I - REASONS FOR BUSINESS USE OF THE INTERNET 10
TABLE II - SUMMARY OF CURRENT INTERNET APPLICATION TYPES 11
TABLE III - PERCENT OF CANADIAN FINANCIAL FIRMS INTENDING TO USE INTERNET 15
TABLE IV - PERCENT OF CANADIAN BUSINESSES INTERESTED IN VARIOUS INTERNET SERVICES 16
TABLE V - GENERAL INTERNET USERS PROFILE 20
TABLE VI - PERCEIVED CHARACTERISTICS OF CANADIAN BANKS COMPARED TO THE INTERNET 21
TABLE VII - EVOLUTION OF VIRTUAL PAYMENTS 27
TABLE VIII - INFORMATION-BASED PAYMENT SYSTEMS 30
TABLE IX - IT AND THE DEVELOPMENT OF NEW BUSINESSES 40
TABLE X - PORTER'S MODEL ON TECHNOLOGY LEADERSHIP VERSUS FOLLOWERSHIP 41
TABLE XI - ITAC MODEL OF IT AND COMPETITIVENESS 46
TABLE XII IMPACT OF INFORMATION ON TIME, GEOGRAPHY AND RELATIONSHIPS 53
TABLE XIII - MARKETPLACE VERSUS MARKETSPACE 55
TABLE XIV - THE PHYSICAL AND VIRTUAL VALUE CHAINS 58
TABLE XV - CRONIN'S INTERNET VALUE CHAIN 59
TABLE XVI - POSITIONS HELD BY INTERVIEWEES 68
TABLE XVII - PERCEIVED IMPORTANCE OF INFORMATION TECHNOLOGY TO THE FIRM 70
TABLE XVIII - QUESTION 5 - WHY THE FIRM CONSIDERS ITSELF AN INFORMATION TECHNOLOGY LEADER 71
TABLE XIX - PERCEIVED IMPORTANCE OF THE INTERNET TO THE FIRM 72
TABLE XX - QUESTION 10 - HOW THE INTERNET MAY PROVIDE COMPETITIVE ADVANTAGE 74
TABLE XXI - QUESTION 11 - WHY FIRM CONSIDERS ITSELF INTERNET LEADER 75
TABLE XXII - QUESTION 12 - PLANNED MEASURES OF INTERNET'S IMPACT ON ROI 76
TABLE XXIII - QUESTION 12 - NON-FINANCIAL REASONS FOR THE FIRM'S INTERNET INVESTMENTS 76
TABLE XXIV - IMPORTANCE OF INTERNET PAYMENTS TO THE FIRM 77
TABLE XXV - QUESTION 17 - COMPETITIVE ADVANTAGE THROUGH INTERNET PAYMENTS 78
TABLE XXVI - QUESTION 18 - HOW THE FIRM IS ADDRESSING SECURITY FOR INTERNET PAYMENTS 79
TABLE XXVII - QUESTION 19 - THE INTERNET'S EXPECTED ROLE IN THE
C清RING/SETTLEMENT SYSTEM
TABLE XXVIII - QUESTION 21 - INTERNET'S EXPECTED IMPACT ON COST DRIVERS
TABLE XXIX - QUESTION 22 - INTERNET'S EXPECTED IMPACT ON SERVICE
DIFFERENTIATION
TABLE XXX - QUESTIONS 24-27 - COST OR DIFFERENTIATION ADVANTAGES THROUGH
R&D
TABLE XXXI - QUESTIONS 28-32 - AVAILABILITY OF INTERNAL SKILLS
TABLE XXXII - COST OR DIFFERENTIATION ADVANTAGES
TABLE XXXIII - PERCEIVED RISK OF COMMODIFICATION
LIST OF FIGURES

FIGURE 1 - CRONIN'S MODEL OF CUSTOMER INTERACTION 13
FIGURE 2 - CANADIAN PAYMENTS CLEARING AND SETTLEMENT SYSTEM 23
FIGURE 3 - THE PROCESS FROM INVENTION TO INNOVATION 36
FIGURE 4 - COMPETENCY BASED MODEL OF SUSTAINABLE COMPETITIVE ADVANTAGE 49
FIGURE 5 - HALL'S MODEL OF INTANGIBLE RESOURCES AND CAPABILITIES 52
FIGURE 6 - SUMMARY TABLE OF CURRENT INTERACTIVE SERVICE CAPABILITIES 69
FIGURE 7 - AGGREGATE RESPONSES INDICATING PERCEIVED IMPORTANCE OF INFORMATION TECHNOLOGY TO THE FIRM 71
FIGURE 8 - AGGREGATE RESPONSES INDICATING IF THE RESPONDENT BELIEVES THE INTERNET IS IMPORTANT TO THE FIRM 73
1. Overview of Thesis

1.1 Introduction

This thesis investigates the current and potential impact of the Internet on Canada's financial services sector. This topic could be examined from a variety of viewpoints, including those of the consumer or the merchant. The perspective taken here is that of the financial institutions themselves.

A study of the Internet in the financial arena is timely and important for several reasons.

1. There have been claims in the popular press that Internet technology will revolutionize many aspects of contemporary society, from education and government to entertainment and business. Conversely, there have been predictions of the demise of the Internet, on the basis that it is not readily adaptable to widespread commercial use. It is useful to develop an understanding of Internet use in what may be its most challenging environment, namely financial services, in order to see if either of these two extremes can be supported, or if a more moderate view is warranted.

2. The Internet's role in commerce is currently hampered by the lack of a secure system of payments. This thesis explores the relationship between the Internet and Canada's payments system.

3. As Canadian banks post record profits, they continue to seek ways of reducing costs and improving customer convenience. The Internet shows great potential to enable financial institutions to pursue these important goals. However, the conservative nature of Canada's banking industry appears to be in opposition to the dynamic and democratic orientation of the Internet.

Internet use in this industry is still very new, and with the exception of the technological pioneers, the scope of services these firms provide on the Internet is rather limited. Nevertheless, there is genuine excitement over the Internet and the possibilities of using it as a vehicle for secure on-line financial transactions.
The main research questions are the following:

- To what degree is the Internet a beneficial technology for financial institutions?
- Will secure Internet services, including on-line payment over open networks, be adopted by the major firms in Canada's banking industry?
- What impact will the conservative nature of Canadian banks have on the deployment of Internet systems?
- Will smaller firms that are more willing to accept the risks of early technology adoption pre-empt the big banks and capture an attractive segment of consumers who are currently using the Internet?
- Is the Internet a likely source of competitive advantage for individual firms? If so, how can the advantage be sustained?

The industrial-organization model comprising four tests of beneficial technologies, proposed by Michael Porter (1985), is used as the basis for determining whether or not the Internet is potentially beneficial to the financial services industry.

Since it can be difficult to discuss the impact of information technology on business strategy without some reference to technical terminology and concepts, a glossary of terms is included in Appendix D.

1.2 Purpose of the Research

Although the Internet was first established in the 1960s, for most of its history it has been the province of educational and research organizations. The introduction of the World Wide Web, earlier in this decade, sparked enormous popular interest in the Internet as a means of communication, information dissemination and commerce.

But the road to Internet commerce has been fraught with problems, including security, accessibility, network speed, and consumer acceptance. Even today, a solid business model has not yet emerged. New Internet business models are being introduced constantly, often before older business models have had time to work (Resnick 1996).
Perhaps the most important missing ingredient needed to make Internet commerce work is a secure system of processing financial transactions, including payments, that is supported by major banks and credit card companies. This would overcome the limitations of most Internet markets where the consumer can look at, learn about, and perhaps even order products on the web, but must resort to off-line payment mechanisms. In fact, the need for an integrated system of electronic payments is one of the four key elements identified by Tenenbaum (1994) as prerequisites for widespread commerce on the Internet, including:

1. Simpler access
2. Better systems for resource location
3. Tighter communications security
4. Workable financial exchange mechanisms

The first two issues, simpler access and improved resource location, are technical problems that are being addressed by IT firms, telecommunications organizations, and cable television companies. Consequently, they are not explored here. However, an overview of the important issue of information security is included due to its relevance to the payment process.

The fourth of these points, methods of payment in Internet commerce, is central to the topic of this thesis. Although a great deal of effort and investment has gone into the development of secure financial exchange mechanisms, it is fair to say that Internet payment systems as of early 1996 are only marginally functional and in need of much more ongoing development.

It is only a matter of time before a broadly accepted model of Internet payments is established, and banks offer their customers Internet access to personal financial information and on-line transactions. However, the last major technological innovation of comparable scope, the Automated Banking Machine (ABM), was considered by some to have had a negative impact on the banking industry by reducing some services to commodity status. According to this view, consumers became attached to the convenient
services offered by ABMs at the expense of brand loyalty to a particular bank. In that sense, ABMs may have eroded competitive advantage, rather than enhanced it.

In light of the hyperbole which surrounds the Internet, there appears to be a risk that it, like ABMs, will further reduce competitive advantage and reduce banking services to commodity status. Conversely, the distinctive range of capabilities offered by Internet systems might enable financial services firms to differentiate themselves from competitors. Furthermore, the web may enable firms to develop other technology-based mechanisms of achieving sustainable competitive advantage.

The time for this investigation is right. Record profits reported by Canadian banks in 1995, coupled with the attention the web is receiving in the business community, indicate that the stakes are high. The Internet is being transformed from a researchers environment into an important tool that contributes to business strategies.

1.3 Approach to Research

Due to the relatively recent involvement of financial services firms with the Internet, and the scarcity of scholarly literature on the topic, an exploratory approach to research was taken. A group of ten financial companies was selected. This group includes five of Canada’s major chartered banks, the two largest international credit card companies, and three firms which might be considered “first movers” in this area.

A telephone interview was conducted with executives from each of these firms. Interview questions were designed to obtain an understanding of the importance the firms place on information technology, the Internet, and Internet payments. The interview then delved into the main elements of Porter’s model of beneficial technologies to determine how the Internet fits the model.

Other models, including those with a resource-based perspective, were also considered. However, Porter’s approach is highly relevant to the main research questions which relate to the common theme of how (and if) the Internet will benefit the financial services industry.
1.4 Summary of Findings and Conclusions

The general findings suggest that the deployment of unique Internet based solutions can provide a source of competitive advantage for first mover firms. However, sustainability of this advantage is tenuous. It relies primarily upon relentless ongoing innovation to retain first mover status, rather than through the erection of barriers to other firms.

Eventually, all banks should reach the same level of Internet systems deployment. This will occur as soon as robust security systems are in place, possibly by late 1996. If, at that time, some of the major Canadian banks launch full on-line services, consumer acceptance of Internet banking will likely increase.

In the longer term, the technology will cease being a source of differentiation because all firms will have relatively equivalent access to expertise. At that point, the source of differentiation will revert to banking services themselves. Considering the strategic importance of information technology to the banking industry, bank services will reflect how Internet technology is deployed through proprietary applications developed with open systems, rather than simply the technology itself. Yet in light of the rapidity with which Internet related technologies continue to develop and change, it is possible that a mature state of these technologies is still far in the future.

1.5 Structure of the Thesis

This thesis is divided into seven main chapters, plus appendices. Following is a brief description of each of the remaining chapters.

- Chapter two, entitled Electronic Commerce and the World Wide Web, discusses the general business environment of Internet commerce. It includes a list of the potential benefits of Internet commerce, a taxonomy of the types of Internet application systems available today, and a discussion of information security and privacy.
• Chapter three on Internet payments outlines the Canadian system of payments. Payments have become increasingly information based (or virtual), leading to new opportunities stemming from information technology innovations such as the Internet.

• Chapter four contains a review of scholarly literature. The main thrust of the chapter is the Internet’s potential role in affecting competitive advantage as seen from the industrial-organization perspective and the resource-based viewpoint. However, because the Internet is a very new technology to the business world, there is little in the way of literature that pertains directly to that topic. Consequently, the broader topic of information technology becomes the focus, with extensive examples from Internet banking and payments to draw linkages to information technology-based theory.

• Chapter five describes the methodology and limitations of the research study.

• Chapter six is a discussion of the findings of the research study. Results are presented and discussed in terms of the Porter model of beneficial technologies.

• Chapter seven presents a set of observations and conclusions drawn from the research findings.

• The appendices include a summary history of the growth and development of the Internet; an overview of web sites operated by the financial institutions included in the research; the interview form; and a glossary of terms used throughout the thesis.

The rate of technology change and adaptation is too dynamic to know with certainty how Internet commerce, banking or payments will look in as little as one year’s time. The overall intent of this thesis is to make a modest contribution to our understanding of how the Internet, specifically its use as a payment medium, will affect competitive advantage.
2. **Electronic Commerce and The World Wide Web**

2.1 **Introduction**

This chapter provides an introduction to the Internet business environment. Details regarding the history and development of the Internet and the World Wide Web are provided in Appendix A.

The chapter begins by suggesting that although the true commercial potential of the Internet is still largely unknown, it has already shown the ability to reduce costs in certain applications. The business capabilities of the Internet are summarized, together with the different types of Internet applications in use. An overview of what firms are doing on the Internet is provided, with some specific reference to Canadian business. The important issues of information security and privacy are also discussed.

2.2 **What Business is Doing on the Internet**

The widespread introduction of the World Wide Web in the early 1990s triggered enormous popular interest in the Internet. Consumers and corporations alike are now exploring new forms of electronic commerce on the global network.

But a frenzy of hyperbole surrounds the web, making it difficult to separate fact from fiction, as corporations try to assess the web’s value to their business. Indeed, some firms may simply assume some level of future value will accrue from the Internet.

As McCready (1995, p. 7) states, “once you’ve scraped away the glitzy marketing applets, what lies beneath (the Internet) is a genuine business-mutation engine of unknown potential.”

At a minimum, investing in an Internet presence in the form of a web home page is becoming a cost of doing business in the 90s. This uncharacteristic act of faith - investing in technology with no clear indication of when or if returns will follow - is not uncommon when it comes to the Internet. Despite the general lack of certainty regarding
its ultimate impact on competitiveness or profitability, public expectations are such that many firms feel compelled to participate on the web.

Nevertheless, even the most cursory examination of the Internet today reveals that global electronic markets are already well established. The software industry, where the product is information was perhaps the easiest to adapt to electronic media. Hence, these firms were the initial adopters and are the most fully developed to date. They are understandably advanced in their use of the Internet as a means of product distribution, customer support and promotion.

Software firms were also among the first to create Virtual Private Networks (VPNs) more commonly known as intranets. The term intranet refers to a firm’s internal business applications that use Internet technologies within a private and secure corporate environment.

One of the attractive characteristics of an intranet is its impact on cost. By building some of their internal electronic communications systems (known as groupware) on an Internet foundation, Booz Allen and Hamilton Inc. reportedly spent “hundreds of thousands of dollars instead of millions” on the applications (Horwitt 1996, p. 22).

Some firms also may create intranet applications in order to gain experience and to develop an understanding of how best to employ the technology in other ways. Applications developed using earlier technologies, such as mainframes, were too difficult for customers to use by themselves and could not have been widely deployed to the public without considerable expense in proprietary networking and training. By contrast, with the open network access and relative ease of use associated with Internet, firms can apply their new-found experience developing intranet systems (internal) directly to Internet systems used by their customers (external). In that sense, the technology

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1 Trade publications, observation plus anecdotal evidence all corroborate the considerable interest in intranets. Major computer companies such as Sun Microsystems and Silicon Graphics Inc. have well developed intranets that support internal business applications such as expense reporting and pricing generators.
supports a continuous learning paradigm and gives firms multiple uses of a single technology.

Despite the utility of internal systems, most of the popular focus is on the consumer market, where early signs of cost savings are also evident. According to figures appearing in Webmaster (1995), Sun Microsystems reported savings of approximately US$1.2 million generated in a single month by offering Internet-based product literature requests, software module deliveries and answers to frequently asked questions. But as outlined in Table I, there are a great many other reasons why business use of the Internet is increasing. In addition to the potential for cost reductions, advantages include immediate globalization, new marketing opportunities, and improved communication and customer service.

In order to derive some of these benefits, firms must develop Internet applications\(^2\) for their customers to use. There are a number of different application types listed in Table II. Each application type has certain functional capabilities that suit it to a particular set of needs.

The table indicates that, within the range of Internet applications available today, the electronic brochure is the most common. Electronic brochures have supplanted text-only information available in earlier Internet technologies such as Gopher. While they represent an improvement over these earlier systems, by including visual images and sound in addition to plain text, they are still limited primarily to a descriptive function. Interactive applications, such as investment modeling tools currently offered by some Canadian financial institutions (see Appendix B) are more useful because they provide direct benefit back to the user (i.e. the customer), in this example by giving the customer personalized investment information.

\(^2\) The term "applications" used here refers to software written to perform a certain function or set of functions.
<table>
<thead>
<tr>
<th>Internet Capability</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication (internal and external)</td>
<td>Asynchronous communication with electronic mail, news groups and list processors enables project teams to interact independent of time and space constraints.</td>
</tr>
<tr>
<td>Corporate logistics</td>
<td>Support of new modes of work, such as telecommuting.</td>
</tr>
<tr>
<td>Levelling the playing field - globalization</td>
<td>Small firms can achieve immediate global scope with negligible investment in infrastructure.</td>
</tr>
<tr>
<td>Achieving and maintaining competitive advantage</td>
<td>Numerous examples from banking and payments are given in the following section.</td>
</tr>
<tr>
<td>Cost containment</td>
<td>Web sites can dramatically reduce the cost of information distribution compared to other means.</td>
</tr>
<tr>
<td>Collaboration and development</td>
<td>Strategic alliances between firms, both large and small, are enabled through electronic links and resource pooling.</td>
</tr>
<tr>
<td>Information retrieval and utilisation</td>
<td>The vast amount of information available on the Internet includes up-to-the-minute data on products, services and training materials that can be accessed publicly or by arrangement with the vendor.</td>
</tr>
<tr>
<td>Marketing and sales</td>
<td>One of the most popular uses of the Internet, currently in the form of “electronic brochures” that illustrate products available for sale, promotions, contests, and links to other interesting Internet sites.</td>
</tr>
<tr>
<td>Transmission of data</td>
<td>This was one of the initial objectives of research and scientific organisations and is now important to businesses and consumers for a variety of purposes including payment.</td>
</tr>
<tr>
<td>Creating a corporate presence</td>
<td>To not have a web site in the mid-1990s brands a corporation as out-of-touch with the times. Even if it serves no immediate competitive purpose, having a presence on the Internet has become a cost of doing business.</td>
</tr>
</tbody>
</table>

Source: Adapted from Ellsworth (1994)
### Table II - Summary of Current Internet Application Types

<table>
<thead>
<tr>
<th>Internet Application</th>
<th>Capability</th>
<th>Status</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Internet Presence</td>
<td>Text only. More likely to be associated with Gopher than with the web.</td>
<td>Declining in favour of multimedia applications.</td>
<td>Provides basic information about the firm such as products, markets, mailing address, etc.</td>
</tr>
<tr>
<td>Electronic Brochure</td>
<td>Text and graphics.</td>
<td>Currently the most prevalent type of application.</td>
<td>Expands upon the text only application by including visual images (pictures of the firm’s products, staff, etc.) to make the site more interesting and worth revisiting.</td>
</tr>
<tr>
<td>Interactive Forms</td>
<td>Text, graphics and formatted information fields.</td>
<td>Growing in use. Provides an evolutionary step from electronic brochures to complete systems</td>
<td>Client can fill in a form and send it to the firm. For example, an order form or survey.</td>
</tr>
<tr>
<td>Interactive Applications</td>
<td>Includes Internet programming languages such as Java.</td>
<td>Growing, although most current examples appear to be more show than value adding.</td>
<td>The introduction of Java as an Internet programming language enables a user to download applications (such as a word processor) from the Internet to run on a local PC.</td>
</tr>
<tr>
<td>Interactive Links to Internal Systems</td>
<td>All of the above plus proprietary links to internal databases and application systems.</td>
<td>Only a few samples currently offered. Some good examples are in the banking community.</td>
<td>This can include forms and reports tailored to a specific client in both content and context. The most sophisticated type of Internet application currently. Examples include full service Internet banking where customers may apply for loans, reconcile statements and make payments through a bank.</td>
</tr>
</tbody>
</table>

Source: Personal observation of Internet sites
There are similarities between the electronic brochure applications and catalogue shopping in that a combination of pictures and text is used to market commodity products. It may be that commodities, adapt readily to catalogues and simple Internet markets because they are relatively easily described and not highly differentiated. For instance, some book stores and florists were successful in the early days of Internet marketing. Customers can make their decision to purchase these kinds of products without an elaborate evaluation or trial usage that might be required for more complex products such as software or automobiles.

Any merchant can create a global presence on the Internet for $3,600 to $6,000 per year by outsourcing the project to an Internet Service Provider (ISP). The ISP can also supply technical and operating expertise, so that small firms do not need to build the technological expertise internally. Therefore the barrier to entry for firms of any size is very low. The cost barrier to consumers is also low since Internet access through an ISP is charged based on the amount of time they are connected to the system, rather than on the volume of information accessed or downloaded.

The modest cost of creating a web presence seems to account for the fact that firms are willing to become involved with the Internet without a clear forecast of financial rewards. Put another way, although the returns from Internet commerce may be marginal, these returns result from equally marginal investments (Metcalfe 1995). Not exactly a strong endorsement, but this perspective helps understand the pioneering spirit behind Internet commerce.

Technological developments should help widen the scope of products and services that can be marketed on the Internet as firms become more advanced in their use of the technology. Sophisticated Internet applications are needed to support the sale and marketing of complex products that have a high level of information content and which

---

3 Forrester Research Inc. as reported in Webmaster, June/July 1995. In addition, first year start-up costs can be in the $2,000 to $4,000 range.
benefit from interaction with potential customers. Computer software is a good example of such a product. It is an inherently information-based product and is often marketed on the Internet by having potential customers download a demonstration version of the package. There may be a limited time period for evaluation after which the software stops working. Prospective customer can use the trial period to decide if they are willing to pay for the purchase of the full product. Netscape, the popular Internet browsing program, is marketed in this way.

According to the model depicted in Figure 1 (Cronin 1994) the Internet offers significant advantages over traditional forms of advertising and promotion for this type of product. When the product is information-intensive, and it is best marketed with a high level of interaction with customers. Cronin states that information servers and personal sales visits are the optimal approaches. Information servers, such as those available on the Internet, have the added advantage of being less expensive to maintain than a large sales force.

The consumer market is not the only place where the potential for Internet-induced cost advantages are attracting attention. Significant returns may exist in business-to-business transactions that currently employ Electronic Data Interchange (EDI) on proprietary Value Added Networks (VANs) (Thierauf 1990). Such transactions, which
include purchase orders and invoice processing, are highly structured in both format and context, and contain none of the graphical or multimedia components found with Internet applications. Yet according to one source (Buchanan 1995), Internet transactions are 90% less expensive than equivalent EDI/VAN transactions.

One of the key reasons for the lower cost of the Internet when compared to proprietary networks, is that the Internet is an open network. To underscore the significance of the Internet’s openness, consider the contrast between it and Value Added Networks. VANs are proprietary networks, often running specially developed software and operated by a firm or group of firms. These firms are also responsible for the network’s operation and management. Users of a VAN pay the network provider a fee based on either subscription or usage. Some large organizations may run their own private networks analogous to VANs in most respects, except that the network is used only by that firm, it is not shared.

On the other hand, the communications protocols used by the Internet result in a single transaction being decomposed into numerous packets of data, each of which may take a different route from source and destination. Thus, information flowing across the Internet will pass through multiple links operated and paid for by any number of universities, government agencies, Internet Service Providers and other corporations. In that sense, the cost of moving information between two companies is subsidized by all of the intermediate sites along the way.

From the Canadian perspective, one possible measure of the business impact of the Internet is the number of new “domain names” assigned to commercial firms. By the end of 1993, 420 companies were registered on the Internet. Two years later, at the end of 1995, the total had risen to 3,452. Within the first four months of 1996, an additional
1,986 firms had registered, bringing the total to 5,438. As a result, 75% of all registered Internet domains in Canada are considered commercial.\(^4\)

A survey by Andersen Consulting Canada in 1995\(^5\) indicates that the overall awareness of the Internet among businesses is extremely high. The majority (76.3%) of those firms use or plan to use the information highway to deliver or access products and services, while 42% of the businesses surveyed have already made use of the Internet.

**Table III - Percent of Canadian Financial Firms Intending to Use the Internet**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>To exchange and retrieve information</td>
<td>63.6%</td>
</tr>
<tr>
<td>To conduct business-to-business transactions</td>
<td>18.2%</td>
</tr>
<tr>
<td>To engage in advertising and promotions</td>
<td>9.1%</td>
</tr>
<tr>
<td>To distribute products and services to clients</td>
<td>5.5%</td>
</tr>
</tbody>
</table>

Source: Andersen Consulting Canada 1995

The financial services sector was among the business groups surveyed. An overview of their intended use of the information highway is summarized in Table III. According to these figures, very few of the firms who responded to the survey intended to use the Internet as a mechanism of distributing services to clients (only 5.5%). It is also interesting to speculate on whether or not the percentage would be greater today than it was when the study was conducted in 1995.

The Andersen survey suggests that electronic banking services rank second in importance to customer communication among the products and services of interest to business. See Table IV. The table also shows that internal communication, which could be facilitated by an intranet system, is another important capability of interest to firms.

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\(^4\) Source: CA*Net Domain Name Report as reported in ftp.cdnnet.ca/ca-domain/statistics, May 5, 1996

\(^5\) From “What Canadian Businesses Think of the Information Highway” as distributed through http://www.ac.com/canada/welcome.html
Table IV - Percent of Canadian Businesses Interested in Various Internet Services

<table>
<thead>
<tr>
<th>Service</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication with customers</td>
<td>83%</td>
</tr>
<tr>
<td>Banking services</td>
<td>68.9%</td>
</tr>
<tr>
<td>Communication within own organisation</td>
<td>65.6%</td>
</tr>
<tr>
<td>Distance or other education programs</td>
<td>56.9%</td>
</tr>
<tr>
<td>Ordering tickets (e.g., airline tickets)</td>
<td>44%</td>
</tr>
<tr>
<td>Buying other goods and services</td>
<td>32.8%</td>
</tr>
</tbody>
</table>

Source: Andersen Consulting Canada 1995

Overall results from the survey seem to indicate that Canadian businesses prefer to minimize the unknowns when considering Internet-based commerce. This is reflected in key findings which show a tendency to rely on more traditional service providers. For instance, established telephone companies were preferred as the suppliers of infrastructure rather than cable-television companies who are relatively new to this area. And Information Service Providers were the choice for the firm launching a presence on the Internet, rather than partnering with telephone or cable companies. These findings tie into the research questions explored here, which include the impact of a conservative industry like Canadian banking on the adoption and successful use of the Internet as a means of delivering services to customers.

The high degree of business interest in the Internet shown in the Andersen survey is consistent with findings reported by Burwell (1995). According to this study, current trends in the growth of electronic information are such that by the year 2000, half of the Canadian working population will be on-line.

2.3 Information Security

Perhaps the most widely known problem in Internet commerce, and the issue which has caused the greatest concern among would-be participants, is information security. While a variety of different security problems have been reported in the popular press,
there are certain issues that impact directly upon the payments process. Of particular interest is the ability of "an honest buyer to convince a seller to accept legitimate payment while preventing the dishonest buyer from doing unauthorized payments" (Janson. Waidner 1995. 3).

It could be argued that the concern over Internet security is overstated: that the risk of transmitting a credit card number to a web site is no greater than the risk associated with traditional plastic cards. According to this view, many consumers are willing to surrender their credit card to an unfamiliar gas station attendant whose trustworthiness is unknown. These consumers then wait patiently as the attendant takes the card into a payment kiosk to presumably authorize payment. While in the kiosk, the attendant could easily copy the credit card number and use it to purchase goods over the telephone where a signed receipt is not required for payment.

What is lacking in this argument is acknowledgement of the difference in scope between a single gas station attendant, and a global network of millions of computers. With the former, if a card number is stolen, there are relatively few sources of fraudulent use, namely those individuals who have had the opportunity to learn the credit card number through direct handling of the card, telephone authorizations, or by obtaining carbon copies of receipts. With the Internet, the number and location of possible thieves is virtually unknown and extremely difficult to trace.

A great deal of research effort has gone into developing encryption techniques designed to withstand known forms of electronic snooping with the expectation that once this problem is solved, new opportunities for competitive advantage will emerge from the Internet's world-wide infrastructure.

More recently, Visa and Mastercard, along with a variety of business partners, began a collaborative effort to develop a security standard for electronic transactions. The protocol, called SET (Secure Electronic Transactions) includes detailed published

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* As reported in a Mastercard press release on http://www.mastercard.com/press/release-960201.htm
standards of how encryption techniques can provide appropriate security for banks, merchants and consumers.

Systems implementing the SET protocol are expected to be offered by the end of 1996. The following excerpt from the published SET specifications illustrates how the protocol will use public-key encryption to provide secure transactions on the Internet.

Public-Key cryptography, also known as asymmetric cryptography, uses two keys: one key to encrypt the message and the other key to decrypt the message. The two keys are mathematically related such that data encrypted with either key can only be decrypted using the other. Each user has two keys: a public key and a private key. The user distributes the public key. Because of the relationship between the two keys, the user and anyone receiving the public key can be assured that data encrypted with the public key and sent to the user can only be decrypted by the user using the private key. This assurance is only maintained if the user ensures that the private key is not disclosed to another. Therefore, the key pair should be generated by the user. The best known public-key cryptography algorithm is RSA (named after its inventors Rivest, Shamir and Adleman).


2.4 Concerns About Privacy

Security of information is universally regarded as a prerequisite for successful commercial Internet applications. Concerns about information privacy, particularly about the credit card numbers and bank account details of individual consumers, is also a highly debated issue and one which can engender emotional responses.

The amount of information that is collected about consumers through existing ordering and payment systems is considerable and itself raises legitimate concerns for individual privacy, the confidentiality of records, and potential for abuse by government or business. Widespread use of Internet payments will add to those concerns. The global
nature of the network raises new questions regarding the ease with which information moves across international borders.

According to a 1990 research study, 21% of large public and private sector organizations exchange personal information relating to Canadians clients and employees with organizations outside the country (Laperrière 1991). The most frequent destinations for such information were the United States, Great Britain and France. The financial services sector, represented primarily by banks and other deposit-taking institutions, ranked about average in the amount of cross-border personal information flow. The large majority of clients whose data was transmitted outside Canada had the opportunity to access and correct errors contained in the data.

The self-reporting technique used by survey respondents would suggest that the 21% average figure noted above is, in all likelihood, a minimum (it is improbable that respondents would over-report the volume of cross-border data). And since this study pre-dates the widespread use of inter-networking technologies by Canadian financial institutions, one can reasonably surmise that the amount of private information related to Canadians transmitted to foreign destinations has increased since 1990.

2.5 Summary

The still unknown business potential of the Internet is not deterring companies from getting involved with various types of web-based systems, from simple to complex. Interactive applications should enable firms to derive more benefits from the Internet than the commonplace electronic brochure by supporting the sale of more complex products. There is a market for Canadian banking services, according to the Andersen study, yet most of the bank web sites still feature the brochure concept.

And while concerns over security and privacy are likely to linger for some time, the single largest inhibiting factor to widespread Internet commerce continues to be the absence of a secure system of payments.

The following chapter delves further into the role of the Internet in Canada’s payment system and the ongoing evolution of “virtual payment”.

19
3. **Internet Payments**

3.1 **The Internet and Canada's Financial Sector - A Clash of Cultures**

It would be difficult to imagine two entities more dissimilar than Canada's financial institutions and the global cluster of networks known as the Internet.

The major chartered banks, trust companies, credit unions and caisses populaires are perceived as conservative, careful in their approach to change, and generally risk-intolerant. They are also considered highly reliable, trustworthy and stable organizations. Egner (1991) describes banking as a "conservative industry by nature" that now finds itself in the "uncomfortable role of a quintessential information age technology leader". This statement is echoed by White (1991) who says that survivors in the banking industry in the 1990s "will be those who can anticipate the future, look beyond the boundaries of how it has always been, and look at the current situation from a new perspective."

The Internet, by contrast, is dynamic. Its importance to commerce and to society in general has been the object of considerable speculation in the popular press. It is developing at breathtaking speed, risk-prone, and essentially managed by no one. Table VI summarizes some key differences which illustrate the clash of cultures between financial institutions and the Internet.

In the face of the apparent disparities between these two worlds, and considering the potential security risks, why are Canadian financial institutions, multinational credit card companies and retail merchants so keen to offer their customers electronic payment options over the Internet? Perhaps their desire is fuelled by demographic studies on users of the Internet which report results such as those summarized in Table V. Although the data in

<table>
<thead>
<tr>
<th>Table V - General Internet Users Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average age</td>
</tr>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>Average household income</td>
</tr>
<tr>
<td>University educated</td>
</tr>
<tr>
<td>Professional or managerial position</td>
</tr>
<tr>
<td>Self-employed</td>
</tr>
</tbody>
</table>

Source: Hermes Project, University of Michigan (1994)
Table V reflects general Internet demographics, it is reasonable to assume that they apply equally well to the Canadian environment. According to the figures, Internet consumers are relatively young and seem to be well-educated, financially comfortable, and to have above-average career prospects. Clearly they represent an attractive customer segment.

**Table VI - Perceived Characteristics of Canadian Banks Compared to the Internet**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Canadian Banks</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioural norms</td>
<td>Conservative, procedural</td>
<td>Democratic, anarchic</td>
</tr>
<tr>
<td>Ability to change</td>
<td>Historically low, as measured by previous opportunities for technology innovation</td>
<td>High, constantly subject to significant technological change and rapid evolution in usage patterns</td>
</tr>
<tr>
<td>Attitude toward risk</td>
<td>Risk is to be managed and minimized, not avoided entirely</td>
<td>Pioneering exploration</td>
</tr>
<tr>
<td>Current and recent growth</td>
<td>Relatively mature state</td>
<td>Very rapid: growth estimates vary between 10% and 15% per month</td>
</tr>
<tr>
<td>Geographic scope</td>
<td>International</td>
<td>Global (growth occurring in developing countries in addition to established locales in North America, Europe, Australia and Japan)</td>
</tr>
<tr>
<td>Information integrity and standards</td>
<td>High: In addition to the comprehensive sets of checks and balances, the entire Canadian banking and payments systems requires a high degree of trust between institutions</td>
<td>High, as regards resistance to failure of a single network node: Low, in terms of consistent response results and the quality and currency of information and references</td>
</tr>
<tr>
<td>Management</td>
<td>Hierarchical, command and control</td>
<td>Unmanaged: the whole is comprised of a set of regional carriers with no formal management structure. Some self-appointed agencies attempt to codify conduct and acceptable behaviour</td>
</tr>
</tbody>
</table>

Sources: Adapted from Egner (1991), and anecdotal evidence from personal experience.
3.2 The Canadian Payments System

In order to see where the Internet fits within the financial services environment, it is helpful to understand some of the characteristics and mechanics of the payments system itself. The payments system of any nation is of pivotal importance to modern economies. It provides the mechanism for transactions between buyers and sellers of all manner of goods and services. The sheer scope and size of Canada’s payment system makes it an important factor in any discussion of electronic commerce.

Over two billion payment items, mainly paper-based, were cleared through the Canadian payments system in 1991 with a value of over $18 trillion, roughly 26 times the value of our gross domestic product (Crow 1992). Paper-based payment transactions still predominate the system (McDougall 1994).

Figure 2 illustrates how the current payments system works in clearing and finalizing settlement of a paper-based transaction (i.e. a cheque). McDougall (1994), Crow (1992) and Poriah (1991) describe Canada’s paper-based payments and clearing system as one of the finest and possibly the most efficient in the world.

According to Crow, the characteristics of a payment system considered most important by businesses and consumers include:

1. Speed
2. Security
3. Reliable confirmation that a transaction has taken place and been cleared
4. The ability to obtain information on resulting changes in accounts
5. Obtaining finality of payment
6. Overall cost of payment-related services

In addition to these capabilities, the payments system must operate within an appropriate regulatory framework. These controls must encourage competition, provide
Steps in the Process

1. Company A prepares and mails a cheque to Company B.
2. Company B receives and processes the cheque.
3. Company B deposits the cheque in its account at Bank B.
4. Bank B processes the cheque and transports it to the Regional Settlement Point for exchange to Bank A.
5. Value is given to Bank B in the amount of the cheque and subtracted from Bank A for the same amount via CPA's Automated Clearing and Settlement System.
6. Company B’s account is credited with funds.
7. The amount is deducted from Company A’s account on the day of posting. Company A must have funds available in Bank A to cover the amount of the cheque.
8. Both banks provide reports to their respective companies in the form of periodic bank statements.

Source: McDougall (1994)
standards to enhance efficiency, and assure the integrity of the system by effectively managing risk.

Characteristic of the Canadian payments system are large volumes of small dollar value transactions ($10 to $20) and a small number of very large transactions (averaging $2 million) that comprise a disproportionate amount of the total value processed (using figures from April 1992 to March 1993. McDougall 1994). Development of a large value transfer system, or LVTS, is now underway in response to concerns raised over obtaining same-day finality of payments, especially for high value transactions.

The absence of such a system is cited by Crow as a competitive weakness in Canada relative to other nations, which is particularly worrisome in light of the increasingly global and interactive nature of financial markets. Unfortunately, as recently as 1995 the LVTS had not been implemented (but was at the “call for proposals” stage) resulting in Canada’s ongoing lag behind many other industrial countries (Thiessen 1995).

The current emphasis in the role of the Internet in payments is mainly in the area of small or micro payments, rather than the large value payments. In that regard there is a good fit between Internet capabilities and the majority of the transactions in the Canadian payments system.

3.3 The Canadian Payments Association

The Canadian payments system is managed by the Canadian Payments Association (CPA) which was formed in 1980 by an Act of Parliament “to establish and operate a national clearings and settlement system and to plan the evolution of the national payments system” (Dorah 1991). Prior to that time, the payments system had been operated by the Canadian Bankers association.

Formation of the CPA resulted from two trends in the way Canadians were making payments by the late 1970s. Non-bank deposit-taking institutions, such as trust companies and credit unions, were becoming more important to the household/consumer sector as providers of financial services, chequing in particular. Yet these institutions had
no direct voice in the evolution of the system of payments. Second, an increasing number of financial transactions were becoming electronically-based (Vachon 1988).

Today, the CPA has approximately 150 members, comprising virtually all financial establishments in the country and including 14 “direct clearers”. Institutions who are empowered to clear payments for all other members and settle net claims in accounts held at the Bank of Canada. The central bank acts as lender of last resort to the financial system (Crow 1990).

Among the innovations the CPA has introduced to the payments system is the Automated Clearing Settlement Systems (ACSS) which logs payment items to and receipts from the 14 direct clearers. It also calculates the aggregate due-to and due-from balances with the Bank of Canada. The importance of the ACSS to the payments system is noted by the central position it occupies in the diagram in Figure 2. However, even with this automated system, finality of payment does not occur until one to two days after a financial transaction is initiated. It is therefore possible that a financial institution that is unable to meet its payment obligations through the Bank of Canada will continue to do business for a corresponding period, thereby escalating the level of risk of total system failure (McDougall 1994).

It is unlikely that any of the various forms of payment associated with Internet commerce will solve this problem directly. The Internet’s current role in the payment system is at the front-end, involving transactions between merchants, consumers, and banks. The finality of payments problem, on the other hand, comes at the back-end of the process, where the existing private networks that connect financial institutions are already in place and likely to remain active for the foreseeable future.

However, Internet payments should have an overall positive effect. Even though they are limited to the front-end of the process, electronic forms of payment provide verification at the time of a transaction of the payer’s ability to pay. As paper-based payments are increasingly substituted with electronic payments, more use will be made of
high-speed electronic funds transfers between banks. This will result in faster settlement for more transactions, thereby reducing the risk from finality of payment.

According to Roberts (1985) existing forms of electronic payment such as electronic funds transfer have been embraced by Canadians and make payments easier and somewhat cheaper in the long run. Roberts goes on to say that there is "no financial institution of any size that doesn't regard the move toward more electronic methods of making payment as inevitable and desirable."

3.4 The Evolution of Virtual Payments

Internet-based financial transactions are only the latest example in an ongoing process of evolution in the payment process. From the earliest (and still active) systems of barter, to the so-called smart cards featuring imbedded microprocessors, information content has steadily gained in importance over the physical entities it represents in trade (Peters 1987).

Table VII summarizes the progressive movement from physical units of payment to those that are entirely virtual or information-based. The table shows the development of common units of value which, over time, take on increased information content with concomitant increases in flexibility, universality and convenience.

The attractiveness of information-based systems, as compared to hard currency, stems in part from the drawbacks associated with paper cash and coins. As Johnson (1994) states, "cash is heavy, dirty, awkward and expensive to handle and store". Banking institutions spend large sums counting, sorting, moving, securing and disposing of cash. In 1992, 41 percent of the Bank of Canada's operating costs resulted from the production and issue of bank notes, the majority of which last only two years in circulation (Johnson 1994).

As recently as forty years ago, multipurpose credit cards did not exist. Plastic cards such as Visa and MasterCard were introduced in Canada during the late sixties and early seventies, at which time they were readily accepted by Canadians. By 1991 these cards
accounted for over $40 billion in retail sales, roughly 10% of total consumer purchases that year. Thomas (1993) noted a trend toward cash alternatives between 1979 and 1990.

Table VII - Evolution of Virtual Payments

<table>
<thead>
<tr>
<th>Method</th>
<th>How Payment is Made</th>
<th>Drawbacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barter</td>
<td>Trade one product or service of value for another</td>
<td>No common unit of exchange. difficulty in determining value of either side of transaction</td>
</tr>
<tr>
<td>Gold</td>
<td>Trade an amount of precious metal for product or service of value</td>
<td>Gold is heavy and difficult to transport. prone to theft</td>
</tr>
<tr>
<td>Paper</td>
<td>Paper notes are redeemable for equivalent value in goods</td>
<td>Wears out quickly. can be heavy. dirty and prone to theft</td>
</tr>
<tr>
<td>Cash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheque</td>
<td>Signed promissory note enables financial transactions between two parties without need for cash</td>
<td>Elaborate security and clearing systems required. possibility of forgery. time to complete the transaction</td>
</tr>
<tr>
<td>Telegram</td>
<td>Transfer funds by using telegram as advice of payment</td>
<td>Requires dedicated infrastructure of telegraph poles and cables. possibility of fraudulent use</td>
</tr>
<tr>
<td>Credit</td>
<td>Plastic card enables holder to purchase goods on credit which can be paid within a predefined period or accrue interest</td>
<td>Cards can be lost or stolen. reliance on signature means risk of forgery</td>
</tr>
<tr>
<td>Card</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATM</td>
<td>Bank machines enable cash withdrawal or transfer without need to accommodate banking hours or locations</td>
<td>Limited functions. require substantial investment by financial institutions. not ubiquitous</td>
</tr>
<tr>
<td>Digital</td>
<td>Various forms emerging, may include debit or credit-based transactions over the Internet</td>
<td>Lack of acceptable security. requires access to personal computer</td>
</tr>
<tr>
<td>Cash or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Increasingly Virtual (Information-based)

Sources: Adapted from Finlayson (1993), Johnson (1994), Singleton (1995)
During that time, the use of hard currency outside banks grew by just 3.3% in inflation-adjusted terms, whereas overall bank card use increased by 230% in real terms.

Credit cards were a significant step in the evolution of virtual payments: one which also presented opportunities for differentiation. The adaptation of brand specific card-oriented technologies can be attributed, at least in part, to differentiation strategies. American Express markets a certain level of exclusivity associated with its service, while Visa stresses the universality of its system over competitors such as American Express. And virtually all of the card companies have varying forms of value added services such as associations with automobile manufacturers, airlines, etc. In this way the credit card has avoided becoming relegated to the status of a commodity, despite the fact that the basic service provided by each firm is identical.

Today, the major credit card companies are on the verge of extending their reach from the plastic card to the computer screen through the Internet. The established giants are not alone, and are not the first, in providing secure payments on an open network. New forms of digitally-based payment systems are or soon will be available on the Internet, based on existing models of currency as well as plastic-card transactions.

However, the impact of the two major credit card companies on Internet commerce will be enormous if the scope of usage of their card-based payment systems in Canada is any indication:

1. In 1991 there were an estimated 46 million credit cards in circulation, or 2.3 cards for every Canadian adult over the age of 18:

2. Of those, 24 million were Visa or MasterCard. 14 million were issued by large retailers and three million were gasoline cards:

3. From 1981 to 1991 the number of Visa and MasterCards doubled - from 12 million to 24.3 million while the average sale transaction charged to the cards grew from $42 to

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*Membership has its privileges*
$67. During the same period the accumulated outstanding balance on these cards increased 300 percent to $11 billion.  

3.5 Digital Banking and Payments

A reliable method of payment is still the missing ingredient in Internet commerce. Existing Internet-based payment systems are very new and are coming into use more slowly than less risky applications such as marketing and customer service.

Of the payment methods listed in Table VII, digital cash and digital credit are the most applicable to Internet payments. Table VIII compares some characteristics of information-based systems such as credit cards and debit cards with the capabilities of the purely digital systems that are emerging on the Internet. The information in this table is based on a survey of six existing Internet payments systems conducted by Singleton (1995). References to product names have been omitted.

Only one of the systems reviewed by Singleton was ranked as “good” in terms of overall suitability to consumers, merchants and banks. He points out that the evolution of electronic commerce is difficult to predict because demands are still changing frequently. Since Internet payment systems are literally in their infancy, some approaches that work today may become completely unworkable within a year.

Such predictions have not deterred the pioneers. In Canada, Toronto-based Bayshore Trust has been offering a full suite of financial services on the Internet for several months (Partridge 1995), using its technological capabilities to promise loan approvals in as little as two minutes. This places at least one Canadian financial institution on the same

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8 Source: Credit Cards in Canada in the Nineties - Report of the Standing Committee on Consumer and Corporate Affairs and Government Operations (1992)
<table>
<thead>
<tr>
<th>Method</th>
<th>Financial Limits</th>
<th>Source of Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credit Card</strong></td>
<td>In most instances some form of limit is placed on the total value that can be charged to the card. The limit is based on creditworthiness of the card holder. Some cards also have an annual membership fee and associated benefits such as travel points.</td>
<td>Purchases charged to the card may be paid in full or in part (a minimum payment determined by the card-issuer) at monthly intervals. Card holders who pay the full amount at each interval effectively receive interest free credit for that period. The card issuing company is charged with the float.</td>
</tr>
<tr>
<td><strong>Debit Card</strong></td>
<td>The spending limit is related to the card-holders bank balance.</td>
<td>When a transaction occurs, the funds are immediately debited to the card-holder’s account.</td>
</tr>
<tr>
<td><strong>Smart (or Stored Value) Card</strong></td>
<td>Spending limit is determined by the amount transferred to the card from the card-holders account.</td>
<td>Purchases may be made up to the amount stored on the card. This system is the most analogous to “real” cash since the card-holder carries the cash equivalent encoded on the card. If the card is lost, so is the value encoded.</td>
</tr>
<tr>
<td><strong>Digital Cash</strong></td>
<td>Similar to debit or smart card systems.</td>
<td>Customer buys digital tokens or coins through a bank interface. When a purchase is made, the customer uses the digital tokens as payment. Merchant redeems the tokens through a bank. Customer is responsible for float.</td>
</tr>
<tr>
<td><strong>Digital Credit</strong></td>
<td>Similar to credit card systems. Major credit card companies are or soon will be offering these services.</td>
<td>Customer enters a credit card number when making a web purchase. Normal authorisation procedures take place. As with plastic credit card transactions, credit card company responsible for float if customer pays at end of current period.</td>
</tr>
</tbody>
</table>
footing as some US banks. The American-based Security-First Network Bank (SFNB), considered the world's first virtual bank, and Wells Fargo which has a much more substantial customer base than SFNB, also went online in 1995⁹.

Bayshore's early use of the Internet, relative to American counterparts, differs considerably from the speed with which other technological innovations have been adopted in Canada's financial sector. Finlayson (1993) points out the five year delay (compared to the US) in Canadian banks issuing their own credit cards. In that sense, Canada's relatively early adoption of Internet banking may be a sign of greater readiness to exploit new information technologies. On the other hand, the summary of financial firm's web sites in Appendix A suggests that the major chartered banks are proceeding much more carefully than these early movers.

Electronic credit and payment systems are not new to Canadians. In fact many consumers already rely on technology-based services such as Automated Banking Machines (ABM), Point of Sale (POS) retail systems, and signatureless electronic payment authorizations at gas pumps and public telephones. However, because it is an open network, the Internet has important distinguishing capabilities when compared to other network systems used for financial transactions.¹⁰

Yet despite the growing popularity of electronic currency and payment systems, we are far from becoming a cashless society. One need only point to the newly-minted two dollar coin as an example of the public interest in hard currency that can be felt, handled, played with, and jingled in a pocket or purse. Kettle (1996) suggests that the widespread introduction of ABMs in the late 1980s actually slowed the trend to a cashless society by making it easier and more convenient for people to obtain cash.

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¹⁰ See page 14 for a description of the significance of an open network.
It was suggested in Table VII that the trend toward virtual, information-oriented payment forms has existed for centuries. Similarly, the notion of a cashless society is not new. Its roots date back to the last century when American novelist Edward Bellamy wrote his novel Looking Backward. It describes a utopian society in which poverty and capitalism have been banished and currency is no longer necessary because every one has a credit card (Finlayson, Martin 1993). In Bellamy’s futuristic vision, a benevolent government supplied its citizens with sufficient credit to enable a good quality of life in the absence of market-based competition. While this idyllic civilization has not emerged in the years since Looking Backward was published, many cash-alternative innovations have developed, including the credit card, the debit card, and the so-called smart card. Each of these technologies replaces physical bearer notes with a greater level of information-enabled abstraction.

3.6 Summary

This chapter has described some of the roles and risks of the Internet in Canada’s system of payments. It has been shown that payments systems are becoming increasingly based on information rather than physical objects, like cash and cheques. Internet payment systems in the form of digital cash and digital credit are now emerging. The next major step forward in the evolution of payments will occur when major credit card companies and banks begin offering secure financial transactions over an open network, something which could take place by the end of 1996.
4. Review of the Literature

4.1 Introduction

Business use of the Internet provides a timely and interesting illustration of how the commercialization of information technology (IT) innovation can affect competition. Yet it is only very recently that the Internet has played a meaningful role in commerce. and its widespread use in payment transactions still lies in the future (although perhaps not too distantly). Consequently, there is a relative scarcity of scholarly literature specifically addressing this topic.

Conversely, much has been written regarding the broader role of information technology in competitiveness and value creation, both from an industrial-organization (I/O) perspective and from a resource-based viewpoint. It is this body of knowledge which forms the basis of this critical review of the literature.

The chapter is broadly organized into four sections covering information technology innovation, the role of IT in creating competitive advantage from both an I/O and resource-based viewpoint, and the impact of information on the value chain. Examples of Internet based banking and payments are used throughout to illustrate if and how Internet applications fit within the various models discussed.

None of the authors surveyed refer to the payments process per sé within these frameworks. Yet this is a key factor in breaking out of the current state of affairs regarding Internet commerce - where most companies offer little more than the equivalent of electronic brochures - to a radically transformed market where entire transactions are information based, including secure payment over a ubiquitous open network.

Throughout this chapter, the broad definition of information technology developed by Porter and Millar (1985) is used. According to this definition, information technology includes "the information that businesses create and use as well as a wide spectrum of increasingly convergent and linked technologies that process the information". The inclusion of information itself in the definition is significant. It
reflects the high level of integration that, according to Rayport and Sviokla (1995), exists among the three elements which collectively comprise the virtual business environment of Internet services:

1. Content - the information:

2. Context - where and how the information is stored and accessed:

3. Infrastructure - the physical elements of the network, including computers and telecommunications equipment.

It is also important to point out that information technology historically has involved proprietary hardware and software systems, as exemplified by the long-standing prevalence of mainframe-based computer applications. Generally speaking, proprietary technologies tend to resist imitation as a result of the substantial resource investments involved in their creation. For instance, the millions of dollars and hundreds of “man months” that IBM expended developing its breakthrough computer operating system OS/360, gave it a highly advantageous position in the computer marketplace of the 1960s. Few other firms could match the level of investment or technical expertise required to duplicate or improve upon IBM’s effort (Brooks 1975).

The Internet, by contrast, is founded on an open set of industry standards. Compared to proprietary mainframes, the hardware and software required to launch a website is very affordable (see page 12), with some software components available in the public domain at no cost. Therefore, it is important to recognize that some elements in information technology strategy theory may not apply to the Internet as a result of this fundamental difference between it and previous applications of information technology.

### 4.2 Information Technology Innovation

This section includes an examination of three important aspects of information technology innovation: the process of transformation from invention to innovation; the relationship of IT innovation to organization theory, including its impact on firm size
(which in the case of the internet can have a direct impact on firm competitiveness): and the impact of IT innovation in the global marketplace.

Several authors have commented on the important distinction between the invention of a new technology through research and development breakthroughs, versus technology innovation which may have genuine commercial potential (Roehrich 1985, Swanson 1994, Zahra, Nash, Bickford, 1994).

Senge (1990) offers one of the clearest descriptions of the process required to transform an invention - in this example, the airplane invented in 1903 - to a commercially viable innovation - the first trans-Atlantic commercial flight service introduced in the mid-1930s. In this instance, the shift from invention to innovation required three decades and the introduction of at least five related technologies in order to occur.

Today, the time lag between invention and innovation is shrinking\textsuperscript{11}. Yet there are striking parallels in the time-frame and development of Internet related technologies that further emphasize the applicability of Senge’s example. First, it has taken approximately 30 years from the inception of the Internet as a means of assuring continuity of communication in the event of a military attack (ARPAnet), to its general level of acceptance for use in commerce. Second, achieving the current level of innovation required the introduction of several supporting technologies over and above the initial ARPAnet infrastructure. The development of robust open communication protocols such as TCP/IP, fibre optics, powerful client/server computer systems, and viable information encryption and security schemes are among the contributing technologies needed to support commercial Internet applications. These relationships are depicted in Figure 3.

\textsuperscript{11} Consider, for instance, the rapid deployment of successive new generations of microprocessors over the past two decades.
Figure 3 - The Process from Invention to Innovation

<table>
<thead>
<tr>
<th>INVENTION</th>
<th>Related enabling technologies</th>
<th>INNOVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airplane</td>
<td>Variable pitch propeller</td>
<td>Trans-Atlantic Commercial Flights</td>
</tr>
<tr>
<td></td>
<td>Retractable landing gear</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monocque body construction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Radial air-cooled engine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wing Flaps</td>
<td></td>
</tr>
<tr>
<td>ARPAnet</td>
<td>TCP/IP</td>
<td>Internet Commerce</td>
</tr>
<tr>
<td></td>
<td>Fibre Optics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Encryption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Powerful Computers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>World Wide Web</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Senge 1990

These parallels in the invention-to-innovation evolution are not conclusive nor are they predictive of what may occur in the future. But the relationships support the notion that the Internet has reached a point in its development where it manifests many of the characteristics Senge ascribes to commercially viable innovations.

Turning to organizational theory. Swanson (1994) argues that there exists no foundational theory of IT innovation from organizational theory in general, citing available research as "both fragmented and limited". He proposes initial groundwork for such a theory based on three distinct IT innovation types, namely:

1. Administrative and technological process innovation;
2. Product and business administrative process innovation;
3. Product and business innovation relative to technological, product and integration processes.
Swanson's framework will not be analyzed in depth here. It is presented primarily as a means of illustrating the relative scarcity of information technology (and by extension, Internet related) innovation theory as applied to organization theory.

_Brynjolfsson, Malone, Gurbaxani and Kambil_ (1994) examine the relationship between information technology innovation and the size of firms in a given industry. In their study, no correlation was found in the financial services sector, where firm size remained relatively constant between 1976 and 1989 while IT investment grew tenfold from less than $2,000 billion to nearly $20,000 billion during the same period.

While no clear conclusions can be drawn that Internet capabilities necessarily lead to smaller firms, it is reasonable to suggest that such capability tends to improve the relative competitiveness of smaller firms in terms of the scale and scope advantages that would normally accrue only to larger corporations. For instance, smaller firms are unlikely to be able to afford the high cost of operating a private network, whereas most firms regardless of size should be capable of the investment required for basic Internet access (see page 12 for Internet access costing information).

A global economic perspective on IT innovation is provided by _Sainsbury_ (1994) who focuses on the role of technology innovation in international competition. Describing innovation as a "coupling process which brings together technology and customer needs", he points to the increasing importance of Newly Industrialized Countries (NICs) whose share of world manufactured exports went up from 1.6% in 1983 to 8.8% in 1989. The near total elimination of sheltered markets in developed countries and the growing ease with which NICs can acquire needed technologies are given as two indications of the growing impact of technology on global competitiveness. While Sainsbury does not limit this statement to information-based technologies, much less its use in the financial services sector, parallels do exist:

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\[12\] In March 1996, the cost of a reasonable speed telecommunications connection (e.g. 1.5 million bits per second) is a minimum of $70,000 per year according to published figures from an Ontario regional network service provider. See http://www.onet.on.ca
• **Near total elimination of sheltered markets in developed countries** - The Free Trade Agreement and NAFTA have led to some erosion of government supported protections in Canadian markets. Despite the oligopolistic nature of the Canadian banking industry, which is dominated by the “big six”, the broader financial services sector cannot accurately be described as sheltered. Witness the increasing scope of member firms into each other’s territory as banks enter the insurance and mutual fund arenas. And Canadian banks are increasing their presence in foreign markets such as Mexico (Partridge, Waldie 1996).

• **Growing ease with which NICs can acquire needed technologies** - A limiting economic factor in many developing nations has been inadequate infrastructure in the form of physical transportation and distribution networks. To remedy this, some developing countries are moving quickly to build their Internet infrastructures. The China Internet Company planned to build Internet sites in 40 industrial cities in 1995. In this way, rather than addressing weaknesses in the physical infrastructure China lacks, the strategy is to build an information infrastructure first thereby placing participating firms in the global marketplace immediately (Rayport, Sviokla 1995).

Missing from Sainsbury’s argument is reference to the managerial and technological know-how that would enable the high level of innovation necessary to transform NICs into competitive players in the global market. The reduction of international trade barriers, together with ready availability of cost-effective technologies, are necessary but insufficient factors to ensure a country (or a firm) of a strong competitive position.

However, these factors could contribute to a trend where traditionally underdeveloped countries draw disproportionate advantage from information technology innovation because they do not have old systems and structures to support while trying to move into new technological areas. This notion of legacy systems acting as an inhibitor to innovation, or actually becoming a disadvantage to current first-movers, reappears in the study of Canadian banks’ use of the Internet, reported in later chapters.
4.3 IT and Competitive Advantage - The Industrial-Organization Perspective

The industrial-organization model generally views competitive advantage as the benefits a firm derives from offering products at low cost or charging a premium for products that are differentiated from those of the competition. This implies that the environmental conditions of a given industry impose pressures and constraints to which a firm must respond. The industry orientation has caused this model to be criticized for ascribing a firm's success to external factors rather than to specific capabilities and resources that are unique to the firm (Lado, Boyd, Wright 1992).

Porter and Millar (1985) describe three specific ways technology changes the nature of competition: by altering industry structure; by supporting new cost and differentiation strategies; and by spawning entirely new businesses.

- **By altering industry structure** - Five competitive forces combine to shape the structure of an industry: the power of buyers, the power of sellers, the threat of new entrants, the threat of substitute products, and the rivalry among existing competitors (Porter 1979). Most if not all of these forces are evident in the banking industry. A technologically innovative firm like Bayshore Trust represents a new entrant that is creating substitute products (near-instant loan approval through the Internet) which affect the power of buyers (Internet approved loans are charged a lower interest rate than those arranged at a Bayshore office). Another relevant example is ABM deployment which had a relatively negative impact on the competitive position of the banking industry by commoditizing some services, thereby improving the power of bank customers (buyers) and changing the structure of the industry to the detriment of firms (Rayport, Sviokla 1994).

- **By supporting new cost and differentiation strategies** - Information technology can alter cost drivers in an industry to enable individual firms to improve their competitive position. CIBC may be doing just that in its pilot project to develop two-tier banking. In this scheme, customers with small bank balances will use electronic interfaces almost exclusively, with more costly face-to-face contact reserved for those with more sizeable balances (Partridge 1996). Differentiation
strategies currently employed by banks and credit card companies include information services customized to the demands of customers through personalized home pages. Such customized services are indicative of a shift away from the established norm in banking products which historically have relied on mass scale as an important means of producing advantage (Pine 1993).

- **By spawning entirely new businesses** - Three elements are included here, each of which corresponds with an aspect of Internet financial services. See Table IX.

**Table IX - IT and the Development of New Businesses**

<table>
<thead>
<tr>
<th>Factor Leading to New Businesses</th>
<th>Example from Internet Financial Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makes some businesses technologically feasible</td>
<td>Internet banking</td>
</tr>
<tr>
<td>Creates demand for new products and services</td>
<td>Rapid electronic loan approval</td>
</tr>
<tr>
<td>Creates new businesses in old ones</td>
<td>Adaptation of the Canadian payments system to include an Internet component</td>
</tr>
</tbody>
</table>


Porter and Millar argue that IT can no longer be the exclusive province of the firm’s technical staff. Rather, executives must become directly involved in the face of a rapidly changing competitive environment. Without such involvement, they argue, it may not be possible to derive maximum benefit from information technology investments to achieve strategic goals.

Porter (1985) also asserts that not all technological change is strategically beneficial nor does technology always lead to profitability. He offers four tests to determine if a planned technology change is desirable:

1. The technological change lowers cost or improves differentiation and it is sustainable:
2. Innovation shifts cost or uniqueness drivers in favour of a firm:
3. Pioneering use of the technology leads to first-mover advantages:
4. Technological change improves overall industry structure.

 Regardless of their adoption of innovative technologies, few would argue that Canadian banks are not profitable. But Porter’s model raises the more interesting question of how Internet-based services would be assessed against these four criteria. In particular, in view of the proposition that innovation can be used as a way of attacking well-entrenched competitors, does Bayshore Trust have an evident first mover advantage? If so, is that advantage sustainable considering the inherently open nature of Internet technologies? These questions are examined through exploratory research in following chapters.

 Porter also outlines some considerations for determining whether to adopt a strategy of either pioneering technology innovation (leadership) or learning from the pioneering experiences of others (followership). The choice of strategy is based on three factors:

**Table X Porter’s Model on Technology Leadership versus Followship**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Decision-Making Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sustainability of the Technology Lead</strong></td>
<td>• Source of the technology change: internal or external</td>
</tr>
<tr>
<td></td>
<td>• Presence/absence of sustainable advantage in IT development spending</td>
</tr>
<tr>
<td></td>
<td>• Relative IT skills</td>
</tr>
<tr>
<td></td>
<td>• Rate of technology diffusion</td>
</tr>
<tr>
<td><strong>First Mover Advantages</strong></td>
<td>• Reputation</td>
</tr>
<tr>
<td></td>
<td>• Pre-empting a position</td>
</tr>
<tr>
<td></td>
<td>• Switching costs</td>
</tr>
<tr>
<td></td>
<td>• Channel selection</td>
</tr>
<tr>
<td></td>
<td>• Proprietary learning curve</td>
</tr>
<tr>
<td></td>
<td>• Favourable access to scarce resources</td>
</tr>
<tr>
<td></td>
<td>• Definition of standards</td>
</tr>
<tr>
<td></td>
<td>• Institutional barriers</td>
</tr>
<tr>
<td></td>
<td>• Early profits</td>
</tr>
<tr>
<td>Factor</td>
<td>Decision-Making Considerations</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>First Mover Disadvantages</td>
<td>• Pioneering costs</td>
</tr>
<tr>
<td></td>
<td>• Demand uncertainty</td>
</tr>
<tr>
<td></td>
<td>• Changes in buyer needs</td>
</tr>
<tr>
<td></td>
<td>• Specificity of investments to early generations or factor costs</td>
</tr>
<tr>
<td></td>
<td>• Technological discontinuities</td>
</tr>
<tr>
<td></td>
<td>• Low-cost imitation</td>
</tr>
</tbody>
</table>

Some of the elements Porter ascribes to these decision-making considerations (e.g. relative IT skills, reputation, proprietary learning curve) transcend the classic industry-organization model of competitive advantage. They are more closely aligned with resource-based strategies in the sense that they focus on unique, firm-specific capabilities rather than industry factors.

Zahra, Nash and Bickford (1994) offer a slightly different perspective on early mover advantage. They describe five mechanisms by which technological pioneering can lead to sustained growth and profitability.

1. **Acquire a Market Leadership Position**: The authors include points such as redefining the industry rules of competition, using economies of scale, establishing the technology as an industry standard, protecting intellectual property rights and building customer loyalty as some of the means by which a firm can achieve market leadership. Of the points listed only one - build customer loyalty - is well suited to Internet commerce. The remaining elements would apply primarily to proprietary technology that can be nurtured and protected in the ways described.

2. **Overcome Incumbent Inertia**: If a leadership or first mover advantage can be achieved, the firm must not rest on past successes. Rather, it needs to practice continuous innovation, develop ties with the market to reduce risks of upgrades, and utilize environmental forecasting. These approaches seem to apply equally well to
both open and proprietary technologies, making them useful for early movers in Internet adoption.

3. **Manage the Duality of Technological Pioneering:** The key points here are balancing the technology portfolio and developing organizational capabilities. Research findings bear out the relevance of a balanced approach to technology innovation. Putting all of the firm's eggs into a single basket can leave it flat-footed when the next inevitable IT innovation appears.

4. **Speed up Technological Development and Commercialization:** By enhancing cross-functional collaboration, the technologists and the marketers (for example) combine to make a technology commercially viable. Many of the Internet developments occurring today involve grass-roots movements that look upon the technology strictly as an enabler rather than as an end unto itself.

5. **Link Pioneering Activities to Competitive Strategy:** In addition to traditional industrial-organization strategy components such as creating barriers to entry, the authors suggest making the technology a focal point of firm strategy.

Although the framework proposed by Zahra, Nash and Bickford focuses on some industry factors, it also includes several references to managerial capability. In that sense, it overlaps with the resource-based perspective. Overall, the framework is only marginally applicable to the Internet or other open technologies. Most of the authors' recommendations apply to proprietary technology, although a few - such as building customer loyalty and engaging in continuous innovation - are more universal.

**Parsons** (1983) introduces a three-level framework for the analysis of IT and competitive advantage, which contains considerable overlap with Porter's earlier work on competitive forces (1980). Unfortunately, there is little additional insight to be gained from Parson's framework that cannot be found in the original.

**Roehrich** (1987) uses Porter's five forces framework to emphasize how technology can introduce instability to an industry. He uses examples from various industries including tires, ethical drugs, steel and supermarkets to illustrate that high return on
equity from technology innovation is linked to the overall profitability of the industry. Roehrich does not provide specific evidence from the banking industry.

However, from his premise it might be reasonably asserted that highly profitable Canadian banks have much to gain from continuing their pattern of information technology investment including Internet based information systems and services. This analysis does not identify nor does it aid in understanding, the impact that an individual firm’s IT investments have on its ROE.

In determining how IS\textsuperscript{13} can produce competitive advantage, McFarlan (1984) suggests five questions that companies must answer:

1. Can IS technology build barriers to entry?
2. Can IS technology build in switching costs?
3. Can the technology change the basis of competition (with reference to Porter’s three generic strategy types)?
4. Can IS change the balance of power in supplier relationships?
5. Can IS technology create new products?

Like some other authors, McFarlan goes on to indicate that management must change the way it operates in light of the issues raised around IT and competition. The true competitive impact of IT expenditures must be clearly understood. He cautions against prevalent rules-of-thumb (such as percentage of sales) for guiding such investments because these measures tend to focus on the efficiency aspects of the IT functions rather than on its contribution to competitive effectiveness. Unfortunately, McFarlan does not provide suggestions for how this contribution to competitive effectiveness can be measured.

\textsuperscript{13} McFarlan uses the term IS, meaning information systems, in reference to the equipment and systems but not including the information component included in the operational definition of IT used elsewhere in this thesis.
McFarlan, McKenney, Pyburn (1983) propose a strategic grid to be used to portray how certain industries fit within four different IS environments: strategic impact of existing systems (high-low) and strategic impact of future systems (high-low). In this grid, major banks ranked at the high end of both categories. This underscores the strategic importance of information technology in banking and credit card companies where IT represents a significant component of the product or service costs and hence can be used as an important differentiable feature, and where those very products are information intensive. The information intensiveness of banking is echoed by several research respondents as well.

The Information Technology Association of Canada (ITAC) describes a matrix framework to analyze the impact of IT on competitiveness, wealth creation and quality of life improvement as shown in Table XI.

This model bears some resemblance to the work of Porter (1985) discussed earlier. The first two levels are analogous to the low-cost leadership and differentiation strategies, while the remaining three levels tie in with Porter’s suggestion of information technology “spawning entirely new businesses”.

However, ITAC’s descriptive model is actually a matrix which proposes that, over and above its impact on competitiveness, IT innovation can result in the creation of new wealth and markets, and can improve the quality of life. For the purposes of illustration, some examples taken from Internet banking and payments have been added to the framework. These examples may be arguable, but they do illustrate the intent behind the ITAC model.

While providing a useful descriptive framework, ITAC’s model is not overly helpful in determining strategy or in identifying opportunities where IT innovation can be beneficially applied.
<table>
<thead>
<tr>
<th>Impact of Information Technology</th>
<th>Competitiveness Enhancement</th>
<th>Wealth Creation &amp; New Markets</th>
<th>Quality of Life Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 5: IT based new concepts and paradigms</td>
<td></td>
<td>Internal and external communication improvements</td>
<td>Secure Internet payments, Personalized web banking services</td>
</tr>
<tr>
<td>Level 4: IT enabled strategic management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3: IT dependent new commodities</td>
<td>ABM deployment</td>
<td>Debit card</td>
<td></td>
</tr>
<tr>
<td>Level 2: Quality enhancement</td>
<td>Electronic funds transfer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1: Cost reduction</td>
<td>Manual records replaced by computerized records</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Information Technology Association of Canada

In summarizing this section, it is reasonable to suggest that industrial-organization perspective has provided considerable insight into the role of information technology in competition. No firm operates in a vacuum, and it would be difficult to imagine developing useful competitive strategies without considering inputs such as suppliers, buyers, the general nature of the industry, and so forth.

However, as its critics point out, I-O theory does not adequately consider the unique capabilities of an individual firm. In the information technology realm, where the pace of innovation is rapid, the ability of companies to develop a high level of internal knowledge, and to keep that knowledge current, is critical to competitiveness. The following section of this chapter provides a closer look at competitiveness from the firm level as proposed in resource-based theory.
4.4 IT and Competitive Advantage - The Resource-based Perspective

In contrast to the industry focus of the industrial-organization perspective on competitive advantage, the resource-based model is oriented toward the distinctive competencies that give a particular firm the edge over its rivals. The firm is viewed as a bundle of specialized resources that combine to provide it with a superior position within the market (Barney, 1986). Nevertheless, the resource-based view does not entirely ignore the industry context within which firms compete. Several authors have contributed to the greater understanding of what constitutes sustainable competitive advantage from this perspective.

Collis and Montomery (1995) propose five tests that a resource must pass in order to qualify as the basis for effective strategy.

1. The Test of Inimitability: Is the resource hard to copy? No matter how well protected it may be, no resource resists imitation forever. Patents ultimately expire, computer hardware can be reverse engineered, and employee turnover can result in the loss of trade secrets. One factor that inhibits imitation is called path dependency, meaning that a resource is unique as a result of all that happens in its accumulation. Possession of a strong brand name is given as an example of a path dependent resource that a competitor cannot duplicate even if it invests considerable time and effort.

Causal ambiguity is another source of inimitability stemming from the difficulty of disentangling the source of value creation. For instance, Wells Fargo’s Internet capabilities are easy to perceive by simply accessing their web site. But comprehending the links to their internal information infrastructure is extremely difficult, making these links a source of advantage for Wells Fargo.

2. The Test of Durability: How quickly does this resource depreciate? According to the authors, “most resources have a limited life and will earn only temporary profits.” In an arena such as information technology, and the Internet in particular, companies
must be wary of their investments that are state of the art today, only to be obsolete
tomorrow.

3. **The Test of Appropriability**: Who captures the value that the resource creates? A
competitive strategy should be bound to resources that are inextricably linked to the
company. Clearly Internet resources, apart from the links to internal technologies,
would not pass this test.

4. **The Test of Substitutability**: Can a unique resource be trumped by a different
resource? This echoes Porter’s five forces framework (i.e. the threat of substitution).
In the Internet environment, substitutability may be achieved by a firm altering the
context of information delivery. A credit card firm may have a bland web home page
but establish context sensitive links to its services through other sites. In this way, it
can provide a convenient means of payment to a customer purchasing an item at an
Internet mall.

5. **The Test of Competitive Superiority**: Whose resource is really better? This final
test stresses the importance of assessing the firm’s competencies against those of the
competition, similar to the notion of benchmarking which has long been a component
of Total Quality Management.

The importance of Collis and Montgomery’s five-test model lies in its
comprehensiveness. It includes elements of both resource-based and industrial-
organization strategies, and highlights both positive and negative aspects of the Internet.
Further, it is apparent that these tests could be useful in managerial decision making, a
capability lacking in many other articles reviewed here.

**Lado, Boyd, and Wright** (1992) describe a competency based model of sustainable
competitive advantage that contains four major components which are linked to one
another and to the environment as shown in Figure 4.
The managerial competencies and strategic focus component in this model allows for the important contribution of managerial competencies to competitive advantage. These competencies include leadership, strategic vision, communication and employee empowerment, factors that are not well accounted for in the I-O model.

Resource-based competencies include anything that can be a strength or weakness that affects the competitiveness of the firm, including human and non-human resources as well as tangible and intangible assets. In the model, this component is linked to the output based and transformation based competencies to illustrate the "synergistic interactions" among them.

The transformation based competencies are those which transform inputs to outputs, and in that sense are linked to the concept of the value chain. It is here that information technology can play a key role (although that role is not emphasized by the model's developers). While information technology can have a positive effect on scale and scope economies, the authors argue that such gains are imitable and likely to erode over time in the absence of matching managerial capabilities. Hence this component is linked to all three of the other components of the model.
Finally, output based competencies are said to include not only physical goods and services delivered to customers, but also invisible outputs such as reputation, brand image and other elements that provide real or perceived value to customers. In many ways, these invisible outputs are key to sustainable advantage, since a reputation built on quality service, responsiveness, flexibility and consistent understanding of customer requirements, would be difficult for a competitor to copy.

This generic resource-based model illustrates some of the firm specific competencies that are, to varying degrees, lacking in industrial-organization models. It does not, however, specifically address information technology strategies and how a firm might develop specific IT based capabilities that would be difficult to imitate.

To that end, Haeckel and Nolan (1993) recommend that companies recognize the difference between IT capabilities as compared to investment in isolated IT systems such as e-mail, reservation systems and inventory control systems. They suggest the need for an enterprise-wide model of the business within which components such as databases, software, and expert systems are integrated. Only with this level of integration will information technology fully enable competitive advantage by reducing time and space constraints in acquiring, using and making decisions based on information.

The importance of intangible resources to overall business strategy is examined by Hall (1993) who includes in the list of such resources: data bases, information in the public domain, personal and organizational networks, know-how of employees, and the culture and reputation of the company. To varying degrees, each of these intangibles corresponds with information technology in general and the adaptation of the Internet in particular. If a resource such as information in the public domain is able to lead to sustainable advantage, then it could be argued that publicly available information technologies (such as Internet and web software) can do the same.

As outlined in Figure 5, Hall divides intangible resources into: those which are people dependent (skills) and others which are people independent (assets). These aspects relate to the functional, cultural, positional and regulatory capabilities available to the firm.
Functional capabilities (the ability to do specific things) and cultural capabilities (the habits, values and beliefs of an organization) are skills based factors. In the context of Internet banking and payments, it may be argued that functional capabilities are of less importance to sustainable competitive advantage than cultural ones since the know-how is, to a considerable extent, equally available to all firms. The firm's ability to learn and to creatively adapt new technology solutions to existing and emerging business opportunities, takes longer to cultivate and is more difficult for a competitor to imitate.

Positional capabilities bridge skills based factors (e.g. reputation) and asset based capabilities (e.g. data bases). The positional capabilities of Canada's major financial institutions are likely to play a critical role in how Internet services are rolled out to customers. In all probability, the conservative nature of the industry will lead to a slow and steady implementation, opening opportunities for less risk-averse firms such as Bayshore Trust to gain a first mover advantage. Regulatory factors are unlikely to have significant bearing on Internet based competitive advantage since trade secrets, for instance, do not apply in the realm of open technology.

However, the links that exist between open systems and proprietary firm-specific capabilities can be a key to competitive advantage because they are difficult for competitors to perceive and/or to imitate.
**Figure 5 - Hall's Model of Intangible Resources and Capabilities**

<table>
<thead>
<tr>
<th>People Dependent</th>
<th>Functional</th>
<th>Cultural</th>
<th>Positional</th>
<th>Regulatory</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Know-how of employees, suppliers, distributors</td>
<td>Perception of quality, Ability to learn</td>
<td>Reputation</td>
<td>Networks</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>People Independent</th>
<th>Cultural</th>
<th>Positional</th>
<th>Regulatory</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contracts licences, trade secrets</td>
<td></td>
<td></td>
<td>Assets</td>
</tr>
</tbody>
</table>

Source: Hall (1993)

Hall’s model is valuable as a descriptive framework of intangible resources that may contribute to competitive advantage, and for the very fact of highlighting these important non-physical resources. Like many of the models surveyed here, it does not provide a normative base for determining IT strategies.

**Williams** (1994) states that the sustainability of competitive advantage varies considerably even within a single industry. Pointing to the information technology field, he observes that microcomputer software products evolve slowly over relatively long periods of time, perhaps as much as a decade. Conversely, microcomputer hardware becomes obsolete in one to two years. Sustainability of advantage therefore stems from the classes of resources and capabilities that create the advantage. Citing several constituents of time-based advantage, Williams suggests that organizational learning processes are at the heart of adaptability to changing competitive conditions.

**Hammer and Mangurian** (1987) also emphasize that the business value of information technology depends on the total system, rather than separately deployed communications or processing functions. As summarized in Table XII, they describe the impact of information on time, geography and relationships, while the potential business
value of IT is assessed against efficiency, effectiveness and innovation. Examples of Internet banking and payments are again used to show a concrete link between this framework and current levels of innovation in these areas. Once again the model does not provide assistance in developing IT specific strategies.

Table XII Impact of Information on Time, Geography and Relationships

<table>
<thead>
<tr>
<th>IMPACT</th>
<th>EFFICIENCY</th>
<th>VALUE</th>
<th>INNOVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time</strong></td>
<td>Accelerate business process:</td>
<td>Reduce information float: e.g. Customer-</td>
<td>Create service excellence: e.g. Rapid loan</td>
</tr>
<tr>
<td></td>
<td>e.g. Electronic funds transfer</td>
<td>supplied information enables instant</td>
<td>approval via Internet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>alterations to service delivery</td>
<td></td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td>Recapture scale: e.g. Global</td>
<td>Ensure global management control: e.g.</td>
<td>Penetrate new markets: e.g. Clients of the</td>
</tr>
<tr>
<td></td>
<td>infrastructure accessible at</td>
<td>Electronic mail and similar tools</td>
<td>China Internet Company go global immediately</td>
</tr>
<tr>
<td></td>
<td>low cost</td>
<td>facilitate global communication.</td>
<td></td>
</tr>
<tr>
<td><strong>Relationships</strong></td>
<td>Bypass intermediaries e.g.</td>
<td>Replicate scarce knowledge: e.g. Management</td>
<td>Build umbilical cords: e.g. Internet services</td>
</tr>
<tr>
<td></td>
<td>Direct contact with customers</td>
<td>can provide information directly to all</td>
<td>based on differentiation raise customer’s</td>
</tr>
<tr>
<td></td>
<td>through web sites</td>
<td>employees and customers</td>
<td>switching costs</td>
</tr>
</tbody>
</table>

Source: Hammer & Mangurian, 1987

The notion that a firm's ability to outperform its rivals is based - at least to some extent - on its own capabilities is consistent with the common sense notion that survival is related to individual, specific and sometimes unique competencies. Indeed, at least some empirical evidence exists to further support the validity of resource theory (Mosakowski, 1993). Thus, the resource-based models provide useful insights into how competitive advantage is achieved.
4.5 Information Technology and the Value Chain

Porter (1985) describes the concept of a value chain which comprises five primary activities and four support activities that combine to create value in a product or service. “Downstream” value activities such as sales and marketing are augmented by “upstream” activities which transform the raw supplier inputs into products or services that are ultimately purchased by consumers. Along the way, each value activity has a physical and an information component. (See Table XIV, page 12 for a summarized diagram of the physical and virtual value chains.)

According to Porter, by the 1980s the pace of IT advancement was already more rapid than improvements to physical processing technologies. Information technology is also highly influential in managing the linkages that exist among activities and which also exist between the firm and the buyers and sellers of its products. These linkages - which would be called interfaces is the computer field - are important because they are not readily evident to competitors, and therefore contribute to the sustainability of competitive advantage.

A relevant example of these linkages would be the interface between the open, public web site operated by a financial services firm, and the mechanisms of accessing existing corporate data stored in internal, private systems.

The collective value chains of all firms, suppliers, channels and buyers create a value system for the industry overall. Within that value system, Internet based links are already established for communications (internal and external), customer support and a variety of other tasks.

Rayport and Sviokla (1994) illustrate how information technology is “recasting the value proposition”. To remain competitive, companies must compete not only in the traditional marketplace, but also in the information-based marketspace where entirely new forms of commercial transactions have emerged. The marketplace and the marketspace differ in terms of content, context and infrastructure. Table XIII illustrates these differences, with marketspace examples from banking and credit-card purchases.
Table XIII - Marketplace versus Marketspace

<table>
<thead>
<tr>
<th>Marketplace Banking</th>
<th>Internet-Based Marketspace Banking</th>
<th>Credit Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content</strong></td>
<td>Physical product: bank statement, passbook, cash.</td>
<td>Personal financial information, savings and loan rates.</td>
</tr>
<tr>
<td><strong>Context</strong></td>
<td>Face to face interaction with bank staff.</td>
<td>Personal &quot;home page&quot; with services tailored to customer preferences.</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>Bank branch, proprietary networks.</td>
<td>Proprietary networks, Internet, home computer, software.</td>
</tr>
</tbody>
</table>

The authors suggest that banks have done a poor job adapting to the marketspace, citing the fact that some banking services have become commodities as a result of ABM deployment. Originally, ABM deployment was based on a strategy of banking automation, chiefly to lower costs for frequent transactions (deposit and withdrawal of funds) by customers with low balances. What banks did not predict was that customers would respond to the convenience of ABM technology rather than to the institution providing the service, thereby eroding customer loyalty and reducing some bank services to commodity status.

However, one may reasonably argue that the problems arising from ABM deployment can be addressed or at least mitigated with Internet based services because the latter enables greater manipulation of the context of service delivery. Unlike ABM networks, Internet based banking and payment services present possibilities to customize consumer access points to banking services through the creation of a personal home page for literally every customer. Since this process can be fully automated, the bank’s

---

14 This is mentioned anecdotally in several other sources and was confirmed in several of the interviews held with Canadian financial institutions as reported in subsequent chapters.
incremental cost to provide personalized customer access is almost zero. At least one Canadian bank offers this very capability already, and uses it as a means of differentiating its services from those of the competition. Bayshore Trust (in Canada) and Wells Fargo (in the United States) have taken this a step further, manipulating the content itself by providing full services through their Internet sites. And unlike ABM networks, the Internet’s global infrastructure enhances a bank’s ability to reach customers regardless of time and place, without the need to invest further in its own proprietary network infrastructure. Therefore, to the extent their context and content differentiation strategies are successful, there should be opportunities for financial institutions to increase scope dramatically at negligible cost.

Personal home pages for banking or other Internet services illustrate what Rayport and Sviokla call the “disaggregation of content”. Unlike most forms of print media where information of value to a customer is blended with other information of lesser or no perceived value, customers using Internet banking pick and choose the information they wish to receive. They can subsequently change this personal profile when and as they see fit.

In addition to obvious customer service benefits, the information a customer provides in order to customize a home page is itself valuable to the bank. Factors such as age, sex, income level and of course the services of interest to the customer, are some of the data elements captured by these systems. In so doing, firms develop a single database of valuable demographic and service information that can be used for multiple purposes. While similar data may be available elsewhere to the bank, different elements are often stored in separate and perhaps incompatible database systems, making the Internet-based data capture more convenient and useful.

Clearly it would seem that information captured for one transaction can be reused and recycled to provide new sources of value for other purposes. Such is the premise of

---

the Virtual Value Chain (VVC) as described by Rayport and Sviokla (1995). By combining the notion of the *marketspace* and Porter’s description of the Physical Value Chain, the authors introduce the VVC as a non-linear, information-based matrix of value creation and extraction. Value can be created at any stage in the VVC by gathering, organizing, selecting, synthesizing and distributing information. Table XIV contains an integrated illustration of the Physical Value Chain, the Virtual Value Chain and the Value Matrix.

Five management principles are introduced by Rayport and Sviokla, and have applicability in the banking and payments arenas as shown in these examples.

1. **The Law of Digital Assets**: Digital assets, unlike physical ones, are not used up in their consumption. Example: Customer profile information required for personal home pages can be reharvested for numerous marketing and service planning purposes.

2. **New Economies of Scale**: Companies can achieve low unit costs for products and services. Example: Existing Internet infrastructure extends the geographic reach of bank services without corresponding increases in network costs.

3. **New Economies of Scope**: A single set of digital assets can be deployed across multiple markets. Example: Customer profile information can lead to focused marketing efforts (sometimes called “narrowcasting”) to sell related services such as insurance and RRSPs.

4. **Transaction-Cost Compression**: Price-performance of information technology is doubling every 18 months (a phenomenon often called “Moore’s Law” named after the former CEO of Intel who initially made the observation). Example: The reduced cost of data storage and calculation enables banks to tailor customer services on demand and to build massive information warehouses to improve marketing and service development effectiveness.
5. **Rebalancing Supply and Demand**: A synthesis of these four axioms resulting in the opportunity to address customer demands rather than simply sell products and services. Example: Personal home page.

**Table XIV - The Physical and Virtual Value Chains**

<table>
<thead>
<tr>
<th>Automated Warehouse</th>
<th>Flexible Manufacturing</th>
<th>Automated Order Processing</th>
<th>Telemarketing</th>
<th>Remote Equipment Servicing</th>
<th>Examples of Information-Based Activities (Support activities excluded)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inbound Production</td>
<td>Outbound</td>
<td>Marketing</td>
<td>Sales</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Physical Value Chain**

Gather
Organize
Select
Synthesize
Distribute

New markets

**Virtual Value Chain**

logistics processes

Value Matrix

New markets

New markets


*Cronin* is the only author reviewed who adapts the value chain concept directly to the Internet. She illustrates the impact of the Internet on three types of value activities which have their roots in Porter's value chain: inputs from suppliers; internal operations; and relationships with customers. Cronin offers Internet value chain illustrations for each of these three categories. They are summarized in Table XV.
Table XV - Cronin's Internet Value Chain

<table>
<thead>
<tr>
<th>Internet Capability</th>
<th>Inputs from Suppliers</th>
<th>Internal Operations</th>
<th>Customer Relations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pricing and Ordering</td>
<td>Global Connectivity</td>
<td>Market/Product</td>
</tr>
<tr>
<td></td>
<td>Product Support</td>
<td>Collaboration</td>
<td>Research</td>
</tr>
<tr>
<td>Benefits to Company</td>
<td></td>
<td></td>
<td>Customer Support/Feedback</td>
</tr>
<tr>
<td></td>
<td>Easy, efficient access</td>
<td>Savings in</td>
<td>Data for market research</td>
</tr>
<tr>
<td></td>
<td>Faster problem resolution</td>
<td>telecommunications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interactive</td>
<td>Facilitates partnerships and joint ventures</td>
<td>Consumer responses to new products</td>
</tr>
<tr>
<td></td>
<td>Non-proprietary system</td>
<td>Shortens development time</td>
<td>Immediate response to customer problems</td>
</tr>
<tr>
<td></td>
<td>Improved planning</td>
<td></td>
<td>More customer contact</td>
</tr>
</tbody>
</table>

Opportunities for Advantage

|                      | Lower materials cost | International reach | Increased market share |
|                      | Faster, more flexible delivery | Effectiveness in information based activities | Enhanced customer satisfaction |

Source: Cronin (1994)

Benjamin (1995) suggests that the Internet will not only give consumers access to vast amounts of information, but will "cause a restructuring and redistribution of profits among the stakeholders along the (value) chain". Citing three elements that determine the price of a product - production costs, co-ordination costs, and profit margin - Benjamin argues that firms always want to economize on co-ordination costs, often through the deployment of information systems. Single source sales channels such as those enabled by networks can disintermediate wholesale and retail functions, resulting in direct contact between producer and consumer through the Internet. More simply put,
the Internet enables firms to cut out the middle-man, resulting in lower prices to consumers as well as greater choice and convenience. Internet markets are thus similar to catalogue shopping services in that both rely on products/services that are easy to describe and not very asset specific (i.e., commodities). This is of particular relevance to the system of payments and the degree to which entire transactions, including payment, can be achieved over open networks such as the Internet. The relationship between the Internet and Canada’s payment system was described in greater detail in an earlier chapter.

Davenport (1996) elaborates on the disintermediating effect of some information technologies by suggesting four key attributes such technologies possess. They are:

1. Broadly available to both buyers and sellers;
2. Easy to use;
3. Not limited purely to text display but comprise multiple media;
4. Supportive of easy switching from summary to detailed information content.

Based on the earlier discussion of the Internet’s key characteristics, all four of these attributes are applicable. (On the other hand, the Internet may be relatively easy to use and readily accessible for firms, but less so for consumers). Davenport points out that Internet services can also lead to efficient markets, making price-based competition increasingly important. D’Cruz and Rugman (1994) also refer to the disintermediating effect of information technologies (which they call deintegration) in the context of business networks such as the Stentor consortium of Canadian telecommunications companies.

4.6 Summary

Although there is very little scholarly literature devoted to Internet based technologies, the breadth of business strategy theory based on information technology is evident from the samples included here.
Many of the frameworks are helpful in describing and understanding some of the underlying elements that can contribute to a successful strategy and by extension to competitive advantage. Fewer of them are useful in actually devising a strategy for the deployment of information technology and the field narrows further when applying the literature to the Internet. The attempt in this chapter has been to bridge that gap, by showing the elements of strategy theory that do or do not apply to the Internet or indeed any open information system.
5. Methodology

This chapter describes the main questions addressed in the research, the methodology chosen, the framework used for analysis, and participants in the research.

5.1 The Research Questions

Most of Canada’s major financial institutions offer some form of Internet service, and initiatives are underway to provide Internet-based payments by the end of 1996.

In that context, the primary research issue is the degree to which the Internet represents a beneficial technology for Canada’s financial institutions. The potential benefits are assessed based on the Internet’s ability to provide sustainable competitive advantage to firms in this industry.

The research attempts to uncover a potential source of competitive advantage stemming from secure Internet services and payments. Alternately, it is possible that the Internet may have a negative effect on competition by weakening each institutions’ ability to differentiate its services from those of competitors. This problem has been attributed to other recent technology innovations such as ABMs.

Theoretically, a first mover (such as Bayshore Trust, Canada’s first full service Internet bank) may have an initial advantage, simply as a result of being the first firm to offer a new technology. The study looks for the existence of this first-mover advantage and for evidence to indicate if the advantage can be sustained, assuming other firms will eventually deploy the same technology. These are some of the key issues explored in the research.

5.2 Description of Research Method

The method chosen is exploratory research through a series of personal telephone interviews.

An exploratory research methodology was chosen for several reasons:
1. Internet banking services are still very new.

2. The websites operated by most Canadian financial institutions primarily feature the electronic brochure application type (described earlier). Only a small number of interactive applications have been deployed, making current levels of customer involvement limited in scope.

3. Internet payments systems are literally in their infancy and likely to change in significant ways within the next year.

4. The structure of the Canadian banking industry limits the maximum sample size to a small number of firms.

5. Because banks are so new to the Internet, there is insufficient data on this topic to support a more quantitative approach to the research.

   This scarcity of data also precluded the use of sophisticated statistical techniques. Rather, descriptive statistics were employed, primarily frequencies and percentages.

   A panel of ten participants was assembled. Participating firms were chosen in order to reflect a cross-section of financial firms involved in Internet services. The five chartered banks alone, for instance, represent a significant portion of Canada’s financial community.

   Since the focus of the research was on strategy formulation rather than the technology itself, participants were garnered from positions in areas such as marketing, customer service, and planning. To help ensure a broad strategic perspective, the selected participants were senior executives with their respective firms.

   A telephone interview of approximately 30-40 minutes duration was conducted with each person. Some participants requested and received facsimile copies of the questions in advance. Since the research was exploratory, prior knowledge of the questions was not considered detrimental to obtaining valid results.

   The interview was divided into five sections. The first three sections provided information on the firm’s strategic use of information technology, the Internet, and
Internet payments. Section four contained seventeen questions relating to Porter's model of beneficial technologies. The final section was a general wrap-up and opportunity for additional remarks by the interview participant.

5.3 Limitations

The methodological limitations are listed below:

1. **Sample size**: With only ten firms included in the study, it is not possible to derive statistically significant trends from the results. Nevertheless, the inclusion of the largest Canadian chartered banks means the sample represents the major competitors in the national market so that reasonable observations and conclusions can be drawn.

2. **Time Commitment of Participants**: While an executive perspective was needed for the research, such individuals are usually very busy and unwilling to devote much time to the interview.

3. **Confidentiality**: A few respondents were reluctant to divulge detailed information regarding strategy formulation, training budgets, or other data that could potentially benefit competitors. When in doubt as to whether or not to answer a question that might include confidential information, some respondents simply refused to answer. Given the small sample size, even one unanswered question could have a significant impact on the results.

4. **Limited Scope of Current Internet Service Offerings**: At present, most of the firms surveyed have only a limited set of services deployed on the Internet. Many are moving cautiously. Some are using their web site more as a sign to their customers of their involvement in the Internet rather than for strategic business purposes. Consequently, the range of different applications is somewhat limited.

5. **Self-reported Perceptions**: The interview data gathering technique required subjects to report their perceptions or opinions in many instances. On several occasions, the respondent would ask for clarification regarding whether the response should reflect their personal opinion or corporate policy. The instruction always was to focus on
corporate policy. although it is likely that some element of personal opinion or perception was included in the open ended responses.

6. **Non-predictive Results**: The previously stated limitations mean that the outcome of the study cannot be used to predict the nature of competition between financial institutions as a result of the deployment of Internet systems. However, it should provide a clearer picture of how these firms believe they can achieve and sustain an advantage over their competitors.

### 5.4 Framework for Analysis

Analysis of the research findings is based a four-element model suggested by Porter (1985) as a means of gauging whether or not a technological change is beneficial to an industry. These four elements were described in detail in the Literature Review. The model reflects an industrial-organization viewpoint on competition and centres on issues such as sustainable improvements in differentiation or cost drivers, first mover advantage, and the technology's impact on industry structure.

In light of the uncertainty surrounding the Internet and its role in competitive advantage, it seems particularly appropriate to use this general framework to gain an understanding of how and if financial institutions will gain advantage. It should also be possible to determine what first-move advantages are enjoyed by the first adopters of full service Internet banking: Bayshore Trust (Canada) and Wells Fargo (United States).
6. Findings

6.1 Introduction

This chapter contains the research findings from a total of ten telephone interviews with executives from leading financial institutions in Canada (7) and the United States (3). The interviews were conducted in March and April 1996.

6.2 List of Participants - Canadian

Five of the Canadian participants were chosen because they are large chartered banks who are among the major firms in the industry. Bayshore Trust was included because it was the first fully on-line bank in the country. Visa Canada represents one of the two largest international credit cards companies.

1. Bank of Montreal
2. Bank of Nova Scotia
3. Bayshore Trust
4. Canadian Imperial Bank of Commerce
5. Royal Bank of Canada
6. Toronto Dominion Bank
7. Visa Canada

6.3 List of Participants - Non-Canadian

Other participants were chosen for their distinctive involvement in the Internet or the North American financial community.

1. First Data
2. Mastercard
3. Wells Fargo

First Data Inc. processes more than fifty percent of all Visa and Mastercard transactions in the United States. Mastercard is one of the two largest credit card companies. Wells Fargo was selected because of its innovative and highly functional Internet capabilities, plus its size in the American financial community (it is the sixth largest institution in the country following an acquisition earlier in 1996).

The following table lists the positions held by the subjects interviewed. To ensure confidentiality, the list is presented in random sequence unrelated to the alphabetized list of firms above. The intent of the table is to show that participants were drawn from managerial and executive ranks of participating firms.

Despite the limited sample size, firm names are not associated with any data reported here. Instead, all results are shown in aggregate.
Table XVI - Positions Held by Interviewees

<table>
<thead>
<tr>
<th>Position Title</th>
<th>Area of Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate Marketing Manager</td>
<td></td>
</tr>
<tr>
<td>Marketing Manager</td>
<td></td>
</tr>
<tr>
<td>Marketing Manager</td>
<td>New Channel Development</td>
</tr>
<tr>
<td>Product Manager</td>
<td>Internet Services</td>
</tr>
<tr>
<td>Product Manager</td>
<td>Cash Management</td>
</tr>
<tr>
<td>Senior Vice President</td>
<td>Customer Service</td>
</tr>
<tr>
<td>Senior Vice President</td>
<td>Strategic Procurement</td>
</tr>
<tr>
<td>Treasurer</td>
<td></td>
</tr>
<tr>
<td>Vice President</td>
<td>Interactive Marketing</td>
</tr>
<tr>
<td>Vice President</td>
<td>Information Technology Planning</td>
</tr>
</tbody>
</table>

6.4 Summary Table of Current Interactive Service Capabilities

This summary table indicates the availability of a service. It does not describe how well that service is provided, nor indeed whether the service adds clear value to a customer.

Interactive services are considered of importance in the context of this paper because they illustrate capabilities that could lead to improved competitive position. Two institutions stand out as a result of unique features they offer:

- **Bayshore Trust** offers on-line rapid loan application and approval:
- **Bank of Montreal** offers personalized home pages for customers or browsers:
### Figure 6 - Summary Table of Current Interactive Service Capabilities

<table>
<thead>
<tr>
<th>INTERACTIVE SERVICES</th>
<th>Bayshore Trust</th>
<th>Bank of Montreal</th>
<th>CIBC</th>
<th>Royal Bank</th>
<th>Toronto Dominion</th>
<th>Scotia Bank</th>
<th>Canada Trust</th>
<th>MasterCard</th>
<th>Visa</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personalized home pages</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>2</td>
</tr>
<tr>
<td>On-line loan application and approval</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>1</td>
</tr>
<tr>
<td>Mortgage application</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>4</td>
</tr>
<tr>
<td>On-line account balance</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>2</td>
</tr>
<tr>
<td>RSP investment guide</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>5</td>
</tr>
<tr>
<td>Mutual fund guide</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>5</td>
</tr>
<tr>
<td>Application forms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>4</td>
</tr>
<tr>
<td>Interest rate comparisons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>4</td>
</tr>
<tr>
<td>ABM locator</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>2</td>
</tr>
<tr>
<td>Customer newsletter</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>4</td>
</tr>
<tr>
<td>Keyword search facility</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>9</td>
</tr>
<tr>
<td>Electronic mail</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>9</td>
</tr>
</tbody>
</table>

### INFORMATION SERVICES

<table>
<thead>
<tr>
<th>Information service</th>
<th>Bayshore Trust</th>
<th>Bank of Montreal</th>
<th>CIBC</th>
<th>Royal Bank</th>
<th>Toronto Dominion</th>
<th>Scotia Bank</th>
<th>Canada Trust</th>
<th>MasterCard</th>
<th>Visa</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial and investment information not likely to be available through other sources</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>7</td>
</tr>
<tr>
<td>Stock and bond prices</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>5</td>
</tr>
<tr>
<td>Promotional material about financial services</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>9</td>
</tr>
<tr>
<td>Special information targeted to small business Internet use</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>4</td>
</tr>
</tbody>
</table>

### 6.5 Importance of Information Technology to the Firm

The initial group of five questions was designed to develop an understanding of the strategic importance each firm ascribes to information technology. Respondents provided their perception of where the firm stands according to four attributes that combine to indicate the importance of IT. These included: IT as a source of competitive advantage, the firm as an IT leader, the size of IT budgets, and the strategic contribution of IT to corporate objectives. Aggregate responses are shown in Table XVII.
The results indicated that the firms interviewed attributed a great deal of importance to information technology:

1. Ninety percent of the responses indicated that information technology is a source of competitive advantage;

2. Eighty percent of the firms consider themselves leaders in information technology;

3. Ninety percent of firms said their IT budgets reflect the strategic importance of information technology to the business;

4. All respondents believed that their firms set information technology priorities with strategic business objectives in mind.

Table XVII - Perceived Importance of Information Technology to the Firm

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Did Not Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Information Technology is a source of competitive advantage for your firm.</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Your firm considers itself a leader in the development and application of IT.</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3. The relative importance of Information Technology is reflected in the size/significance of IT budgets.</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Information Technology priorities are determined on the basis of their contribution to the achievement of strategic objectives.</td>
<td>6</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A summary of these findings is presented in Figure 7 shows the strong perception that information technology is of strategic importance to the firms represented in the sample. The chart in Figure 7 is based on aggregate responses from questions 1 through 4, grouping answers of Strongly Agree and Agree as indicative of a high level of importance for information technology.

Question 5 was an open-ended follow up to the previous four. It provided an opportunity for respondents to elaborate on the reasons why they felt their firms were IT leaders. As summarized in Table XVIII, half of those surveyed felt that information is core to the business of the firm: that information is the “product” the firm produces and deals in. Almost as many indicated that their firm had achieved some form of first mover advantage in the information technology arena. Examples mentioned included the firm being first to offer on-line banking (through a

### Table XVIII - Question 5 - Why the Firm Considers Itself an Information Technology Leader

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information is core to the business</td>
<td>5</td>
<td>All financial products are inherently information based or have a technology component. The importance of the information content versus the physical product is increasing. The only real “product” the firm deals in is information.</td>
</tr>
<tr>
<td>First mover</td>
<td>4</td>
<td>These firms have deployed innovative interactive IT applications in the past. In some cases there is a history of innovation dating back several years.</td>
</tr>
<tr>
<td>IT leadership is a corporate goal</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Did not answer</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
private network), being first to launch ABMs, and being an award winner for innovative deployment of new client/server technology systems.

6.6 Importance of the Internet to the Firm

As was the case with the initial group of five questions, the next seven questions can be readily grouped together. Here, the information technology focus began narrowing to the Internet and its perceived importance to the firms interviewed.

Similar measures to those in the previous section were used to obtain an overall picture of the importance of the Internet to participating firms: the Internet as a source of competitive advantage; the firm as an Internet leader; the strategic orientation of Internet initiatives; and the expectation of return on investment (ROI) in the Internet context.

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Did Not Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. The Internet is or will be a source of competitive advantage for your firm.</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Your firm considers itself a leader in the development and application of Internet financial services.</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Your firm’s Internet strategy falls within a larger overall framework for Information Technology strategies.</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Internet initiatives are expected to show a positive return on investment.</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

The results shown in Table XIX indicate a significant importance attributed to the Internet, although not as strong an endorsement as for information technology in general:

1. Ninety percent believed the Internet is, or will be, a source of competitive advantage:
2. Seventy percent believed their firm is already a leader in Internet technology:

3. Ninety percent of the firms indicated that their Internet strategy is part of overall IT strategy (as opposed to the grassroots movements that are sometimes associated with establishing a corporate home page in some industries).\(^\text{16}\)

4. Only fifty percent of respondents thought that the Internet would show a positive return on their investment.

The aggregate results of questions 6 - 9 are shown in Figure 8, with responses for all four questions accumulated according to specific response. The aggregation is based on grouping answers of Strongly Agree and Agree together as being indicative of a high level of importance for the Internet.

Considering that ninety percent of the firms indicated that the Internet is or will be a source of competitive advantage, it is important to understand what they believe will be the source of that advantage. As outlined in Table XX, there was a wide range of responses to this question (10) and respondents were free to name as many sources of advantages as they deemed important.

\[\text{Figure 8 - Aggregate Responses Indicating If the Respondent Believes the Internet is Important to the Firm}\]

\(^{16}\) This is perhaps particularly true in the public sector where pressure to be on the web can bubble up from individuals or departments who see its importance and utility before corporate IS departments.
Table XX - Question 10 - How the Internet May Provide Competitive Advantage

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low cost</td>
<td>3</td>
<td>Some described &quot;huge&quot; savings in processing Internet transactions versus either branch or phone. Savings may be passed on to customer in the form of lower service charges. Internet service deployment means fewer costly branches have to be built and maintained. Internal intranets were also cited as a source of cost reduction.</td>
</tr>
<tr>
<td>Differentiation</td>
<td>3</td>
<td>Target or &quot;micro&quot; marketing.</td>
</tr>
<tr>
<td>Availability of new products &amp; service delivery channels</td>
<td>3</td>
<td>Some products will only be available on the Internet. new services will make it possible to attract and retain customers.</td>
</tr>
<tr>
<td>First mover</td>
<td>2</td>
<td>These firms are among the first movers in the deployment of Internet technologies as they were with information technology in general</td>
</tr>
<tr>
<td>Changes in value chain</td>
<td>2</td>
<td>The disintermediating effect of Internet systems will create new opportunities for financial services companies. Old means of service provision will be inadequate.</td>
</tr>
<tr>
<td>Switching costs</td>
<td>2</td>
<td>Brand or firm preferences in the financial services sector are mature and difficult to change. The Internet will make it easier to &quot;steal&quot; customers from competitors.</td>
</tr>
<tr>
<td>Adaptability</td>
<td>1</td>
<td>Some firms may make or have already made investments in Internet technologies that will soon be outdated. It is important to avoid sinking large amounts into narrow technology choices. Instead, remain flexible and adaptable to the rapid and sometimes unpredictable changes in technology.</td>
</tr>
<tr>
<td>Internet demographics</td>
<td>1</td>
<td>Current Internet users are an attractive and potentially profitable segment.</td>
</tr>
</tbody>
</table>

Seventy percent of respondents indicated that their firm considered itself an internet leader. Question 11 probed the reasons why, with results summarized in Table XXI. Two firms cited first mover advantage. In both cases, these assertions of first mover status seem reasonable in light of the advanced functionality of the respective web sites.
Being involved in industry standards development was also mentioned twice, both times in the context of security standards. This matches with current initiatives in the SET standard, which is being collaboratively developed by the major credit card firms.

**Table XXI - Question 11 - Why Firm Considers Itself Internet Leader**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First mover</td>
<td>2</td>
<td>Some firms equate leadership with being a first mover. The interpretation of first mover advantage varies somewhat. For some firms, a first mover in the Internet involves being first to provide financial transactions to customers. while for others it is tied to their involvement with setting industry standards in collaboration with other firms. Being &quot;almost first&quot; but having a much larger customer base than the &quot;absolute first&quot; was given as another meaning of the term first mover.</td>
</tr>
<tr>
<td>Taking the lead in standards development</td>
<td>2</td>
<td>These firms are involved, usually in partnership with other firms, in the development of operational standards for Internet commerce. The SET standard for secure payment was one example cited.</td>
</tr>
<tr>
<td>Quality of web site</td>
<td>1</td>
<td>Issues such as design of the site, information content (currency, scope, quality, quantity) were mentioned as elements of the quality of individual web sites.</td>
</tr>
<tr>
<td>Avoid investing too much too early</td>
<td>1</td>
<td>This response was reported but seems to contradict the notion of leadership. It really points to a strategy of waiting to see what develops and perhaps capitalizing on the efforts and mistakes of others.</td>
</tr>
</tbody>
</table>

A further three firms did *not* consider themselves Internet leaders for a variety of reasons:

1. The current web sites are very limited, they only offer electronic brochures rather than true interactive applications:

2. The Internet is still a technical person's realm rather than an effective place to do business, therefore the firm is not pursuing a leadership position:
3. The current leaders are basically trying to establish standards for doing business on the Internet and (our) firm will become involved once those questions have been straightened out;  

4. The firm is very conservative and does not consider the Internet a priority.  

Only about half of the firms sampled were expecting a return on their Internet investments in the next two years. In many respects this is not surprising, given the relatively small size of Internet investments and the uncertainty of the longer term business prospects for electronic commerce.  

The planned measures of the impact on ROI appear somewhat vague and only three responses were recorded. The results are summarized in Table XXII and Table XXIII.  

**Table XXII - Question 12 - Planned Measures of Internet’s Impact on ROI**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Visits to Web Site</td>
<td>2</td>
<td>Tracking what services are used</td>
<td></td>
</tr>
<tr>
<td>Closure rates</td>
<td>1</td>
<td>The ability to get and retain customers over the long haul</td>
<td></td>
</tr>
<tr>
<td>Did not answer</td>
<td>2</td>
<td>Number of total who said they were looking for ROI but would not say how they would know they got it</td>
<td></td>
</tr>
</tbody>
</table>

**Table XXIII - Question 12 - Non-financial Reasons for the Firm’s Internet Investments**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaining experience</td>
<td>3</td>
<td>The firm is learning “how to play” in the Internet arena. Concerns regarding commodification. Some firms also called this “intellectual ROI”.</td>
<td></td>
</tr>
<tr>
<td>Low cost of experimentation</td>
<td>2</td>
<td>There is very little incentive not to launch a web site because the cost of doing so is low. Even if it contributes nothing, the low cost and potential for future opportunities make it attractive</td>
<td></td>
</tr>
</tbody>
</table>
6.7 Internet Payments

The next group of seven questions continued to narrow the focus of the study to Internet payments.

Eighty percent of respondents agreed or strongly agreed that Internet payments would become a source of competitive advantage; that the firm would offer such payments within the next 12 months; and that the firm has satisfactorily addressed security issues.

Only about half of the firms felt that the Internet would play a role in the clearing and settlement system. Overall aggregate results are shown in Table XXIV.

**Table XXIV - Importance of Internet Payments to the Firm**

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Did Not Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Internet payments are or will be a source of competitive advantage for your firm.</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Your firm will offer Internet payments within the next 12 months.</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15. Your firm has a satisfactory security strategy for Internet payment services.</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>16. The Internet will play an important role in the clearing system.</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Similar to the answers to question 10, several respondents indicated that they have, or anticipate having, a first mover advantage in providing Internet payments. In some cases this was expected to be an outgrowth of the firm's overall first mover advantage in technology and other Internet services.

Several firms also cited increased convenience for their customers as an important benefit of Internet payments. The ability to handle routine banking tasks, or to easily and
securely pay for purchases from home were the examples given of increased customer convenience. See Table XXV for the full results.

**Table XXV - Question 17 - Competitive Advantage Through Internet Payments**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First mover</td>
<td>3</td>
<td>Similar to question 10. This advantage applies primarily in the short term.</td>
</tr>
<tr>
<td>Increased customer convenience</td>
<td>3</td>
<td>To a bank, the customer is the end consumer. To card companies and processors, the bank is the customer.</td>
</tr>
<tr>
<td>Cost Reduction</td>
<td>2</td>
<td>For payments and funds transfer</td>
</tr>
<tr>
<td>Switching costs</td>
<td>1</td>
<td>Once a customer is accustomed to banking or paying on the Internet they are likely to remain with whatever firm gets the business first.</td>
</tr>
<tr>
<td>Did not answer</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Two firms did not feel the Internet will be a source of competitive advantage because all of their major competitors will be able to provide the same capability. That is to say, there would be no opportunity for differentiation. On the other hand, they noted that there could be some disadvantage if their firm is not involved at least in a perfunctory way, simply because the Internet is so popular.

Of the firms who responded to question 18 regarding how they are approaching the security issue, most indicated the need to partner with other firms. They cited numerous interdependencies required to make a broad security standard work. Multiple stakeholders from different parts of the transaction must agree to the protocol: merchants, card companies, banks, etc. Thus, partnerships with customers, suppliers and even competitors were said to be necessary. See Table XXVI.
Table XXVI Question 18 - How the Firm is Addressing Security for Internet Payments

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnerships with other firms</td>
<td>5</td>
<td>The firm is developing its security strategy in collaboration with other firms, including rival firms, because it is too expensive to undertake alone.</td>
</tr>
<tr>
<td>Setting and modifying security standards</td>
<td>2</td>
<td>The firm is addressing security by taking the lead in standards development.</td>
</tr>
<tr>
<td>Experimentation with internal intranets</td>
<td>1</td>
<td>Experimentation with encryption and firewall technology is taking place first. Once it is proven internally, similar approaches can be deployed for publicly available services on the Internet.</td>
</tr>
<tr>
<td>Did not answer</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Most respondents felt the Internet would have a very limited role in the Canadian clearing and settlement system. As indicated in Table XXVII, the most likely role suggested was the predictable one of enabling merchants and consumers to complete a payment transaction.

Table XXVII - Question 19 - The Internet’s Expected Role in the Clearing/Settlement System

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal or none</td>
<td>5</td>
<td>It will be integrated as a channel and is not in the immediate future.</td>
</tr>
<tr>
<td>Significant</td>
<td>2</td>
<td>Eventually, the Internet will be the preferred choice compared to private networks due to lower cost. This will only happen when security issues have been resolved.</td>
</tr>
<tr>
<td>Did not answer or did not know</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
6.8 Porter's Model of Beneficial Technologies

The second section of the interview is concerned with Porter's (1985) model of what constitutes a beneficial technology. There are four elements in the model, with the first of these elements broken down further into four factors that indicate the sustainability of competitive advantage.

6.8.1 Model Element 1 - The technological change lowers cost or improves differentiation and it is sustainable

Only one respondent indicated that some cost savings had already been achieved through the deployment of Internet services. This firm felt that its Internet capabilities meant it did not need to expand the number of expensive branch locations in order to increase customer scope. The resultant cost savings were then passed on to customers in the form of interest rate bonuses, making them a source of competitive advantage.

More frequently, however, respondents indicated an *expectation* that costs would be reduced as a result of being on the Internet, although the time frame for such savings varied widely. Aggregate responses are shown in Table XXVIII.

Table XXVIII - Question 21 - Internet's Expected Impact on Cost Drivers

<table>
<thead>
<tr>
<th>Internet Services Expected to Reduce Costs</th>
<th>Frequency</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 1 year</td>
<td>3</td>
<td>Cost savings will result from paper, postage, in-branch brochures, and other advertising costs. Some speculation that staff savings may contribute, but these are not well defined.</td>
</tr>
<tr>
<td>Within 2 years</td>
<td>2</td>
<td>Electronic banking is a lower cost channel than branch banking. Routine or low-value-added transactions will be migrated to electronic delivery.</td>
</tr>
<tr>
<td>More than 2 years</td>
<td>4</td>
<td>Direct mail and other advertising costs. Need to migrate a large existing customer base. Exploring many other alternative delivery channels in addition to the Internet (e.g. PC banking, phone banking)</td>
</tr>
</tbody>
</table>
The firm's ability to differentiate itself from competitors was the focus of question 22 as summarized in Table XXIX. The factors the firms gave as being important sources of differentiation match quite well with the types of services being provided on their corporate web sites. For instance, several firms feel they provide added-value content through small applications such as interactive financial modelling tools, and several such tools are to be found among the web sites of participating firms. Similarly, a few also felt they provide unique services such as those noted in the overview of web sites (see Appendix B).

Table XXIX - Question 22 - Internet's Expected Impact on Service Differentiation

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Added Information Content</td>
<td>5</td>
<td>Content aimed at being useful for customer without being overtly promotional for the firm. Examples include wealth allocation models and other financial planning tools.</td>
</tr>
<tr>
<td>Unique services</td>
<td>4</td>
<td>Provision of unique services makes the firm different from others in industry. First to offer these services, no other competitors appear to be close to matching these capabilities. Examples include personal home pages for customers, loan approval, bank balances online.</td>
</tr>
<tr>
<td>Currency of Information Content</td>
<td>4</td>
<td>Time sensitive information such as interest rates and stock prices.</td>
</tr>
<tr>
<td>Context appropriate content</td>
<td>1</td>
<td>The quality of the firm’s web site, and the information it contains, is of less strategic importance than the context in which a client accesses the firm’s services. For instance, a client should be able to “seamlessly” use the firm’s on-line payment services from an Internet mall17 rather than have to leave the context of the mall and access the firm’s web site in order to arrange payment.</td>
</tr>
</tbody>
</table>

17 An Internet site modelled on a shopping mall, involving multiple vendors marketing and selling products from the same “location”.

81
<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not answer</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

6.8.2 Sustainability Factor 1: Source of Technological Change

Porter's model indicates that the source of a strategically beneficial technology is important. Internal sources are preferable to external ones because they are harder for competitors to perceive and to copy. Since most Internet systems are built on industry standards that are readily available in the public domain, the key to internal technology capabilities is more likely to lie with the development of unique and proprietary applications.

Responses to question 23 revealed that seven of the ten firms interviewed are planning to deploy proprietary applications in the foreseeable future:

1. Four will have applications on-line in less than a year (e.g. bill payments);
2. Two will have applications ready in less than 2 years (e.g. fraud and risk management);
3. One will deploy new systems later (more than 2 years).

Three other firms were not yet planning to develop proprietary applications. These firms were taking a more cautious approach to the Internet generally. There was some indication from these respondents that while their firms may be appear out-of-step with more advanced competitors, they believed that if a profitable business model were to emerge for the Internet, the firm could make the necessary investments to deploy applications quickly.

6.8.3 Sustainability Factor 2 - Internal R&D Spending

The next group of four questions focused on cost or differentiation advantages that may be forthcoming through research and development spending in the area of Internet systems and applications. All firms reported an increase in internal spending on Internet
related projects, with further increases expected in coming years. However, when compared to total information technology budgets, these investments still represented a “drop in the bucket” as one respondent put it. See Table XXX.

Some interesting comments arose from question 27 regarding the staff resources allocated to Internet projects. Several firms indicated that while the number of staff on such projects may be limited, the quality of those individuals is well above average. In one case it was stated that measuring IQ points is more important than measuring the number of people assigned to a project. The emphasis on quality suggests a higher level of importance associated with the Internet projects than would be inferred from financial investments alone.

**Table XXX - Questions 24-27 - Cost or Differentiation Advantages Through R&D**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Frequency</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>Internet budget relative to total IT budget</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Changes in level of investment in Internet in past 2 years</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>same</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>decrease</td>
</tr>
<tr>
<td>26</td>
<td>Expected changes in level of investment in Internet in coming year</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>same</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>decrease</td>
</tr>
<tr>
<td>27</td>
<td>Percentage of Internet costs that are R&amp;D related</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>less than 50%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>did not answer</td>
</tr>
</tbody>
</table>

**6.8.4 Sustainability Factor 3 - Internal Technical Skills**

Another important factor in determining a beneficial technology is the availability of internal skills. This was measured in questions 28-32 as summarized in Table XXXI. Most firms did some or all of their internet developments in-house, rather than
contracting it entirely to an outsourcing agency. Additional comments in the interviews indicated that of those firms who currently do some outsourcing, all but one intend to do more of the work in-house within the next year. In most cases, in-house development was said to facilitate the creation of strategically important applications, whereas outsourcing would make its greatest contribution for operational (i.e. non-strategic) systems.

The staff of most information systems departments in banks and other institutions surveyed are traditionally focused on highly structured internal applications (i.e. mainframe systems). Therefore, in order to get a rapidly develop Internet expertise, many firms are hiring knowledgeable people "off the street" rather than developing a core of capability through training of existing staff. One firm is developing additional expertise by concentrating on intranet applications first, then transposing those skills to external applications when a business case for such systems becomes more obvious.

<table>
<thead>
<tr>
<th>Table XXXI - Questions 28-32 - Availability of Internal Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measure</strong></td>
</tr>
<tr>
<td>Internet services provided in-house or outsourced</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Training budget to build internal technical skills</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Approximate number of staff with Internet technical skills</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Percentage of total IS staff with Internet skills</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
6.8.5 Sustainability Factor 4 - Rate of Technological Diffusion

Question 33 is linked to question 23 in the sense that both examine the development and implementation of Internet systems. Both of these questions caused the greatest amount of hesitation among respondents. Possibly they were reluctant for outsiders to have this information.

Of those firms who did respond to this question, four indicated plans to deploy new Internet applications in the next year. One respondent indicated a "wait and see" attitude. Sample applications to be deployed include: lending on-line (information, application, and approval) and Internet mall payments.

6.8.6 Model Element 2 - Cost or Differentiation advantages even if technology imitable

Question 34 asked respondents about any unique or firm specific Internet applications that had reduced cost or improved differentiation.

Timing on this question is a critical issue. While some first movers believe they have achieved a cost advantage, most respondents were unable to determine this until more applications had been deployed. Differentiation was perceived to be more prevalent than cost reduction.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Too Soon to Tell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Differentiation</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Table XXXII - Cost or Differentiation Advantages

6.8.7 Model Element 3 - How Firms Protect Their Advantage

Following is a series of paraphrased responses to the question of how firms intend to protect an existing advantage they may have in the Internet arena.

1. Stay ahead of the game and ahead of the curve:
2. Cannot prevent others from copying what you do, therefore must continually strive to be first to keep the advantage, let others play catch-up and imitation will be perceived by customers;

3. Ensure the brand is protected (more difficult to do this in a virtual marketplace);

4. Competition is based on speed not protection ("it is a race, not a fortress");

5. Avoid becoming bogged down in a single concept (i.e. the Internet). Instead, have multiple new channels under development and evaluation;

6. Cast the net wide and create many different projects knowing some of them will fail;

7. The key to proprietary advantage is not the surface technology but the links to proprietary information and systems that cannot be duplicated;

8. Any advantage will be inherently short-lived and cannot be protected.

6.8.8 Model Element 4 - Technological Change Improves Overall Industry Structure

   Question 36 asked respondents to describe the role of Canadian banking industry in the adoption rate of Internet technology, and the resultant impact on the industry itself.

   Most respondents attached a significant importance to the Canadian banking industry's role in the adoption and diffusion of Internet services. Following are sample responses:

1. It (the industry) drives public perception of Internet issues such as security and safety;

2. As more of the big players become more heavily involved, more consumers will be willing to use Internet based services;

3. There is an enormous threat of disintermediation;

4. The industry is inherently conservative. Most major players will take a wait and see attitude while US banks and smaller competitors in Canada (like Bayshore Trust) will continue to be on the leading edge;
5. The big chartered banks want to “own the client” and will be slow to move into full Internet services:

Question 37 examined the perceived impact of the Internet on the banking industry by relating it (the Internet) to an earlier technological innovation, the Automated Banking Machine. As discussed earlier, the ABM had the effect of reducing differentiation and brand awareness. Although responses are somewhat mixed, the predominant feeling was that some low value transactions will indeed be made more of a commodity by the Internet. Other transactions, especially those of a higher value (and thus more readily differentiated) will not become commodities.

Table XXXIII - Perceived Risk of Commodification

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Either or both is possible</td>
<td>6</td>
<td>Could go either way: demographics may not support brand loyalty; existing customers have to be brought into this new channel; will happen in some cases: need to be intelligent and “get it” re the potential of the technology in order to avoid commodification. Both: will commodify lower value-added transactions (such as cashing a cheque) but higher value-added services are also likely (i.e. it will enable entirely new ways of buying). It is acceptable for some products to become commodities as long as others can be differentiated. Brand and image protection may be more important than whether or not services become a commodity.</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>The web brings a face back to the bank which was lost through the ABM, the technology enables this. ABMs are capable only of simple transactions whereas the Internet can support higher value-added transactions, therefore the risk of services becoming commodities is much lower for Internet than for ABMs.</td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>The risk of services becoming commodities is significant.</td>
</tr>
</tbody>
</table>
6.9 Summary

The research findings provide the basis for some interesting discussion regarding the Internet's actual, perceived and expected role in the financial services industry. The results indicate that information technology, and the Internet in particular, are seen as sources of competitive advantage in this industry. While information technology expenditures are significant, Internet resource allocation is still quite modest. However, the relatively small size of these allocations is compensated in part by the calibre of staff assigned to Internet-related projects.

With the exception of the first movers, cost reductions through Internet systems deployment are not evident yet. But participating firms have a strong expectation that both cost reduction and differentiation will take place within the next one to two years. Firms are differentiating themselves by developing proprietary applications that are not readily copied by competitors. In the longer term, relentless innovation is viewed as the only realistic way to attain and keep competitive advantage.

The next concluding chapter attempts to put these points in perspective.
7. Discussion and Conclusions

7.1 Introductory Comments

Perhaps the most obvious conclusion derived from the research findings presented in the previous chapter is that most of the firms that participated in this study did not seem to have elaborate business strategies for the Internet. Despite the fact that information technology is a core part of their business, many were taking a wait-and-see approach with the anticipation of being able to react quickly if and when profitable competitive opportunities emerge from the Internet.

At first, such results seem rather disappointing. After all, during the time this thesis was being developed, the web became even more prevalent in the commercial sector. Indeed, it is becoming impossible to avoid. It is now the norm to see an Internet address displayed for popular television programs, films, or upcoming events. Such was not the case even six months ago. One forms the impression that the Internet has been woven into the fabric of modern business. and in a sense that is true.

But on closer scrutiny it becomes clear that most of these sites offer standard fare: electronic brochures, company profiles, email links to anonymous “webmasters” and marketing gimmicks like contests or jokes-of-the-day, the purpose of which is to gather information about customers rather than to provide valuable services to them. Companies have learned how to build attractive web sites that are stimulating in terms of sight and sound. In fact, many of the handbooks on business use of the web concentrate on telling firms how to make their site interesting to the consumer while not violating the established behavioural norms of the Internet.

Recall the example of technology convergence required to make the airplane a commercially viable technology (Senge 1990) and the issues noted by Tenenbaum (1994) regarding technical advances needed for widespread adoption of Internet commerce. There is a need for significant progress along these lines. The following
points are suggested as examples of the technology convergence that is still required for Internet commerce.

1. **Speed of data transfer**: Even the fastest modems on the market today are too slow for complex applications involving large amounts of graphics, video, sound, and payment. Much of the existing telecommunications infrastructure was installed to carry voice traffic and does not have the capability of transporting the volume of data generated by multi-media applications. Joint ventures between telephone and cable television companies could solve this problem so that existing home cable hook-ups can be used to deliver Internet services at very high speeds.

2. **The utility cost of a personal computer**: The price-performance of personal computers continues to improve dramatically and more PCs are finding their way into people's homes. But a suitably configured personal computer with multi-media capabilities still costs between $2,500 and $4,000, making it a sizeable financial commitment. And while PCs are becoming increasingly affordable, they represent a poor financial investment because new generations of technology are introduced frequently and render existing equipment obsolete. Other "home appliances", such as televisions or stereo systems, are far more resistant to obsolescence and their value is better understood by consumers. Consequently, when an average family weighs the costs and benefits of a PC against other purchases, they may respond in the same way financial firms have responded to the Internet: they will wait-and-see. New information devices that rely on the network for most of their processing capabilities are now coming onto the market. They are said to cost a few hundred dollars and to provide a greater level of portability than personal computers. Perhaps these new devices will be sufficiently affordable and functional for most consumers.

3. **Ease of use**: The popular windowing systems now in use are a great advance over earlier computer interfaces. However, the computer is still a complicated device. Setting one up, especially for network access, is fraught with problems. Because of the complexity involved, problems are difficult to diagnose and solve without some technical training. Considering the popularity of jokes about people who are unable
to set the clock on a VCR, the ease of use problem is a significant disincentive to average consumers becoming involved with the Internet.

4. **Accessibility**: Most Internet Service Providers are located in large urban areas. Smaller or more remote communities may find Internet access very limited. In Ontario, there is an initiative underway to provide toll-free Internet access to all residents of the province.\(^{18}\) It remains to be seen if OPNet will provide the hoped-for geographical breadth of access.

In light of the foregoing, the research findings reported here are useful. Financial firms are not so far from the mainstream of Internet business use. It could even be said that the first movers in this industry (Bayshore Trust and Wells Fargo, for instance) are among the most innovative firms on the Internet, since they are offering personal financial products to customers on the web.

It is also possible that the results of the study were simply diluted because firms were not willing to discuss confidential business strategies in the interview.

### 7.2 The Importance of Information Technology to the Firm

It is clear from the research findings that, at least according to the perceptions of interview respondents, information technology plays a strategic role in the business success of these firms. All of the firms link information technology priorities and budgeting to the achievement of strategic objectives.

The earlier discussion of how payments have evolved from barter systems to information-based transactions, supports the notion that information is the actual product sold by these firms. This assertion was made by several respondents as an indication of why their firm was a leader in the information technology field. The purpose of most of the IT systems deployed by banks has been to enable faster and more efficient processing of financial transactions and records using proprietary technology. Consequently, there

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was not the same clash of cultures inherent in their foray into Internet services. The financial institution had control over its system deployment for internal purposes, whereas it must think like the customer when providing on-line services on the web.

Thinking like an Internet customer has further connotations for financial institutions. The democratic Internet culture, which supports free expression of opinion but is highly intolerant of overt marketing "come-ons", represents a singular challenge for Canadian banks. Here is another good reason for the cautious approach. Conversely, a first mover like Bayshore Trust shows its comprehension of the Internet culture by using interesting graphics and humour throughout its web site. Bayshore actually uses the culture to its own advantage by poking fun at chartered banks while at the same time pointing out cost incentives to consumers using their Internet banking services.

7.3 The Importance of the Internet to the Firm

Respondents showed less certainty regarding the Internet's importance than was the case with information technology generally. In light of the preceding discussion, this is no surprise. Nevertheless, there is evidence that the firms are taking a strategic approach to the Internet with the expectation of future competitive advantage and financial returns.

It is interesting to note that two elements from industrial-organization strategy theory (cost reduction and service differentiation) were among the most frequently mentioned sources of current or future competitive advantage. Particularly among the first mover firms. Internet transactions were said to be significantly less costly than traditional methods, including branch banking, telephone access and ABMs. This seems intuitively correct, but participants were not willing to share specific cost comparison figures.

Only Bayshore Trust has demonstrated the degree of their commitment to low cost strategies on the Internet by offering their customers better rates for loans or deposits transacted on the web. At the other end of the spectrum are firms that think Internet cost savings will stem from the lower printing, handling and postage costs associated with electronic media versus paper. Doubtless there are savings to be had in this area. The savings may be significant if the paper can be eliminated, but will be limited if electronic
publishing is simply a duplicate vehicle of information dissemination. And besides, surely there must be greater scope for benefit from technology of such promise as the Internet.

The low cost advantages noted in this portion of the interview were especially intriguing in light of the results from a subsequent question (21) wherein all but one respondent indicated that the Internet had not yet reduced their operating costs. Most expected it to do so in the foreseeable future. This suggested that low cost advantage stemming from Internet services was an expected advantage rather than one that has already been obtained.

Differentiation advantages stem from the firm’s ability to target services to individuals or groups. Recall the study by Andersen (1995) which indicated that Internet clients are a highly desirable segment, and the discussion of the near-zero incremental cost of customizing customer home pages. It seems clear that differentiation has real potential to be an important source of advantage.

The next most frequently mentioned sources of competitive advantage - first mover, disintermediation, and switching costs - are somewhat related and can be grouped together. Each has to do with the ability of a firm to obtain and retain customers. A first mover in this area, Bayshore Trust for example, has changed the value proposition by eliminating intermediate steps in loan application and approval. Once a customer becomes accustomed to the new way of doing business, there is a built-in switching cost resulting from the increased convenience and lower cost of the Internet-based service. At the same time, Bayshore has taken steps to reduce the cost to customers of moving their business to Bayshore. They provide an on-line form which can be used to authorize transferral of bank accounts from competitors.

These are clever tactics, and show a deep understanding of the capabilities of the technology. A successful Internet strategy is especially important to Bayshore, since it is
clearly at a competitive disadvantage relative to the chartered banks in terms of its assets, the size of its customer base, and even public awareness of its existence.19

Only one respondent indicated that the Internet was not expected to be a source of competitive advantage. Rather, the firm regarded it as “the thing to do” at present. According to this view, the current purpose is to learn and gain experience for whatever technology (presumably one that is more useful) comes later. Although this respondent’s firm does have a presence on the Internet, it was described as a cost of doing business required to not be perceived as behind the times.

Perhaps this firm is unduly conservative. Then again, when taken in the context of general ROI expectations, a cautious approach is more understandable. Only three responses were recorded to the question of how the firm intends to measure the Internet’s effect on ROI. Half of those interviewed did not express the belief that financial returns would be forthcoming from the Internet in the foreseeable future. It could thus be concluded that the more realistic responses were from the firms that indicated they were on the web in order to gain experience with a potentially beneficial technology, and felt they could do so at a relatively modest cost.

Measures such as the number of times a web site is accessed are not useful indicators of a successful Internet strategy. There are an abundance of statistics reporting massive numbers of “hits” on various web sites. However, the nature of the web is such that a page containing, say, five images plus accompanying text, is accessed six times in order to download the full page of information. This translates into six “hits”, illustrating the futility of using this measure of success.

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19 As of December 1994, Bayshore Trust’s assets totalled under $500 million. Total assets reported by the Royal Bank of Canada for the same period were $173,000 million.
7.4 Internet Payments

Eighty percent of the firms involved in this study expressed the belief that they would derive a source of competitive advantage from Internet payments, and that such payments would be offered within the next year. This seems at odds with responses in the previous section which indicated considerable caution toward the adoption of Internet transactions. Perhaps some firms have confidential plans for new Internet applications that they were not willing to divulge during the interview. Others may be looking to the SET protocol, established by Visa and Mastercard, as a source of secure electronic payments. Obviously, security is of paramount importance in any discussion of Internet payments.

Internet payments were thought to provide competitive advantage in many of the same ways as overall Internet services: first mover benefits, cost reduction and switching costs being among the factors mentioned. Some firms also thought the increased convenience to the customer will be important. It may be that they were referring to services such as bill payments on the Internet, in addition to the more obvious interactions between merchant and consumer. In this latter case, it is easier to see an advantage to the merchant obtaining the sale than to the bank which processes the transaction.

Results regarding the Internet’s impact on the overall payments system indicated that most firms think its role will remain limited to the front-end of a purchase and sale transaction, as is the case today. Two responses from early mover firms, however, indicate the possibility that the lower cost of the Internet will lead to the demise of private networks.

But there are too many uncertainties to draw this type of conclusion. The Internet is low cost today in part because of government funding that has gone into the development of the telecommunications infrastructure. And existing private networks for such functions as settling daily transactions between major financial institutions are firmly entrenched, stable and reliable. While they may be costly to operate relative to the Internet, there is no guarantee that this cost differential will exist permanently if the
Internet is more subject to free-market cost structures. And the loss of control over management and operation of the network is likely to be a significant disincentive to a risk-averse group of firms.

7.5 The Internet as a Beneficial Technology

Much of the previous discussion in this chapter relates to the benefits of the Internet to financial firms. This final section concentrates on how these elements relate to Porter’s model of beneficial technologies.

One way in which Porter identifies a beneficial technology is that it lowers cost or improves differentiation in sustainable ways. Apart from one first mover that reported known cost savings, all other respondents indicated the expectation of lower costs. And many of these firms do not expect savings to begin for more than two years. While these institutions may genuinely have a solid plan that forecasts cost savings in the future, it is perhaps more likely that their long-term expectations are largely speculative. That is not to say that savings will not occur; they probably will. But they will not result from formal strategies identified by the firms in this study. In much the same way as any business can benefit from, say, continuing improvements in the price-performance of personal computers, it could be argued that savings from Internet services are almost inevitable. The real cost advantage will go to those firms who approach the cost reduction opportunity strategically. Again, Bayshore Trust stands as a current example of the strategic use of lower costs available through technology.

A key element in determining cost reduction will be whether Internet services replace or simply augment existing channels. If they replace existing services, then cost reductions are likely, whereas if they merely augment what is already available, cost reductions will not be as easily gained.

It is too early to tell which will happen until customers move en masse to the new medium. However, it was also pointed out that baby boomers (who make up a sizeable market segment) are still cautious regarding electronic banking and payments. On the
other hand, the so-called "Nintendo generation" is less risk-averse. They are expected to be the first big group of adopters, and will soon be a large consumer group as well.

Firms also try to differentiate their services on the Internet. Bearing in mind that most banking web sites currently offer little more than electronic brochures, the present potential for differentiation appears limited. Apart from first movers, the most advanced applications are, for example, financial modelling tools. These systems enable users to anonymously enter information about their financial situation. During RSP season there are numerous models to determine an individual's optimal level of investment, or to identify the financial impact of borrowing to invest in a RSP.

These applications are far more valuable than electronic brochures, yet it is still difficult to see the sustainability of advantage stemming from readily imitable capabilities such as simple financial modelling tools. Unless the modelling tool offered by a particular institution is matched by a RSP program that fits the user's need, these applications present the same drawbacks as ABMs. That is, the end user appreciates the convenience of the service rather than building loyalty to the company offering it.

The financial modelling tools may also be replaced by services from other firms that do a better job and are not affiliated with banks. For instance, a new web service was recently launched which provides personalized news and financial information 24 hours a day at no cost. The consumer need not go to a web site to get these services because once the software is installed, it comes on as a screen saver. This product shows the potential to disintermediate banks from providing such information, and also indicates the growing convergence of broadcast technology with the Internet (Resnick 1996).

Financial services firms need to develop proprietary applications that provide customers with access to personal banking services. Otherwise, they will be limited to offering services that are readily imitated. This is consistent with Porter's assertion that benefits from a technology are more readily sustainable if the technology source is internal to the firm, rather than external.
Sustainability is also enhanced by the amount of research and development spending the firm is willing to commit. Results from this study showed that the current level of Internet R&D spending among these firms was very small, in both absolute and relative terms. In fact most respondents estimated it at less than one percent of the total information technology budget.

The low research expenditures were matched by the seemingly insignificant number of staff resources assigned to Internet projects. Most firms indicated that only a handful of people were involved in this area. Although in most cases the number is growing, it is still trifling when compared to the total staff involved in other information technology areas.

But staff numbers only tell part of the story. Most firms self-assessed their internal skill level regarding Internet systems as “primitive to low”, but in most cases on the rise. Several firms commented that while they may not allocate a lot of people to Internet development, they carefully choose the brightest individuals possible. One respondent said that when it comes to Internet systems, “people either get it or they don’t.” This is a significant comment, for as we have seen in earlier discussion, the development of an Internet business model is challenging. It also underscores the notion that firms see likely potential in the Internet even if that potential is not quite clear. Many firms want to be the one to develop a highly profitable business model. A holy grail for Internet commerce.

7.8 Opportunities for Further Research

It has been stated here that Internet commerce, and Internet payments in particular, are recent developments in the business environment. There are few other studies of the impact of the Internet on competition, and certainly there is a need for more research. This study was exploratory in nature, and consequently is limited in its ability to help formulate business strategy. Hopefully, however, it can act as a basis for additional research of a more quantitative nature. Following are some possibilities for such study:
1. The current study focused on large financial services firms, predominantly Canadian banks and trust companies using brief exploratory interviews and observation of Internet sites as the main methodologies. A case study approach could prove useful in gaining insight into the internal issues resulting from the clash between the banking and Internet cultures.

2. An examination of Internet competitive advantage from a resource-based perspective, rather than the industrial-organization orientation taken here, may cast a different light on the issues.

3. A future follow-up on the stated intention of firms involved in this study would be interesting. Presumably, in one year's time, most of these firms will be participating in some form of Internet payment system. It would then be clearer whether these interactive systems do have the expected positive effect on cost drivers and differentiation described here.

7.9 Summary

There is little doubt that the Internet will continue to be the focus of considerable attention for some time to come. A growing number of firms will deploy innovative applications to a growing segment of consumers. New technologies in the form of Internet "appliances" and high bandwidth networks should result in even more rapid adoption of the technology by the public.

First movers can differentiate themselves from competitors through the implementation of unique systems that later adopters are not offering.

In the Canadian financial services industry, where conservatism continues to be a strong characteristic of member firms, the adoption rate will depend on the perceived level of security which in turn will be influence by the presence of major chartered banks in the electronic marketplace. Because Internet technology is readily available to all firms, the enduring source of competitive advantage will not come from the technology.
Competitive advantage will result from the quality of the services these firms offer to customers.

Finally, a brief comment on the impact of information technology on people. It is heartening to think that the Internet will enable banks and other firms to reduce their costs and enhance consumer convenience through improved service. Canada needs a globally competitive business environment, and profitability is essential to that competitiveness. But it is distressing to consider that much of the cost savings comes in the form of reductions in employment. And it is disturbing to note that despite record profits by Canada's chartered banks, they continue to eliminate jobs to reduce operating costs even further. As we deploy new and better technology in the workplace, one can only hope that some people will remain employed to benefit by it.
APPENDIX A - A BRIEF HISTORY OF THE INTERNET AND WORLD WIDE WEB

The Internet had its origins in a project launched by the US Department of Defence in 1969. The Advanced Research Projects Agency (ARPA) wanted to build a network that would enable researchers to share computer resources and communicate with each other. Packet switching protocols were chosen to run the network so that, in the event of a military attack, the system would continue to operate even if one or more nodes stopped functioning. Similar protocols are used today and give the Internet its high degree of reliability for data transmission. If individual packets are damaged or routed in error, they are resented. Rather than create a breakdown in transmission, these errors usually result only in a reduction in overall speed of the network.

Over the following two decades, the original Department of Defence needs diminished, while universities and government agencies began using the emerging global Internet for a variety of new purposes. Ironically, electronic mail, which is still the most used Internet application, was added to the ARPAnet only as an afterthought. (Tapscott 1995) In the late 1980s new and oddly-named applications (Gopher, Archie, Veronica) began to emerge. These systems introduced greater convenience in locating and accessing the already vast information repositories on the Internet. Gopher offered a user a series of menus from which an item of interest could be chosen. When selected, the Gopher system would look up the address of the computer on which the information was stored, regardless of its geographic location, and connect the user to that site.

Although there was some business use of the Internet using Gopher and similar systems in the early 1990s, the amount and scope were negligible. A major drawback to these applications was their text-only presentation, which compared unfavourably with an information technology industry that was increasingly multimedia and “windows” oriented.

In 1989, the World Wide Web was developed by the European Particle Physics Lab. In order to readily exchange research information across the international network.
the developers created a data representation standard called the Hypertext Markup Language (HTML). In January 1993, Mosaic became the first program to enable easy navigation of the web by employing the HTML standard to link Internet documents containing text and graphics. In 1994, four thousand people a day downloaded a free copy of Mosaic. Correspondingly, the number of web servers grew from fifty world wide in January 1993 to 100,000 in December 1995 (Tapscott 1995).

The aggregate Internet user population has grown from an estimated 1 million in 1988 to more than 25 million from over 100 countries in 1995, with growth continuing at approximately 15 percent per month. Despite well publicised concerns over issues such as security, low-cost accessibility and ease-of-use, commercial internet sites now outnumber the long-standing domains of education and government (Internet World May 1995).
APPENDIX B - SUMMARY OF FINANCIAL-SERVICES WEB SITES

This section is comprised of summaries listing the interactive and information based services available on nine financial services web sites as of early March 1996. The sites summarized include five of the major Canadian chartered banks, two trust companies, and the two major credit card companies.

Since these sites are modified and improved frequently, the services offered at each site are likely to increase in number and sophistication with the passage of time. Most of the sites reviewed here were either not on-line one year ago, or contained many fewer services than is the case today.

The summaries were developed from a subjective assessment of what services each site provided that (a) were unique, distinctive or interesting, and (b) were unlikely to be available through the normal branch banking context.

BAYSHORE TRUST

GENERAL CHARACTERISTICS

- Web Slogan: “Every Dollar Counts”:
- Total of 8 branches in Canada: 6 in Toronto, 1 in Ottawa, 1 in Calgary:
- Free unlimited chequing account paying GIC interest (single account):
- Better returns on savings than banks:
- Aggressively “anti-bank” with captions such as “Bayshore Bashes the Banks”:
- Bayshore has no tellers in its branches. The customer deals directly with an Account Manager who has more authority and capability than a teller:
- Claim to be first financial institution in the world to offer online financial transactions and first to offer online RSP contributions:
- Internet RSP returns 1/8% higher than from branches:
• Lower loan interest than other banks (chart provided):

**Interactive Services**
• Chart comparing Bayshore to major banks showing lower service costs and better returns on chequing;
• GIC rates offered through Internet yield 1/8% higher returns than is the case in their own branches which are, in turn, higher than bank return rates;
• They claim to be passing on cost savings that result from not maintaining a large network of physical branches
• GIC purchases can be done through an application form:
• Mutual Funds link to a “financial advisor” via email;
• RSP segment has an interactive, semi-confidential “retirement tracker” to advise if you are saving enough for your retirement goals, assist in developing a retirement action plan
• Instant RSP loans at prime interest;
• Interactive RSP contribution calculator;
• Online transfer of RSP holdings from other institutions;
• On-line loan approval can be in as little as 60 seconds
• Calculator shows total savings on interest comparing Bayshore rates to bank rates over life of the loan
• Provide an interactive form for loan application
• “Bash the banks” - a contest to submit bank jokes with a $500 weekly prize awarded for joke of the week;

**Information Services**
• Mutual funds limited promotional information given;
• Emphasize that they are, at heart, conservative business people:

• Copy of 1994 annual report on-line:

• Founded in 1977. growth milestones charted:

• Secured mortgages represent 90% of their total loan base:

• A chart shows Bayshore mortgage rates compared to banks:

• Bayshore is up to 0.1% lower for short terms and up to 0.35% lower on longer terms (i.e. 5 years)

• NOTE: no information given on how to apply for a mortgage. which is a problem since they only have 5 branches
Canada Trust

General Characteristics

- Overall rich in current information content
- Wide array of service options provided
- Includes "soft" information, such as environmental issues related to investments
- No Internet-specific strategies evident

Interactive Services

- Internet account summary of transactions in past 30 days
- PC Banking (not yet available)
- ABM Locator (map of North America, click on your location, list of local addresses of ABMs)
- Interactive investment planner - comprehensive and anonymous unless user chooses to identify self
- RSP: comprehensive guide, detailed information on investment strategies such as whether or not to borrow for RSPs
- Application for MasterCard

Information Services

- EasyLine telephone banking service (promotional)
- Investor Newsletter - comprehensive, is it available in branches or only online?
CIBC - "Define the Role of Internet Banking"

General Characteristics

- Interesting looking home page with Java applet (photos of customers flash on and off the screen):

- This is mainly a R&D site at the moment. Little in customer value:

Interactive Services

- Interactive questionnaire on Internet banking services:

- ABM locator:

Information Services

- A list of comments from customers since site went live in December/95

- Promotional material on telephone banking, RSPs etc. None of which is interactive

- Phone Banking overview

- Interac Direct Payment promotion
Bank of Nova Scotia

General Characteristics

- Web site slogan - "Third Edition On-line". (The site is regularly updated with new features and information. this being the third major edition):

Interactive Services

- Interactive VISA savings calculator:

- Mutual Fund prices (full prospectus):

- Interactive questionnaire "Reality Check" to assess if current savings are adequate for retirement plans:

- Make business software available. endorsed by professional organizations (e.g. College of Family Physicians of Canada):

- Planning information for different professions:

- Interactive action plan developer for RSP strategies:

- ABM and branch locator:

- Keyword search of web site:

Information Services

- Information on services for seniors, students, others:

- Economic commentary - analysis of leading economic indicators including Global Economic Outlook:

- Provides information on different options to make up any shortfalls in RSP contributions:
Royal Bank

General Characteristics
- Choice of languages - English or French:

Interactive Services
- Interactive business planner:
- Interactive EDI application analyzer (for larger businesses):

Information Services
- Analysis of federal budget:
- Daily currency and market reports:
- A “10 minute guide” to small business use of the Internet, with information on what the Internet is (and isn’t), what uses it has (information distribution, marketing, etc.):
- How to do business with Royal Bank on Internet:
Toronto Dominion

General Characteristics
- Offer language choice - English, French or Japanese:
- Award winner for web site:

Interactive Services
- Wealth allocation model to design personal portfolio of investments:
- Retirement savings planner:
- RSP loan application forms:
- "Wealth Manager" helps plan and optimise capital:
- Interactive questionnaire called Business Forum. User can also post a question:
- Case studies and business library:
- Interactive questionnaire on investment planning, but most is information:
- Interactive budget planner:
- Keyword search of web site:

Information Services
- Information on market prices, economic reports, etc.:
- Information on home buying, including checklist of things to do, mortgage selection, closing, etc.:
- Commentary on current issues (e.g. 1996 federal budget):
BANK OF MONTREAL

GENERAL CHARACTERISTICS

- Award winner for top web site:
- Very cool "look and feel" (e.g. first page enables download of animation sequence):
- Includes "soft" references such as community services the bank is involved with:

INTERACTIVE SERVICES

Custom home page for individual customer or browser:

- Customer enters following information to customize page: name, email address, gender, age range, occupation, income range, residence (own or rent), and whether or not user is Bank of Montreal customer and what account type;
- Preferences can be updated anytime;
- Personal pages involve a few steps and a password to access. can be cumbersome. slow and irritating;
- Personal pages are also used to market services: if Mutual Fund information is in preferences. then a mutual fund promotion will appear on the first access of personal page;

Small Business Centre - The "Virtual Head Office"

- The Virtual Head Office is comprised of several virtual departments or functions analogous to those found in many corporations;
- Finance Department: information on rates and technology centres;
- Loading Dock: documents on success factors in business. free clip-art site information;
- Strategic Planning: does not work:
- Mail Room: recommended news groups about small business. suggestion box which includes all posted suggestions;
- Water Cooler: mainly news groups;
- Corner Office: humour and news groups;
- Boondoggles: humour;
- Research Department: web resources for small business (links). Institute for Small Business (includes a research study);
- Public Relations: as you might expect;

**RSP Services**

- Interactive game rather than questionnaire

**Information Services**

- Technology Innovation Centres
- PC Banking (not through Internet)
- Phone based banking
- Personal banking
- Investment information
- North America-wide financial news
MASTERCARD

GENERAL CHARACTERISTICS

- One of the target markets is college students, with considerable resources devoted to issues from a student's perspective:

- Overall the site has an unfinished look. The main hook to get browsers to return to the site would be the list of links to other sites which may be of interest (e.g. an entire set of links and text concerning health-care issues):

INTERACTIVE SERVICES

- Currency exchange rate converter:

- ABM locator (this services lists ABMs in only 8 cities worldwide, none in Canada):

- List of links to other web sites of interest to students:

- Downloadable spreadsheet for students to do financial planning:

- Link to one site that provides on-line card application through AT&T, but no on-line application directly at the MasterCard web site:

- List of links to banks that provide web-based services. Canada Trust is the only Canadian link, plus one in Argentina, two in Japan, and seven in the USA:

INFORMATION SERVICES

- Student information resources include information on the benefits of their becoming MasterCard members and advertisements for a job-hunting book commissioned by Mastercard which sells for $9.95:

- Many other links and pointers to other sites of no clear relevance to credit cards, banking or electronic commerce:
**Visa**

**General Characteristics**
- The site has a "global expo" theme with images of clocks showing the time of day in various cities around the world including one in Canada (Montreal):
- Generally sophisticated and polished appearance to the site:

**Interactive Services**
- Browser can customize a home page without identification. Simply a mnemonic that the system recognizes:
- The custom page groups existing information content according to the preferences indicated by the client:
- Links to on-line shopping malls where Visa is accepted:
- Student services include an interactive financial planning package that can be downloaded:
- Interactive explanation of the various components of a standard Visa statement. Enables the client to get information on specified fields on the form:

**Information Services**
- Newsletter on the topic of money power:
APPENDIX C - THE INTERVIEW FORM

Text that appears in *bold italics* will not form part of the interview. It is included here to indicate the purpose of each block of questions.

**Importance of Information Technology to the Firm**

*Does the firm take a strategic approach to information technology investment? Also serves as introduction and warm-up to the interview.*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Information Technology is a source of competitive advantage for your firm.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. Your firm considers itself a leader in the development and application of Information Technology.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. The relative importance of Information Technology is reflected in the size/significance of IT budgets.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. Information Technology priorities are determined on the basis of their contribution to the achievement of strategic objectives.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

**Follow-up questions**

5. **Re question 2 on technology leadership:**

Please explain why the firm does or does not consider itself an information technology leader?
Importance of the Internet to the Firm

**Does the firm have a strategic approach to Internet services (i.e. proactive rather than reactive)?**

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. The Internet is or will be a source of competitive advantage for your firm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Your firm considers itself a leader in the development and application of Internet financial services.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Your firm’s Internet strategy falls within a larger overall framework for Information Technology strategies.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Internet initiatives are expected to show a positive return on investment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Follow-up questions**

10. **Re question 1 on competitive advantage:**
    If yes, please explain the nature of competitive advantage gained through the Internet.
    If no, why is the firm deploying Internet services? (i.e. cost of doing business)

11. **Re question 2 on Internet services leadership:**
    Please explain why the firm does or does not consider itself a leader in the development of Internet applications.

12. **Re question 4 on ROI:**
    How is the firm measuring return-on-investment regarding its Internet services?
(Few firms are doing this today, so these questions are relevant to future developments of Internet based payment systems.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Internet payments are or will be a source of competitive advantage for your firm.</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>14. Your firm will offer Internet payments within the next 12 months.</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>15. Your firm has a satisfactory security strategy for Internet payment services.</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>16. The Internet will play an important role in the clearing system.</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
</tr>
</tbody>
</table>

**Follow-up questions**

17. **Re question 13 on competitive advantage:**
    If yes, please explain the nature of competitive advantage gained through Internet payment.

18. **Re question 15 on security:**
    How is the firm addressing the issue of security for Internet payments?

19. **Re question 16 on the clearing system:**
    What role will the Internet play in the clearing system?

20. **Probe for any inconsistencies between plans for payments within 12 months but inadequate security.**
Item 1 - The technology lowers cost drivers or enhances differentiation and is sustainable (difficult for others to copy).

Sustainability is determined by four factors:
(a) Source of Technology - Internal or External
(b) Cost or differentiation advantages through R&D
(c) Available of internal technological skills
(d) Overall rate of technology diffusion

Item 1 - General Questions - What is the Internet's impact on cost drivers?:

21. Have the firm's Internet services reduced the cost of delivering services?
   If yes:
      In what way?
      By how much?
      How is it measured?
   If not:
      Is it expected to reduce costs in the future?
      If so, when?
      How will it be measured?
What is the Internet’s impact on service differentiation strategies?

22. In terms of the Internet services currently offered, how does the firm differentiate itself from competitors? (i.e. Does it provide unique content or services, project a specific image, etc.?)

Explain (examples will be helpful)

Ia questions: Source of Technology - Internal or External (Note that because the Internet is an open network, employing open technology standards, the “source of technology” is assumed to be external unless proprietary uses or new firm-specific developments are present)

23. Is your firm developing any unique or proprietary Internet related application systems or tools that will be unavailable to other firms?

   If yes:
   Please describe these application systems or tools.
   Are they in use today?
   If not, when will they be available?

   If no: (for clarification and reinforcement)
   Does this mean you are using the same Internet technologies as your competitors?

Ib questions - Cost or differentiation advantages through R&D

24. As a percentage of total Information Technology budgets, what is the firm’s current level of investment in Internet services?

25. How has that level changed in the past two years? (up/down/same)

26. What is the planned level of investment in the next year or beyond?
   (May ask if detailed information is available for the years 1994/5/6/7/8?)
27. What percentage of those investments is R&D as opposed to operational support?

(A pie-chart showing relative proportions of Internet related budget expenditures would be ideal.)

1c questions - Availability of internal technological skills

28. Are your current Internet service developments outsourced or provided in-house?

Is that expected to change in the next 12 months?
If outsourced, what firm are you employing?

(Does more than one competitor outsource to the same company, thereby further eroding any proprietary advantage?)

29. What is the firm’s current training budget to develop the technical skills required to build, deploy or manage Internet services?

30. What is the approximate number of staff who have been trained on Internet system development?

31. What does that amount represent relative to the total number of IS staff?

32. In your own words, how would you assess the firm’s overall internal skill level regarding Internet systems?

1d questions - Overall rate of technology diffusion

(The current level of Internet technology diffusion can be assessed using the summary of available services through Canadian financial institutions)

33. What new Internet services does your firm plan to offer in the next 12 months?
**Item 2 - The technology results in cost or differentiation advantages through R&D even if the technology can be imitated**

34. Comparing your firm to other competitors in the industry: Has your deployment of Internet services had any **unique firm-specific** impact on your company's cost drivers or its ability to differentiate itself from the competition?

**Item 3 - Technology pioneering leads to first-mover advantages besides those inherent in the technology itself**

*(OPTIONAL: This question is only relevant to those who answered agree/strongly agree to the question regarding leadership in Internet developments.)*

35. You mentioned earlier that your firm is a leader in the development and application of Internet systems.
   - How are you protecting the leadership advantage you currently enjoy?
   - How are you preventing others from simply copying what you already do?

**Item 4 - Technology improves the overall industry structure**

36. What role, if any, does the structure of the Canadian banking system (i.e. the big six) have on the diffusion/adaptation rate of Internet technology?
37. Please comment on the following statement: Internet services, because they are based on "open technologies", will lead to the commodification of services. (ABM example)
Is the Internet mentioned anywhere in general corporate literature such as annual reports?

38. Can you supply a copy of current and recent annual reports?

39. Any other final comments before concluding the interview?

40. Would you be willing to have a short follow-up discussion in case any points require clarification?

41. If you think of anything, please contact me.
APPENDIX D - GLOSSARY OF TERMS

Archie
A tool (software) for finding files stored on anonymous FTP sites. User must know the exact file name or a substring of it.  

Anonymous FTP
A very common method of moving files between two Internet sites. FTP is a special way to login to another Internet site for the purposes of retrieving and/or sending files. There are many Internet sites that have established publicly accessible repositories of material that can be obtained using FTP, by logging in using the account name "anonymous", thus these sites are called "anonymous ftp servers".  

Automated clearing settlement systems (ACSS)
A computer-network system that performs the tasks of (a) logging payments to and receipts from Canadian financial institutions, and (b) calculating the “due-to” and “due-from” balances based on the amount of funds transferred.  

Circuit switching
A switching method where a dedicated path is set up between the transmitter and receiver. The connection is transparent, meaning that the switches do not try to interpret the data.  

Client
A software program that is used to contact and obtain data from a Server software program on another computer, often across a great distance. Each Client program is designed to work with one or more specific kinds of Server programs, and each Server requires a specific kind of Client. A "Web Browser" is a specific kind of Client.  

CommerceNet
A consortium formed to address issues related to Internet-based electronic commerce. A non-profit organization of over 130 electronics, computer, financial service, and information service companies, working to accelerate the use of the Internet for business applications.  

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20 Source: http://www.matisse.net/

21 Source: Poriah (1991)

22 Source: http://www.wiltel.com/glossary/glosc.html

23 Source: http://www.comercenet.com
**Commodification**  
The tendency of some forms of information technology to turn products and services into commodities.  

---

**Digital cash**  
The digital equivalent of a cashier’s cheque or bearer bond. That is, a token issued and authorized by a financial institution, with a random unique identifying number and the amount of money represented.

**Disintermediate**  
Reducing or eliminating intermediaries from the value chain by substituting their products or services with information or information technology, resulting in direct contact between producer and consumer.

---

**Electronic brochures**  
Term to describe a prevalent use of World Wide Web documents to duplicate the function of a colour marketing brochure with information content that is similar to that found on paper, though with additional features such as links to other web sites.

---

**Electronic commerce**  
The ability for buying, selling and payment transactions to occur through computers and telecommunications networks.

---

**Electronic data interchange (EDI)**  
An industry standard (ANSI X12. X.400) for direct computer-to-computer information exchange.

---

**Electronic Mail (E-mail)**  
Messages, usually text, sent from one person to another via computer. E-mail can also be sent automatically to a large number of addresses, called a mailing list.

---

**Encryption**  
Altering the format of information in such a way that it can be transmitted over an open network securely. It includes “public key encryption” systems such as SET which use a public key to encrypt, say, a credit card number, together with a private key known only to the card holder.

---

**Gopher**  
A widely successful method of making menus of material available over the Internet. Gopher is a Client and Server style program, which requires that the user have a Gopher Client program. Although Gopher spread rapidly across the globe in only a couple of years, it is being largely supplanted by Hypertext, also known as WWW (World Wide Web). There are

---

24 Source: Author.

25 Source: Singleton (1995)

26 Source: Benjamin (1995)

27 Source: Author (1996)
still thousands of Gopher Servers on the Internet and we can expect they will remain for a while.

**Home page**
The information screen that appears at the first level of a world wide web site, usually containing overview information and links to other pages or documents at the same or other sites.

**Hypertext markup language (HTML)**
The coding language used to create Hypertext documents for use on the World Wide Web. HTML looks a lot like old-fashioned typesetting code, where you surround a block of text with codes that indicate how it should appear. Additionally, in HTML you can specify that a block of text, or a word, is "linked " to another file on the Internet. HTML files are meant to be viewed using a World Wide Web Client Program, such as Mosaic or Netscape.

**Information highway**
Commonly used term for the presumed successor to the Internet, which will provide faster speed and wider access networks. For an overview of the Canadian government’s approach to the information highway see: http://info.ic.gc.ca/ic-data/info-highway/general/report.april94.e.txt

**Internet**
(Upper case I) The vast collection of inter-connected networks that all use the TCP/IP protocols and that evolved from the ARPANET of the late 60's and early 70's. The Internet now (July 1995) connects roughly 60,000 independant networks into a vast global Internet.

**internet**
(Lower case i) Any time you connect 2 or more networks together, you have an internet - as in inter-national or inter-state.

**Internet service provider (ISP)**
A commercial institution that provides access to the Internet in some form, usually for profit.

**Intranet**
Web based networks used for internal rather than external applications.

**Java**
An Internet programming language developed by Sun Microsystems to create a greater level of interactivity through the web. A simple example of Java programming can be found at CIBC’s web site http://www.cibc.com. Images of the bank's customers flash on and off the screen in various locations and for varying periods of time. See also http://www.sun.com
Marketspace
Analogous to the physical marketplace, this term is used to describe transactions that are defined by information and which create and extract value through information.²⁸

Moore’s Law
An observation or rule of thumb that the price performance of computer hardware doubles every 18 months or so. ²⁴

Mosaic
The first WWW browser that was available for the Macintosh, Windows, and UNIX all with the same interface. "Mosaic" really started the popularity of the Web. The source-code to Mosaic has been licensed by several companies and there are several other pieces of software as good or better than Mosaic. Most notably, "Netscape". ²⁰

National Information Infrastructure
A Clinton/Gore administration plan to deregulate communication services beginning with 1994 legislation. It will integrate concepts from Internet, CATV, telephone, business, entertainment, information providers, education, etc. The potential impact to businesses, schools, homes and society as a whole are significant. CATV will be allowed to provide telephone and video-conferencing services. Phone companies will be allowed to provide movies and information services. Aggressive companies could be major winners in the next few years. The potential is only limited by our imagination and creativity. The rate of change sparked by the Information Superhighway may be faster than anything the telecommunications industry has ever experienced before. ²²

Netscape
A WWW Browser and the name of a company. The Netscape (tm) browser was originally based on the Mosaic program developed at the National Center for Supercomputing Applications (NCSA).

Netscape has grown in features rapidly and is widely recognized as the best and most popular web browser. Netscape corporation also produces web server software. Netscape provided major improvements in speed and interface over other browsers, and has also engendered debate by creating new elements for the HTML language used by Web pages -- but the Netscape "extensions" to HTML are not universally supported. The main author of Netscape, Mark Andreessen, was hired away from the NCSA by Jim Clark, and they founded a company called Mosaic Communications and soon changed the name to Netscape.

²⁸ Rayport & Sviokla (1994)
Packet switching

The method used to move data around on the Internet. In packet switching, all the data coming out of a machine is broken up into chunks, each chunk has the address of where it came from and where it is going. This enables chunks of data from many different sources to co-mingle on the same lines, and be sorted and directed to different routes by special machines along the way. This way many people can use the same lines at the same time.

Payment system

The chain of events that occurs in making a payment with a cheque, automated banking machine, credit card, etc. from the point the transaction begins until all funds have been cleared through the payer and payee’s financial institutions and the Bank of Canada.

Point of sale (POS)

Point of sale systems enable merchants to create multiple simultaneous transactions at the time a sale is made. In addition to recording the sale, inventory levels may be immediately updated, and payment can be instantly completed.

Secure Electronic Transaction Protocol (SET)

Visa and MasterCard have jointly developed the Secure Electronic Transaction (SET) protocol as a method to secure bankcard transactions over open networks. SET is being published as open specifications for the industry. These specifications are available to be applied to any bankcard payment service and may be used by software vendors to develop applications.

Server

A computer, or a software package, that provides a specific kind of service to client software running on other computers. The term can refer to a particular piece of software, such as a WWW server, or to the machine on which the software is running, e.g. "Our mail server is down today. That's why e-mail isn't getting out." A single server machine could have several different server software packages running on it, thus providing many different servers to clients on the network.

Smart card

See "digital cash".

TCP/IP

The suite of protocols that defines the Internet. Originally designed for the UNIX operating system. TCP/IP software is

---


30 Source: http://www.mastercard.com/Press/release-960201.htm
now available for every major kind of computer operating system. To be truly on the Internet, your computer must have TCP/IP software.  

**Value added network (VAN)**  
These networks are often associated with Electronic Data Interchange (EDI) systems. They enable computers from different companies to exchange information over privately owned and operated telecommunications networks. Added value services such as servers and electronic mailboxes mean that users do not have to invest in or operate their own systems.  

**Veronica**  
Developed at the University of Nevada, Veronica is a constantly updated database of the names of almost every menu item on thousands of gopher servers. The Veronica database can be searched from most major gopher menus.  

**Virtual**  
In the context of information technology, a term often used to describe an information system or structure that is a logical representation of a physical entity (e.g. virtual reality).  

**Virtual private networks (VPI)**  
Switched network with special services like abbreviated dialing. A customer can call between offices in different area codes without having to dial all eleven digits.  

**World Wide Web**  
Two meanings - First. loosely used: the whole constellation of resources that can be accessed using Gopher, FTP, HTTP, telnet, Usenet, WAIS and some other tools. Second, the universe of hypertext servers (HTTP servers) which are the servers that allow text, graphics, sound files, etc. to be mixed together.


Broadhead, R. The Canadian Internet Advantage. Scarborough: Prentice-Hall. 1995


Hall. Richard. "A Framework Linking Intangible Resources and Capabilities to


House of Commons Standing Committee on Consumer & Corporate Affairs & Government Operations. Credit Cards in Canada in the 90s. Parliament Library.


Partridge, John. "Bayshore Set to Become First Internet Banker". *Globe & Mail*. October 6, 1995 (B1).


Vita Auctoris

Ted Dodds has held a variety of information technology related positions in two Ontario universities over the past 15 years. He is currently employed as Director. Computing Services, at the University of Windsor. His undergraduate degree is a double major in Information Science and Psychology, received from the University of Guelph in 1987.
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313/761-4700  800/521-0600
AN EXPERIMENTAL STUDY OF THE DRAG FORCE ON A WATER SUPPORTED CONVEYOR BELT

By

Rick Anema, B.Eng

A Thesis submitted to the
Faculty of Graduate Studies and Research
through the Department of Civil and Environmental Engineering
in Partial Fulfilment of the Requirements for the
Degree of Master of Applied Science
at the University of Windsor

Windsor, Ontario, Canada
April, 1996
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APPROVED BY:

Dr. K. Sridhar  
Department of Mechanical and Materials Engineering  
University of Windsor

Dr. N. Biswas  
Department of Civil and Environmental Engineering  
University of Windsor

Dr. J.A. McCorquodale, Advisor  
Department of Civil and Environmental Engineering  
University of Windsor

Dr. B. Budkowska, Chair  
Department of Civil and Environmental Engineering  
University of Windsor
ABSTRACT

Belt conveyor systems have been used to transport materials since the early 1900's. In an effort to reduce the conveying costs, variations of the traditional belt conveyor systems have become common place.

An investigation into an alternate method of supporting the conveyor belt and material was the objective of this research. The method investigated uses water, in lieu of flights of idlers, to support the belt and material. Water flowing in an open channel provides the buoyancy for the support of the conveyor belt and material.

The specific objective of this research was to determine the drag coefficient of a representative section of a water bed conveyor. This involved the investigation of the drag on a flexible membrane form in a confined open channel. Dimensional analysis was used as a basis for the design of the physical model of the water bed conveyor. The physical model was designed, constructed and installed within a flume. Testing of the physical model consisted of measuring the drag force on the Test Section and velocity distribution within the boundary layer developing along the Test Section. The measurements were undertaken while the Test Section was loaded with various quantities of different material types. The Test Section was fixed in the direction of flow by one load cell, while water was pumped through the flume at 25 l/s, 38 l/s and
63 l/s. A power-law velocity distribution within the boundary layer was assumed. The power-law exponents for the three material type set-ups were similar in magnitude and found to be independent of Reynolds Number in the test range. The average exponent, over the length of the Test Section, for the material set-ups of water, rocks and sand were 6.7, 5.5 and 6.5 respectively. However, the exponents at specific locations along the Test Section ranged from 3 to 11.7.

Momentum principle and the velocity data were used to calculate the drag force on the Test Section; this was then compared with the drag force recorded directly. The drag recorded and calculated showed a good correlation and confirmed that momentum principle was suitable for calculating the drag force in the nonuniform flow region of a water bed type conveyor (WBC) system.

The drag coefficient was calculated and comparisons were made to establish whether the tension in the membrane and/or the material type set-ups affected the drag coefficient. The relationship among the drag coefficient, Reynolds Number and Froude Number were investigated. The results indicated that the drag coefficient was independent of Reynolds Number (based on the hydraulic radius of the Test Section) greater than 10000. The effects of Froude number were found to be minimal under the test conditions selected.
ACKNOWLEDGEMENTS

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TABLE OF CONTENTS

ABSTRACT........................................................................................................ iv

ACKNOWLEDGEMENTS.............................................................................. vi

TABLE OF CONTENTS.............................................................................. vii

LIST OF TABLES......................................................................................... x

LIST OF FIGURES......................................................................................... xii

1.0 INTRODUCTION..................................................................................... 1
   1.1 Traditional Belt Conveyor Systems....................................................... 3
   1.2 Water Bed Conveyor System............................................................... 4
   1.3 Advantages and Disadvantages of the WBC system........................... 5
         1.3.1 Advantages................................................................................... 5
         1.3.2 Disadvantages.............................................................................. 6
   1.4 Objective.............................................................................................. 7
   1.5 Scope of Work...................................................................................... 8

2.0 BACKGROUND AND LITERATURE REVIEW........................................... 9
   2.1 Introduction........................................................................................... 9
   2.2 Mechanical Friction............................................................................. 9
       2.2.1 Idler Rotational Resistance........................................................... 10
       2.2.2 Belt Indentation Resistance........................................................... 11
       2.2.3 Flexure Resistance of Belt............................................................ 12
       2.2.4 Flexure Resistance of bulk Material............................................ 12
   2.3 Hydraulic Skin Friction....................................................................... 12
       2.3.1 Boundary Layer Theory............................................................... 13
       2.3.2 Flexible Membrane..................................................................... 15

3.0 DIMENSIONAL ANALYSIS....................................................................... 18
   3.1 Introduction.......................................................................................... 18
   3.2 Dimensional Variables....................................................................... 18
   3.3 Dimensionless Groups......................................................................... 22
   3.4 Laws of Similarity.............................................................................. 22

4.0 DESIGN, FABRICATION, INSTALLATION AND MATERIALS..................... 25
   4.1 Physical Model................................................................................... 25
   4.2 Inner Flume....................................................................................... 29
   4.3 Test Section....................................................................................... 31
       4.3.1 Flexible Membrane.................................................................... 31
       4.3.2 Tensioning Device..................................................................... 33
       4.3.3 Belt Tensioning Rods and Rod Supports................................. 35
       4.3.4 Bulkheads and Endplates........................................................... 36
       4.3.5 Outriggers.................................................................................. 36
   4.4 Transition Sections............................................................................... 37
   4.5 Measurement Systems....................................................................... 38

vii
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5.1 Force Measurement Rig</td>
<td>38</td>
</tr>
<tr>
<td>4.5.2 Pressure Measurement Rig</td>
<td>40</td>
</tr>
<tr>
<td>4.5.3 Profile Rig</td>
<td>43</td>
</tr>
<tr>
<td>4.6 Materials</td>
<td>43</td>
</tr>
<tr>
<td>5.0 INSTRUMENTATION AND METHODS</td>
<td>45</td>
</tr>
<tr>
<td>5.1 Methods</td>
<td>45</td>
</tr>
<tr>
<td>5.2 Phase 1.0 Force Measurement Methodology</td>
<td>50</td>
</tr>
<tr>
<td>5.3 Phase 2.0 Pressure Measurement Methodology</td>
<td>52</td>
</tr>
<tr>
<td>6.0 RESULTS AND DATA REDUCTION</td>
<td>53</td>
</tr>
<tr>
<td>6.1 Preliminary Tests</td>
<td>53</td>
</tr>
<tr>
<td>6.1.1 Flexible Membrane Sample Test</td>
<td>53</td>
</tr>
<tr>
<td>6.1.2 Bench Top Model Test</td>
<td>53</td>
</tr>
<tr>
<td>6.2 Physical Model Tests</td>
<td>55</td>
</tr>
<tr>
<td>6.2.1 Calibration of the Force Measurement Rig</td>
<td>55</td>
</tr>
<tr>
<td>6.2.2 Raw Data</td>
<td>60</td>
</tr>
<tr>
<td>6.2.2a Force Measurements</td>
<td>60</td>
</tr>
<tr>
<td>6.2.2b Pressure Measurements</td>
<td>61</td>
</tr>
<tr>
<td>6.2.3 Calculated Velocities</td>
<td>61</td>
</tr>
<tr>
<td>6.2.4 Boundary Layer Thickness</td>
<td>61</td>
</tr>
<tr>
<td>6.2.5 Power-Law Exponents</td>
<td>62</td>
</tr>
<tr>
<td>6.2.6 Drag Force</td>
<td>62</td>
</tr>
<tr>
<td>6.2.7 Skin Friction</td>
<td>62</td>
</tr>
<tr>
<td>6.3 Profile Data</td>
<td>63</td>
</tr>
<tr>
<td>7.0 DISCUSSION</td>
<td>129</td>
</tr>
<tr>
<td>7.1 Raw Data</td>
<td>129</td>
</tr>
<tr>
<td>7.1.1 Force Measurements</td>
<td>130</td>
</tr>
<tr>
<td>7.1.2 Pressure Measurements</td>
<td>130</td>
</tr>
<tr>
<td>7.2 Calculated Velocity</td>
<td>132</td>
</tr>
<tr>
<td>7.3 Boundary Layer Thickness</td>
<td>133</td>
</tr>
<tr>
<td>7.4 Power-Law Exponents</td>
<td>135</td>
</tr>
<tr>
<td>7.5 Drag Force</td>
<td>137</td>
</tr>
<tr>
<td>7.5.1 Recorded Drag Force</td>
<td>137</td>
</tr>
<tr>
<td>7.5.2 Calculated Drag Force</td>
<td>138</td>
</tr>
<tr>
<td>7.5.2a Station 1</td>
<td>140</td>
</tr>
<tr>
<td>7.5.2b Station 4</td>
<td>143</td>
</tr>
<tr>
<td>7.5.2c Station 1 - 4</td>
<td>144</td>
</tr>
<tr>
<td>7.6 Skin Friction Coefficient</td>
<td>146</td>
</tr>
<tr>
<td>7.7 Uncertainty Analysis</td>
<td>151</td>
</tr>
<tr>
<td>7.8 Applications</td>
<td>151</td>
</tr>
<tr>
<td>7.8.1 Comparison of Traditional and WBC System</td>
<td>152</td>
</tr>
<tr>
<td>8.0 CONCLUSION AND RECOMMENDATION</td>
<td>172</td>
</tr>
<tr>
<td>8.1 Conclusion</td>
<td>172</td>
</tr>
<tr>
<td>8.1.1 Boundary Layer Development</td>
<td>172</td>
</tr>
<tr>
<td>8.1.2 Power-Law Exponent</td>
<td>173</td>
</tr>
<tr>
<td>8.1.3 Drag Force</td>
<td>173</td>
</tr>
<tr>
<td>viii</td>
<td></td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 3.1 Design Summary of Traditional Conveyor.............. 19
Table 3.1 Design Summary of Traditional Conveyor – Continue ............................................ 20
Table 5.1 Instrumentation................................. 46
Table 6.1 Summary of Phase 1.0 Tests................................. 56
Table 6.2 Summary of Phase 2.0 Tests................................. 57
Table 6.3 Raw Data: Phase 1.0.................................. 64
Table 6.4 Raw Data: Phase 2.0.................................. 65
Table 6.5 Raw Data: Phase 1.0 – Load Cell
Measurements................................................. 66
Table 6.6 Raw Data: Phase 2.0 – Pressure Transducer
Boundary Layer Measurements: Water @ 63 l/s.... 72
Table 6.7 Raw Data: Phase 2.0 – Pressure Transducer
Boundary Layer Measurements: Sand @ 63 l/s... 73
Table 6.8 Raw Data: Phase 2.0 – Pressure Transducer
Boundary Layer Measurements: Rocks @ 63 l/s.. 74
Table 6.9 Calculated Local Mean Free Stream Velocities
for Phase 2.0.................................................. 87
Table 6.10 Calculated Average Free Stream Velocities...... 88
Table 6.11 Boundary Layer Thickness – Phase 2.0......... 102
Table 6.12 Local Power-law Exponents.......................... 112
Table 6.13 Average Forces Recorded and Calculated @ Full
Load (50 kg)................................................. 122
Table 6.14 Average Forces Recorded – Phase 1.0........ 123
Table 6.15 Calculated Local Drag Forces and Drag
Coefficients @ Full Load (50 kg)......................... 124
Table 6.16 Average Recorded and Calculated Skin Friction
Coefficients.................................................... 125
Table 7.1 Statistical Comparison of the Average of the
Recorded Bulkhead and Inner Flume Forces..... 139
Table 7.2 Summary of Reynolds, Froude Numbers and $C_r$ - Phase 2.0
Table 7.3 Summary of Reynolds, Froude Numbers and $C_r$ - Phase 1.0
Table 7.4 Comparison of Traditional Conveyor and WBC System
LIST OF FIGURES

Figure 1.1 Traditional Belt Conveyor.......................... 2
Figure 1.2 Water Bed Conveyor................................. 2
Figure 4.1 Plan View of Flume and Physical Model........... 26
Figure 4.2 Plan and Cross-sectional View of Physical Model......................................................... 27
Figure 4.3 Test Section and Upstream Transition Section................................................................. 28
Figure 4.4 Upstream Transition Section......................... 28
Figure 4.5 Inner Flume Located in Outer Flume................. 30
Figure 4.6 Inner Flume Floor During Construction............ 30
Figure 4.7 Test Section.......................................... 32
Figure 4.8 Test Section Components........................... 32
Figure 4.9 Test Section Components (Sketch).................. 34
Figure 4.10 Force Measurement Rig............................. 39
Figure 4.11 Force Measurement Rig (Sketch)................... 39
Figure 4.12 Pressure Measurement Rig – Front View........ 41
Figure 4.13 Pressure Measurement Rig – Pitot-static Tube... 41
Figure 4.14 Pressure Measurement Rig – Vernier Calliper.. 42
Figure 4.15 Profile Measurement Rig............................ 44
Figure 5.1 Pressure Measurement Set-up – Process and Instrumentation Diagram................................. 49
Figure 6.1 Stress Strain Relationship of Flexible Membrane.............................................................. 54
Figure 6.2 Calibration of Force Rig – Top View............... 58
Figure 6.3 Calibration of Force Rig – End View............... 58
Figure 6.4 Calibration Curves for Loop System................. 59
Figure 6.5 Load Cell Data: Water @ 63 l/s – Bulkheads......67
Figure 6.6 Load Cell Data: Water @ 63 l/s – wall..............67
Figure 6.7 Load Cell Data: Water @ 38 l/s – Bulkheads......68
Figure 6.8 Load Cell Data: Water @ 38 l/s – wall..............68
Figure 6.9 Load Cell Data: Water @ 25 l/s – Bulkheads......69
Figure 6.10 Load Cell Data: Water @ 25 l/s – wall..............69
Figure 6.11 Load Cell Data: Sand @ 63 l/s – Bulkheads......70
Figure 6.12 Load Cell Data: Sand @ 63 l/s – wall..............70
Figure 6.13 Load Cell Data: Rocks @ 63 l/s – Bulkheads.....70
Figure 6.14 Load Cell Data: Rocks @ 63 l/s – wall..............70
Figure 6.15 Pressure Transducer Data: Water @ 63 l/s – Station 1........................................75
Figure 6.16 Pressure Transducer Data: Water @ 63 l/s – Station 2........................................76
Figure 6.17 Pressure Transducer Data: Water @ 63 l/s – Station 3........................................77
Figure 6.18 Pressure Transducer Data: Water @ 63 l/s – Station 4........................................78
Figure 6.19 Pressure Transducer Data: Sand @ 63 l/s – Station 1........................................79
Figure 6.20 Pressure Transducer Data: Sand @ 63 l/s – Station 2........................................80
Figure 6.21 Pressure Transducer Data: Sand @ 63 l/s – Station 3........................................81
Figure 6.22 Pressure Transducer Data: Sand @ 63 l/s – Station 4........................................82
Figure 6.23 Pressure Transducer Data: Rocks @ 63 l/s – Station 1........................................83
Figure 6.24 Pressure Transducer Data: Rocks @ 63 l/s – Station 2........................................84
Figure 6.25 Pressure Transducer Data: Rocks @ 63 l/s – Station 3........................................85

xiii
Figure 6.26 Pressure Transducer Data: Rocks @ 63 l/s - Station 4 .................................................. 86

Figure 6.27 Velocity Profiles - Water @ 63 l/s ............ 89
Figure 6.28 Velocity Profiles - Water @ 38 l/s & 35 l/s ... 90
Figure 6.29 Velocity Profiles - Water @ 25 l/s & 22 l/s ... 91
Figure 6.30 Velocity Profiles - Sand @ 63 l/s .............. 92
Figure 6.31 Velocity Profiles - Sand @ 38 l/s & 41 l/s .... 93
Figure 6.32 Velocity Profiles - Sand @ 25 l/s & 22 l/s .... 94
Figure 6.33 Velocity Profiles - Rocks @ 63 l/s ............ 95
Figure 6.34 Velocity Profiles - Rocks @ 38 l/s ............ 96
Figure 6.35 Velocity Profiles - Rocks @ 25 l/s ............ 97
Figure 6.36 Extrapolation of Velocity: Water @ 63 l/s - Station 1 .................................................. 98
Figure 6.37 Extrapolation of Velocity: Water @ 63 l/s - Station 2 .................................................. 99
Figure 6.38 Extrapolation of Velocity: Water @ 63 l/s - Station 3 .................................................. 100
Figure 6.39 Extrapolation of Velocity: Water @ 63 l/s - Station 4 .................................................. 101
Figure 6.40 Boundary Layer Development: Water @ 63 l/s .... 103
Figure 6.41 Boundary Layer Development: Water @ 38 l/s .... 104
Figure 6.42 Boundary Layer Development: Water @ 25 l/s .... 105
Figure 6.43 Boundary Layer Development: Sand @ 63 l/s ..... 106
Figure 6.44 Boundary Layer Development: Sand @ 38 l/s ..... 107
Figure 6.45 Boundary Layer Development: Sand @ 22 l/s ..... 108
Figure 6.46 Boundary Layer Development: Rocks @ 63 l/s .... 109
Figure 6.47 Boundary Layer Development: Rocks @ 38 l/s .... 110
Figure 6.48 Boundary Layer Development: Rocks @ 25 l/s .... 111

xiv
Figure 7.9 Variation of Skin Friction Coefficient with $Re_{ho}$: Phase 1.0 and 2.0 ......................... 161

Figure 7.10 Variation of Skin Friction Coefficient with $Fr_0$: Water ........................................ 162

Figure 7.11 Variation of Skin Friction Coefficient with $Fr_0$: Sand ............................................. 163

Figure 7.12 Variation of Skin Friction Coefficient with $Fr_0$: Rocks ............................................ 164

Figure 7.13 Variation of Skin Friction Coefficient with $Fr_{ho}$: Phase 1.0 and 2.0 ......................... 165

Figure 7.14 Variation of Skin Friction Coefficient with $Fr_{ho}$: Water ........................................ 166

Figure 7.15 Variation of Skin Friction Coefficient with $Fr_{ho}$: Sand ........................................... 167

Figure 7.16 Variation of Skin Friction Coefficient with $Fr_{ho}$: Rocks ......................................... 168

Figure 7.17 Variation of Skin Friction Coefficient with $Fr_{ho}$: Phase 1.0 and 2.0 ......................... 169

Figure 7.18 Velocity Profile ...................................................... 171

Figure 7.19 Free Body Diagram of Belt ........................................... 171

Figure 7.20 Control Volume of Water ........................................... 171
1.0 INTRODUCTION

Conveyors are one of many devices used by industries to transport commodities. The types of conveyors currently in use span the alphabet from apron conveyors to zero pressure accumulation conveyors. The type of conveyor used is a function of industry demands. The demands of the mining industry are of particular interest to the author. The mining industry has been the greatest proponent of belt conveyor technology, and since transportation costs are an integral part of the economics of the industry it warrants further investigation.

Belt conveyors have been used to transport materials such as coal since the mid-nineteenth century. The principle of operation has not changed significantly to date; however, the components (e.g. belt, idlers) of the conveying system have developed proportionately to the respective component industries. The assimilation of the "new and approved" components have in turn decreased the $/kg of material conveyed, making overland conveying economically viable. However, further reductions in $/kg of material conveyed can be realised if the conveyor system is analyzed as a complete system rather than as an assembly of components. A review of the principle of operation of the traditional conveyor is in order, and furthermore, will help explain the fundamental limitation of the traditional system in achieving lower $/kg
Figure 1.1 Traditional Belt Conveyor

Figure 1.2 Water Bed Conveyor
of material conveyed.

1.1 Traditional Belt Conveyor Systems

In its simplest form traditional belt conveyors comprise at least a head and tail pulley, flights of idlers and a drive train. The raw material is fed onto the conveyor belt at the tail end of the conveyor. The belt and raw material are then dragged over a flight of idlers (Figure 1.1) by the action of the head pulley which is driven by the drive train.

The types of idlers employed in the conveyor system are often broadly categorised as either carry or return idlers. The carry idlers are responsible for providing support to the material being conveyed and are generally assembled in sets of 2, 3 or 5. The return idlers provide the support for the returning belt and are assembled in sets of 2 or as a single stand alone idler. The spacing and number of idlers in each set is dependant on the required load carrying capacity of the conveyor system.

The belt provides the medium for the tension required to overcome motional resistances, and is often categorised according to the tension member, i.e., carcass. Three types of carcasses are currently in use: solid woven, plied fabric and steel cord. The carcass is protected from wear and tear by a top and bottom belt cover. The belt covers are generally manufactured from a rubber compound.
It is the interaction of the idlers, belt and material that ultimately lead to the friction that must be overcome by the installed drive train. This friction, which is further quantified in Chapter 2, is the primary limitation of the traditional conveyor system in achieving lower $/kg of material conveyed. The capital and operating costs associated with the installation, operation and maintenance of the traditional belt conveyor system further contribute to the $/kg of material conveyed. These limitations are the reasons why the author sought to investigate a conveying method that is distinctly different in how the belt and material are supported.

1.2 Water Bed Conveyor System

The operating principle of the proposed water bed conveyor (WBC) is inherently the same as the traditional belt conveyor system (Figure 1.2). However, the carry idlers by in large are replaced by water. Water flowing in an open channel forms the support for the belt and the material being conveyed much like water does for a boat. The belt and raw material are thus continuously buoyant in the channel and are pulled by the action of the head pulley and drive train. The water is not pumped and does not drag the belt and material, but instead provides the support for the belt and material. The velocity of the belt in fact drags the water which is continuously recirculated through the
recirculating pipe.

The pressure distribution on the belt and the tension within the belt, may not be sufficient to maintain the troughing form of the belt and material over the length of the conveyor. To ensure a stable troughing form, additional support idlers placed intermittently along the length of the conveyor may be required.

The return side of the WBC system will be similar to the traditional system. The inadequate troughing characteristic of an empty belt supported by water will not permit the same setup as the carry side of the WBC system. The WBC system, like the traditional system, will still require idlers at the feed point and transition sections.

1.3 Advantages and Disadvantages of the WBC system

1.3.1 Advantages

The coefficient of friction, associated with the traditional conveyor system, is replaced by a friction factor between the water and belt (Refer to Chapter 2). This factor is believed to be lower than the coefficient of friction. This results in a reduction in primary resistance and inertia (fewer rotating parts) of the conveyor system. An overall decrease in motional resistance leads to the selection of a belt with a lower tension rating. Furthermore, with greatly reduced belt idler interaction,
mechanical wear is reduced which permits a thinner belt cover. The net result is a lower belt to material weight ratio which further decreases the motional resistance and lift of the conveyor system.

Power requirements are based on the motional resistance of the conveyor system. Lower motional resistance leads to the installation of smaller power packs. Operating costs are thus lower.

Installation of the idlers in the traditional system involves intense labour due to the precision required in locating the idler sets relative to the adjacent set. Precision of up to 2 mm over 3000 mm spans is not uncommon and this leads to installation costs that are significant when compared with the WBC system. The savings become more evident in overland conveyors. Fewer idlers leads to a decrease in maintenance costs as the need for bearing failure detection and consequent idler replacement is reduced.

The operational, installation and maintenance costs are the major contributors to the overall $/kg of material conveyed. The proposed alternative WBC should provide reductions in these costs.

1.3.2 Disadvantages

The nature of the medium used for the support of the belt and material, i.e., the basis of the concept of the
proposed conveyor system, may be the major limitation of the WBC system. The inclination of the channel is, to a large extent, dictated by open prismatic channel flow restraints. Although the water may be dragged by the belt, the inclination of the WBC system is limited by maintaining the equilibrium of the major forces: shear forces of the belt, channel walls and gravitational force. A scheme that may overcome this disadvantage is a scheme that divides the channel into sections. Each section being vertically staggered and containing a separate recirculating pipe. The layout of this proposed scheme would be analogous to a loch system used in the shipping industry.

The choice of material for the construction of the channel and the necessary supports are all unknowns and therefore required specialised attention which may influence design costs. An investigation into the troughing form (Section 1.2) of the WBC system may also be required, and may further increase the design costs.

The installation of the system is obviously limited to areas where water is abundant.

1.4 Objective

The objective of this research was to determine the drag coefficient on a representative section of a water bed conveyor. This involved the investigation of the drag on a flexible membrane form in a confined open channel.
1.5 Scope of Work

The scope of this research included the following:

i) Design of a typical traditional conveyor system to be used as basis for the design of a physical model of a WBC system.

ii) Application of dimensional analysis to the traditional conveyor design for the determination of an appropriate physical model scale factor.

iii) Design, construction and installation of the physical model and required measurement system.

iv) Recording of drag force on the flexible membrane under various drafts and flow rates.

v) Recording of velocity profiles in the developing boundary layer on the flexible membrane.

vi) Developing generalised friction parameters for estimation of the friction drag on the water belt conveyor system.
2.0 BACKGROUND AND LITERATURE REVIEW

2.1 Introduction

A review of the current literature pertaining to water bed type conveyors has proven the uniqueness of the WBC concept. With the exception of work performed by Nagy (1983), no further references to the WBC concept were found. Nagy performed work, at the Central Institute for Mining Development in Hungary, on a conveying system that operated on a similar principle as the proposed water bed type conveyor (WBC) system. Unlike the WBC system, water was introduced and removed at various point along the conveyor. Nagy found that power requirements for the WBC system were 80% lower than for a similar traditional horizontal conveyor operating at 2.5 m/s with a capacity of 990 t/h. The underlining reason for this remarkable power reduction is the objective of this review. The background and literature review will therefore be limited to explaining the sources of the mechanical friction associated with traditional conveyors and the hydraulic skin friction associated with the WBC systems.

2.2 Mechanical Friction

Frictional resistances associated with conveyor systems are generally divided into two groups namely primary and secondary. Primary frictional resistance is often further
categorised into the following:

a) Idler rotational resistance,
b) Belt indentation resistance,
c) Flexure resistance of belt,
d) Flexure resistance of bulk material.

In determining the required power of the conveyor system, primary frictional resistance calculations dominate, nevertheless, secondary frictional resistance is worth mentioning. The secondary frictional resistance is the sum of the resistances associated with the removal of overburden from the belt (using belt scrapers) and the acceleration of the bulk material at the feeding point. The secondary frictional resistance is often calculated as a fraction of the total primary frictional resistance. The following discussions will thus be limited to issues pertaining to the primary frictional resistance.

2.2.1 Idler Rotational Resistance

Greune (1990) highlighted that bearing and seal friction are the cause of this type of resistance. It is often a measure of the force, at the circumference of the idler, required to overcome the frictional moment due to the presence of the bearing and seal. Increases in belt velocity, bearing diameter, bearing load and lubricant viscosity are believed to increase the idler rotational resistance. Furthermore manufacturing tolerances and general
maintenance practices impact on the average rim drag resistances.

2.2.2 Belt Indentation Resistance

Jonkers (1980) commented that hysteresis is the primary reason for this type of resistance. As the conveyor belt moves over the idler the belt is subjected to a deformation and, since the belt is not free of hysteresis, a transfer of energy to the idlers occurs. Spaans (1991) used a linearised approximation to the hysteresis loop of the belt which simplified the determination of this resistance. Spaans (1991) also mentions that the visco-elastic properties of the belt covers, loading and unloading of the belt as it passes over the idlers leads to a time delay in recovering the deformation of the belt. This time delay gives rise to a horizontal force component which is another source of belt indentation resistance. Naturally with fewer idlers in the WBC system, this source of friction, as well as the idler rotational resistance, becomes negligible in comparison.

2.2.3 Flexure Resistance of belt

The bending moment induced in the belt due to the idlers is the main factor contributing to flexure resistance of the belt. The bending moment experienced by the belt when approaching the idler is larger than when leaving the idler due to the presence of hysteresis, and this difference in
bending moment is what leads to an energy transfer (Spaans 1991).

2.2.4 Flexure Resistance of Bulk Material

The catenary shape of the belt between idler sets is one of two factors that contribute to the flexure resistance of the material. The bulk material is subjected to a sequential (cyclic) loading as it passes over the idler sets. The second factor contributing to this resistance is the affect of a continuous change in cross-section of the bulk material as the material approaches and leaves the idler sets. This deformation of the material volume leads to a passive stress state (closing of the material volume) and active stress state (opening of the material volume) as it flows. Since the internal friction of the bulk material is not negligible there is a net transfer of energy, Spaans (1991). In the WBC system both the belt and material flexure resistance is minimal as the cross-sectional area of the belt and material remain essentially constant over the length of the conveyor.

2.3 Hydraulic Skin Friction

The boundary layer theory associated with a flat plate will be discussed to demonstrate how the drag force and skin friction can be determined. Discussions regarding drag forces over a flexible membranes will follow.
2.3.1 Boundary Layer Theory

Boundary layer growth along a flat plate under zero pressure gradient will be the focus of this section. Steady turbulent uniform flow in an unconfined space is assumed, as well as a power-law velocity distribution within the boundary layer. The assumption of a power-law velocity distribution in a pipe was confirmed experimentally by Nikuradse (Schlichting 1968) for Reynolds number between $4 \times 10^3$ and $3 \times 10^6$. Since the theory of boundary layer growth along a flat plate has been based on experimental work on boundary layer development in pipes, the power-law assumption followed.

The drag force, $F_D$ acting on a fluid/boundary interface is a function of the momentum of the fluid particles in the boundary layer. The momentum integral equation (Equation 2.1)

$$\tau_0 / \rho = x \frac{d(U_s^l \delta^2_l(x))}{dx} + \left[ \frac{d(U_s)}{dx} \right] U_s \delta_l$$  ... 2.1

provides a means for determining the drag force acting on the boundary. This equation is based on the application of the momentum equation (Equation 2.2) to a boundary layer.

$$\Sigma F = \frac{d(mv)}{dt}$$  ... 2.2

The derivation of the momentum integral equation is covered in most fluid mechanics text books (e.g. Massey (1984)) and will
not be derived here. Equation 2.1 is a function of the change in momentum thickness, \( \delta_2 \) and displacement thickness, \( \delta_1 \) with distance; and since a zero pressure gradient was assumed, the displacement term is neglected and Equation 2.2 reduces to Equation 2.3.

\[
\frac{\tau_0}{\rho} = x \frac{d(U_*^2 \delta_2(x))}{dx} \quad \text{... 2.3}
\]

The calculation of the drag force therefore reduces to solving an expression that relates the momentum thickness with distance. This expression can be derived using experimental data collected over the years by various researchers. Schlichting (1968) showed that, for a power-law velocity distribution within a boundary layer, the relationship between momentum thickness and boundary layer thickness, \( \delta \) is dependent on the power-law exponent, \( n \) only (Equation 2.4).

\[
\delta_1 = \delta / (n+1)(n+2) \quad \text{... 2.4}
\]

The derivation of the boundary layer growth equation (Equation 2.5) was based on Blasius's formula (Equation 2.6) for hydraulically smooth pipes, momentum integral equation (Equation 2.3) and Reynolds Number (Equation 2.7).

\[
\delta(x) = C_\delta x / \text{Re}_x^{-0.2} \quad \text{... 2.5}
\]
\[
\frac{\tau_0}{(\rho U_*^2)} = 0.0225 \left( \frac{\nu}{U_* \delta} \right)^{0.25} \quad \text{... 2.6}
\]
\[
\text{Re}_x = \nu x / \nu \quad \text{... 2.7}
\]
The drag force can be determined using the simplified momentum integral equation and an equation relating the power-law exponent and the momentum thickness, Equation 2.8. Note \( C_0 \) and \( C_0^2 \) are constants of integration ( \( C_0 = 0.37, C_0^2 = 0.0463 \)). These two equations may be simplified to Equation 2.9.

\[
\delta_2 = \frac{x C_0}{((n+1)(n+2)) R_e x^{0.2}} \quad \ldots \quad 2.8
\]
\[
F_0 = C_0^2 \rho U_*^2 A_\nu R_e^{-0.2} \quad \ldots \quad 2.9
\]

The average skin friction, Equation 2.10, can be reduced to Equation 2.11 using Equations 2.10 and 2.8. The coefficient of Equation 2.11 was modified from 0.072 to 0.074 as Schlichting (1968) suggests that this leads to a better agreement with experimental data.

\[
C_f = \frac{F_0}{0.5 \rho U_*^2 A_\nu} \quad \ldots \quad 2.10
\]
\[
C_f = \frac{0.074 R_e^{-0.2}}{} \quad \ldots \quad 2.11
\]

2.3.2 Flexible membrane

A concise historical review of research conducted on drag forces on flexible membranes was undertaken by Sharek (1994). The first studies on flexible membranes were performed by Gray in 1936. The agility of dolphins was investigated by Gray to explain the reason behind their speed and manoeuvrability. Gray implied that dolphins have a unique ability to delay the
onset of turbulence. The first laboratory experiments, according to Sharekh (1994), on flexible surfaces were conducted by Kramer during the late 1950's and early 1960's. Kramer claimed a 60% reduction in drag force. Carpenter and Garrard (1985) provide an overview of Kramer's work and that of other earlier researchers. As the theoretical knowledge base of the subject increased in the 1980's, Kramer's work became quite topical and perhaps even controversial. Kramer's observations and conclusions have been disputed based on today's understanding of the phenomenon. Nevertheless his observations of a reduction in drag force (compared to a rigid body) have been verified on numerous occasions by various researchers including Sharekh (1994).

Sharekh (1994) attempted to characterize the turbulent boundary layer development, through experimentation and numerical modelling, over three flexible surfaces and one rigid body. The flexible surfaces comprised a rubber membrane covering a foam base (of various configurations) supported by a rigid flat plate. The rubber membrane was not under tension. Sharekh (1994) recorded drag reductions in the range of 8 - 20% when compared with the rigid surface. The reduction depended on the dampening characteristics of the flexible membrane.

The desirable characteristic of flexible membranes has been investigated both numerically (via suitable turbulence computer models) and experimentally. The general consensus is
that flexible membranes have a stabilizing effect on the boundary layer by reducing the amplification rate of the disturbance waves in the flow near the boundary (Carpenter and Garrad 1985, 1986; Babenko and Kozlov 1973) as cited by Sharekh (1994). This results in an increase in the critical Reynolds number and a delay in the transition to turbulence.
3.0 DIMENSIONAL ANALYSIS

3.1 Introduction

Dimensional analysis was used as a basis for determining the configuration of the physical model and the testing programme. To quantify the selection, an analysis of the layout and the components comprising the full scale traditional conveyor system was necessary. Tables 3.1 provides a summary of the overall design parameters associated with the traditional conveyor that was used as a bench mark for the physical model. In brief a 1.2 m wide conveyor belt carrying aggregate at a mass flow rate of 1000 t/h (0.6 m/s) over 500 m was selected. An operating tension ranging from 59 kN (slack side of drive pulley) to 100 kN (tight side of drive pulley) was calculated, which required 24.7 kW to overcome the total motional resistance. The design of the traditional conveyor was based on the design practices recommended in the design manual provided by Contitech. The design was confirmed, by comparison, with an example from the design manual provided by Bridgestone and the example cited by Brouwers (1986).

3.2 Dimensional Variables

The drag force of the WBC system was selected as the dependent variable. The following groups of dimensions were considered appropriate.
Table 3.1 Design Summary of Traditional Conveyor

<table>
<thead>
<tr>
<th>Principal data:</th>
<th>Material Specification:</th>
<th>Belt Specification:</th>
<th>Idler Specification:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design tonnage, t/h</td>
<td>Type</td>
<td>Manufacturer</td>
<td>NA</td>
</tr>
<tr>
<td>Conveying length, m</td>
<td>Aggregate</td>
<td>Carry - troughing angle, deg</td>
<td>NA</td>
</tr>
<tr>
<td>Elevation, m</td>
<td>Lump size, mm</td>
<td>- diameter, mm</td>
<td>NA</td>
</tr>
<tr>
<td>Belt width, mm</td>
<td>Bulk density, kg/m^3</td>
<td>- rotating weight, kg/m</td>
<td>17</td>
</tr>
<tr>
<td>Belt speed, m/sec</td>
<td>Angle of repose, deg</td>
<td>- spacing, mm</td>
<td>1000</td>
</tr>
<tr>
<td>Acceleration - loaded, m/sec^2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deceleration - loaded, m/sec^2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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### Factors and Coefficients:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary resistance coefficient</td>
<td>0.0135</td>
</tr>
<tr>
<td>Secondary resistance coefficient</td>
<td>1.2</td>
</tr>
<tr>
<td>Friction - pulleys and belt</td>
<td>0.3</td>
</tr>
<tr>
<td>Motor efficiency, %</td>
<td>85</td>
</tr>
<tr>
<td>Starting factor</td>
<td>1.5</td>
</tr>
<tr>
<td>Breakaway factor</td>
<td>1.3</td>
</tr>
<tr>
<td>Belt Safety factor - start</td>
<td>5.88</td>
</tr>
<tr>
<td>- operating</td>
<td>7.22</td>
</tr>
<tr>
<td>Angle of wrap - head pulley, deg</td>
<td>180</td>
</tr>
</tbody>
</table>

### Power:

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required - loaded, kW</td>
<td>24.7</td>
</tr>
<tr>
<td>- unloaded, kW</td>
<td>NA</td>
</tr>
<tr>
<td>Installed, kW</td>
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### Peripheral and Inertia Forces:

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Peripheral force</td>
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<tr>
<td>Normal operation, kN</td>
<td>41.10</td>
</tr>
<tr>
<td>Start operation, kN</td>
<td>63.75</td>
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<tr>
<td>Inertia force</td>
<td></td>
</tr>
<tr>
<td>Start operation - top run, kN</td>
<td>21.71</td>
</tr>
<tr>
<td>- bottom run, kN</td>
<td>0.94</td>
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### Resistance Forces:

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<th>Type</th>
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<tr>
<td>Primary resistance - top run, kN</td>
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</tr>
<tr>
<td>- bottom run, kN</td>
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<tr>
<td>- total, kN</td>
<td>34.26</td>
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<td>Secondary resistance, kN</td>
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<tr>
<td>Gradient resistance - top run, kN</td>
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</tr>
<tr>
<td>- bottom run, kN</td>
<td>0.0</td>
</tr>
<tr>
<td>- total, kN</td>
<td>0.00</td>
</tr>
<tr>
<td>Special resistance, kN</td>
<td>0.0</td>
</tr>
<tr>
<td>Total resistance, kN</td>
<td>41.10</td>
</tr>
</tbody>
</table>

### Belt Tensions:

<table>
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<tr>
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<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Operation</td>
<td></td>
</tr>
<tr>
<td>Belt tension - T1, kN</td>
<td>99.8</td>
</tr>
<tr>
<td>Belt tension - T2, kN</td>
<td>58.7</td>
</tr>
<tr>
<td>Belt tension - T3, kN</td>
<td>60.1</td>
</tr>
<tr>
<td>Belt tension - T4, kN</td>
<td>60.1</td>
</tr>
<tr>
<td>Belt tension - T5, kN</td>
<td>67.0</td>
</tr>
<tr>
<td>Start Operation:</td>
<td></td>
</tr>
<tr>
<td>Belt tension - T1, kN</td>
<td>122.4</td>
</tr>
<tr>
<td>Belt tension - T2, kN</td>
<td>58.7</td>
</tr>
<tr>
<td>Belt tension - T3, kN</td>
<td>61.1</td>
</tr>
<tr>
<td>Belt tension - T4, kN</td>
<td>61.1</td>
</tr>
<tr>
<td>Belt tension - T5, kN</td>
<td>67.9</td>
</tr>
</tbody>
</table>
Belting:  
- width of conveyor belting [L]  
- thickness of conveyor belting [L]  
- mass of belt per unit length [M/L]  
- average density of belt material [M/L³]  
- modulus of rigidity of the cover [M/LT²]  
- modulus of rigidity of the carcass - warp [M/(LT²)]  
- modulus of rigidity of the carcass - weft [M/(LT²)]  
- tension in the belt [ML/T²]  
- roughness of cover material [L]  
- cross-sectional area of belt perpendicular to flow [L²]  

Bulk Material:  
- mass of bulk material per unit length of belt [M/L]  

Water:  
- average velocity of water in flume [L/T]  
- average density of water [M/L³]  
- kinematic viscosity of water [L²/T]  
- hydraulic radius of Test Section [L]  
- drag force per metre length of belt [M/T²]  
- acceleration due to gravity [L/T²]  
- water depth [L]  
- gap between Transition and Test Section bulkheads [L]  
- surface tension [M/T²]  

21
3.3 Dimensionless Groups

Given the above twenty dimensional variables, seventeen dimensional groups were determined using the Indicial Method. The groups have been divided according to the type of physical similarity

\[
F_0 = \rho_v v^2 w F\{ \pi_2, \pi_4, \ldots \pi_{17} \} \quad \ldots 3.1
\]

\[
\begin{align*}
\pi_1 &= F_0/\rho_v v^2 w ; \\
\pi_2 &= v d /\nu ; \\
\pi_3 &= v/(dg)^{0.5} ; \\
\pi_4 &= \rho_v g p v^2 /\sigma ; \\
\pi_5 &= T / \rho_v v^2 A ; \\
\pi_6 &= m_m /m_1 ; \\
\pi_7 &= m_n v^2 /T ; \\
\pi_8 &= \rho_v v^2 /G_c ; \\
\pi_9 &= \rho_n v^2 /G_c ; \\
\pi_{10} &= AG_c /T ; \\
\pi_{11} &= w / d ; \\
\pi_{12} &= k / R ; \\
\pi_{13} &= R / d ; \\
\pi_{14} &= d G_c^{0.5} /\nu^{0.5} ; \\
\pi_{15} &= G_{ve} /G_c ; \\
\pi_{16} &= G_{ve} /G_c ; \\
\pi_{17} &= w / t
\end{align*}
\]

3.4 Laws of Similarity

As discussed in Section 1.2 the principle of operation of the WBC is that water provides the support for the belt and material. The water is therefore confined to flowing in an open prismatic channel. The forces associated with open channel flow were therefore considered appropriate for dynamic similarity. These forces are: inertia, gravity, viscous and surface tension. The surface tensions (\(\pi_4\)) between the
bulkheads of the transition sections and the bulkheads of the Test Section were assumed to be in equilibrium. The validity of this assumption was based on the condition that the gap between the bulkheads remained constant (refer to Figure 4.2). Satisfying dynamic similarity of the remaining forces is practically impossible and inertia and gravity force were considered more important than viscous forces. Dynamic similarity was thus based on Froude Law ($\pi_3$) but the effect of Reynolds number ($\pi_4$) was investigated by varying the velocity through the flume.

The tension in the membrane was kept constant which prevented investigation into the effects of tension on load carrying capacity of the Test Section. However, if future studies were conducted with tension as a variable, dimensionless groups $\pi_7$, $\pi_{10}$, $\pi_{14}$ and $\pi_{17}$ may provide insight into the effect of the tension on the load carrying capacity of the conveyor system (Appendix A: Bench Top Model Test). The dimensionless groups; $\pi_{15}$, $\pi_{16}$ and $\pi_{17}$, were categorised under structural properties of the membrane and were kept constant. A prototype to model length ratio of 4:1 was determined based on laboratory constraints. This led to Froude Law kinematic ratio of 2:1 and dynamic ratio of 64:1. The design of the physical model was based on these ratios and led to the following relationship between the dimensions listed in Table 3.1 and the dimensions of the physical model:
\[(w)_{\text{model}} = \frac{(w)_p}{4}; \quad (w)_{\text{model}} = 1200 \text{ mm} / 4 = 300 \text{ mm}\]

\[(v)_{\text{model}} = \frac{(v)_p}{2}; \quad (v)_{\text{model}} = 0.6 \text{ m/s} / 2 = 0.30 \text{ m/s}\]

\[(T)_{\text{model}} = \frac{(T)_p}{4}; \quad (T)_{\text{model}} = 67.9 \text{ kN} / 64 = 1.06 \text{ kN}\]

The width of the belt actually selected for the model was 400 mm since this was a standard size available by the vendor. The velocity through the flume varied between 0.18 m/s and 0.38 m/s. The tension in the membrane was 1.0 kN based on the tension T5 in Table 3.1. Tension, T5 represents the belt tension between the head and tail pulley.
**4.0 DESIGN, FABRICATION, INSTALLATION AND MATERIALS**

**4.1 Physical Model**

A physical model was designed, fabricated and installed in an existing Flume, hereafter referred to as Outer Flume, depicted in Figure 4.1. The Outer Flume was 1.22 m wide by 11.7 m long. The flow rate capacity of the Outer Flume was 100 l/s (1600 Gpm). The design, fabrication and installation of the physical model, encompassed all work associated with the Inner Flume, Test Section, Transition Sections and the Measurement Systems (Figure 4.2).

The model was designed to simulate a water bed conveyor (WBC) system under normal operating tension. Water flowing through the Inner Flume (Item 1 in Figure 4.2) provides the support for the Test Section (Item 2) and the Transition Sections (Item 3). Tension is applied to the belt, hereafter referred to as the flexible membrane (or membrane), via a Tensioning Device (Item 4). The operation of this Device is analogous to a turnbuckle, whereby the Outer Section of the Tensioning Device is rotated, resulting in the displacement of the Inner Sections of the Tensioning Device. This displacement, which is consistent with twice the pitch of the Tensioning Device, exerts an equivalent displacement to the membrane (Item 5) via the Rods (Item 6), Rod Supports (Item 7), End Plates (Item 8) and Bulkheads (Item 9).

The components of the model were fabricated from either
Figure 4.3 Test Section and Upstream Transition Section

Figure 4.4 Upstream Transition Section
stainless Steel (Type 304), aluminium or plywood using standard workshop machinery. The components were then assembled, tensioned and position in the Inner Flume (Figure 4.2 and 4.3).

4.2 Inner Flume

Modifications to the Outer Flume were performed to ensure that the desired velocities were attainable. These modifications included the construction and installation of the Inner Flume (450 mm wide) within the Outer Flume, Figure 4.2.

The side walls, floor and floor supports were constructed from 19-mm and 12.5-mm GIS plywood; and the wall supports from 100-mm x 50-mm sprucewood. The wall supports were located at 610-mm spacing, and the floor supports at 200-mm spacing (Figure 4.5 and 4.6). Prior to construction, two coats of marine varnish were applied to the wood to prevent swelling.

The walls were constructed and installed in 2400-mm section lengths, and joined at specific wall support locations. Floor supports were then located and the floor installed in 1200-mm section lengths. All joint were sealed (see Section 4.3.5 for exception) and a finishing coat of a latex paint was applied. Two pressure taps were installed in the Inner Flume, and located adjacent to Station 1 and 4.

The centre line of the Outer Flume was determined. Wedges were used to position the centre-line of the Inner Flume to
Figure 4.5 Inner Flume Located in Outer Flume

Figure 4.6 Inner Flume Floor During Construction
within 1.5 mm of the Outer Flume centre-line.

Flow straighteners were fabricated from 3-mm plexiglass and 19-mm plywood and located at the start of the Inner Flume. A weir was installed across the Outer Flume (Figure 4.1). This provided a means of controlling the water level in the Inner Flume. The height of the weir was 280 mm.

4.3 Test Section

The components associated with the Test Section (Figure 4.2 and 4.7) include the flexible membrane; Inner and Outer Sections of the Tensioning Device; Tensioning Rods and Rod Supports; Bulkheads and Endplates; and the Outriggers. See Figure 4.8 and 4.9.

4.3.1 Flexible Membrane

The Flexible Membrane is, in essence, standard conveyor belting used in the manufacturing and service industries. Although it is believed to be unsuitable for the mining industry, it sufficed for this application. The characteristics of the membrane are listed below:

Carcass : warp - polyester
weft - polyester
Cover : top - PVC
Bottom - PVC
Thickness : 1.6 mm (total)
Figure 4.7 Test Section

Figure 4.8 Test Section Components
Length: 3000 mm

Siegling Catalogue No.: E4/1 V5/V5 - Green

The tension in the belt was selected at 1.0 kN. This was calculated based on the stress/strain relationship (Section 6.1) and cross-sectional area of the membrane.

4.3.2 Tensioning Device

The Tensioning Device comprised the Inner and Outer Sections. It was designed to transmit a maximum tension (to the belt) of 1500 N. The diameter and pitch of the thread was 3 5/8 - 10 T.P.I; and 75% of full depth of thread was selected. The choice of pitch was based on the decision to minimise the number of turns of the Outer Sections while providing an accuracy of approximately 5 mm per rotation of the Outer Section. Alternatively, 17% of the maximum elongation of 30 mm is realised per each rotation of the Outer Section. The torque required to exert 1500 N in the belt was in the range of 7 - 20 Nm depending on, amongst other factors, the coefficient of friction of the lubricant used. The resulting screw efficiency thus ranges from 6 - 18%. The maximum combined shear stress in the thread was calculated to be approximately 0.1 MPa, well within the design limits of the materials.

The Outer and Inner Sections were fabricated from solid bars of aluminium and stainless steel respectively. Boring,
Figure 4.9 Test Section Components (Sketch)
turning, tapping and cutting of a left and right hand thread on the bars were performed on a lathe in the Central Research Shop. The choice of material was based on: a) availability of material at time of fabrication and b) the specific need for dissimilar materials to prevent possible seizure.

4.3.3 Belt Tensioning Rods and Rod Supports

The Belt Tensioning Rods were each designed to carry a compressive load. Design for buckling was the basis for material selection and cross-section. The diameter of the Belt Tensioning Rods was 15.9 mm enabling a total of 1500 N to be applied to the belt with a safety factor of 1.35 against buckling. Stainless steel was selected over standard low-carbon steel since protection against corrosion was required. Although low-carbon steel may have sufficed over the test period, possible further experimentation (at a later date by others) warranted the selection of stainless steel.

The purpose of the Rod Supports was twofold: firstly and primarily to locate the Rods near the centroid of the Bulkhead, and secondly to support the rods. The locations of the Rod Supports were based on the need to minimise the bending moment on the Bulkheads. This was achieved by locating the Rod Supports as close as possible to the centroid of the line representing the contour of the flexible membrane. The choice of material was again based on the operating environment.
4.3.4 Bulkheads and End Plates

The shape of the Bulkheads and consequently the End Plates were based on the maximum carrying capacity of the Test Section of 50 kg. The width of the bulkhead was selected based on the need for sufficient surface area for attaching the modified hose clamps. Four 250-mm hose clamps were modified and attached to either end of the Bulkheads. The hose clamps provided the clamping force required to prevent "pulling out" of the flexible membrane once under tension. The hose clamps required a width greater than 25 mm. To attain this width two pieces of standard 19-mm GIS plywood were bonded together and coated with latex paint and marine varnish to protected against swelling.

The End Plates were fabricated from stainless steel and functioned as distributors of the applied load over the face of the Bulkheads, as well as base plates for the Rod Supports.

4.3.5 Outriggers

The purpose of the Outriggers was to offset the dead load of the Test Section and thus permit measurements to be based on the live loads only. The dead load of the Test Section was offset by permitting water to enter the space between the Outer Flume and Inner Flume (Figure 4.2). The method in which the water entered this space was discovered by accident rather than by design; however the method proved effective and was not modified. The Inner Flume walls and floor joints would
ordinarily have been sealed to prevent leakage; however by not sealing the joints at selected points along the first 500 mm of the Inner Flume, water flowed into the space in question. The water level in the space would rise until the hydrostatic head was balanced by the water level in the Inner Flume. The flow rate in the space was monitored and recorded as approximately 0.5 l/s. The water in this space provided the buoyancy to the Outriggers and thus the Test Section via the Outrigger arms.

The Outriggers were fabricated from 25-mm x 25-mm aluminium angles, 50-mm x 50-mm T-section and plywood. The plywood was used as a base for attaching the Outrigger arms to eight "paint" cans. These cans each had a 3.8 l displacement. The total mass of the Test Section including the Outriggers was 29 kg.

4.4 Transition Sections

Transition Sections were located upstream and downstream of the Test Section. The upstream Transition Section was 1160 mm in length and the downstream Transition Section 1000 mm (Figure 4.1). A nose cone was attached to the front of the Bulkhead of the upstream Transition Section and is the reason for the difference in lengths. The purpose of the cone was to minimise possible flow separation at the bulkhead and ensure smooth boundary layer development before the Test Section. The position of the nose cone relative to the Outer Flume is
depicted in Figure 4.1. The Transition Sections were constructed in a similar manner as the Test Section; however, the tension mechanism was far simpler. Instead of a turnbuckle arrangement, a single stainless steel rod was end drilled and tapped, and placed in the centre of the Transition Section. Tension was imparted to the membrane via a torque applied to the bolt located in the end of the rod.

Pressure taps were located in the Bulkheads. They were positioned such that they were below the draft of the no load case, and such that "edge effects" on the pressure readings were minimal.

4.5 Measurement Systems

The three measurement systems used were: force measurement, pressure measurement and profile measurement.

4.5.1 Force Measurement Rig

The force measurement rig (Figure 4.10 and 4.11) consisted of a load cell positioned within a loop system. The loop system consisted of a force measurement device developed by Pramono (1995), hereafter referred to as Wasidevice (Item 4 Figure 4.11), one load cell (Item 1), four pulleys (Item 2), two turnbuckles (Item 3), and piano wire (Item 5).

The pulleys and load cell were mounted onto vertical supports that contained slots that facilitated precise positioning of both load cell and pulleys. The Wasidevice was

38
Figure 4.10 Force Measurement Rig

Figure 4.11 Force Measurement Rig (Sketch)
a unique design and consists of a restricted ball and socket type of arrangement located within a cylindrical aluminium tube. This design has three degrees of freedom permitting horizontal, vertical forces to be measured. The Wasidevice was attached to the Test Section via the slotted supports. Piano wire was used to transmit the desired drag force applied to the Test Section to the load cell. The tension within the loop system was selected to ensure transmission of the drag force. This selection was based on minimising the effects of friction within the loop system.

4.5.2 Pressure Measurement Rig

The pressure measurement rig consisted of a pitot static tube attached to a vernier calliper that traversed the Inner Flume on a rail, see Figures 4.1 and 4.12 to 4.14. The pitot static tube was an "in house design" as space requirements within the Inner Flume prevented the use of a standard pitot tube. The dimensions of the pitot static tube were selected according to a manufacturers recommendations. The pitot tube was manufactured from stainless steel.

The mechanism used to attach the pitot static tube to the vernier calliper consisted of a simple bracket with set screws. This design permitted quick and easy adjustment during commissioning of the pressure measurement rig, see Figure 4.11. Quick release clamps were used to attach the vernier calliper to the railing.
Figure 4.12 Pressure Measurement Rig - Front View

Figure 4.13 Pressure Measurement Rig - Pitot-Static tube
Figure 4.14 Pressure Measurement Rig - Vernier Calliper
4.5.3 Profile rig

The profile rig shown in Figure 4.15 was used to record the profile of the membrane while under load. It was constructed from aluminium and formed to a radius of 180 mm using a bending machine. Ten adjustable knobs were positioned at 30 mm intervals.

4.6 Materials

The materials used, include the materials of construction listed above and the materials associated with the tests. The three material types used were water, sand and rocks.

The type of sand used was masonry. The test results of a sieve analysis of the sand are included in Appendix B: Material Types. In brief approximately 40% of the sand was in the 300 µm - 600 µm range.

The mass and volume of the rocks used are listed in Appendix B: Material Types. In brief the average mass and volume of the rocks were 0.569 kg and 0.233 ml respectively.
Figure 4.15 Profile Measurement Rig
5.0 INSTRUMENTATION AND METHODS

The instrumentation used in recording, calibrating and testing of the physical model are shown in Table 5.1.

5.1 Methods

The force and pressure measurements were conducted in two stages. The first stage referred to as Phase 1.0, consisted of recording the force acting on the Test Section. The next stage, referred to as Phase 2.0, consisted of recording the velocity in the developing boundary layer. The profile measurements were conducted after the force and pressure measurement.

5.2 Phase 1.0 Force Measurement Methodology

The force recorded by the load cell includes the differential pressure force acting on the bulkheads. The pressure drop between the upstream and downstream was thus recorded as part of this phase. The test procedure was as follows:

1) The pump was started and the gate valve, connecting the pump to the Inner and Outer Flumes, opened to produce the desired flow rate.

2) Ten minutes were allowed to establish steady state conditions in the Inner Flume, and to ensure that the
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Purpose</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Megadac Data Acquisition System</td>
<td>Model No. 3008AC</td>
<td>Excite and record signals from load cell and pressure transducer.</td>
<td>Optim Electronics</td>
</tr>
<tr>
<td>Minibeam Load Cell</td>
<td>Model No. mb - 5 - 89</td>
<td>Record the force acting on the Test Section.</td>
<td>Interface Inc</td>
</tr>
<tr>
<td></td>
<td>Capacity: 5 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Differential Pressure Transducers</td>
<td>Series P - 3061.</td>
<td>Record pressure at the following locations:</td>
<td>Lucas Schaewitz</td>
</tr>
<tr>
<td></td>
<td>Capacity: 2&quot; &amp; 5&quot;</td>
<td>a) Boundary layer,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Bulkheads and flume walls.</td>
<td></td>
</tr>
<tr>
<td>Propeller Flow Meter</td>
<td>Model FP 5301</td>
<td>Record flow rate through flume.</td>
<td>Omega Engineering</td>
</tr>
<tr>
<td>Portable Water Current Meter</td>
<td>Model # 201D</td>
<td>Record average velocity in inner flume.</td>
<td>Marsh McBlrney</td>
</tr>
<tr>
<td></td>
<td>Range 0 - 20 feet/s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitot-Static Tube</td>
<td>Outer dia: 6.35 mm</td>
<td>Convey water pressure to pressure transducer.</td>
<td>In house fabrication</td>
</tr>
<tr>
<td>Vernier Callipers</td>
<td>Range 0 - 13&quot;</td>
<td>Accurately position the pito-static tube.</td>
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<td>Force Gauge</td>
<td>Model DFG - 10</td>
<td>Used to calibrate the load cell and force rig.</td>
<td>Omega Engineering</td>
</tr>
<tr>
<td></td>
<td>0 - 10 lb Range.</td>
<td></td>
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</tr>
<tr>
<td>Instron Tensile Testing Machine</td>
<td>Model No. 8500</td>
<td>Record the strain rate in a sample of membrane.</td>
<td>Instron</td>
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</table>
water level in the Outer Flume was constant.

3) Next the Test Section was freed from the backup supports. This permitted the Test Section to float in the Inner Flume. Note that the backup supports functioned as protection against possible overloading of the load cell. Overloading may result from a loss in water level in the Inner or Outer Flume. Pump failure may lead to a loss in water level.

4) The Test Section was then loaded with the desired material.

5) The material was then evenly distributed within the Test Section. To ensure an even distribution, the elevations relative to two bench marks, were recorded. The difference in elevation was less than 1 mm in all tests. Note that the two bench marks were surveyed.

6) The nuts, located in the centre of the Outrigger system, were adjusted such that less then 2% of the height of the paint cans was above the water level (Figure 4.2). Note that the height of the Outrigger system was a direct indication of the displaced dead weight.

7) The Transition Sections were next loaded with rocks. The Transition Sections were positioned such that the distances between the bulkheads of the Transition Sections and the Bulkheads of the Test Section were less than 2 mm. Note that rocks were used in the Transition Sections for all experiments as it was found to be the
most convenient type of material to transport and position.

8) The Test Section and the load cell were next attached to the loop system via the turnbuckles (Item 3: Figure 4.11).

9) Stopcock 1, 7, 2 and 9 (Figure 5.1) were closed for Bulkhead pressure measurements.

10) The load cell and pressure transducer were next balanced. In the case of the load cell this was achieved by loosening nut No.2 (Item 6: Figure 4.11). This deactivated the load cell and allowed the Test Section to move freely. The load cell thus experienced no load and is balanced. The Test Section was next moved upstream manually and nut No.1 (Item 7) tightened. The force measurement now recorded is the profile drag force on the Test Section. Refer to the Pressure Measurement Methodology described in Section 5.3 for balancing of pressure transducer.

11) Load cell and Pressure measurements were next recorded for 60 seconds using the data acquisition system.

12) Steps 9, 10 and 11 were repeated for Inner Flume wall pressure measurements, except in step 9 stopcock 1, 6, 2 and 8 were closed.

13) Next the load cell and pressure transducer were deactivated and steps 1 to 13 repeated for the next load type or flow rate.
5.3 Phase 2.0 Pressure Measurement Methodology

The methodology associated with this phase consisted of recording the differential pressure:
- within the boundary layer using a pitot-static tube;
- between the Bulkheads of the upstream and downstream Transition Sections using pressure taps;
- over the Test Section length using the pressure taps installed in the Inner Flume wall.

The reason for repeating the Bulkhead and Inner Flume wall tests was because different pressure transducers were used in Phases 1 and 2.

Phases 1 and 2 were conducted over different periods, consistent model set-up was thus imperative. The methodology of Phase 1 was therefore repeated in Phase 2, except; the original load cell was replaced with a dummy load cell and the pressure transducers changed. The following test procedure was conducted.

1) The pitot-static tube was positioned at the respective Station (Figure 4.1) and adjusted such that it contacted the underside of the flexible membrane.

2) Air was next removed from the tubing that linked the pitot-static tube with the pressure transducer.

3) The data acquisition system was activated and the pressure transducer balanced.

4) The test commenced and data was collected over a 60
second period.

5) Next the pitot-static tube was moved to the subsequent position within the boundary layer and steps 3 to 5 repeated.

6) After completing all the measurements at Station 1, the pressure transducer was isolated, by closing stopcock 2 and 3 (Figure 5.1), and the pressure measurement rig moved to Station 2.

Note the following:

- the pressure transducer was isolated to prevent possible overloading;
- the pitot-static tube was moved manually and maintained below the water level to prevent air from entering the tubing.

7) Steps 3 to 6 were repeated for the remaining Stations.

8) Next the Bulkhead pressure drops were recorded. This was achieved by disconnecting the tubing connecting the pitot-static tube with the transducer and connecting it to the Bulkhead pressure taps.

9) The pressure transducer was balanced and the differential pressure recorded.

10) Steps 8 and 9 were repeated for the Inner Flume wall differential pressure measurements.

11) Steps 1 to 10 were repeated for the next material type and/or flow rate.
5.4 Profile Measurement Methodology

After completing all force and pressure measurements, profile measurement rig was manually positioned in the Inner Flume and the knobs adjusted until contact between the knob and membrane was evident. The rig was then removed and the position of the individual knobs recorded.
6.0 RESULTS AND DATA REDUCTION

6.1 Preliminary Tests

Two preliminary tests were conducted. The first test consisted of determining the properties of the flexible membrane used. The second test consisted of two parts: construction of a 1/8th scaled bench top model of the Test Section; and an investigation into the relationship between the depth of submergence of the bench top model, tension in the membrane and the inward side curvature of the membrane.

6.1.1 Flexible Membrane Sample Test

The results of the experiments on the samples of flexible membrane are depicted in Figure 6.1. Figure 6.1 indicates a linear relationship between the stress and strain and thus verifying that the samples obeyed Hook's law in the range of the strain tested. The modulus of elasticity of each specimen was calculated; and the average of the four specimens was found to be approximately 73 MPa (see Appendix C: Tensile Test).

6.1.2 Bench Top Model Test

The results of the tests conducted confirmed the prediction that the inward side curvature of the bench model was a function of the tension in the membrane. An increase in
membrane tension produces both a reduction in side curvature; and an increase in load carrying capacity of the model (see Appendix A: Bench Top Model Test). The inward side curvature was caused by the hydrostatic pressure distribution on the sides of the model.

6.2 Physical Model Tests

The tests performed are summarised in Tables 6.1 and 6.2. In essence Phase 1.0 consisted of recording the drag force acting on the Test Section while under tension and subjected to various material loads and flow rates. The drag force was recorded simultaneously with the Bulkhead differential pressure and then simultaneously with the Inner Flume wall differential pressure. Each test was thus conducted twice (see Section 5.2). The tests conducted in Phase 2.0 consisted of recording the pitot-static tube differential pressure at ten points in the boundary layer and at four different positions along the Test Section. Each test thus consisted of recording the differential pressure at forty points, and the Bulkhead and Inner Flume wall differential pressure. The tension in the membrane was 1.0 kN (see Section 4.3.1).

6.2.1 Calibration of the Force Measurement Rig

To determine the relationship between the actual load applied and the load recorded by the load cell, a calibration curve for the system was required. Figure 6.2 and 6.3 show the
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na - not applicable
### Table 6.2 Summary of Phase 2.0 Tests

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<tr>
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Figure 6.2 Calibration of Force Rig - Top View

Figure 6.3 Calibration of Force Rig - End View
set-up and Figure 6.4 depict the trends under different loop
tensions. The plots indicate a lack of linearity in the lower
range of load cell readings. This non linearity is more
evident in the standard tension case, and an error band of
±0.06N in the low range and ±0.03N in the high range was
found. This error band was deduced by placing a line of best
fit through the high and standard tension data points, and
comparing a point on this line with the actual data point
recorded.

6.2.2 Raw Data

The test conditions for the raw data collected are
summarised in Table 6.3 for Phase 1.0, and Table 6.4 for Phase
2.0. The raw data collected by the data acquisition system are
described in Sections 6.2.2a and 6.2.2b.

6.2.2a Force Measurements

Figures 6.5 to 6.14 indicated the typical data trends
associated with the load cell measurements. A test length of
60 seconds, and a sampling rate of 5 data/second was selected
for all load cell measurements. Each experiment was repeated
for every test conducted. Each experiment recorded
simultaneously the force acting on the Test Section and either
the Bulkhead or Inner Flume wall differential pressure. Table
6.5 provides a summary of the load cell measurements.
6.2.2b Pressure Measurements

Figures 6.15 to 6.26 indicate the typical data trends associated with the recording of the differential pressure, within the boundary layer, by the pressure transducer. A test length of 60 seconds, and a sampling rate of 20 data/second was selected for all pressure transducer measurements. Tables 6.6 to 6.8 provide a summary of the pressure transducer measurements. The differential pressure recorded is the velocity head from which the local mean velocity was calculated. This was then plotted against the perpendicular distance from the flexible membrane. The data trends are shown in Figures 6.27 to 6.35.

6.2.3 Calculated Velocities

The local mean (time averaged) free stream velocity was calculated and indicated in Table 6.9. This velocity represents the velocity of the free stream at the respective stations. The average free stream velocities are displayed in Table 6.10 and represents the average of the local mean free stream velocities indicated in Table 6.9.

6.2.4 Boundary Layer Thickness

The pressure measurements collected were converted into velocity and plotted against the normal distance \( y \) on a log/log scale. The plot was then extrapolated to the 99\% mainstream velocity line to determine the boundary layer
thickness. Samples of this procedure are shown in Figures 6.36 to 6.39. The local boundary layer thickness was then plotted against $x/Re^{0.2}$ to determine the growth of the boundary layer along the Test Section. The results are plotted and tabulated in Figures 6.40 to 6.48 and Table 6.11. Linear regression was used to determine the line of best fit and the corresponding boundary layer thicknesses are included in Table 6.11.

6.2.5 Power-law Exponents

The local power-law exponents are summarised in Table 6.12. These exponents were determined by plotting $\log(u/U)$ against $\log(y/U)$, Figures 6.49 to 6.57, and calculating the slope. Linear regression was used to calculate the slopes.

6.2.6 Drag force

The measured and calculated drag forces associated with a full load case are shown in Table 6.13. The force recorded by the load cell represents an average of two forces recorded during each test (see Section 6.2.2a). The range indicated includes the non-linearity associated with the loop system. Table 6.14 highlights the drag force recorded under various live loads, i.e., different drafts or displacements. The local drag force between stations is highlighted in Table 6.15.

6.2.7 Skin Friction

The local skin friction coefficients are listed in Table
6.16. The average skin friction coefficient for Phase 1.0 and Phase 2.0 are listed in Table 6.12.

6.3 Profile data

The profiles associated with the water, sand and rock set-ups are shown in Figure 6.58, 6.59, 6.60 respectively.
## Table 6.3 Raw Data: Phase 1.0

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<th>WL (mm)</th>
<th>HT (mm)</th>
<th>Draft (mm)</th>
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<th>R (mm)</th>
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1 - Water level in Inner Flume; 2 - Wetted perimeter; 3 - Hydraulic radius; 4 - Average temperature from Phase 2.0
5 - Reynolds Number based on hydraulic radius; 6 - Reynolds Number based on diameter of Bulkheads.
### Table 6.4 Raw Data: Phase 2.0

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<th>HT mm</th>
<th>Draft mm</th>
<th>P mm</th>
<th>R mm</th>
<th>Area mm²</th>
<th>v m/s</th>
<th>T °F</th>
<th>Re⁴</th>
<th>Re⁵</th>
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1 - Water level in Inner Flume; 2 - Wetted perimeter; 3 - Hydraulic radius; 4 - Not available; 4 - Reynolds Number based on hydraulic radius; 5 - Reynolds Number based on diameter of Bulkheads.
### Table 6.5 Raw Data: Phase 1.0 - Load Cell Measurements

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<th>Degrees of Freedom</th>
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Figure 6.5 Load Cell Data: Water @ 63 l/s - bulkheads

Figure 6.6 Load Cell Data: Water @ 83 l/s - wall
Load Cell Force Recorded
(Water, 50 kg, @ 38 l/s - bulkheads)

Figure 6.7 Load Cell Data: Water @ 38 l/s - bulkheads

Load Cell Force Recorded
(Water, 50 kg, @ 38 l/s - wall)

Figure 6.8 Load Cell Data: Water 38 l/s - wall
Figure 6.9 Load Cell Data: Water @ 25 l/s - bulkheads

Figure 6.10 Load Cell Data: Water @ 25 l/s - wall
Figure 6.11 Load Cell Data: Sand @ 63 l/s - bulkheads

Figure 12 Load Cell Data: Sand @ 63 l/s - wall
Figure 6.13 Load Cell Data: Rocks @ 63 l/s - bulkheads

Figure 6.14 Load Cell Data: Rocks @ 63 l/s - wall
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Figure 6.15 Pressure Transducer Data: Water @ 63 l/s - Station 1

Figure 6.15 Pressure Transducer Data: Water @ 63 l/s - Station 1 - Continue
Figure 6.16 Pressure Transducer Data: Water @ 63 l/s - Station 2

Figure 6.16 Pressure Transducer Data: Water @ 63 l/s - Station 2 - continue
Figure 6.17 Pressure Transducer Data: Water @ 63 l/s - Station 3

Figure 6.17 Pressure Transducer Data: Water @ 63 l/s - Station 3 - continue
Station 4 - Water @ 63 l/s
Distance (mm): 3.175, 5, 7.5, 10, 15

Figure 6.18 Pressure Transducer Data: Water @ 63 l/s - Station 4

Station 4 - Water @ 63 l/s
Distance (mm): 20, 25, 30, 50, 90

Figure 6.18 Pressure Transducer Data: Water @ 63 l/s - Station 4 - continue

78
Station 1 - Sand @ 63 l/s
Distance (mm): 3.175, 5, 7.5, 10, 15

Figure 6.19 Pressure Transducer Data: Sand @ 63 l/s - Station 1

Station 1 - Sand @ 63 l/s
Distance (mm): 20, 25, 30, 50, 90

Figure 6.19 Pressure Transducer Data: Sand @ 63 l/s - Station 1 - Continue

79
Figure 6.20 Pressure Transducer Data: Sand @ 63 l/s - Station 2
Figure 6.21 Pressure Transducer Data: Sand @ 63 l/s - Station 3

Figure 6.21 Pressure Transducer Data: Sand @ 63 l/s - Station 3 - continue
Station 4 - Sand @ 63 l/s
Distance (mm): 3.175, 5, 7.5, 10, 15

Figure 6.22 Pressure Transducer Data: Sand @ 63 l/s - Station 4

Station 4 - Sand @ 63 l/s
Distance (mm): 20, 25, 30, 50, 90

Figure 6.22 Pressure Transducer Data: Sand @ 63 l/s - Station 4 - continue
Figure 6.23 Pressure Transducer Data: Rocks @ 63 l/s - Station 1

...
Figure 6.24 Pressure Transducer Data: Rocks @ 63 l/s - Station 2

Figure 6.24 Pressure Transducer Data: Rocks @ 63 l/s - Station 2 - continue
Figure 6.25 Pressure Transducer Data: Rocks @ 63 l/s - Station 3

Station 3 - Rocks @ 63 l/s
Distance (mm): 3.175, 5, 7.5, 10, 15

Figure 6.25 Pressure Transducer Data: Rocks @ 63 l/s - Station 3 - continue
Figure 6.26 Pressure Transducer Data: Rocks @ 63 l/s - Station 4

Station 4 - Rocks @ 63 l/s
Distance (mm): 3.175, 5, 7.5, 10, 15

Figure 6.26 Pressure Transducer Data: Rocks @ 63 l/s - Station 4 - continue
Table 6.9 Calculated Local Mean Free Stream Velocities for Phase 2.0

<table>
<thead>
<tr>
<th>Material</th>
<th>Q (l/s)</th>
<th>Station 1</th>
<th>Station 2</th>
<th>Station 3</th>
<th>Station 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>25</td>
<td>0.177</td>
<td>0.181</td>
<td>0.169</td>
<td>0.173</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>0.244</td>
<td>0.249</td>
<td>0.254</td>
<td>0.245</td>
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<tr>
<td></td>
<td>63</td>
<td>0.361</td>
<td>0.367</td>
<td>0.374</td>
<td>0.380</td>
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<td>0.168</td>
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<td>0.176</td>
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<td>0.254</td>
<td>0.259</td>
<td>0.265</td>
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<td>63</td>
<td>0.366</td>
<td>0.373</td>
<td>0.379</td>
<td>0.386</td>
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<tr>
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<td>25</td>
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<td>0.183</td>
<td>0.187</td>
<td>0.191</td>
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<td>38</td>
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<td>0.254</td>
<td>0.259</td>
<td>0.264</td>
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<tr>
<td></td>
<td>63</td>
<td>0.366</td>
<td>0.373</td>
<td>0.379</td>
<td>0.386</td>
</tr>
</tbody>
</table>

1 - Flow rates lower by approximately 3 l/s;   2 - Flow rate higher by approximately 3 l/s
Table 6.10 Calculated Average Free Stream Velocities

<table>
<thead>
<tr>
<th>Material</th>
<th>Q (l/s)</th>
<th>Phase 1.0 (m/s)</th>
<th></th>
<th>Phase 2.0 (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>NL (0 kg)</td>
<td>QL (12.5 kg)</td>
<td>HL (25 kg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 l/s</td>
<td>0.163</td>
<td>0.168</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38 l/s</td>
<td>NA</td>
<td>0.234</td>
</tr>
<tr>
<td></td>
<td></td>
<td>63 l/s</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 l/s</td>
<td>0.163</td>
<td>0.168</td>
</tr>
<tr>
<td>Sand</td>
<td>38 l/s</td>
<td>NA</td>
<td>0.233</td>
<td>0.240</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
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<td>NA</td>
<td>NA</td>
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<tr>
<td></td>
<td>25 l/s</td>
<td>0.163</td>
<td>0.170</td>
<td>0.173</td>
</tr>
<tr>
<td>Rocks</td>
<td>38 l/s</td>
<td>NA</td>
<td>0.233</td>
<td>0.238</td>
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<tr>
<td></td>
<td>63 l/s</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Note: NL - No Load; QL - Quarter Load; HL - Half Load; FL - Full Load; NA - Not Applicable
Velocity Profiles
Water @ 38 l/s & 35 l/s

Distance, y (mm)

Velocity, u (m/s)

Figure 6.28 Velocity Profiles - Water @ 38 l/s & 35 l/s
Figure 6.31 Velocity Profiles - Sand @ 38 l/s & 41 l/s
Figure 6.34  Velocity Profiles - Rocks @ 38 l/s
Velocity Extrapolation (Water @ 63 l/s)
Station 1 (x = 0.06 m)

Figure 6.36 Extrapolation of Velocity: Water @ 63 l/s - Station 1
Figure 6.37 Extrapolation of Velocity: Water @ 63 l/s - Station 2

Velocity Extrapolation (Water @ 63 l/s)
Station 2 (x = 0.975 m)

Velocity, u (m/s)

Distance, y (mm)
Figure 6.38 Extrapolation of Velocity: Water @ 63 l/s - Station 3
<table>
<thead>
<tr>
<th>Material</th>
<th>Q (l/s)</th>
<th>( Q_{raw} )</th>
<th>( Q_{fit} )</th>
<th>( Q_{raw} )</th>
<th>( Q_{fit} )</th>
<th>( Q_{raw} )</th>
<th>( Q_{fit} )</th>
<th>( Q_{raw} )</th>
<th>( Q_{fit} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
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<td>76</td>
<td>107</td>
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<td>153</td>
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<td>55</td>
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<td>135</td>
<td>141</td>
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<td>71</td>
<td>71</td>
<td>na</td>
<td>109</td>
<td>na</td>
<td>145</td>
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<td>63</td>
<td>34</td>
<td>43</td>
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<td>75</td>
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<td>104</td>
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<td>132</td>
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</tbody>
</table>

1 - Line of best fit (See Figure 6.40 to 6.48); 2 - Flow rates lower by approximately 3 l/s; 3 - Flow rate higher by approximately 3 l/s.
Figure 6.40 Boundary Layer Development: Water @ 63 l/s
Figure 6.42 Boundary Layer Development: Water @ 25 l/s
Boundary Layer Correlation
Sand @ 38 l/s

Figure 6.44 Boundary Layer Development: Sand @ 38 l/s
Figure 6.45: Boundary Layer Development: Sand @ 22 l/s
Figure 6.46 Boundary Layer Development: Rocks @ 63 l/s
Boundary Layer Correlation
Rocks @ 38 l/s

Figure 6.47 Boundary Layer Development: Rocks @ 38 l/s
<table>
<thead>
<tr>
<th>Material Type</th>
<th>Flow rate l/s</th>
<th>Local Power-law Exponents, n</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Station 1</td>
<td>Station 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raw</td>
<td>Fit₁</td>
</tr>
<tr>
<td>Water</td>
<td>25 l/s</td>
<td>7.5</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>4.0</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>7.9</td>
<td>7.5</td>
</tr>
<tr>
<td>Sand</td>
<td>25 l/s</td>
<td>5.3</td>
<td>8.2</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>9.2</td>
<td>11.5</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>11.7</td>
<td>11.7</td>
</tr>
<tr>
<td>Rocks</td>
<td>25 l/s</td>
<td>5.3</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>8.5</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>5.9</td>
<td>6.8</td>
</tr>
</tbody>
</table>

1 - Line of best fit (See Figure 6.49 to 6.57); 2 - Flow rates lower by approximately 3 l/s; 3 - Flow rate higher by approximately 3 l/s
Power-law Exponents
Water @ 38 l/s + 35 l/s

Figure 6.50 Power-law Exponents: Water @ 38 l/s & 35 l/s
Figure 6.51  Power-law Exponents: Water @ 25 l/s & 22 l/s
Figure 6.53  Power-law Exponents: Sand @ 38 l/s & 41 l/s
Figure 6.55 Power-law Exponents: Rocks @ 63 l/s
Figure 6.56  Power-law Exponents:  Rocks @ 38 l/s
Table 6.13 Average Forces Recorded and Calculated @ Full Load (50 kg)

<table>
<thead>
<tr>
<th>Material</th>
<th>Flow rate (l/s)</th>
<th>Recorded (N)</th>
<th>Calculated (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Load cell</td>
<td>Bulkhead Force</td>
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<tr>
<td>Water</td>
<td>25 l/s</td>
<td>0.182</td>
<td>0.032</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>0.220</td>
<td>-0.015</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>0.693</td>
<td>0.145</td>
</tr>
<tr>
<td>Sand</td>
<td>25 l/s</td>
<td>0.258</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>0.289</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>0.765</td>
<td>0.126</td>
</tr>
<tr>
<td>Rocks</td>
<td>25 l/s</td>
<td>0.303</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>0.336</td>
<td>0.063</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>0.767</td>
<td>0.189</td>
</tr>
</tbody>
</table>

1 - Differential Pressure Transducer; 2 - Level of uncertainty in results; 3 - Error in calculated force is approximately 30% of the momentum flux due to errors in "n", U and the growth of the boundary layer.
<table>
<thead>
<tr>
<th>Material Type</th>
<th>Flow rate l/s</th>
<th>No Load (0 kg)</th>
<th>Quarter Load (12.5 kg)</th>
<th>Half Load (25 kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Load cell</td>
<td>Force</td>
<td>Load cell</td>
</tr>
<tr>
<td></td>
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<td>Total</td>
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<tr>
<td>Water</td>
<td>25 l/s</td>
<td>0.189</td>
<td>0.003</td>
<td>0.186</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Sand</td>
<td>25 l/s</td>
<td>0.189</td>
<td>0.003</td>
<td>0.186</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Rocks</td>
<td>25 l/s</td>
<td>0.189</td>
<td>0.003</td>
<td>0.186</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>NA</td>
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<td>NA</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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</tbody>
</table>

1 - Differential Pressure Transducer; 2 - Level of uncertainty in results; NA - Not Applicable
Table 6.15 Calculated Local Drag Forces and Drag Coefficients @ Full Load (50 kg)

<table>
<thead>
<tr>
<th>Material</th>
<th>Flow rate l/s</th>
<th>Station 1 - 2</th>
<th>Station 2 - 3</th>
<th>Station 3 - 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Momentum Pressure Flux</td>
<td>Force$^1$</td>
<td>Total</td>
<td>Cf</td>
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<td>Water</td>
<td>25 l/s</td>
<td>0.003</td>
<td>0.031</td>
<td>0.034</td>
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<td></td>
<td>38 l/s</td>
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<td>0.006</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>0.166</td>
<td>0.061</td>
<td>0.227</td>
</tr>
<tr>
<td>Sand</td>
<td>25 l/s</td>
<td>0.038</td>
<td>0.020</td>
<td>0.058</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>0.135</td>
<td>0.018</td>
<td>0.153</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>0.347</td>
<td>0.069</td>
<td>0.416</td>
</tr>
<tr>
<td>Rocks</td>
<td>25 l/s</td>
<td>0.060</td>
<td>0.037</td>
<td>0.097</td>
</tr>
<tr>
<td></td>
<td>38 l/s</td>
<td>0.138</td>
<td>0.027</td>
<td>0.164</td>
</tr>
<tr>
<td></td>
<td>63 l/s</td>
<td>0.356</td>
<td>0.067</td>
<td>0.423</td>
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</table>

1- Differential Pressure Transducer
<table>
<thead>
<tr>
<th>Flow rate</th>
<th>Water</th>
<th>Sand</th>
<th>Rocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 l/s</td>
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<td>0.0287</td>
<td>0.0287</td>
</tr>
<tr>
<td>38 l/s</td>
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<td>0.0287</td>
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<tr>
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<td>NA</td>
<td>NA</td>
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</tbody>
</table>

Calculated Skin Friction Coefficients

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<tr>
<th>Load</th>
<th>No Load</th>
<th>Quarter Load</th>
<th>Half Load</th>
<th>Full Load (50 kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0 kg)</td>
<td>0.00000</td>
<td>0.00000</td>
<td>0.00000</td>
<td>0.00000</td>
</tr>
<tr>
<td>(12.5 kg)</td>
<td>0.00000</td>
<td>0.00000</td>
<td>0.00000</td>
<td>0.00000</td>
</tr>
<tr>
<td>(25 kg)</td>
<td>0.00000</td>
<td>0.00000</td>
<td>0.00000</td>
<td>0.00000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Water</th>
<th>Sand</th>
<th>Rocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate (l/s)</td>
<td>25</td>
<td>38</td>
<td>63</td>
</tr>
<tr>
<td>Load (kg)</td>
<td>0</td>
<td>12.5</td>
<td>25</td>
</tr>
<tr>
<td>Skin Friction Coefficients</td>
<td>0.00000</td>
<td>0.00000</td>
<td>0.00000</td>
</tr>
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</table>
Figure 6.58 Profile of Membrane Water under Full Load

Location: Middle  Location: Outrigger  Location: Bulkhead
Figure 6.59 Profile of Membrane: Sand
7.0 DISCUSSIONS

The determination of drag coefficients ($C_f$) of the Test Section, associated with various material type set-ups, was the primary objective of this research. The effects of certain dimensionless groups on $C_f$ were investigated. The dimensional analysis performed in Chapter 3.0 led to the establishment of many dimensionless groups of which Reynolds Number and Froude Number were selected as a basis of comparison for the drag coefficients. The drag coefficients were a function of the drag force on the Test Section, which in turn was a function of the free stream velocity, boundary layer development and power-law exponents.

The raw data collected, and subsequently used for determining the drag coefficients, serves as a starting point for the discussion of the drag coefficients of the various material type set-ups. The effects of free stream velocity, boundary layer thickness and power-law exponents on the drag coefficients will then be discussed.

7.1 Raw Data

Force and pressure measurements collected by the data acquisition system, and profile measurements recorded manually are discussed in Sections 7.1, 7.2 and 7.3 respectively. Note, all raw data collected was used in the analysis, i.e., the
data was not pre-selected.

7.1.1 Force measurements

Samples of the load cell measurements collected are depicted in Figures 6.5 to 6.14. Upon comparison of the Bulkhead force data with the Inner Flume wall force data, the trends and range appear similar for water and rocks. In the case of sand the range was noticeably different. Maintaining the alignment and positioning of the Transition Sections with respect to the Test Section, during this test, proved to be difficult and may perhaps explain the differences in range.

The range or amplitude of the data was interpreted as an indication of the damping characteristics of the material type set-up. The ranges of the force data of water and rocks, at 63 l/s, appear to be similar, i.e., approximately 0.4 to 1.1 N. This implied that the damping characteristics of the two set-ups were similar. Sand displayed a higher range of approximately 0.3 to 1.18 N and was interpreted as behaving more as a rigid body than a flexible membrane.

7.1.2 Pressure measurements

Figures 6.15 to 6.26 are samples of the differential pressure recorded. The frequency and amplitude of the data may be affected by the two factors. The first factor is the attenuating capacity of the tubing linking the pitot-static
tube to the pressure transducer. The second factor is the geometry of the pitot-static tube which did not permit the recording of differences in phases associated with total and static pressure ports. Nevertheless, the data indicated that the levels of fluctuations increased as the distance from the boundary layer increased. The fluctuations were due to possible shedding vortices from the nose cone. Furthermore, the level of fluctuations decreased in the downstream direction.

Figures 6.27 to 6.35 indicate that the velocity profiles were consistent with few exceptions. The exceptions are reflected in Figures 6.29, 6.32. The occasional inability (possible air entrainment from the pump intake) of the pump to maintain a constant flow rate throughout the test, resulted in an inconsistent velocity profiles with respect to the velocity profiles of the adjacent stations. This difference in flow rate characterised as a displaced velocity profile with an initial and final local mean velocity that was lower (or higher) than the corresponding stations.

The velocity gradient, in some instants (e.g. Figure 6.32) near the boundary is small. The reason for this was due to the distortion of the membrane under load, which resulted in difficulties at locating the pitot-static tube at the membrane. See Figure 6.58 to 6.60 for profile of membrane when under load.
7.2 Calculated Velocities

The velocities shown in Table 6.9 and 6.10 were calculated based on the assumption of a 1/7th power-law velocity distribution (see Equation 7.1 where \( n = 7 \)) in the boundary layers of the Inner Flume walls and Test Section. This assumption, combined with velocities collected (using a current meter) at a point (300 mm) upstream of the Transition Section, provided a means for determining the theoretical boundary layer development along the surfaces in question. The theoretical boundary layer and displacement thickness was then calculated (Equations 7.2 and 7.3) using the boundary layer theory presented in Schlichting (1968).

\[
\frac{u}{U_*} = \left( \frac{y}{\delta} \right)^{1/n} \quad \ldots \ 7.1
\]

\[
\delta(x) = 0.37 \frac{x}{Re^{0.1}} \quad \ldots \ 7.2
\]

\[
\delta(x)_1 = \delta(x) / (n + 1) \quad \ldots \ 7.3
\]

Knowing the displacement thickness, the effective cross-sectional area at each station was calculated. This area was a function of the location of the Test Section in the Inner Flume, and the water depth. The location of the Test Section further depended on the load in the Test Section and the position of the outriggers. The water depth was dependent on the flow rate.

Table 6.10 summarises the average free stream velocities
for the material types. Fluctuations of less than 1% were calculated during Phases 1.0 and 2.0. However, when specifically comparing the high flow rate cases of water and rocks during Phase 1.0 tests, a decrease of approximately 2.4% in the average free stream velocities was calculated. The reason for this difference, and other differences listed in Tables 6.9 and 6.10, is specifically due to one or more of the following:

a) Spillage occurring during the manual transportation of up to 50 kg of the material resulted in less material been placed in the Test Section and consequently a lower draft,
b) Inconsistent distribution of material in the Test Section resulted in a difference in elevation of the upstream and down streams. Note differences of less than 2 mm over 3000 mm were ensured,
c) Inconsistent positioning of the outriggers, although monitored, further led to differences in the location of the Test Section,
d) Fluctuations in the flow rate of the order of +/- 0.5 l/s were practically impossible to avoid.

7.3 Boundary Layer Thickness:

The local mean free stream velocities calculated were used as the basis for determining the boundary layer thickness
at the respective stations. Figures 6.36 to 6.39 show the extrapolation of the velocity data to the local mean free stream velocity. In some instances, especially at station 1, the extreme data points collected appeared to lie within the main stream flow region.

The boundary layer thicknesses (Table 6.11) determined were plotted (Figure 6.40 to 6.48) and represent the boundary layer development under nonuniform flow and confined space conditions. For the sake of comparison, the boundary layer development along a flat plate under uniform flow and unconfined space conditions was plotted and is represented by the boundary layer theory presented in Schlichting (1968). Upon comparison of Schlichting curve and the experimental data, the slope of experimental data was calculated to be approximately double the slope of the Schlichting curve. A slope of 0.37 for the Schlichting curve is cited in Schlichting (1968). Extrapolation of the boundary layer growth line pertaining to the experimental data, indicates that the line does not pass through the origin. This implies that when $xRe^{-0.2}$ equals zero, the boundary layer thickness is not zero which is unlike the Schlichting curve. In the case of a flat plate, Prandtl suggested (according to Massey (1984)) that a zero intercept assumption agrees well with experimental data provided the onset of turbulence is assumed to occur at the leading edge of the flat plate. However, this assumption would
lead to a poor correlation between the data points and would lead to a false indication of boundary layer growth and was thus disregarded.

The boundary layer growth rates for all the materials at 63 l/s \( (1.5 \times 10^6 < \text{Re}_x < 1.53 \times 10^6) \) are very similar (Table 6.11), implying that the growth rate was independent of the material type at the selected membrane tension of 1.0 kN. At lower flow rates \( (6.96 \times 10^5 < \text{Re}_x < 1.05 \times 10^6) \) the boundary layer growth depended on the material type. This suggests that the damping characteristic of each material type affected the boundary layer growth. The Reynolds Number is based on \( x \) with \( x = 0 \) at the nose of the upstream Transition Section.

7.4 Power-Law Exponents:

The assumption of a power-law velocity distribution in a pipe was confirmed experimentally by Nikuradse (Schlichting 1968) for Reynolds Number (based on distance, \( x \)) between \( 4 \times 10^3 \) and \( 3 \times 10^6 \). The power-law velocity distribution over a flat plate was assumed by Prandtl, according to Schlichting (1968), to be identical to the velocity distribution in a pipe. Schlichting (1968) cited that Hansen and Burgers confirmed Prandtl's assumption for \( \text{Re}_x < 10^6 \).

The exponent, \( n \), used in the power-law equation (Equation 7.1) was determined by plotting the dimensionless variables
log \( (u / U_e) \) and log \( (y / \delta) \) on a linear scale and linear regression to determine the slope (Figures 6.49 to 6.57). This slope corresponded to the exponent, \( n \). The exponents are summarised in Table 6.12. The local values ranged from approximately 5 to 8.5 with the exception of a few cases in which the values were as high as 11.7 and as low as 3. The low extreme value can be attributed to the fact that a loss in flow rate occurred during this test. This resulted in perhaps an under or over calculation of the local free stream velocity, and thus an incorrect extrapolation.

In the 25 l/s flow rate case \( (1.93 \times 10^5 < \text{Re} < 7.56 \times 10^5) \), average exponent values of 6.6, 5.6, 5.3 were calculated for the water, rocks and sand set-ups respectively. In the 63 l/s flow rate case \( (4.25 \times 10^5 < \text{Re} < 1.53 \times 10^6) \), the values were very similar i.e., 6.7, 5.4, 7.6 for the water, sand and rocks set-ups respectively. Schlichting (1968) suggested that the exponent increases with increasing Reynolds Number. This was not observed due to the small range of Reynolds Number \( (1.93 \times 10^5 < \text{Re} < 1.53 \times 10^6) \) used. When comparing the overall average exponents with material type, the exponents associated with rocks were consistently lower than sand. This was to be expected due to the higher damping characteristics of the rocks set-up. The nature of the rocks set-up resulted in pockets of air distributed throughout the mass in the Test Section. This air / water interface at the
pockets is believed to lead to an overall damping of the fluid fluctuations near the membrane boundary.

7.5 Drag Force

Tables 6.13 and 6.14 outline the recorded and calculated drag forces on the flexible membrane. The recorded and calculated drag forces are in good agreement as depicted by the standard deviation of the data. The magnitude of the forces increased with load carrying capacity of the Test Section. This was expected as the wetted area was a function of the live load. The total momentum flux in the x direction increased with flow rate; however, in the 25 l/s flow rate case the total drag force acting on the membrane was primarily due to the pressure gradient.

The methods utilised in determining the recorded and calculated drag forces are described below.

7.5.1 Recorded Drag Force

The force recorded by the load cell was in fact the profile drag acting on the Test Section. The friction drag, referred to as drag force from here on, was determined by deducting the Bulkhead pressure force from the load cell measurement. The pressure drag was calculated based on the recorded pressure drop between the upstream and downstream Bulkheads, and the submerged cross-sectional area of the
Bulkheads.

The recorded forces were analysed statistically using formulae for hypothesis testing (t - distribution) of two averages from independent populations. A significance level of 5% was used. The intent was to determine whether or not the averages of the forces recorded, under same flow rate with different material loads, were statistically different. The results are summarised in Table 7.1 and indicate that, with the exception of a few cases, the forces were statistically different and thus the magnitude of the forces were due to the material type, load or flow rate. An average of the Bulkhead and Inner Flume wall forces were used in the hypothesis testing. The standard deviations used were the square-root of the sum of the squares of the Bulkhead and Inner Flume wall standard deviations (see Table 6.5).

Further statistical analysis was performed separately on the Bulkhead force data and on the Inner Flume wall force data (see Appendix D: Statistical Data). This analysis indicated that under the 63 l/s and full load cases, the forces recorded were statistically the same, i.e., the recorded forces were independent of the material type and load.

7.5.2 Calculated Drag Force

The momentum equation was used to calculate the drag force acting on the membrane. The general momentum equation, with respect to the x direction, states that the summation of the external forces acting on a control must be balanced by
Table 7.1 Statistical Comparison of the Averages of the Recorded Forces

<table>
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<th>25 l/s</th>
<th>38 l/s</th>
<th>63 l/s</th>
<th>25 l/s</th>
<th>38 l/s</th>
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<td>-2.28 Reject</td>
<td>-10.62 Reject</td>
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<td></td>
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<td>-0.88 Accept</td>
<td>-14.32 Reject</td>
<td>-11.52 Reject</td>
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<td></td>
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<td>-22.37 Reject</td>
<td>-12.54 Reject</td>
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<td>-18.37 Reject</td>
<td>-3.15 Reject</td>
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<td>Sand</td>
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<td>-0.65 Accept</td>
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<td>-0.07 Accept</td>
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</table>

1 - Result of hypothesis testing (t-distribution) for two means: Independent populations; 2 - Accept or Reject the hypothesis that forces are the same.

Note: P(T ≤ c1) = 2.5% and P(T ≤ c2) = 97.5% and with 299 degrees of freedom we obtain c1 = -1.96 and c2 = 1.96 from Kreyszig (1983).

Accept hypothesis if c1 ≤ t ≤ c2. Significance level of 5% was used.
the momentum flux in the x direction. The momentum flux consists of three components: momentum of the fluid entering at station 1, momentum of fluid exiting at station 4 and the momentum of the fluid between stations 1 and 4 that may be entering or leaving the control volume. A control volume was selected (Figure 7.1) with stations 1 and 4 providing the outer x limits, and the thickness of the boundary layer at station 4 the outer y limit. The three components will next be explained separately.

7.5.2a Station 1

The momentum of the fluid entering the control volume is given by Equation 7.4.

\[ F_1 = -\rho \int_{0}^{a} u_1^2 \, dA \] ... 7.4

Where: \[ dA = r \, dr \, \theta \] ... 7.5

\[ u_1 = U_1 \, (r_1 - r)^{1/\delta_1} \] ... 7.6

At station 1, the integrand "a" depicted in Equation 7.4 consists of two regions. A region in which the velocity changes within the boundary layer and a region in which the
Figure 7.1 Sketches for Drag Force Calculations
velocity is constant. Equation 7.4 is further divided into Equation 7.7.

\[
\rho \int_{0}^{a} u_1^2 \, dA = \rho(\pi/180) \theta_{BG} \int_{r_0}^{r_1} u_1^2 \, dr + \rho(\pi/180) \theta_{EH} \int_{r_0}^{r_1} U_1^2 \, dr \\
+ 2 F_{ABCD} + 2 F_{BEF} \quad \ldots \quad 7.7
\]

Where: \( F_{ABCD} = \rho(\pi/180) \Sigma_i (\theta_{i14i} \int_{r_0}^{r_{lai}} u_1^2 \, dr) \quad \ldots \quad 7.8 \)

\[
F_{BEF} = \rho(\pi/180) \Sigma_i (\theta_{i4ai} \int_{r_0}^{r_{l4ai}} U_1^2 \, dr) \quad \ldots \quad 7.9
\]

The growth of the boundary layer along the Test Section was limited by the growth of the boundary layer along the Inner Flume walls. Equation 7.7 therefore includes two terms, \( F_{ABCD} \) and \( F_{BEF} \), that reflect this influence of the Inner Flume wall boundary layer on the control volume. The integration limits of Equations 7.8 and 7.9 were based on the position at which the boundary layer of the Test Section intersected with the boundary layer of the Inner Flume walls. This is schematically indicated in Figure 7. The momentum of the shaded areas ABCD
and BEF are represented by Equation 7.8 and 7.9. The shaded areas were divided into small segments (angle of less than 1.3 degrees) and the momentum of each segment calculated. The total momentum of each area was the summation of the momentum of each segment.

7.5.2b Station 4

The momentum of the fluid entering the control volume is given by Equation 7.4.

\[ F_4 = + \rho \int_{0}^{a} u_4^2 \, dA \] ...

Where:

\[ dA = r \, dr \, \theta \]

Where:

\[ u_4 = \frac{U4_\ast (r_\ast - r)^{1/n_4}}{\delta_4} \] ...

The integrand "a" depicted in Equation 7.10 consists of one region; a region governed by the boundary layer thickness at station 4. Equation 7.10 is further divided into Equation 7.12.

\[ \rho \int_{0}^{a} u_4^2 \, dA = \rho (\pi/180)\theta_{EH} \int_{r_0}^{r_\ast} u_4^2 \, dr + 2F_{DCGE} \] .... 7.12
Where: \( F_{DCGE} = \rho (\pi/180) \sum_{i} (\theta_{4i} \int_{r_0}^{r_{4i}} U_{4i}^2 \, dr) \) ....7.13

The momentum associated with the shaded area DCGE, depicted in Figure 7.1, is represented by Equation 7.13 and was explained in Section 7.52a.

7.5.2c Station 1 - 4

The momentum entering and exiting station 1 and 4 were calculated using Equations 7.4 to 7.13. However, the momentum of the fluid entering or exiting the boundary layer between these stations has yet to be determined and will be discussed next.

The flow rate entering stations 1 and exiting station 4 was calculated based on Equation 7.14 and 7.15.

\[
Q_1 = (\pi/180) \theta_{BG} \int_{r_0}^{r_1} u_1 \, dr + 2 (Q_{ABCD} + Q_{BEF}) \quad ... 
\]

\[
Q_4 = (\pi/180) \theta_{EH} \int_{r_0}^{r_4} u_4 \, dr + 2 Q_{DCEG} \quad ... 7.15
\]
Where:

\[ Q_{ABCD} = \rho \left( \frac{\pi}{180} \right) \sum_i \left( \Theta_{14i} \int_{R_0}^{R_{14i}} u_1 \, dr \right) \quad \ldots \quad 7.16 \]

\[ Q_{BEF} = \rho \left( \frac{\pi}{180} \right) \sum_i \left( \Theta_{14i} \int_{R_1}^{R_{14i}} U_{1*} \, dr \right) \quad \ldots \quad 7.17 \]

\[ Q_{DGGE} = \rho \left( \frac{\pi}{180} \right) \sum_i \left( \Theta_{4i} \int_{R_0}^{R_{4i}} U_{4*} \, dr \right) \quad \ldots \quad 7.18 \]

The limits of integration associated with the flow rate equations are described in Section 7.5.2a. The momentum entering or exiting the boundary layer between the respective stations was calculated based on an average of the local free stream velocities at stations 1 and 4, and the net flow rate into or out of the boundary layer. This is represented by Equation 7.19.

\[ FQ = \rho \, U_{4*} \left| (Q_4 - Q_1) \right| \quad \ldots \quad 7.19 \]

Equation 7.20 represents a simplified version of the equations associated with the momentum flux in the x direction and the external forces acting on the control volume.
\[
-F_0 + \int_0^a \delta P \, dA = - \rho \int_0^a u_1^2 \, dA + \rho \int_0^a u_2^2 \, dA \pm FQ \quad ... \quad 7.20
\]

7.6 Skin Friction Coefficient

The average skin friction coefficient was calculated using Equation 7.21 and the results are summarised in Tables 7.2 and 7.3.

\[C_f = \frac{F_0}{\rho u^2 L P} \quad .... \quad 7.21\]

Where: 
- \(L\) - length of Test Section (3 m) 
- \(P\) - Wetted Perimeter 
- \(u\) - Average free stream velocity (Table 6.10)

The dependence of the average skin friction coefficient on Reynolds and Froude Numbers was investigated. The characteristic length used in Reynolds Number was the hydraulic radius of the Test Section, or the hydraulic depth of the Inner Flume. Figures 7.2 to 7.9 indicate the relationship between \(C_f\) and Reynolds Number. The data in these Figures appear to follow a curve that is characteristic of the Moody diagram. The \(C_f\) curve for the water set-up appears to fall below the smooth boundary while the sand and rock set-ups near the smooth boundary condition. The curves associated with
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<th>Load kg</th>
<th>Re Rv/</th>
<th>Re HDu/</th>
<th>Fr u/(gD)</th>
<th>Fr u/(gHD)</th>
<th>Re xu/</th>
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<td>8.63E+03</td>
<td>1.70E+05</td>
<td>0.268</td>
<td>0.079</td>
<td>2.48E+05</td>
<td>8.92E+05</td>
<td>0.0110</td>
</tr>
<tr>
<td>1.21</td>
<td>Rocks</td>
<td>38</td>
<td>50</td>
<td>1.22E+04</td>
<td>1.91E+05</td>
<td>0.232</td>
<td>0.080</td>
<td>2.57E+05</td>
<td>9.33E+05</td>
<td>0.0083</td>
</tr>
<tr>
<td>1.22</td>
<td>Rocks</td>
<td>63</td>
<td>50</td>
<td>2.03E+04</td>
<td>3.27E+05</td>
<td>0.327</td>
<td>0.113</td>
<td>3.87E+05</td>
<td>1.40E+06</td>
<td>0.0072</td>
</tr>
</tbody>
</table>

1 - Reynolds Number based on hydraulic radius; 2 - Reynolds Number based on hydraulic depth; 3 - Froude Number based on Draft; 4 - Froude Number based on hydraulic depth; Reynolds Number at x = 1.140 (start of Test Section) 5 - Reynolds Number at x = 4.140 (end of Test Section); 7 - Drag coefficient
Table 7.3 Summary of Reynolds, Froude Numbers and Cf: Phase 2.0

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Material Type</th>
<th>Q (l/s)</th>
<th>Load (kg)</th>
<th>Re (Rv)</th>
<th>Re (HDu)</th>
<th>Fr (u/(gD))</th>
<th>Fr (u/(gHD))</th>
<th>Re (xu)</th>
<th>Re (xu)</th>
<th>Cf</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Water</td>
<td>25</td>
<td>50</td>
<td>8.83E+03</td>
<td>1.26E+05</td>
<td>0.165</td>
<td>0.059</td>
<td>1.84E+05</td>
<td>6.67E+05</td>
<td>0.0082</td>
</tr>
<tr>
<td>2.2</td>
<td>Water</td>
<td>38</td>
<td>50</td>
<td>1.23E+04</td>
<td>1.92E+05</td>
<td>0.233</td>
<td>0.080</td>
<td>2.58E+05</td>
<td>9.37E+05</td>
<td>0.0067</td>
</tr>
<tr>
<td>2.3</td>
<td>Water</td>
<td>63</td>
<td>50</td>
<td>1.88E+04</td>
<td>3.21E+05</td>
<td>0.337</td>
<td>0.112</td>
<td>3.82E+05</td>
<td>1.39E+06</td>
<td>0.0075</td>
</tr>
<tr>
<td>2.4</td>
<td>Sand</td>
<td>25</td>
<td>50</td>
<td>9.54E+03</td>
<td>1.29E+05</td>
<td>0.160</td>
<td>0.060</td>
<td>1.87E+05</td>
<td>6.77E+05</td>
<td>0.0125</td>
</tr>
<tr>
<td>2.5</td>
<td>Sand</td>
<td>38</td>
<td>50</td>
<td>1.35E+04</td>
<td>1.96E+05</td>
<td>0.225</td>
<td>0.081</td>
<td>2.63E+05</td>
<td>9.53E+05</td>
<td>0.0072</td>
</tr>
<tr>
<td>2.6</td>
<td>Sand</td>
<td>63</td>
<td>50</td>
<td>2.02E+04</td>
<td>3.26E+05</td>
<td>0.328</td>
<td>0.113</td>
<td>3.87E+05</td>
<td>1.41E+06</td>
<td>0.0081</td>
</tr>
<tr>
<td>2.7</td>
<td>Rocks</td>
<td>25</td>
<td>50</td>
<td>9.15E+03</td>
<td>1.28E+05</td>
<td>0.163</td>
<td>0.060</td>
<td>1.85E+05</td>
<td>6.72E+05</td>
<td>0.0163</td>
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<tr>
<td>2.8</td>
<td>Rocks</td>
<td>38</td>
<td>50</td>
<td>1.34E+04</td>
<td>1.96E+05</td>
<td>0.225</td>
<td>0.081</td>
<td>2.62E+05</td>
<td>9.52E+05</td>
<td>0.0083</td>
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<tr>
<td>2.9</td>
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<td>63</td>
<td>50</td>
<td>2.02E+04</td>
<td>3.26E+05</td>
<td>0.328</td>
<td>0.113</td>
<td>3.87E+05</td>
<td>1.41E+06</td>
<td>0.0072</td>
</tr>
</tbody>
</table>

1 - Reynolds Number based on hydraulic radius; 2 - Reynolds Number based on hydraulic depth; 3 - Froude Number based on draft; 4 - Froude Number based on hydraulic depth; 5 - Reynolds Number at x = 1.140 (start of Test Section)
6 - Reynolds Number at x = 4.140 (end of Test Section); 7 - Drag coefficient
rocks and sand set-ups were surprisingly similar. Sand was expected to exhibit a higher (than rocks) $C_f$ for a given Reynolds Number, since the set-up of sand in the Test Section, is similar to a flow across a rigid body with no damping effects. The $C_f$ values for the water set-ups were lower than for the other materials type set-ups. This is believed to be due to the damping characteristic of the water set-up. However, in the rock set-up, $C_f$ values lower than water were expected, since with the rock set-up the membrane/air interface in the voids should have a greater damping effect than water. This was not observed as a net effect. It is believed that the irregular form of the Test Section, when loaded with rocks, offsets the damping qualities of this type of set-up, See Figures 6.58 to 6.60.

The $C_f$ values were investigated to determine whether the differences observed were of a statistical nature rather than of a physical nature. Section 7.5.1 outlines the statistical analysis performed on the recorded forces. The conclusion drawn from this analysis apply also to the $C_f$ values since, by Equation 7.21, $C_f$ is proportional to $F_0$ with free stream velocity and wetted perimeter similar for each set-up.

The dependency of $C_f$ on Reynolds Number and material type was observed to be more pronounced in the region $Re_{HR} < 1 \times 10^4$ or $Re_{HD} < 2 \times 10^5$. In the region $Re_{HR} > 1 \times 10^4$ or $Re_{HD} < 2 \times 10^5$, $C_f$ was independent of Reynolds Number and material type and
was found to be approximately 0.0175.

The range of Re\(_x\) associated with the Test Section length is between 1.65 \times 10^5 and 9.52 \times 10^5. Schlichting (1968) suggests that the transition to turbulence takes place between 3.5 \times 10^5 < Re < 1 \times 10^6, with Reynolds Number based on distance x.

Although the effects of Reynolds Number and Froude Number cannot be separated, the trends associated with Froude Number and C\(_f\) were investigated and are shown in Figures 7.10 to 7.17. Conclusions regarding the effects on Fr\(_D\) on C\(_f\) were difficult to reach due to the scatter of the results. The effects of Fr\(_HD\) on C\(_f\) were not evident in Figure 7.14 to 7.17, and a Reynolds Number effect is more likely evident in these plots.

The local average skin friction coefficients between station (1 and 2), (2 and 3), (3 and 4) were calculated using principles to those described in Section 7.5. The pressure gradient along the Test Section, used in the calculations in Section 7.5, was divided according to the section lengths. Equation 7.21 was then used to calculate the friction coefficients. Averages of the local free stream velocities, i.e., an average between for example station 2 and 3, were used in the local skin friction calculation.
7.7 Uncertainty Analysis

The uncertainty in the force data collected is shown in Tables 6.13 and 6.14. This was calculated using the standard deviations listed in Table 6.5 and the error band associated with the Loop System.

The mean pressures and standard deviations associated with the boundary layer measurements of the 63 l/s case are shown in Tables 6.6 to 6.8.

7.8 Applications

The design of a WBC system requires an understanding of the mechanisms effecting the drag force of the system. The mechanisms can be described in terms of the velocity profile, free body diagram and a control volume of a section of the belt (Figures 7.18, 7.19 and 7.20 respectively). The equilibrium equations indicate that the weight of the material is balanced by the buoyancy force (Equation 7.22) and the drag force on the belt balanced by the shear force on the channel, pressure force and momentum flux (Equation 7.23).

\[ F_v = F_B \]

\[ - \frac{dP}{dx} L_b A_{ch} + \rho(C_f) b V_a^2 P_b L_b - \rho(C_f) b V_a^2 P_{ch} L_b = \rho Q^2 B \left( \frac{A_1 - A_2}{A_1 A_2} \right) \]
To simplify the analysis of Equations 7.23, the following assumptions were made:

a) $V_d = \frac{V_{belt}}{2}$

b) $(C_f)_b = (C_f)_c$

c) For uniform steady state flow: $A_1 = A_2$

7.8.1 Comparison of Traditional and WBC systems

The traditional conveyor system referred to in Table 3.1 was designed for 1000 t/h. This system was used as basis for comparison against a water bed conveyor (WBC) system designed for the same mass flow rate. The comparison was limited to the following variables: primary resistance (top run), velocity of belt and power required to overcome primary resistance. These variables were selected based on the assumption that the carry side (top run) of the WBC system was supported by water and the return side (bottom run) supported in the same manner as the traditional conveyor system. The results are shown in Table 7.4 and show that the WBC system uses approximately 142% less power than the traditional conveyor system. Alternatively, the WBC system may convey approximately 35% more material than the traditional conveyor.

The method used to calculate the drag force consists of the following steps:

a) Calculate hydraulic radius of the WBC system. Note,
Equation 7.22 may be simplified to $A_{\text{disp}} = A_{\text{load}} \cdot SG_{\text{load}}$

b) Calculate Reynolds Number based on hydraulic radius and $V_a = \frac{V_{\text{belt}}}{2}$,

c) Determine $(C_f)_b$: if $Re_{HR} > 10000$ use $(C_f)_b = 0.0175$, if $Re_{HR} < 10000$ use Figure 7.4,

d) Calculate $F_0$, $F_b = \rho (C_f)_b V_a^2 P_b L_b$. 
Figure 7.2 Variation of Skin Friction Coefficient with $\text{(Re)}_{HA}$: Water

Average Skin Friction Coefficient - $\text{(Re)}_{HA}$

Water
Figure 7.3 Variation of Average Skin Friction Coefficient with $(Re)_{HR}$: Sand
Figure 7.4 Variation of Average Skin Friction Coefficient with $(Re)_{HR}$: Rocks
Figure 7.6 Variation of Average Skin Friction Coefficient with (Re)_{H_D} : Water
Figure 7.7 Variation of Average Skin Friction Coefficient with (Re)_{H0} : Sand
Figure 7.8 Variation of Average Skin Friction Coefficient with \((Re)_{H0}\): Rocks

\[ Re = \frac{U*D}{V} \]

Phase 1.0: □  Phase 2.0: *

Average Skin Friction Coefficient: \((Re)_{H0}\) for Rocks
Figure 7.9 Variation of Average Skin Friction Coefficient with $(Re)^{*}_{HD}$. Phase 1.0 and 2.0
Figure 7.10 Variation of Average Skin Friction Coefficient with \((Fr)_\delta\) : Water
Figure 7.11 Variation of Average Skin Friction Coefficient with $(Fr)_\Delta$: Sand
Figure 7.12 Variation of Average Skin Friction Coefficient with $(Fr)_D$ : Rocks
Figure 7.13 Variation of Average Skin Friction Coefficient with $(Fr)_o$ : Phase 1.0 and 2.0
Figure 7.14 Variation of Average Skin Friction Coefficient with $\left( Fr \right)_{HD}$: Water
Figure 7.15: Variation of Average Skin Friction Coefficient with \( (F_{r})_{AF} \): Sand

\[ Fr = \frac{U}{n(r)} \left( \frac{gHD}{\eta} \right) \]

\( \eta \)

167
Figure 7.16 Variation of Average Skin Friction Coefficient with $(Fr)_{H0}$: Rocks
Figure 7.17 Variation of Average Skin Friction Coefficient with $(Fr)_{H,D}^{-}$: Phase 1.0 and 2.0
<table>
<thead>
<tr>
<th>Traditional Conveyor System</th>
<th>Water Bed Conveyor Case A</th>
<th>Water Bed Conveyor Case B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belt velocity: 0.6 m/s</td>
<td>Belt velocity: 1.5 m/s</td>
<td>Belt velocity: 2.01 m/s</td>
</tr>
<tr>
<td>Primary Resistance: 32.81 kN</td>
<td>Drag force: 5.41 kN</td>
<td>Drag force: 9.867 kN</td>
</tr>
<tr>
<td>Required Power: 19.7 kW</td>
<td>Required Power: 8.12 kW</td>
<td>Required Power: 19.9 kW</td>
</tr>
<tr>
<td>Hydraulic Radius: 0.1751</td>
<td>Reynolds Number: 128,728</td>
<td>Reynolds Number: 172,495</td>
</tr>
<tr>
<td>Drag Coefficient, Cf: 0.0175</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 - Top run (See Table 3.1); 2 - Based on hydraulic radius of WBC; 3 - See Figure 7.2.
8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

The primary objective of this research was to record the drag force and subsequently calculate the drag coefficient on a tensioned flexible membrane subjected to various loads. This required an investigation into the boundary layer development along the Test Section and the power law exponents associated with the velocity distribution in the boundary layer.

8.1.1 Boundary Layer Development

The boundary layer growth rates of all material type set-ups were consistently higher than the calculated boundary layer growth rate along a rigid body.

The boundary layer growth equation (Equation 7.2), developed from the momentum integral equation (uniform flow) and Blasius formula for hydraulically smooth pipes, should be modified to account for the material type set-up and flow rate.

8.1.2 Power-Law Exponents

The 1/7th power-law exponent is a good approximation to determine the velocity distribution within the boundary layer of a tensioned (2.5 N / mm width of belt) flexible membrane.
8.1.3 Drag Force

The recorded and calculated drag forces were in good agreement. This confirmed that the application of momentum principle is a suitable technique for determining the drag force on a tensioned flexible membrane subjected to steady nonuniform flow.

8.1.4 Drag Coefficient

The drag coefficient is a function of the material type and flow rate. Reynolds Number, based on the hydraulic radius (HR) of the Test Section may be used to determining the drag coefficient of a different belt and material configurations. The drag coefficient was found to be independent of Reynolds Number and material type for Re_{HR} greater than 10000. For Re_{HR} less that 10000, the drag coefficient of the water set-up was found to be consistently lower than for the sand and rock set-ups. The drag coefficients of the sand set-up was found to be marginally higher than for the rock set-up.

The effects of Froude number on the drag coefficient were found to be small under the test conditions selected.

8.2 Recommendations

A brief overview of the parameters used in this research will facilitate an understanding of other possible parameters worth investigating. The smooth membrane was subjected to a 1000 N tension. Water, sand and rocks were the materials used.
Four load types were used, namely no load (0 kg), quarter load (12.5 kg), half load (25 kg) and full load (50 kg). Three flow rates were selected: 25 l/s; 38 l/s and 63 l/s. A weir height of 285 mm was selected (see Figure 4.1).

The effects of tension on the load carrying capacity of the Test Section is important and should be investigated as this will provide insight into the stability of the load on the belt. Knowledge of this will help in deciding the location of the support idlers (Figure 1.2). Dimensionless group, \( \pi_t = \frac{m_v}{\sqrt{T}} \) can be useful for determining this relationship.

The effects of tension on the drag coefficient is worth investigating. The damping characteristics, which are a function of the tension in the membrane, may provide further insight into the effects of tension on the drag coefficient.

The effect of roughness on the development of the boundary layer along the membrane, and consequently the drag coefficient should be investigated; furthermore, establish whether the membrane surface may be considered as hydraulically smooth.

The impact of different material types on the form of the belt should be investigated. Materials of a lower density than water, such as grain (used in agriculture industry) or coal as well as high density materials such as iron ore should be considered. Dimensionless groups, \( \pi_\gamma = \frac{\rho v^2}{G_c} \) may be useful in establishing this relationship.

The height of the Test Section above the Inner Flume
floor was dependent on the weir height. Changing the weir height will effect the boundary layer development and consequently the drag force and drag coefficient. To minimise the drag force and to facilitate the selection of the optimum volumetric flow rate and flume dimensions, the height of the weir should be investigated.
NOMENCLATURE

Dimensions are given in terms of mass (M), length (L), time (T).

\( a \) - Integrand \( L \)

\( A \) - Flow area \( L^2 \)

\( A_v \) - Wetted area of plate \( L^2 \)

\( C_0 \) - Constant of integration for Equation 2.5 Dimensionless

\( C_{g2} \) - Constant of integration for Equation 2.8 Dimensionless

\( C_f \) - Skin friction coefficient Dimensionless

\( F \) - Force for Equation 2.2 or rate of change of momentum \( ML/T^2 \)

\( F_0 \) - Drag force \( ML/T^2 \)

\( FQ \) - rate of change of momentum between station 1 and station 4 \( ML/T^2 \)

\( Fr \) - Froude Number Dimensionless

\( L \) - Length \( L \)

\( m \) - Mass for Equation 2.2 \( M \)

\( n \) - Power-law exponent Dimensionless

\( n1 \) - Power-law exponent at station 1 Dimensionless

\( n4 \) - Power-law exponent at station 4 Dimensionless

\( P \) - Wetted perimeter \( L \)

\( Q \) - Flow rate \( L^1/T \)

\( Re \) - Reynolds Number Dimensionless

\( r_0 \) - Radius of Bulkhead \( L \)

\( r \) - Radius of boundary layer relative to Bulkhead, see Figure 7.1 \( L \)

\( U_e \) - Local free stream velocity \( L/T \)
$U_{1e}$ - Local free stream velocity at station 1  
$U_{4e}$ - Local free stream velocity at station 4  
$U_{14e}$ - Average of free stream velocity at station 4 and station 1  
$u$ - Local velocity in boundary layer  
$V_o$ - Average free stream velocity over length of belt, for Equation 7.22  
$v$ - Velocity for Equation 2.2  
$x$ - Distance along physical model with $x=0$ at start of upstream Transition Section  

Greek Symbols

$\beta$ - Momentum correction factor  
$\delta$ - Boundary layer thickness  
$\delta_1$ - Displacement thickness  
$\delta_2$ - Momentum thickness  
$\delta_1$ - Boundary layer thickness at station 1  
$\delta_4$ - Boundary layer thickness at station 4  
$\theta$ - Angle between the points of intersection of the boundary layers of the Test Section and the Inner Flume walls. See Figure 7.1  
$\tau_0$ - Shear stress on membrane or flat plate  
$\rho$ - Density  
- Kinematic viscosity  
$\delta P$ - Differential pressure between station 1 and station 4
Subscripts

1     -  Station 1
1ai   -  Incremental angle or radius of small element in area enclosed by points A, B, C and D.
14ai  -  Incremental angle or radius of small element in area enclosed by points B, E and F.
4     -  Station 4
4ai   -  Incremental angle or radius of small element in area enclosed by points D, C, G and E.
B     -  Buoyancy
b     -  belt
D     -  Draft
w     -  Weight of material on WBC system
BG    -  Points B and G in Figure 7.1
ch    -  Channel
EH    -  Points E and H in Figure 7.1
HD    -  Hydraulic depth of Inner Flume
HR    -  Hydraulic radius of Test Section
BEF   -  Points B, E and F in Figure 7.1
ABCD  -  Points A, B, C and D in Figure 7.1
DCGE  -  Points D, C, G and E in Figure 7.1
APPENDIX A: Bench Top Model Test
Table A.1 Effect of Mass on Width of Membrane: Radius 75 mm

<table>
<thead>
<tr>
<th>Reading No.</th>
<th>T1 Mass (excl cont'nr) (g)</th>
<th>T1 Mass (cummul.) (g)</th>
<th>T1 Width (mm)</th>
<th>T2 Mass (excl cont'nr) (g)</th>
<th>T2 Mass (cummul.) (g)</th>
<th>T2 Width (mm)</th>
<th>T3 Mass (excl cont'nr) (g)</th>
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<td>420</td>
<td>163</td>
<td>440</td>
<td>440</td>
<td>163</td>
<td>420</td>
<td>420</td>
<td>159</td>
</tr>
<tr>
<td>2'nd</td>
<td>400</td>
<td>820</td>
<td>160</td>
<td>440</td>
<td>880</td>
<td>160</td>
<td>450</td>
<td>870</td>
<td>159</td>
</tr>
<tr>
<td>3'rd</td>
<td>420</td>
<td>1240</td>
<td>159</td>
<td>420</td>
<td>1300</td>
<td>159</td>
<td>440</td>
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<td>420</td>
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<td>155</td>
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<td>1810</td>
<td>150</td>
<td>240</td>
<td>1950</td>
<td>150</td>
<td>320</td>
<td>2050</td>
<td>149</td>
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<td>6'th</td>
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<td>2170</td>
<td>NA</td>
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Total (incl model): 2250 2610 2490
Direct from scales: 2340 2640 2520
Figure A.1 Impact of Mass on Membrane Width. Radius = 75 mm

Impact of Mass on Membrane Width
Radius = 75 mm
<table>
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<tr>
<th>T1</th>
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<th>T3</th>
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<tr>
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<td>Mass (cumul.) (g)</td>
<td>Width (mm)</td>
</tr>
<tr>
<td>1st</td>
<td>420</td>
<td>420</td>
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<tr>
<td>2nd</td>
<td>840</td>
<td>830</td>
</tr>
<tr>
<td>3rd</td>
<td>1300</td>
<td>1300</td>
</tr>
<tr>
<td>4th</td>
<td>178</td>
<td>178</td>
</tr>
<tr>
<td>5th</td>
<td>230</td>
<td>230</td>
</tr>
<tr>
<td>6th</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>Total (incl. model):</td>
<td>Direct from scales:</td>
<td></td>
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<tr>
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182
APPENDIX B: Materials
# REPORT ON SIEVE ANALYSIS TEST RESULTS

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<th>Sieve Size</th>
<th>Percent of Sample Passing Sieve</th>
<th>Specification</th>
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</tr>
<tr>
<td>3/8 in</td>
<td>9.5 mm</td>
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</tr>
<tr>
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<td>100</td>
</tr>
<tr>
<td>No. 8</td>
<td>2.38 mm</td>
<td>99.4</td>
</tr>
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<td>No. 16</td>
<td>1.18 mm</td>
<td>93.7</td>
</tr>
<tr>
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</tr>
<tr>
<td>No 50</td>
<td>300 μm</td>
<td>38.7</td>
</tr>
<tr>
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**Comments:**

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</tr>
<tr>
<td>Project:</td>
<td>Quality Control</td>
</tr>
<tr>
<td>Material:</td>
<td>Masonry Sand</td>
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<td>Reference Standard:</td>
<td>OPSS 1004-2</td>
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Report Distribution: Erle Sand and Gravel

Results Reviewed By
C. Palmer C.E.T.,
Field & Laboratory Manager
### Group 1

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Total Mass, kg: 13.078  
Ave Mass, kg: 0.594  
Ave Volume, ml: 0.241
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Total Mass, kg  
Ave Mass, kg   
Ave Volume, ml
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Total Mass, kg: 12.378
Ave Mass, kg: 0.495
Ave Volume, mL: 0.201

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Total Mass, kg 12.708
Ave Mass, kg 0.706
Ave Volume, ml 0.297
APPENDIX C: Tensile Test
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APPENDIX D: MISCELLANEOUS DATA
Table D.1 Statistical Comparison of the Average of Recorded Forces: Bulkheads

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### Table D.2 Statistical Comparison of the Average of Recorded Forces: Flume wall

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Notes: Reject if the value is outside the range; Accept if the value is within the range.
REFERENCES


Bridgestone, Conveyor Belt Design Manual.


Pramano, W., Personal Communication, (June 1995).


NAME: Rick Anema

PLACE OF BIRTH: Sydney, Australia

YEAR OF BIRTH: 1966

EDUCATION:

Northcliff High School, Northcliff, South Africa
1980 - 1982

Scoresby High School, Scoresby, Victoria, Australia
1983 - 1984

Monash University - Caulfield Campus, Melbourne, Victoria, Australia
1985 - 1989,
B.Eng (Mechanical and Computing)

University of Windsor, Widsor, Ontario, Canada 1993 - 1996,
M.A.Sc (Environmental Engineering)
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CHILDREN OF CHRONIC PAIN SUFFERERS:
ASSESSING THEIR SOCIAL COMPETENCE

by
Sophie Beugnot

A Thesis
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APPROVED BY

Cheryl D. Thomas
Chair

K. LaFrance

Donald R. Leslie
ABSTRACT

Literature on chronic pain has identified alexithymia, depression and marital difficulties as characteristics of chronic pain populations. Previous research has also linked these parental characteristics with social competence deficits in children, suggesting a need to assess the social skills of chronic pain sufferers’ children. In the current study, samples of chronic pain sufferers and pain-free participants were compared in terms of levels of alexithymia, depression and marital difficulties as well as in their children’s social competence. The predictive value of these parental characteristics and others for children’s social competence was also investigated. Gender differences in social competence and correlates of boys’ and girls’ social competence were also assessed. No group differences were found in children’s social skills levels but chronic pain sufferers did report more depression and alexithymia than pain-free participants. Children’s social competence across both groups was predicted by children’s age and by parental alexithymia. In the pain sample, children’s social skills were predicted by the length of time for which they were exposed to their parent’s pain, parental pain intensity, depression, and alexithymia. Contrary to prediction, level of marital satisfaction was not an important predictor of children’s social competence. No gender differences were found in children’s social skills but results suggested they did differ on correlates of their social competence. Implications of these findings for intervention in chronic pain families are discussed.
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TABLE OF CONTENTS

ABSTRACT

ACKNOWLEDGMENTS

LIST OF TABLES

CHAPTER

I. INTRODUCTION
   Chronic Pain: Definition and Characteristics
   Gaps in the Chronic Pain Literature

II. REVIEW OF THE LITERATURE
   Impact of Illness on the Family: Theoretical Perspectives
      and Research Findings
   Effects of Chronic Pain on Families
   Family Characteristics of Chronic Pain Sufferers
      Alexithymia, Emotion Expression, and Chronic Pain
      Depression and Chronic Pain.
      Marital Adjustment and Chronic Pain.
   Family Environment and Social Competence in Children.
      Family Expressiveness and Development of Social
      Competence.
      Parental Depression and Children's Social Adjustment.
      Marital Adjustment and Social Adjustment in Children
      Socioeconomic Status and Social Adjustment in
      Children.
   Social Competence in Children of Chronic Pain Sufferers.
   The Current Study
      Hypothesis 1.
      Hypothesis 2.
      Hypothesis 3.
      Hypothesis 4.
      Hypothesis 5.
      Hypothesis 6.

III. METHOD
    Subjects.

Page

iii

iv

viii

1

3

4

8

11

14

18

21

22

25

27

29

30

32

33

33

33

34

34

35

36
TABLE OF CONTENTS (Continued)

Recruitment Procedures. 36
Matching Procedures. 37
Characteristics of Sample. 38

Parental Measures.
Alexithymia. 41
Depression. 44
Marital Satisfaction. 47
Socioeconomic Status. 49

Child Measures.
Social Competence. 49

Procedures. 51

IV. RESULTS
Data Screening and Preliminary Analyses 54
Demographic Differences Between Groups 55
Hypothesis 1 55
Hypothesis 2 56
Hypothesis 3 58
Hypothesis 4 60
Post-Hoc Analyses on the Relationship between Pain Duration and Children’s Social Competence 62
Hypothesis 5 63
Hypothesis 6 63
Post-Hoc Analyses on Raw MESSY Scores 64

V. DISCUSSION
Social Competence in Children of Chronic Pain Sufferers. 66
Depression, Alexithymia, and Marital Satisfaction in Chronic Pain Sufferers. 71
Predictors of Children’s Social Competence.
Across Groups. 73
In the Pain Sample. 73
Gender Differences in Mother-Child Pairs.
Children’s Social Competence. 76
Correlates of Children’s Social Competence. 76

VI. CONCLUSION 79
# TABLE OF CONTENTS (Continued)

<table>
<thead>
<tr>
<th>REFERENCES</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>81</td>
</tr>
</tbody>
</table>

## APPENDIX

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Screening Questionnaire for Pain Group.</td>
<td>93</td>
</tr>
<tr>
<td>B</td>
<td>Screening Questionnaire for Control Group.</td>
<td>94</td>
</tr>
<tr>
<td>C</td>
<td>Informed Assent Form for Children in Pain Group.</td>
<td>95</td>
</tr>
<tr>
<td>D</td>
<td>Informed Assent Form for Children in Control Group.</td>
<td>96</td>
</tr>
<tr>
<td>E</td>
<td>Consent Form for Parents’ Participation.</td>
<td>97</td>
</tr>
<tr>
<td>F</td>
<td>Release of Information Consent Form.</td>
<td>100</td>
</tr>
<tr>
<td>G</td>
<td>Demographic Questionnaire for Pain Group.</td>
<td>101</td>
</tr>
<tr>
<td>H</td>
<td>Demographic Questionnaire for Control Group.</td>
<td>103</td>
</tr>
<tr>
<td>I</td>
<td>Instructions to Teacher.</td>
<td>104</td>
</tr>
</tbody>
</table>

## VITA AUCTORIS

Page 105
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demographic Characteristics of Chronic Pain Sufferers and Controls</td>
<td>39</td>
</tr>
<tr>
<td>2</td>
<td>Pain Characteristics of the Chronic Pain Sample and Related Data</td>
<td>42</td>
</tr>
<tr>
<td>3</td>
<td>Means, Standard Deviations, and Group Differences on the BDI, TAS, and SMAT</td>
<td>57</td>
</tr>
<tr>
<td>4</td>
<td>Results of the Hierarchical Regression for Total MESSY Scores in the General Sample</td>
<td>59</td>
</tr>
<tr>
<td>5</td>
<td>Results of Regression Analyses for the Social Competence of Chronic Pain Sufferers’ Children</td>
<td>61</td>
</tr>
<tr>
<td>6</td>
<td>Correlations between Variables for Boys and Girls in the Chronic Pain Sample</td>
<td>65</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Chronic Pain: Definition and Characteristics

Chronic pain has been typically defined as non-malignant pain that has persisted for at least 6 months (Dura & Beck, 1988; Hendler, 1984). Chronic pain can be constant or recurrent within those 6 months. This definition, however, is not universal, and some researchers have used a less conservative criterion of a duration of one month (Magni, Caldieron, Rigatti-Luchini, & Merskey, 1990). Moreover, chronic pain cannot be attributed to an acute physiological etiology (Dura & Beck, 1988) although some researchers have included cases with organic pathology in their definition of chronic pain sufferers (Feuerstein, Papciak, & Hoon, 1987).

Research on chronic pain has grown rapidly in the past decade and has helped improve our understanding of the psychosocial aspects of this condition. Interest in chronic pain has been fueled by knowledge of its prevalence in the general population and the consequences it engenders in both the sick individual and society as a whole. In the general population, 11% of adult Canadians (Crook, Rideout, & Brown, 1984) and 14.4% of the U.S population between 25 and 74 years old are suffering from chronic pain related to joints or to the musculoskeletal system (Magni, Caldieron, Rigatti-Luchini, & Merskey, 1990).

There is some evidence for a relationship between socioeconomic level and chronic pain. In their national survey of musculoskeletal pain, Magni, Caldieron, Rigatti-Luchini, and Merskey (1990) found that people with chronic pain, as a group, had lower incomes
than other non-chronic pain people surveyed. This finding was confirmed by Crook, Rideout, and Browne (1984) who compared chronic pain sufferers with a group of temporary pain sufferers defined as those who have experienced pain only in the last two weeks. They found that the temporary pain group had a higher modal income and were better educated than the chronic pain group although these differences were not significant. Spouses of chronic pain patients have also reported that one area of impact of chronic pain on their family life was in their financial functioning (Rowat & Knafli, 1985). Finally, people with lower socioeconomic status may be at higher risk for developing chronic pain as shown by Reisbord and Greenland (1985) who found an inverse relationship between education level and reports of back pain in a population-based study. The association between education and back pain was only modest, however, in the unmarried group.

Although some have argued for the possible homeostatic function of chronic pain in a family system (Kunzer, 1986), in general, the psychological and social consequences of chronic pain make it a very disabling condition for the sufferer. Although it is often difficult to disentangle the causes from the consequences of chronic pain, studies have generally suggested that depression is often present in this group of patients. Estimates of depression have varied from one study to another but in their review of the literature, Romano and Turner (1985) reported moderate to high levels of depression in chronic pain samples. Other consequences of chronic pain involve social relationships. Social withdrawal and a decrease in pleasurable activities have generally been found in this group. Philipps and Jahanshahi (1985) reported that patients attending a headache clinic
in London, England avoided a variety of social activities with a range of 75% to 82% avoiding activities such as attending parties and visiting family and friends and 88% preferring to rest instead of engaging in any activity.

The consequences of chronic pain, however, are not limited to the individual. The prevalence of chronic pain has greatly contributed to the spiraling costs of health care and disability pensions. In a comparison of family practice patients and pain clinic patients, Crook and Tunks (1985) found that 23% of the pain clinic patients were employed and 38% disabled as opposed to 52% of family practice patients being employed and 2% disabled. The remaining people consisted of students, retired people or housewives and the two groups did not differ significantly in these categories.

**Gaps in the Chronic Pain Literature**

Chronic pain has important consequences and is therefore a worthwhile topic of study. It is only recently, however, that researchers in this field have begun to look at the consequences of chronic pain on the family. Few studies so far have attempted to uncover how family members of the patient are affected by and cope with this disabling condition in a loved one. Among these few studies, the focus has primarily been on the spouse of the patient and on the marital relationship whereas children have largely been neglected as a focus of research. This neglect of the family, particularly children, needs to be corrected given the growing literature on family systems which underscores how disturbances in the family system, such as illness, affect each family member.
CHAPTER II

REVIEW OF THE LITERATURE

Impact of Illness on the Family: Theoretical Perspectives and Research Findings

The family is an important unit in which individuals develop in close interaction with other family members. General Systems Theory emphasizes the intimate relation existing between individuals and their family by representing the individual as a subsystem of the family within the hierarchy of natural systems (from the cell to the biosphere). In this model, if change occurs at one level of the hierarchy, other systems in the hierarchy will be affected as well. Thus, illness in a family member has the ability to disrupt the entire family system and therefore, affect other family members (Schwenk & Hughes, 1983).

Family Stress theorists adapted General Systems Theory to better represent family functioning (Doherty & Baird, 1983, p. 29-31). They made the following statements regarding family functioning: (1) The family is more than a collection of individuals. Individuals within the family are connected in such a way that change affecting one family member will affect the entire family system. (2) Families’ interaction patterns regulate the behavior of family members. If those interaction patterns are disrupted, individuals’ behavior in the family may be disrupted as well. (3) Healthy family functioning refers to the family’s ability to adapt to change. Chronic illness may disrupt family interaction patterns and may challenge the ability of the family system to be flexible and adapt to changes (Doherty & Baird, 1983). Thus, illness may impair family functioning and create
family disorganization and conflict and impact on the adjustment of its individual members (Mauksch, 1974).

Rankin and Weekes (1989) emphasized the necessity to study the impact of illness on the family: “The interdependence of family members,...and the acknowledgment that individuals do not develop in isolation, but rather in step with their “consociates” (family members and others with whom one has close and enduring relationships) underscore the necessity of studying the impact of chronicity on families”. In fact, feelings of distress are often reported in spouses of chronically ill individuals (Ell & Northern, 1990). In a study of dementia patients and their spouses, Lieberman and Fisher (1995) found that spouses’ levels of anxiety, depression and somatic symptoms were directly related to the severity of the patients’ dementia. Finally, Woods and Lewis (1995) studied cancer patients and their families. Length of diagnosis and the amount of illness-related demands made by the cancer patient had a direct negative effect on the marital relationship which in turn affected family coping strategies, mother-child relationships and general family functioning.

Despite these results, some ambiguity persists concerning the impact of illness on the family, with some studies reporting contradictory data. Brown, Rawlinson, and Hardin (1982) have failed to find impaired functioning in families with one parent suffering from chronic stable cardiac disease and found no relationship between adequacy of family functioning and either objective or perceived health status in that sample. This failure to find significant results may have been due to the lack of variability in the sample, the nature of the illness studied which is more intermittent in nature than chronic, and the authors’ reliance on retrospective data. Litman (1974) also reported little effect of illness on family solidarity. Unlike Brown, Rawlinson, and Hardin (1982), however, Litman
found a direct relationship between perceived severity of illness and its impact on family relations, with the impact being positive and negative with equal frequency. He concluded that illness may serve to increase cohesiveness in families with premorbid family disorganization whereas it may impair family relations in those with good premorbid functioning.

Given the importance of family characteristics and family functioning in children’s development (Cohn, Patterson, & Christopoulos, 1991; Ladd, 1991; Patterson, Vaden, & Kuppersmidt, 1991) it is not surprising that illness, by disrupting the family system, may put children of sick individuals at risk for maladjustment. Several studies also indicate that parental illness may in fact affect children's social and psychological adjustment (Hammen, Adrian, Gordon, Burge, & Jaenicke, 1987; Hammen, Gordon, Burge, Cheri, Adrian, Jaenicke, & Hiroto, 1987). Adult children of dementia patients were found to show more somatic symptoms as the severity of the dementia increased. Somatic symptoms were related to the amount of care given by children to the patient (Lieberman & Fisher, 1995). Woods and Lewis (1995) reported that disruption of the marital relationship in cancer patients led to impaired mother-child relationships and poor psychosocial adjustment in their children. In another study, 52% of children of Huntington’s patients were diagnosed with either conduct disorder or an affective disorder. Children’s diagnosis was predicted by parental diagnosis and their rate of antisocial behavior was related to level of disruption in the family (Folstein, Franz, Jensen, Chase, & Folstein, 1983). This study suggests that illness may not directly affect children but may do so by affecting family functioning and parental functioning, as already shown by Woods and Lewis (1995). In their review of the literature on the impact of illness on the family, Armistead, Klein, and Forehand (1995)
concluded that studies consistently describe child functioning in ill groups as poorer than in non-ill groups but that no conclusions could be drawn at this point regarding the effect of specific illnesses. They further proposed a model in which the key link between parental illness and child adjustment is the amount of disruption in parenting directly resulting from parental illness or indirectly through parental depression and conflict which often accompany illness.

Despite strong evidence for the impact of illness on the family, this relationship may vary with several factors, such as age and gender of family members and socioeconomic status of the family. Lieberman and Fisher (1995) reported that female spouses of dementia patients reacted differently to a spouse’s illness than male spouses with female spouses reporting more anxiety and depression than males. These findings were supported by Kerns and Curley (1985) who described wives of disabled men as more isolated than husbands of disabled women, which seemed to result from women spending most of their time helping their husband and doing household chores. Likewise, several authors have argued for the importance of the mother in family functioning and the important impact of her illness on the family (Litman, 1974).

Interactions between gender of parent and gender of child may also affect the impact of illness on the family. This was confirmed in a study on the effect of parental cancer on children, where the child’s level of distress was related to sex of the sick parent and sex of the child, with adolescent girls of sick mothers showing the highest levels of distress (Compas et al., 1994).

Age has also been linked to differential effects of illness. Rankin and Weekes (1989) reported that families with adolescent children are most at risk to face disruption in
response to parental illness and that men and women of different ages may also react differently to illness in oneself or in a family member, with middle-aged adults showing more difficulties when faced with illness.

The impact of illness may also vary with socioeconomic status (SES). Woods and Lewis (1995) found that in families with a mother diagnosed with breast cancer, SES predicted mother's perception of the mother-child relationship, which in turn predicted the child's social functioning, with high SES leading to better mother-child relations and better child functioning. Furthermore, other studies have reported the protective value of financial resources which seems to help physical recovery by making other resources available (i.e.: professional services) and of education level which protects against negative affect but does not predict overall psychological adjustment during an illness (Funch & Mettlin, 1982).

Overall, these studies suggest that illness may have an impact on other family members, including children. This effect on children may directly result from the illness status of the parent or indirectly from social and psychological characteristics of the sick individual and his or her family, such as depression and conflict. Furthermore, the impact of illness on the family may be mediated by such variables as age, gender and SES.

Effects of Chronic Pain on Families

The disturbing effect of chronic pain on families has already been stressed.

"Chronic pain in a family member not only has the potential of upsetting the family system, but seemingly has the capacity for exerting a substantial influence on the well-
being of the other family members as well" (Roy, 1992, p. 85). Research on the impact of chronic pain on families has focused mainly on the spouse and the marital relationship. Although most studies assessing the physical and emotional well-being of spouses are correlational in nature, and therefore don't allow inferences about causal relationships, they are still significant sources of information about adjustment in spouses of chronic pain patients. Spouses are often required to take on more responsibilities in the household while at the same time receiving less support and nurturance from their sick spouse (Roy, 1985). Rowat and Knafl (1985) found that a group of highly distressed spouses of chronic pain patients had to take on a role of protector, that is, keep stress levels down for the patient and take on the responsibilities that the sick spouse was not able to fulfill. Role strain is therefore likely to occur in these marriages (Hudgens, 1979). Studies also indicate that spouses of chronic pain patients show higher levels of depression than control groups (Ahern, Adams, & Follick, 1985; Flor, Turk, & Scholz, 1987). Rowat and Knafl (1985) reported that up to 69% of spouses in their study showed emotional disturbances that they attributed to the sick partner and to feelings of uncertainty about family life due to unexpected disturbances associated with chronic pain. Also, 40% of the same sample reported feelings of helplessness. Spouses of chronic pain patients were also found to be more distressed than a control group of non-patients on the Global Severity Index of the Symptom Checklist-90 (Shanfield, Heiman, Cope, & Jones, 1979). Finally, spouses also seem to suffer physical symptoms such as sleep difficulties and headaches (Rowat & Knafl, 1985), especially pain complaints (Flor et al., 1987).

Other adverse effects of chronic pain are on the marital relationship and on the family environment. Marital dissatisfaction has been repeatedly reported in both chronic
pain patients and their spouses. Some researchers have reported significant decreases in marital satisfaction associated with pain (Ahern et al., 1985; Flor et al., 1987), although these samples consisted of male reporters only. Marital dissatisfaction was correlated with the level of psychosocial disability (social withdrawal, lack of communication) of the patient, but may also be due to the decrease in sexual activity often reported by chronic pain couples (Ahern et al., 1985; Flor et al., 1987). Likewise, general family functioning seems to be affected by chronic pain. The family environment has been described as less cohesive, less expressive and with more conflict than in control groups (Dura & Beck, 1988; Hudgens, 1979). Furthermore, of the 50% of spouses of chronic pain patients classified as highly distressed, 3/4 reported disruptions in 4 or more areas of family life, including their relationships with children and marital partners, family activities, and financial functioning (Rowat & Knafl, 1985).

Given these disturbances in parental emotional adjustment, the marital relationship, and family environment, we can expect children of chronic pain sufferers to be adversely affected. However, few studies have addressed this issue. Rickard (1988) reported more teacher-rated behavior problems in children of chronic pain patients than in control groups of children of diabetic patients and healthy parents. She hypothesized that these were the result of observational learning of paternal illness behaviors, although she did not provide evidence for her view. Dura and Beck (1988) found that children of chronic pain sufferers in the community tended to have lower social skills, more behavior problems and more days with illness complaints than children of diabetic patients although these results failed to reach significance. Unfortunately, no attempt was made to find predictors of child functioning. Mikail and Von Baeyer (1990) observed chronic headache sufferers and their
children and found significantly higher levels of somatic focus and delinquency as well as a higher occurrence of headaches in these children than in children of pain-free controls. They reported several moderate correlations between parental symptoms and child symptoms but did not elaborate on their meaning. Their study was also limited by their reliance on parental reports for most of their measures of child functioning and by a small sample. Chun, Turner, and Romano (1993) were the first to undertake the task of finding correlates of child adjustment and stressed the need to identify mediating variables between parental chronic pain and child functioning. In their study of pain clinic patients, they found level of parental disability to be a significant predictor of child adjustment whereas parental depression and marital adjustment were not. Chun et al. (1993) were also the first to look at possible interaction effects of patient and child gender in predicting child adjustment. They reported a significant effect of patient gender in predicting parent-rated social competence, with children of male patients being less socially competent than those of female patients. Also, they found a significant effect of child gender on teacher-rated social competence with male children being rated as less competent than their female counterparts. Together, these previous studies suggest a need to further assess child functioning in chronic pain families and to identify potential parental correlates of child adjustment.

Family Characteristics of Chronic Pain Sufferers

Alexithymia, emotion expression, and chronic pain. A characteristic of chronic pain patients that may have implications for family adjustment, particularly for children's social-emotional development is alexithymia. Alexithymia ("no words for emotions") was
first proposed by Sifneos (1978) as a characteristic of individuals with psychosomatic illnesses. He used this term to describe patients who lack the ability to fantasize, are constrained emotionally, have difficulties in interpersonal relationships and, most strikingly, cannot find the appropriate words or labels to describe their emotions. Such patients have difficulty recognizing their own emotions and expressing them verbally to others. In their description of the "pain-prone" personality, Blumer and Heilbronn (1981) described the chronic pain patient as generally stoic and lacking the ability to verbalize feelings. Research on chronic pain patients with no organic explanation for their pain has been consistent with Sifneos' description of psychosomatic individuals. These patients have generally been described as alexithymic and as having difficulty expressing emotions (Pinsky, 1978). Mendelson (1982) reported that 47% of chronic pain patients referred for treatment showed alexithymic features, although he relied on the MMPI subscales of alexithymia which have poor internal consistency and lack validity. However, 53% of patients with somatoform pain disorder were considered alexithymic using the Toronto Alexithymia Scale-20 items (Cox, Kutch, Parker, Shulman, & Evans, 1994) and nearly 100% of low back pain patients were alexithymic as determined by two clinicians based on tape-recorded protocols of the Thematic Apperception Test (Sivik & Hosterey, 1992). Using three different measures of alexithymia, other researchers found that chronic pain patients were more alexithymic than both chronic non-painful disease patients (Joukamaa & Nurmiko, 1987) and a control group of healthy people (Sriram, Chaturvedi, Gopinath, & Shanmugham, 1987). This research suggests that chronic pain patients, along with other psychosomatic groups, show a lack of awareness of their own emotions, have difficulty describing them in words, and are unable to engage in fantasy.
Some studies have also focused on the ability of chronic pain sufferers to express their emotions freely and have found a general tendency to inhibit emotional expression. A general model of chronic pain patients as repressing emotional conflicts, especially guilt, and channeling these repressed feelings through somatic symptoms has been described by many researchers. Engel (1959), in his famous paper "Psychogenic Pain and the Pain-Prone Patient" was one of the first to propose a role for repressed emotions in the development of chronic pain. He argued that pain constitutes a conversion symptom for repressed guilt. This idea has been supported by other researchers and by observations made about the beneficial effect of emotion expression on pain symptoms (Kaufman & Aronoff, 1983). Although this model has mainly been refuted over the years because of the difficulty of establishing a causal relationship between repressed emotions and chronic pain, it is still recognized that chronic pain patients have difficulty verbally communicating their emotions to others. Pilowski and Spence (1975), using the Illness Behaviour Questionnaire, reported that a chronic pain group had significantly more anger inhibition than a comparison group of "explained pain" patients. These findings, however, were based on a single item asking "When you get angry, do you tend to bottle up your feelings?" Other studies based on clinical observations lend support to these findings (Wetchler, 1992). An analysis of group psychotherapy with depressed females reporting chronic pain provided strong evidence for a lack of emotional expression in this group (Corbischley, Hendrickson, Beutler, & Engle, 1990). The goal of psychotherapy was to enhance expression of anger and other negative emotions. In a comparison with a non-pain depressed group, the chronic pain patients showed more difficulty with spontaneous expression of anger and less range of affect. Furthermore, whereas depressed patients
acknowledged their feelings and admitted suppressing them, the depressed pain group was more likely to report not being aware of their feelings or to deny them completely. It is therefore clear that chronic pain patients tend to inhibit emotional expression although their reason for doing so may vary, with some lacking the ability to be aware of and express their emotions while others refrain from communicating their emotions as a result of a conscious effort to suppress them.

Depression and chronic pain. Another characteristic often reported in chronic pain patients, and which may affect their children, is depression. The association between chronic pain and depression has been repeatedly documented in the literature and different theories about the nature of this relationship have been postulated. Romano and Turner (1985), in their review of research done on depression and chronic pain, reported that rates of depression found in previous studies of chronic pain ranged between 31% and 100%. The majority of studies (Doan & Wadden, 1989; Kerns & Turk, 1984; Magni, 1987) agree on a prevalence rate of at least mild depression in between 30% and 60% or about two thirds of this population. These are considerably higher than rates reported in the U.S. general population of 5% to 9% for females and 2% to 3% for males (American Psychological Association, Diagnostic and Statistical Manual of Mental Disorders (4th ed.), 1994). They are also higher than rates of depression found in pain-free individuals in the Magni, Caldieron, Rigatti-Luchini, and Merskey (1990) national survey of the United States' general population which indicated an 8% depression rate.

The discrepancy in prevalence rates across studies is mainly due to methodological variations, with rates varying with the sampling method and diagnostic
tools used. For example, most studies done so far have looked at clinical samples of chronic pain, that is, patients who have been referred to pain clinics. It has been argued (Magni, 1987) that these patients represent more severe cases who therefore might be expected to suffer more psychologically. Higher rates of depression are therefore expected in these samples compared to a general population of chronic pain sufferers. In fact, Magni (1984) conducted an epidemiological study of chronic pain in the general population and found that only 4.3% were depressed. However, in a national survey of the general population in the United States, Magni et al. (1990) reported that chronic pain was a significant elevator of depression scores and found that chronic pain sufferers were more depressed than non sufferers with 18% of them and 8% of non sufferers being depressed. These results, although higher than previous findings, may still be an underestimate of the actual rate of depression since the authors defined chronic pain as pain lasting at least one month. This criteria is considerably less conservative than the usual one where a pain duration of at least six months is required and less severe cases were therefore included. This may have decreased the proportion of depressed cases within the sample.

The higher incidence of depression in chronic pain populations may not be specific to chronic pain and may be found in other populations. Ahles, Yunus, and Masi (1987) compared a group of patients suffering from primary fibromyalgia syndrome, a condition characterized by multiple, diffuse aches and pains without an identifiable organic pathology, with a control group of rheumatoid arthritis where pain is known to have an organic cause. They found no significant difference between these two groups' scores on the Zung Self-Rating Depression Scale (Zung, 1965), with both groups reporting more
depressive symptoms than a group of non-pain controls. Hudson, Hudson, Pliner, Goldenberg, and Pope (1985), however, did find that both DSM-III diagnoses of major affective disorder and family history of major affective disorder were higher in a fibromyalgia group than in a rheumatoid arthritis group.

In summary, although methodological issues make it difficult to draw clear conclusions about the nature of the relationship between chronic pain and depression (Romano & Turner, 1985), there is still considerable agreement on the presence of depressive symptoms in chronic pain populations, both in clinical samples and in the general population. However, the extent and specificity of this relationship may vary between different types of chronic pain populations and depression may not always coexist with chronic pain.

Some theorists postulate that chronic pain is a variant of depression and others argue that depression is a reaction to the difficulty of living with pain. Lefebvre (1981), in his study of depression in low back pain patients, found that these patients had general cognitive distortions similar to those found in depressed non-pain populations. However, the pain group also had cognitive distortions specifically related to their pain, not present in the depressed non-pain group, which contributed greatly to their depressed mood. Both a general cognitive vulnerability to depression and an effect of pain on the cognitive functioning of low back pain patients may be responsible for their depression.

Blumer and Heilbronn (1982) argued for the concept of a "pain-prone" person. They described such a person as one suffering from depressive symptoms pre-dating the onset of pain and masked by this somatic symptom. They found 83% of their sample of chronic pain patients were depressed according to a battery of projective tests, and
showed other symptomatology of depression such as sleep disturbances. However, the authors provided no evidence for the onset of depression pre-dating or causing the appearance of pain symptoms.

A biological connection between depression and pain seems to exist (Magni et al., 1987) but no clear causative relationship can be inferred from this biological similarity between the two disorders. These authors reported that 68.7% of chronic pain patients in their sample had at least one first-degree relative affected by depression or depressive spectrum disorders. These rates are meaningful given the absence of major depression or a history of it in their sample. Interpretation of these findings, however, is limited by the lack of corresponding data from a control group. Still, other researchers have compared rates of depressive spectrum disorders in first-degree relatives of chronic pain patients versus healthy controls and have reported significantly lower rates in relatives of controls than in those of chronic pain sufferers (Schaffer, Donlon, & Bittle, 1980). Higher familial prevalence rates of major affective disorder have also been found in a fibromyalgia group compared to a rheumatoid arthritis group (Hudson et al., 1985). Furthermore, 64% reported the onset of depression to be at least 1 year before that of fibromyalgia. Although only a few studies have been conducted so far, a genetic vulnerability to depression seems to be present in pain patients and may be expressed in a chronic pain syndrome.

Evidence for the development of depression following chronic pain has also accumulated. Living with a chronic condition, in general, has been found to adversely affect the psychological well-being of patients. The presence of depression in other medical populations has already been documented, with reported rates ranging between
12% and 56% (Romano & Turner, 1985). In a sample of 71 chronic low back pain patients, 83% met Research Diagnostic Criteria for either major depression, minor depression or intermittent depression (Krishnan et al., 1985). Most of them reported developing depression after the onset of pain, providing support for depression as a reaction following the development of chronic pain. Turk and Salovey (1984) have also argued for the secondary nature of depression in their critique of Blumer and Heilbronn's article "Chronic pain as a variant of depressive disease: The pain-prone disorder" (1982). Turk and Salovey disputed the conclusions arrived at by Blumer and Heilbronn who argued for the existence of a pain-prone disorder where pain symptoms are the result of a "masked depression". Turk and Salovey pointed to the lack of adequate evidence provided by the authors for this concept as well as to the methodological flaws and circular reasoning in their study. They offered more parsimonious alternatives for Blumer and Heilbronn's findings, instead arguing that depression is secondary to the development of pain. Despite the impressive amount of research done on the connection between chronic pain and depression, results are conflicting and no clear conclusion as to the nature of the relationship between chronic pain and depression may be reached at this time (Gupta, 1986).

Marital adjustment and chronic pain. Roy (1985) has conducted extensive research on the psychological and social characteristics of chronic pain sufferers and has reported on the marital difficulties often present in this group. He described marital maladjustment in these patients as pervasive and resulting from several changes that occur in the patient and his or her spouse as a result of pain. Role changes occur in these
couples where the spouse is faced with more responsibilities, including financial ones, in order to compensate for the patient's disability and loss of role. This can create psychiatric distress, such as depression, in the spouse who is faced with increased stress. Communication patterns between patient and spouse are also affected whereby anger often predominates and a reduction or elimination of sexual activity occurs (Roy, 1987).

Thomas and Roy (1989) measured marital satisfaction in chronic pain patients and their spouses using a measure of family adaptability, which indicates the ability of the couple to change in response to stress, in this case, pain. Their findings indicated that the couples were functioning in the moderately dysfunctional range with a loss of role and intimacy, indicating unsatisfactory marital relations. Further studies have looked at marital adjustment in these populations. Although some have failed to discover marital problems (Feinauer & Steele, 1992), a majority report marital and sexual difficulties as well as deterioration in the relationship (Maruta & Osborne, 1978) and the consistency in the measure of marital satisfaction used across studies support the reliability of these findings. Using the Marital Adjustment Scale (Locke & Wallace, 1959), over half of a male sample of chronic pain patients and their spouses reported marital dissatisfaction with a third of them being severely dissatisfied (Kerns & Turk, 1984). Using the same measure of marital adjustment, other studies reported that between 28% and 39% of patients and between 39% and 51% of spouses were dissatisfied (Ahern et al., 1985; Flor et al., 1987). However, the average level of marital adjustment in this last study was in the normal range indicating overall satisfaction but with a wide range of variability. These findings may be explained by Feinauer and Steele's findings about "caretaker marriages" whereby both patient and spouse adapt to the roles of patient and caretaker respectively, and get
satisfaction out of these roles so that no stress or conflicts arise in the marital relationship. These last findings are consistent with reports on the potential stabilizing function of pain (Kunzer, 1986) and illness (Armistead et al., 1995).

Couples vary in how they cope with stress and in their ability to adapt in response to pain and therefore vary in their level of marital dissatisfaction. In fact, marital satisfaction in both patients and spouses has been found to correlate with measures of spouse support (Kerns & Turk, 1984), indicating that as the spouse accepts the caretaker role, marital dissatisfaction is less likely. Still, pain is a powerful stressor as already argued by Roy (1985) and marital difficulties seem to arise in a significant proportion of couples faced with a chronic pain syndrome. This may be due, in part, to the effect of a patient's depression rather than to chronic pain alone (Mohamed, Weisz, & Waring, 1978) since depression is often observed in this patient group.

In summary, chronic pain patients have been described as lacking awareness about their emotions and as having difficulty expressing them, a characteristic also referred to as alexithymia. Depression and marital difficulties have also often been observed in this group. The way in which these parental characteristics interact is unclear, however, and their relationship may vary in different family systems. Alexithymia may be either primary and be a predisposing factor for the development of diseases or it may appear as a protective factor or defense mechanism in response to being ill. As such, it is referred to as secondary alexithymia and may be transitory or chronic depending on the acute or chronic nature of the illness after which it developed (Freyberger, 1977). With regard to the relationship between alexithymia and depression, they have been shown to be closely related (Parker, Bagby, & Taylor, 1991) and the relationship between alexithymia and
marital adjustment may also be deducted from evidence for the importance of communication and self-disclosure in marital satisfaction (Brown, Rawlinson, & Hardin, 1982; Honeycutt, 1986; Waring, McElrath, Lefcoe, & Weisz, 1981). Finally, correlations between depression levels and marital adjustment have been reported in a sample of cancer patients (Lewis, Hammond, & Woods, 1993) and Ahern et al. (1985) found that depressed spouses of chronic pain sufferers reported a greater need for changes in their marriage than non-depressed spouses suggesting marital maladjustment in those families in which chronic pain and depression coexist. It is clear, therefore, that these problems may be interrelated in some way in a family system, but the particular sequence in which they appear in a given system is unknown and may vary from one family to another.

These aspects of the chronic pain family must influence family members, particularly children who grow up and learn by observing and interacting with their parents. In fact, previous research has linked these parental characteristics to social competence deficits in children.

Family Environment and Social Competence in Children

There is increasing recognition that social competence and the way one interacts with peers is greatly influenced by the family system. Ladd (1992) described several ways in which a child's peer system may be influenced by family relationships and processes. He talked about both direct and indirect pathways by which the family, particularly parents, affects the child's peer relations. Indirect pathways consist of characteristics of the family environment and of the relationships between its members to which the child is exposed. Such characteristics as the quality of child-parent attachment and child-rearing practices
are examples Ladd provides for indirect pathways between family and peer relations. Parents may also directly influence their children's social competence by being actively involved in their socialization, monitoring their social contacts, and teaching them how to act around their peers.

Family expressiveness and development of social competence. A characteristic often absent in chronic pain families, family expressiveness or the extent to which emotions are openly expressed between family members, seems to be an indirect pathway through which parents influence their children's social competence. Denham and Grout (1992) studied the effect of maternal expressiveness on children's prosocial behavior and reported a positive relationship between maternal level of expressiveness and children's prosocial behavior, except when negative emotions were expressed. This last finding is supported by several studies where parental negative emotional expression was associated with lower peer acceptance (Carson, 1991). These studies therefore suggest that emotion expression in the family is an important determinant of social competence in children and that specific types of emotions affect peer relations differentially.

A model of the factors involved in the association between family expressiveness and children's sociometric status was proposed by Parke and his colleagues (Parke, Cassidy, Burks, Carson, & Boyum, 1992). They argued that family expressiveness, through parent-child interactions, led to the development of "affect management skills" important in successful peer relations. This model was based on the assumption that adequate social relations require one to be able to understand others' emotional displays and to communicate clearly one's own emotions. Affect management skills therefore
consist of one's ability to identify and understand others' emotions as well as the ability to 
express and regulate one's emotions. Several studies provide support for this model.
According to social learning theory and the importance of parents as models of behavior, 
it is not surprising that children's ability to express emotions is greatly influenced by their 
parents' emotional expressiveness. This association between parental and child's 
expressiveness may be specific to the emotions expressed, with mothers' positive 
emotional expression being associated with children's positive expressiveness and 
mothers' negative emotion expression being associated with children's negative 
expressiveness (Denham, 1989).

Likewise, emotion understanding is affected by parental level of expressiveness. 
The degree to which parents express emotions determines individual differences in 
children's ability to understand emotions (Denham, Zoller, Couchoud, & Holt, 1994) as 
supported by several studies (Daly, Abramovitch, & Pliner, 1980; Kallioposka, 1985). 
Negative emotions expressed by parents, however, result in children's reduced ability to 
understand emotions, as supported by studies where maternal anger was negatively 
correlated with child's emotion recognition ability (Dunn & Brown, 1994). Also, 
Halberstadt (1986) reported low family expressiveness to be associated with better 
decoding ability of posed emotions. These results, however, may not be a valid 
representation of the relationship between family expressiveness and decoding ability in 
real-life situations, considering that family expressiveness was measured retrospectively in 
a sample of undergraduate students, that emotions were posed rather than spontaneous, 
and that undergraduates have already been exposed to other socialization influences that 
may mediate the relationship between family expressiveness and decoding ability.
A major criticism of all these studies is their emphasis on maternal influence which restricts the generalizability of their findings since most children are under both parents' influence and some gender specific effects may be involved. However, it seems reasonable to conclude, based on the overall consistency of previous research findings, that parental emotion expression contributes to the development of affect management skills in their children, namely the ability to express and understand emotions adequately.

In the second part of their model, Parke and his colleagues argue for the link between affect management skills and social competence. Several studies have provided support for the importance of both emotional encoding and decoding ability in one's ability to interact effectively with peers. Socially competent 9 and 12-year old children were better at both encoding and decoding facial expressions compared to those who were lower in social competence (Custrini & Feldman, 1989). This effect, however, was mostly due to a group difference between girls. That is, encoding and decoding ability seemed to be a more important determinant of social competence in girls than in boys. The authors argued that these results are consistent with the different socialization of girls and boys, with girls being taught to value the communication of internal states such as emotions in their interaction with others whereas boys resort more to overt behaviors. Such a gender difference in the relationship between social competence and affect management skills was corroborated in other studies (Feldman, White, & Lobato, 1982).

Further studies lend support to the model by Parke et al. (1992). Children's encoding ability was found to be associated with a general measure of their social skills as assessed by two adults familiar with them (Feldman et al., 1982). Children's ability to recognize others' emotions has also been shown to be an important determinant of
prosocial behavior and general peer competence (Denham, 1989; Denham et al., 1990). However, Feldman et al. (1982) failed to find a relationship between this same measure of social skills and decoding ability in a group of normal children. Yet, they found that emotionally disturbed children, who are assumed to be lower in social skills, were not as efficient in decoding others' emotions as were a group of normal children, suggesting a possible relationship between these two variables.

From this extensive literature review, it can be concluded that the degree of emotional expressiveness in the environment of children greatly affects their affect management skills, which in turn affects whether they effectively interact with others. This suggests the need to monitor the social skills of children living in environments which do not encourage expression of one's emotions.

**Parental depression and children's social adjustment.** Another characteristic of chronic pain patients, depression, adversely affects their children’s social functioning. Research on the adjustment of children of depressed parents reveals deficits in social competence that seem to be linked to the parenting style of depressed individuals and to other associated factors. Depressed parents are less effective in their interactions with others, including their children (Laroche, 1986) and they are less emotionally expressive with their newborns (Betts, 1988). They are also restricted in their behavior and more irritable which is likely to elicit less positive relationships with others (Downey & Coyne, 1990). Depressed parents may also be inadequate models of social competence since they seem to lack social skills themselves (Libet & Lewinsohn, 1973).
Several studies report social adjustment problems in the offspring of depressed parents. Children of depressed mothers score lower on teachers' ratings of popularity (Goodman, Brogan, Lynch, & Fielding, 1993) and 5-year old children of depressed mothers show more externalizing (i.e.: aggression) and internalizing (i.e.: social withdrawal) behavior problems than children of well mothers, with boys being more at risk for both types of behavior problems than girls (Zahn-Waxler, Iannotti, Cummings, & Denham, 1990). Children's behavior problems were also more stable over time in the depressed group, with aggressive behavior against the environment at age 2 being a significant predictor of externalizing behavior problems at age 5. On the other hand, for children of non-depressed mothers, behavior problems at age 2 were not as good a predictor of externalizing behaviors at age 5. These results therefore indicated less persistence of behavior problems in the non-depressed group over time. Furthermore, in their observations of mother-child interactions, Zahn-Waxler, Iannotti, Cummings, and Denham (1990) found that depressed mothers were less likely to encourage activities that facilitate peer relations for their child, such as playing with other children. The authors concluded that depressed mothers, by being introverted, socially withdrawn and ineffective in their social relations, are likely to transmit these problems to their children which will adversely affect their peer relationships. Maternal history of depression (both current and in remission) is also associated with both mothers' and teachers' ratings of child behavior problems on the Child Behavior Checklist (Richters & Pelligrini, 1989). Furthermore, these mothers are likely to report more child behavior problems as their depressed mood increased, replicating previous findings (Goodman, 1987).
A distinction has been made between current depressive symptoms and a diagnosis of major depression as predictors of children's social competence. Current maternal level of depressive symptoms, as measured on the Beck Depression Inventory, is a better predictor of maternal and teachers' ratings of child behavior problems and social competence than a diagnosis of major depression (Hammen et al., 1987).

It is not clear whether the social maladjustment of children of depressed parents is specific to that group. In other studies, the children of depressed parents have been found to be similar to children of other psychiatrically ill parents, such as schizophrenics (Goodman, 1987). However, it has been shown that a mediating factor in that relationship is the marital discord often present in marriages with a depressed spouse, but that this mediating effect of marital discord is specific to depression and is not found in schizophrenic mothers (Emery, Weintraub, & Neale, 1982). Goodman et al. (1993) also lend support for a multiple risk factor model of child behavior where depression alone may not always be associated with lower social functioning in the child, but along with concurrent factors such as marital discord or paternal diagnosis is likely to adversely affect the child. We can argue as well, following this model of multiple risk factors, that depression associated with chronic pain is likely to have a negative impact on children's social competence.

Marital adjustment and social adjustment in children. It has been documented that the quality of the marital relationship, often poor in chronic pain populations, affects children's social adjustment. There are two ways in which the marital relationship can affect children's social competence (Bryant & DeMorris, 1992). First, social adjustment
can be influenced through overt conflict to which the child is exposed and which provides him or her with poor models of behavior and a stressful environment. Second, it can be affected by a disruption in parent-child relationships (Emery & O’Leary, 1984).

It is important to distinguish between marital dissatisfaction and marital conflict as predictors of child adjustment. Although measures of marital adjustment are correlated with measures of open conflict (Emery & O’Leary, 1982), and although the former is associated with problem behaviors in children (Emery, 1982), it seems that marital conflict, particularly overt conflict, is a better predictor of behavior problems as measured on both the Externalizing-Internalizing dimensions of the Child Behavior Checklist and the Problem Behavior Checklist (Johnston, Gonzales, & Campbell, 1987; Porter & O’Leary, 1980). Grych and Fincham (1990) reviewed the literature on this relationship and concluded that marital conflict was associated with a range of behavior problems of overcontrol and undercontrol as well as with general measures of social competence in children. The relationship between marital conflict and children’s social competence may vary, however, depending on whether social competence is independently assessed or self-reported (Long, Forehand, Fauber, & Brody, 1987).

Gender differences have been reported in the relationship between children’s social competence and both marital dissatisfaction and marital conflict (Grych & Fincham, 1990; Peterson & Zill, 1986) with boys and girls being more likely to have behavior problems of undercontrol and overcontrol, respectively. Some studies have also found that although boys’ behavior problems were predicted by marital maladjustment and conflict, girls’ behavior problems were not. Both boys and girls were equally exposed to and aware of these marital problems, but were differentially affected by them (Emery &
O'Leary, 1982). In summary, research findings indicate that marital dissatisfaction, and more particularly marital conflict, are associated with socialization problems in children living in such a disrupted familial environment, but that these may affect boys and girls differentially.

**Socioeconomic status and social adjustment in children.** Socioeconomic status (SES), as measured by either income level or education level, or both, has been associated with several measures of social adjustment. Ladd (1991) developed a taxonomy of the different pathways between the family and children’s peer relations. Based on his review of the literature, he described the economic milieu of the family as an important variable influencing the quality of children’s peer relations. In fact, Patterson, Vaden, and Kupersmidt (1991) studied the relationship between peer rejection status and family background in elementary school children and reported that low parental income was one of the most important predictors of peer rejection. Furthermore, in a related study, Patterson, Griesler, Vaden, and Kupersmidt (1992) concluded that children who came from low-income housings had fewer companions for activities outside of school than children from more affluent homes and had even fewer companions for in-home activities. It therefore seems that economic disadvantage may put children at risk for social isolation. Patterson et al. (1992) offer some hypotheses, only indirectly supported by literature findings, for possible mediating variables between economic circumstances of the family and children’s social adjustment. For example, life transitions (moving, divorce) often occur concurrently with economic hardship and may be responsible for the relationship between low SES and children’s peer relations. Also, family interactions and family
processes in low-income families may be different than in higher-income families although this may not always be the case (Maziade, Bernier, Thivierge, & Cote, 1987). Based on these findings, it is likely that SES affects in some way children’s social functioning and it is therefore important to take this variable into account when studying children’s peer relations.

**Social Competence in Children of Chronic Pain Patients**

Since the familial environment is a powerful influence on children’s social development, children of chronic pain patients may show a deficit in social skills. As reported before, the chronic pain family has been described as alexithymic, depressed, and having marital difficulties. Each of these parental characteristics has also been linked to social competence deficits in children. Alexithymic pain patients are unlikely to express emotions clearly or even understand their own and others’ emotions. As a result, they may not provide their children with an adequate socialization experience. Both parents may also be depressed which, along with marital dissatisfaction, may increase the risk of social problems in the child. Although most studies on the marital relationship of chronic pain patients have measured spouses' satisfaction rather than amount of conflict, there often is conflict in the family functioning of these patients (Dura & Beck, 1988) as well as behavior control problems (Roy, 1987), and disturbances in parent-child relationships (Rowat & Knafl, 1985), all of which are associated with behavioral problems in children. It is therefore expected that children of chronic pain patients will have social competence deficits resulting from the characteristics of the sick parent and of the family context.
Prior findings have already suggested that children of chronic pain patients may have social competence deficits and behavior problems (Chun et al., 1993; Rickard, 1988).

Social competence has been identified as a protective factor against illness, with poor social competence being a very strong predictor of psychiatric prognosis, including depression (Wierzbicki & McCabe, 1988) and of outcome across a wide range of disorders (Harder et al., 1990). Social competence has also been associated with better social support (Cohen, Sherrod, & Clark, 1986) which, in turn, is a protective factor for health (Cassel, 1976) and has a stress-buffering effect (Cohen et al., 1986). Schwartzman (1985) stated that family socialization, by influencing the development of social skills, also impacts on the physical health of children and numerous studies have supported this view. Blechman, McEnroe, Carella, and Audette (1986) reported that children of depressed caregivers who lack social competence with peers are at higher risk of developing depression later than children with adequate social skills. Similar findings by Zahn-Waxler et al. (1988) show that two-year-old children of manic-depressive parents who demonstrated poor social skills were at higher risk for several psychiatric diagnoses by age six. These findings suggest that social competence, especially for children of maladjusted parents, may be a protective factor in the development of these children. Children of maladjusted parents with social skills deficits may therefore be at higher risk for health-related problems than other children.

A lack of social competence in children of chronic pain patients may put them at higher risk for developing chronic pain themselves thereby reproducing the familial cycle of chronic pain. Social competence may therefore be a determining factor in whether children of chronic pain patients develop chronic pain or not. Thus, findings about the
social competence of these children have important implications for their later adjustment and in understanding the cycle of chronic pain development within families.

The Current Study

The current study was designed to elaborate on previous studies which have looked at the impact of chronic pain on children. Most studies conducted so far (Dura & Beck, 1988; Rickard, 1988) have simply looked for group differences in the functioning of children from chronic pain families and pain-free families without attempting to provide explanations for differences observed. Chun et al. (1993) did attempt to identify potential predictors of children's functioning in chronic pain families but failed to find significant effects for depression and marital adjustment as predictors of child competence. Furthermore, Chun et al. (1993) neglected to look at the potential importance of alexithymia in the relationship between parental chronic pain and child functioning. Also, their findings may have been limited by methodological shortcomings, such as parents selecting which child would participate in the study.

In the current study, children of chronic pain patients in the community were compared to children of healthy, pain-free parents on measures of social competence. This study expanded on previous research by looking at a variety of direct and indirect links between chronic pain and child social competence. Specifically, the direct relationship between pain status and social competence was assessed and parental alexithymia, depression, and marital difficulties were evaluated as potential indirect links between chronic pain and child social functioning. The predictive value of pain duration, pain intensity, and length of time for which a child is exposed to the parent's pain were
also observed. Furthermore, due to evidence on the interaction between child gender and the impact of parental characteristics (Compas et al., 1994), differences between mother-daughter and mother-son pairs in the chronic pain group were assessed. Specifically, these pairs were compared on levels of child social competence and on predictors of child social competence.

**Hypothesis 1.** Based on studies conducted so far and on a body of literature providing support for the relationship between parental characteristics present in chronic pain families and children’s social competence, it was expected that children of chronic pain patients would show a deficit in social competence compared to a group of control children from families without chronic pain.

**Hypothesis 2.** Given previous findings on the high levels of depression (Kerns & Turk, 1984), alexithymia (Sivik & Hosterey, 1992), and marital difficulties (Ahern et al., 1985) found in chronic pain sufferers, it was expected that the chronic pain sample in this study would differ from the control group on these variables. Specifically, higher levels of depression, alexithymia, and marital dissatisfaction were expected in this group.

**Hypothesis 3.** Despite Chun et al.’s (1993) findings suggesting the lack of predictive value of depression and marital adjustment for children’s behavior problems, it was expected that parental characteristics of alexithymia, depression, and marital maladjustment would be significant predictors of social competence in children when
groups are combined. It was also suggested that pain status would be a predictor of children's social competence.

**Hypothesis 4.** As studies on the impact of illness have already suggested, it may be that illness status affects children indirectly by altering the quality of family relationships and the well-being of parents (Armistead et al., 1995; Folstein et al., 1983). It was expected that depression, alexithymia, and marital satisfaction in chronic pain sufferers would be significant predictors of their children's social competence. Furthermore, it was expected that social competence would be predicted by pain intensity and duration. Although no prior studies have looked at the length of time for which a child has been exposed to the parent's pain nor how this contributes to child functioning, it was expected that this variable would be an important factor in the relationship between parental chronic pain and child social competence.

**Hypothesis 5.** Several studies have looked at the social competence of children exposed to similar parental characteristics (i.e. depression) that children of chronic pain sufferers may be exposed to. They have reported, in some cases, more behavior problems in boys than in girls (Zahn-Waxler et al., 1990). Male children of chronic pain sufferers were also rated by teachers as less socially skilled than female children (Chun et al., 1993). Child social competence may therefore be different according to child gender, with girls of mothers with chronic pain showing more social skills than boys.
**Hypothesis 6**. Boys' social competence may be predicted by different parental characteristics than girls' social competence. Previous studies, for example, have shown emotion expression to be a more important determinant of girls' social competence than of boys' social competence (Custrini & Feldman, 1989). The ability of parents to express emotions may therefore affect girls more than it does boys.
CHAPTER III

METHOD

Subjects

Recruitment procedures. Support groups for injured workers, chronic headache sufferers, and fibromyalgia sufferers, located in Windsor, were contacted and volunteers were recruited from those groups. Also, posters advertising for participants were placed in a variety of medical, physiotherapy, and chiropractic clinics in the Windsor area and students attending the University of Windsor and St-Clair College were also reached through announcements in classes and posters. Finally, letters were sent to parents of children in junior kindergarten through grade 8 attending several public schools in Windsor and posters were put up in some child care centers.

Chronic pain sufferers were included in this study based on the following criteria: (1) Pain has been present for more than six months (Dura & Beck, 1988); (2) Pain is not due to a chronic disease such as cancer or multiple sclerosis, for example. These criteria define the chronic pain syndrome and are similar to criteria used in previous studies (Beutler et al., 1988, Dura & Beck, 1988); (3) Participants have children between the ages of 4 and 14 in junior kindergarten through grade 8. This age range was selected for two reasons: (i) The Teacher's Rating Form of the Matson Evaluation of Social Skills for Youngsters can be used to assess their behavior; and (ii) They are still in elementary school and therefore have regular contact with a teacher who can fill out the rating form. If more than one child met those criteria, all were tested in order to facilitate later matching of the chronic pain and control parent-child dyads on demographic characteristics. Only one child per family was ultimately included in the data analysis.
Inclusion criteria (4) required that children have lived at home with the chronic pain sufferer all their life and (5) Other family members of the chronic pain sufferer, including children, are free of any chronic illnesses or mental disorders. For practical reasons and the need for an adequate sample size, asthma was made an exception to criteria (5) unless it was described as severe. Also, children with behavioral disturbances such as conduct disorders were also included since these symptoms may reflect poor social competence and the exclusion of this group could therefore have biased the results.

Participants were included in the control group based on the following inclusion criteria: (1) They have never been in pain for more than six months; (2) They have children between 4 and 14 who are in junior kindergarten through grade 8; (3) Children have lived with the parent being assessed all their life (4) All family members are healthy (no chronic illness or mental disorder). Participants who reported being depressed were included since depression is a variable of interest in this study and children with behavioral disturbances or asthma were also included for reasons outlined previously.

Matching procedures. In the end, of the 20 pain families and 24 control families who participated, 20 parent-child pairs in each group were included in the analyses after each pair in the pain group was matched on age and sex of parent and age and sex of child with a pair in the control group. Matching pairs in terms of age was done within a range of 5 years or less. For example, a 36-year old female chronic pain sufferer and her 7-year old son were matched with a 32-year old female in the control group and her 6-year old son. These matchings were made in light of literature findings stressing the interaction effect of sex of parent and sex of child in the impact of illness on children (Compas et al.,
findings which were also found in studies looking at the functioning of children in chronic pain families (Chun et al., 1993). Finally, age of parent and child were also described as important variables mediating the effect of illness on the family (Rankin & Weekes, 1989). Previous studies which have looked at the impact of chronic pain on children have matched the groups on several variables, including sex and age of parent and sex and age of child (Chun et al., 1993; Dura & Beck, 1988; Rickard, 1988) but none of them have matched specific parent-child dyads on all these variables at once. These pairings will allow for clearer conclusions about differences in the social competence of children in the two groups, unbiased by demographic variables.

Characteristics of sample. After matching, there were 18 mothers and 2 fathers in each group, with 10 male children and 10 female children in each group. The average parental age in the chronic pain group was 35.8 (range 30-43) and 35.3 in the control group (range 28-44) while children of chronic pain sufferers and children of controls had an average age of 8.1 (range 5-14) and 7.2 (4-13), respectively. The age distribution of children as well as other demographic characteristics of chronic pain sufferers and controls are shown in Table 1.

Twenty-five percent of chronic pain sufferers reported head pain, another 45% reported head pain accompanied by pain in at least one other area including neck and shoulders, back, limbs, hands and feet, stomach or other. Another twenty-five percent
Table 1

**Demographic Characteristics of Chronic Pain Sufferers and Controls.**

<table>
<thead>
<tr>
<th></th>
<th>Chronic Pain Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Married, never divorced</td>
<td>16(80%)</td>
<td>13(65%)</td>
</tr>
<tr>
<td>-Divorced, remarried</td>
<td>1(5%)</td>
<td>3(15%)</td>
</tr>
<tr>
<td>-Divorced, single</td>
<td>2(10%)</td>
<td>4(20%)</td>
</tr>
<tr>
<td>-Single, never married</td>
<td>1(5%)</td>
<td>0</td>
</tr>
<tr>
<td><strong>Duration of marriage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>12.6 years</td>
<td>12.4 years</td>
</tr>
<tr>
<td>Range</td>
<td>9mths-23 yrs.</td>
<td>10mths-21yrs.</td>
</tr>
<tr>
<td><strong>Spouse's age</strong></td>
<td></td>
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</tr>
<tr>
<td>Mean</td>
<td>37.9 years old</td>
<td>38.1 years old</td>
</tr>
<tr>
<td>Range</td>
<td>28-48</td>
<td>25-49</td>
</tr>
<tr>
<td><strong>Number of children</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Range</td>
<td>1-5</td>
<td>1-5</td>
</tr>
<tr>
<td><strong>Age of children</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-6</td>
<td>5(25%)</td>
<td>11(55%)</td>
</tr>
<tr>
<td>7-9</td>
<td>9(45%)</td>
<td>5(25%)</td>
</tr>
<tr>
<td>10-12</td>
<td>5(25%)</td>
<td>3(15%)</td>
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<td>13-14</td>
<td>1(5%)</td>
<td>1(5%)</td>
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*Table continues*
<table>
<thead>
<tr>
<th>Household SES*</th>
<th>Chronic Pain Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>-I</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>-II</td>
<td>2 (12.5%)</td>
<td>3 (15.8%)</td>
</tr>
<tr>
<td>-III</td>
<td>6 (37.5%)</td>
<td>10 (52.6%)</td>
</tr>
<tr>
<td>-IV</td>
<td>7 (43.7%)</td>
<td>4 (21%)</td>
</tr>
<tr>
<td>-V</td>
<td>1 (6.2%)</td>
<td>2 (10.5%)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>Chronic Pain Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Full-time</td>
<td>6 (30%)</td>
<td>10 (50%)</td>
</tr>
<tr>
<td>-Part-time</td>
<td>4 (20%)</td>
<td>2 (10%)</td>
</tr>
<tr>
<td>-Disabled</td>
<td>4 (20%)</td>
<td>0</td>
</tr>
<tr>
<td>-Unemployed</td>
<td>3 (15%)</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>-Student</td>
<td>3 (15%)</td>
<td>4 (20%)</td>
</tr>
</tbody>
</table>

* A higher SES is indicated by a lower class on the Hollinshead measure.
reported neck and shoulders pain without head pain but accompanied by pain in one or more of the areas already described and 5% reported back pain. On average, participants had been in pain for 11.7 years (range 2-27) and reported a pain intensity of 6.2 (range 1-10) on the visual analog scale ranging from 1 (no pain) to 10 (worst pain imaginable). Participants were also asked about pain frequency, diagnosis of pain disorder, injury, surgery and pain medication. These results are reported in Table 2.

Finally, all participants were asked about a history of diagnosed depression. In the chronic pain group, 40% reported having been diagnosed with depression in the past whereas only 10% of pain-free participants did. Of those who reported a history of depression, half of the pain group reported being currently depressed whereas nobody in the control group did. Furthermore, 87.5% and 50% of pain sufferers and pain-free participants, respectively, who reported a history of depression had taken anti-depressants in the past whereas half of those in the control group and only 37.5% of pain sufferers were currently taking anti-depressant medication.

Parental Measures

Alexithymia. The Toronto Alexithymia Scale-20 items (TAS-20, Bagby, Parker, & Taylor, 1994) was used to measure alexithymia in chronic pain patients. The TAS (Taylor, Ryan, & Bagby, 1985) was first revised in order to improve its factor structure. It produced the following four factors: (1) difficulty identifying and distinguishing between feelings and bodily sensations; (2) difficulty describing feelings; (3) reduced daydreaming; and (4) externally-oriented thinking. Although the four factors were
Table 2

Pain Characteristics of the Pain Group and Related Data

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequencies (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain Disorder</td>
<td></td>
</tr>
<tr>
<td>-Headaches/Migraines</td>
<td>10(50%)</td>
</tr>
<tr>
<td>-Fibromyalgia</td>
<td>4(20%)</td>
</tr>
<tr>
<td>-None</td>
<td>6(30%)</td>
</tr>
<tr>
<td>Pain Frequency</td>
<td></td>
</tr>
<tr>
<td>-All the time</td>
<td>11(55%)</td>
</tr>
<tr>
<td>-Once a day</td>
<td>2(10%)</td>
</tr>
<tr>
<td>-Once a week or more</td>
<td>2(10%)</td>
</tr>
<tr>
<td>-Less than once a week</td>
<td>4(25%)</td>
</tr>
<tr>
<td>Pain caused by injury</td>
<td>11(55%)</td>
</tr>
<tr>
<td>Received surgery for pain</td>
<td>6(30%)</td>
</tr>
<tr>
<td>-Nbr. of surgeries</td>
<td>2.3 (range 1-5)</td>
</tr>
<tr>
<td>Currently taking medication</td>
<td>17(85%)</td>
</tr>
</tbody>
</table>
replicable across samples, the first two factors were highly correlated and the third factor was poorly correlated with the full TAS and negatively correlated with the first factor. The revised TAS (TAS-R; Taylor, Bagby, & Parker, 1992) is a 23-item scale with two factors: Factor 1 is composed of items assessing the ability to distinguish between feelings and the bodily sensations associated with emotional arousal and the ability to describe feelings. Factor 1 corresponds to the first two factors of the TAS. Factor 2 is composed of items assessing externally oriented thinking and corresponds to factor 4 of the TAS.

The TAS-R was revised again in order to yield a three factor structure representing better the data. A new set of items were extracted from the item pool used to create the TAS-R. The forty three items were factor analyzed to see how they loaded on the four original factors of the TAS. The criterion for loading was set higher than in previous scales. Factor 3 (daydreaming) was eliminated due to a lack of items significantly loading on it. Twenty of the forty three items significantly loaded on a three factor solution forming the new TAS-20. Factor 1 represents one’s ability to identify feelings and distinguish between feelings and bodily sensations of emotional arousal, Factor 2 represents one’s inability to communicate feelings to others, and Factor 3 relates to externally-oriented thinking. This factor structure is replicable across clinical and nonclinical populations and in young adult populations of different cultural background (Bagby, Parker, & Taylor, 1994; Parker, Bagby, Taylor, Endler, & Schmitz, 1993).

The TAS-20 demonstrates good internal consistency. Cronbach’s alpha coefficients are 0.81 for the total scale, 0.78 for factor 1, 0.75 for factor 2, and 0.66 for factor 3 (Bagby et al., 1994). Similar coefficients have been reported by Parker, Bagby, et al. (1993). The scale also has good test-retest reliability with a coefficient of 0.77.
Evidence for the concurrent, convergent, and discriminant validity of the TAS-20 is also available (Bagby et al., 1994). Convergent validity was established by strong negative correlations, between scores on the TAS-20 and both measures of openness to feelings ($r = -0.30$) and openness to fantasy ($r = -0.55$), two characteristics theoretically incongruent with alexithymia. Authors also argued for the discriminant validity of the TAS-20 based on nonsignificant correlations between scores on the total scale and scores on measures of agreeableness and conscientiousness, two concepts unrelated to alexithymia. Finally, concurrent validity of the scale was established in a behavioral medicine sample with a significant correlation ($r = 0.53$) between TAS-20 total score and score on the Beth Israel Hospital Psychosomatic Questionnaire, another measure of the alexithymia construct.

Respondents complete the TAS-20 by using a 5-point Likert scale to indicate the extent to which they agree or disagree with each statement. The scale ranges from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate higher levels of alexithymia and cut-off scores are 51 or less for nonalexithymic and 61 or above for alexithymic (Parker, Taylor, & Bagby, 1993). Parker, Bagby, et al. (1993) reported gender differences in scores on the TAS-20, with men scoring significantly higher than women. Authors argued that such a finding is consistent with research showing that women are better at communicating feelings than their male counterparts.

**Depression.** Parental depression in both groups of parents was measured using the Beck Depression Inventory (BDI, Beck, Rush, Shaw, & Emery, 1979). This version was developed to address several problems with the original BDI version (Beck, Ward,
Mendelson, Mock, & Erbaugh, 1961) and therefore had a reduced number of responses for some items and differently worded responses for other items. The BDI is a self-report scale consisting of 21 clusters of items each representing a depressive symptom, for example, irritability, pessimism, and weight loss. Items are rated from 0 to 3 in terms of intensity and respondents have to choose which item best describes them.

Beck, Steer, and Garbin (1988) reviewed the literature on psychometric properties of the BDI. They reported alpha coefficients ranging from 0.76 through 0.95 with a mean of 0.86 in psychiatric populations, a finding consistent with Beck and Steer (1984) who reported an alpha coefficient of 0.86 for the 1978 version of the BDI in a psychiatric sample. In non-psychiatric samples, Beck et al. (1988) found that alpha coefficients ranged from 0.73 through 0.92 with a mean of 0.81. They also reviewed studies looking at the stability of the BDI over time. They reported Pearson product-moment correlation coefficients ranging from 0.48 to 0.86 in psychiatric populations and from 0.60 to 0.83 in non-psychiatric populations.

The validity of the BDI has been shown in many studies. These were reviewed by Beck et al. (1988) who reported Pearson product-moment correlation coefficients of the BDI with clinical ratings and other measures of depression. They found that correlations with clinical ratings were between 0.55 and 0.96 in psychiatric populations, with a mean of 0.72 whereas they ranged between 0.55 and 0.73 in non-psychiatric samples with a mean of 0.60. Furthermore, correlations with the Zung Depression Inventory (Zung, 1965) ranged between 0.57 and 0.83 with a mean of 0.76 in psychiatric populations and ranged between 0.66 and 0.86 with a mean of 0.71 in non-psychiatric populations.
The BDI was shown to have good discriminant validity and was able to differentiate between psychiatric and non-psychiatric populations (Byerly & Carlson, 1982; Cavanaugh, Clark, & Gibbons, 1983) and some of its items were useful in discriminating psychiatric, medical, and normal samples (Cavanaugh et al., 1983). Furthermore, the BDI demonstrated good construct validity with studies reporting positive relationships between BDI scores and loneliness (Reynolds & Gould, 1981) and between different stressful life events and depression levels as measured on the BDI (Hammen & Mayol, 1982).

A maximum score of 63 may be obtained with suggested cut-off scores varying between different samples and depending on one’s purpose for using the BDI (Beck et al., 1988). Turner and Romano (1984) compared scores on the BDI and clinical diagnoses of depression and suggested a cut-off score of 13 with an associated sensitivity of 0.83 and a specificity of 0.82. On the other hand, Bishop, Edgley, Fisher, and Sullivan (1993) suggested a cut-off of 15 for this population and reported a sensitivity of 0.80 and a specificity of 0.70 when using that cut-off. Furthermore, they reported sensitivity and specificity values for all cut-offs between 9 and 21 and reported a sensitivity of 0.84 and specificity of 0.60 when using the cut-off score of 13 suggested by Turner and Romano (1984). Clearly, Turner and Romano may have underestimated the specificity value associated with a cut-off score of 13, a finding which may be attributed to their significantly smaller sample than the one used by Bishop et al. (1993). Other studies (Williams & Richardson, 1993) have used 13 as a cut-off and have argued that the BDI may overestimate the rate of depression in chronic pain populations. They explained this finding by pointing to the number of somatic items in the scale. They suggested that
raising the cut-off score would not be an adequate solution to this problem but rather, that one should compute separately participants’ score on the somatic factor they identified and look at its contribution to the total score. The limitation of using somatic items in measuring depression in chronic pain populations (Turner & Romano, 1984) and in medical populations (Cavanaugh et al., 1983) has been stressed in previous studies. However, these same studies, after studying the utility of the BDI in these samples, have argued for the usefulness of this scale in both chronic pain and medically ill populations. Endicott (1984) also turned his attention to this problem and suggested that somatic items related to physical symptoms observed in the population under study be omitted from the diagnostic criteria or scale. Given findings about the usefulness of the BDI when used with a cut-off score of 13 in a chronic pain population (Turner & Romano, 1984), this value was used to screen for depression in this study. However, the contribution of somatic items to the total score were monitored to detect a possible inflation of depression scores due to the confounding effects of these items, as suggested by Williams and Richardson (1993).

Marital satisfaction. The Short Marital Adjustment Test (SMAT; Locke and Wallace, 1959) was used to measure marital satisfaction in this study. It is one of the most frequently used scale of marital adjustment (Harrison & Westhuis, 1989). Locke and Wallace defined marital adjustment as "the accommodation of a husband and a wife to each other at a given time". The scale contains 15 items and has no subscales. Scores may range between 2 and 158 on the scale and a cut-off score of 100 was suggested by
Locke and Wallace (1959) to differentiate between adjusted and maladjusted marriages with a sensitivity of 0.96 and a specificity of 0.83.

The SMAT has a split-half reliability of 0.9 (Locke & Wallace, 1959) and good internal consistency as measured by an alpha coefficient of 0.83 (Burnett, 1987). Cross and Sharpley reported between item-correlations ranging between 0.04 and 0.61 with a mean of .38. Finally, a product-moment correlation of 0.88 has been found between different administrations of the SMAT, therefore establishing its test-retest reliability (Hudson & Glisson, 1976).

Discriminant validity for the SMAT was established, with significant differences in SMAT scores between clinical couples and non-clinical ones (Haynes, Follingstead, & Sullivan, 1979; Hudson & Glisson, 1976). A concurrent validity of 0.89 with the Stuart Marital Precounseling Inventory (Stuart, 1973) has been reported (Haynes et al., 1979) while Hudson and Glisson (1976) reported a concurrent validity of -0.74 with their Index of Marital Satisfaction. Bagarozzi (1985) reported a concurrent validity of 0.88 among divorced couples and of 0.86 among married couples with the Dyadic Adjustment Scale (Spanier, 1976).

The SMAT was criticized by Cross and Sharpley (1981) for having items which do not contribute to its validity with item 1 and item 14 together having almost the same discriminant validity as all 15 items together. However, there are no disadvantages to using all items, except for time. They also reported two factors in the SMAT, one measuring marital adjustment and accounting for 89% of the variance and a second factor they interpreted as reflecting social desirability. However, Hawkins (1966) had previously shown that social desirability only introduced a negligible amount of error in the
measurement of marital satisfaction using the SMAT. Advantages of this scale are that it is short, easy to administer and requires an 8th to 9th grade reading ability (Dentch, O'Farrell, & Cutter, 1980).

**Socioeconomic status (SES).** The Two Factor Index of Social Position developed by Hollingshead (1965, as cited in Myers & Bean, 1968) was used to measure SES. The scale is divided into two separate scales, one for occupation and one for educational level. The occupation scale ranges from 1 (executives and proprietors) to 7 (unskilled workers). The educational scale also ranges from 1 (graduate professional training) to 7 (less than seven years of schooling). The Social Position score is calculated by multiplying the occupational level by 7 and the educational level by 4 and adding them up. Scores may range from 11 to 77 with a high score indicating lower social position. One’s social class may also be determined using the following criteria for each of five social classes: (I) 11-17, (II) 18-27, (III) 28-43, (IV) 44-60, and (V) 61-77.

**Child Measures**

**Social competence.** The Teacher-Report version of the Matson Evaluation of Social Skills with Youngsters (MESSY; Matson, Rotatori, & Helsel, 1983) was used to assess children's social competence. This scale is appropriate for children aged 4 to 18 years. It consists of 64 items describing a wide range of social behaviors. Teachers rate each item on a 5-point Likert scale ranging from 1 (not at all) to 5 (very much) according to the frequency with which the child performs the behavior described or feels like the statement described. Subscales are Appropriate Social Skills, Inappropriate
Assertiveness/Impulsive and Miscellaneous Items. These subscales were obtained through factor analysis and item loadings of 0.3 was required for items to be retained on a factor. Separate scores may be obtained for each factor or a total score may be computed. A higher score indicates fewer social skills.

The scale shows good internal consistency and test-retest reliability. Pearson correlation coefficients of at least 0.55 for a 2-week interval test-retest reliability was the inclusion criterion for all items (Matson et al., 1983). Split-half reliability coefficients of 0.87 and interitem correlations of 0.93 (Matson, 1990) were found in populations of visually-impaired and hearing-impaired children.

Concurrent and predictive validity of the MESSY were established with the Children Depression Inventory (Wierzbicki & McCabe, 1988) and both factors of the MESSY, appropriate social skills and inappropriate social skills, were shown to correlate negatively and positively with childhood depression as measured by total score on the CDI, respectively. Both factors correlated differentially with different factors on the CDI as well (Helsel & Matson, 1984). The MESSY was also shown to correlate well with other measures of social skills in a non-clinical population, such as structured interviews, popularity rankings, and the School Behavior Checklist (Matson, 1990). Concurrent validity of the MESSY with other measures of social skills, such as nomination measures of social behavior, was also established in clinical populations of children (Kazdin, Matson, & Esveldt-Dawson, 1984). Finally, discriminant validity of both scales of the MESSY was established in a study comparing clinical populations of children and normal controls on their level of social skills. Both groups of clinic children were shown to have
fewer social skills and more inappropriate assertive/impulsive social skills than controls (Strauss, Lease, Kazdin, Dulcan, & Last, 1989).

Matson (1990) provided norms for the MESSY which were established on a sample of 322 normal children. Norms were calculated by estimating linear age and gender effects. The author reports gender effects on the MESSY, with girls showing lower scores (i.e., more social skills) than boys, as well as age effects, with younger children showing higher scores (i.e., less social skills) than older children. Wierzbicki and McCabe (1988), however, did not find gender effects.

Procedures

Participants were first selected over the phone on the basis of a screening questionnaire (see Appendix A/B) assessing them in terms of the inclusion criteria mentioned before. Those who met selection criteria were given an appointment for themselves and their child or children either at the University of Windsor or at their own home. Those who traveled to the university for testing were compensated with $2 for gas expenses. During testing, each child was first informed about the study, what it involved for him or her, and was asked to sign an assent form if he or she agreed to participate (see Appendix C/D). Each child had the opportunity to refuse to participate in this study. Then the parent was asked to read and sign a consent form (Appendix E) and to fill out a Release of Information Consent Form (see Appendix F) allowing the teacher to complete the MESSY and return it to the researcher. Finally, the parent completed a battery of questionnaires including a demographic data questionnaire (see Appendix G/H), the TAS-20, the BDI and the SMAT. Spouses of chronic pain sufferers and of their matched
controls were not asked to complete the SMAT for practical purposes and based on previous studies showing intercorrelations between spouses' reports on this scale.

Lichtman, Taylor, and Woods (1987) reported a significant correlation ($r = .54, p < .001$) between spouses' scores on the SMAT as well as Ahern, Adams, and Follick (1985) who reported a correlation of $r = 0.57$ ($p < 0.001$) between scores of chronic pain patients and their spouses.

With all the consent forms completed, the Teacher's Rating Form of the MESSY was sent to the teacher identified by parents and children as having the most contact with the child. The teacher was told only that the child was participating in a study on the social competence of children between the ages of 4 and 14 to avoid future prejudice toward the child by the teacher, that is, to avoid the child being seen as different from others by the teacher because of parents' health status. The teacher received a package containing an instruction sheet (see Appendix I), the form allowing the release of information, the Teacher's Rating Form of the MESSY, and a return envelope. Those teachers who failed to return questionnaires within three weeks were contacted.

All information was kept strictly confidential. Code numbers were assigned to parent-child dyads and only these numbers appeared on the questionnaires. The name and code number appeared together only on the parent consent form, child assent form, and release of information form. These were kept separate from the completed questionnaires.

To respect the child's rights to confidentiality and to minimize risks associated with getting feedback on the questionnaires completed, both parent and child agreed not to look at their scores and parents agreed not to have access to their child's score on the MESSY. However, since completing questionnaires may increase one's awareness about
personal issues and cause a need to consult, a list of agencies was included with the parent consent form. All participants were entered into a draw to win a $50 gift certificate at Big V stores.
CHAPTER IV

RESULTS

Data Screening and Preliminary Analyses

Examination of the data prior to analyses revealed that BDI scores, TAS scores, and child age were not normally distributed in the sample. Data transformations were performed, with BDI scores undergoing a logarithmic transformation and TAS scores and child age, an inverse transformation.

Examination of the chronic pain sample (n=20), revealed that the variable “exposure to pain” was not normally distributed so a logarithmic transformation was applied to this variable for subsequent analyses.

In the sample of chronic pain mothers and their children (n=18), T scores on the total MESSY and raw scores on the inappropriate/impulsive subscale of the MESSY lacked a normal distribution and were therefore transformed with a logarithmic function. Within that sample, T scores on the Inappropriate/impulsive subscale of the MESSY lacked a normal distribution in the female children group. This variable was therefore transformed into its inverse. In the male children group, values representing children’s length of exposure to their parents’ pain and child age were not normally distributed. These variables therefore underwent an inverse transformation for further analyses.

To address the issue raised by Williams and Richardson (1993) concerning the possible inflation of BDI scores in chronic pain samples due to overendorsement of somatic items of work inhibition, sleep disturbance, fatigability, loss of appetite, and loss of weight, the items most frequently endorsed by chronic pain sufferers were identified.
The most frequently endorsed item, fatigability, was reported by 100% of the sample, irritability was the second most frequent complaint with 90% of the sample endorsing it, while sleep disturbance was found in 80% of them and work inhibition in 75% of them along with somatic preoccupation.

Demographic Differences Between Groups

First, given the potential influence of SES on children’s social competence (Patterson et al., 1991) and on the family living with a chronic condition (Woods & Lewis, 1995), differences in household SES between the pain and control groups were assessed using a Pearson chi-square test. No significant difference emerged between the groups on that measure ($X^2 (3, N=35) = 2.11, p>0.05$). Also, given evidence for the effect of marital status, specifically of divorce and single parenting (Patterson et al., 1991) on children’s social competence, differences between groups on these variables were also assessed using a Pearson chi-square test. Again, no significant differences were found between the groups’ marital status, with $X^2 (3, N=40) = 2.97, p>0.05$.

Finally, to confirm the appropriate matching of groups on parent’s age and child’s age, groups were compared on both variables using t-tests for independent groups. No significant differences were found on either parent’s age ($t(34)= -0.37, p>0.05$) or child’s age ($t(38)= -1.12, p>0.05$).

Hypothesis 1

It was expected that children of chronic pain sufferers would be rated by teachers as having less appropriate social skills and more inappropriate social skills than children of
pain-free controls. Mean T scores for the pain group and control group, respectively, were 45.2 and 46.4 on the total MESSY, 45.6 and 47.6 on the inappropriate/impulsive social skills subscale, and 52.6 and 55 on the appropriate social skills subscale. Group differences on these measures were assessed using t-tests for independent samples. No significant differences were found between groups on any of these child measures.

Hypothesis 2

It was predicted that chronic pain sufferers would be more depressed, less satisfied with their marital relationship, and more alexithymic than controls. Frequencies revealed that 45% of chronic pain sufferers scored in the depressed range on the BDI whereas none of the controls did, 58.8% of them reported a lack of marital satisfaction on the SMAT as opposed to 37.5% of controls, and 35% of pain sufferers scored in the alexithymic range of the TAS whereas 5% of the controls did. To assess whether there were significant group differences on levels of depression, alexithymia, and marital satisfaction a one-way MANOVA was performed. Results showed a significant difference between groups on these variables using Hotellings’ $T^2$ as criterion for significance with $F(4,28)=8.11$, $p<0.01$. Univariate comparisons revealed significant differences between groups in depression levels ($F(1,29)=31.6$, $p<0.001$) and a marginal difference in alexithymia ($F(1,29)=3.9$, $p<0.1$). Mean scores and standard deviations for each group and results of univariate F-tests are shown in Table 3.
Table 3.

**Means, Standard Deviations, and Group Differences in BDI, TAS, and SMAT**

<table>
<thead>
<tr>
<th></th>
<th>Pain Group</th>
<th>Control Group</th>
<th>Univariate F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BDI</strong></td>
<td></td>
<td></td>
<td>34.4**</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>14.2</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>9.3</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td><strong>Total TAS</strong></td>
<td></td>
<td></td>
<td>3.42*</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>47.0</td>
<td>37.5</td>
<td></td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>17.1</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td><strong>SMAT</strong></td>
<td></td>
<td></td>
<td>2.8</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>90.2</td>
<td>109.2</td>
<td></td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>36.3</td>
<td>28.4</td>
<td></td>
</tr>
</tbody>
</table>

* p<0.1, ** p<0.001.
Hypothesis 3

Parental depression, marital satisfaction, alexithymia, and pain status were expected to predict children’s social competence. A hierarchical multiple regression was performed to assess the contribution of these characteristics to the child’s overall social competence taking into account relevant covariates identified through correlation matrices.

Child age was treated as a covariate because of its correlation with total MESSY score ($r(40) = 0.38$, $p<0.05$) and was entered first into the regression equation. Results revealed a significant regression coefficient ($F(1, 29) = 6.42$, $p<0.05$) for child age with higher age being associated with more social skills. Unstandardized regression coefficients ($R$) and squared partial correlations ($R^2$) for child age and other predictors added to the regression equation as well as multiple correlation coefficient ($R$) and $R^2$ are shown in Table 4.

Standard multiple regressions were then performed to predict children’s inappropriate/impulsive social skills and appropriate social skills. No predictors for appropriate social skills or inappropriate social skills were found.

Examination of simple correlations between variables revealed significant correlations between BDI and SMAT ($r(29) = -0.38$, $p<0.05$), with depression being positively associated with marital difficulties. Correlations between BDI and TAS ($r(29) = -0.6$, $p<0.001$) and between BDI and Pain status ($r(29) = 0.72$, $p<0.001$) also revealed that depression was positively associated with both alexithymia and pain status. Furthermore, a significant correlation was found between TAS and pain status ($r(29) = 0.35$, $p<0.05$) indicating that alexithymia is positively associated with pain status.
Table 4

Results of the Hierarchical Regression for Total MESSY Scores in the General Sample.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>$sr^2$</th>
<th>B</th>
<th>Multiple R</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child age</td>
<td>.18</td>
<td>58***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*TAS</td>
<td>.22</td>
<td>-419.6***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

.63**        4

* p<0.1; ** p<0.05; *** p<0.01

*Parental alexithymia predicted fewer social skills
**Hypothesis 4**

The social skills of children of chronic pain sufferers were expected to be predicted by parental depression, marital satisfaction, alexithymia, pain intensity, and pain duration. It was also expected that length of children’s exposure to parental pain would be an important predictor of their social competence. A hierarchical multiple regression was performed to assess the specific importance of various characteristics of chronic pain sufferers in predicting child overall social competence. Parental variables used as predictors included level of depression, alexithymia, and marital satisfaction as well as pain intensity and duration.

Length of time for which children were exposed to their parent’s pain ("exposure to pain") was also assessed as a predictor of their social competence. Child age was again treated as a covariate and entered first into the regression equation due to its significant correlation with Total MESSY ($r(20)=0.49$, $p<0.05$). Results revealed non significant regression coefficients for child age alone. Multiple $R$ and $R^2$ obtained after other predictors were entered into the regression equation as well as unstandardized regression coefficients ($B$) and squared partial correlations ($sr^2$) of significant predictors are shown in Table 5.

Two standard multiple regressions were then performed using the same predictor variables for both inappropriate/impulsive social skills and appropriate social skills. Results for appropriate social skills are shown in Table 5. Inappropriate social skills, however, failed to be significantly predicted by those parental characteristics included in these analyses.
Table 5.

Results of Regression Analyses for the Social Competence of Chronic Pain Sufferers’

Children.

<table>
<thead>
<tr>
<th></th>
<th>Multiple R</th>
<th>R square</th>
<th>sr²</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total social competence</td>
<td>.83*</td>
<td>.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain Intensity</td>
<td>.23</td>
<td>1.6**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure to pain</td>
<td>.23</td>
<td>-17.9**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BDI</td>
<td>.12</td>
<td>-43*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAS</td>
<td>.16</td>
<td>.27*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriate social comp.</td>
<td>.82**</td>
<td>.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BDI</td>
<td>.27</td>
<td>1.5**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAS</td>
<td>.28</td>
<td>-.82**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure to pain</td>
<td>.38</td>
<td>46.9***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p<0.1; ** p<0.05; *** p< 0.01.

*Fewer social skills as indicated on the total MESSY were predicted by lower parental depression, less exposure to a parent’s pain, higher parental pain intensity, and higher alexithymia.

*Fewer appropriate social skills were predicted by higher parental depression and alexithymia, and less exposure to a parent’s pain.
Significant correlations were found between exposure to pain and both total social competence ($r(15) = -0.5$, $p<0.05$) and appropriate social skills ($r(15) = 0.61$, $p<0.01$) as expected from the multiple regressions' results. The only correlation with inappropriate social skills was a marginally significant one with pain intensity ($r(15) = 0.4$, $p<0.1$) which indicated a positive relationship between the two variables. Other significant correlations were found between the BDI and TAS ($r(15) = 0.81$, $p<0.01$) and between BDI and pain duration ($r(15) = -0.46$, $p<0.05$) indicating that parental depression is positively associated with alexithymia and decreases as pain duration increases. Finally, pain duration and exposure to pain were positively correlated with each other ($r(15) = 0.55$, $p<0.05$).

Post-hoc Analyses on the Relationship between Parental Pain Duration and Children's Social Competence

In an attempt to find explanations for the lack of significant difference between the chronic pain and control group on measures of child social competence, data were further examined. Specifically, it was observed that 19 out of the 20 chronic pain sufferers had a pain duration of longer than 3 years. Furthermore, post-hoc analyses were conducted to look for differences in child social competence between groups of different pain duration. The chronic pain sample was therefore divided along its median split for pain duration which corresponded to a pain duration of 9 years.

Mean scores for the group with shorter pain duration and the group with longer pain duration were 46.7 and 43.3, respectively, on the total MESSY, 45.9 and 45.1 on the inappropriate/impulsive subscale, and 47.9 and 58.4 on the appropriate social skills subscale. Differences between the two newly created groups in total MESSY score and
each of the two subscales were assessed using t-tests for independent samples. Only a marginal significant difference emerged between these groups in levels of appropriate social skills ($t(18) = -1.99, p < 0.1$).

In order to assess whether the differences observed in children’s appropriate social skills may be due to differences in parents’ functioning between the two groups, a MANOVA was conducted with BDI, TAS, and SMAT. No significant differences were found between groups on these variables.

**Hypothesis 5**

Male children were expected to have less social skills than female children. Gender differences in children’s scores on the total MESSY, appropriate social skills scale, and inappropriate/impulsive social skills scale were tested using t-tests for independent samples. No significant differences were found on these measures.

**Hypothesis 6**

Predictors of social competence were expected to be different between boys and girls. Despite the small sample sizes ($n=9$ in boys, $n=7$ in girls), multiple regressions were conducted for each social skill subscale and for the total scale using parental alexithymia, depression, marital satisfaction, pain intensity, and exposure to pain as predictors of boys’ and girls’ social competence, respectively. In the male group, marital status was treated as a covariate of inappropriate/impulsive social skills ($r(7) = 0.66, p < 0.5$) and child age as a covariate of total MESSY scores ($r(7) = 0.75, p < 0.05$).
Due to the small sample size, a near perfect solution was obtained for the regression of females’ total scores on the MESSY but no significant predictors of social competence were identified in either group. The BDI, however, contributed marginally to the variance in the total MESSY scores of boys ($r^2 = 0.5$) and indicated that parental depression predicted more social skills in boys. Significant correlations between social skills measures and relevant variables in each gender group are shown in Table 6.

**Post-hoc Analyses on Raw MESSY Scores**

To assess whether the lack of gender differences in social skills may have been due to the use of T scores on the MESSY, t-tests for independent samples were computed using raw scores on each subscale of the MESSY. Mean raw scores for boys and girls respectively were 68.9 and 73.8 on the appropriate social skills subscale, 67.5 and 66.5 on the inappropriate/impulsive social skills subscale, 126.3 and 118.1 on the total scale. No significant gender differences were found.
Table 6

Correlations between Variables for Boys and Girls in the Chronic Pain Sample.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Variables</th>
<th>MESSY Appropriate</th>
<th>MESSY Inappropriate</th>
<th>MESSY Total</th>
<th>Exposure to pain</th>
<th>BDI total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td><strong>BDI</strong></td>
<td>0.63**</td>
<td>0.6**</td>
<td>-0.75**</td>
<td>-0.6*</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>TAS</strong></td>
<td>0.53*</td>
<td>0.56**</td>
<td>0.72**</td>
<td>0.76**</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Exposure to pain</strong></td>
<td>-0.53*</td>
<td>0.62*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td><strong>TAS</strong></td>
<td>-0.64*</td>
<td>-0.76**</td>
<td>0.97***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Pain intensity</strong></td>
<td></td>
<td>-0.79**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Exposure to pain</strong></td>
<td>0.82**</td>
<td>-0.65*</td>
<td>-0.71**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p<0.1, ** p<0.05, *** p< 0.001

**More social skills in males were predicted by higher parental depression and alexithymia, and longer exposure to parental pain.**

**More social skills in girls were predicted by lower parental alexithymia and pain intensity, and longer exposure to parental pain.**
CHAPTER V

DISCUSSION

Social Competence in Children of Chronic Pain Sufferers

The hypothesis that children of chronic pain sufferers would exhibit fewer social skills than children of pain-free parents was not supported in this study. The current results are surprising given previous studies which reported behavioral problems in these children (Chun et al., 1993; Rickard, 1988). Also, the use of teacher ratings of social competence in this study was expected to yield significant results given that Chun et al. (1993) reported teacher-rated social competence deficits although they failed to find behavioral problems when relying on parents' reports.

The current lack of support for the first hypothesis may have been due to the use of the MESSY as a measure of children's social skills. Closer examination of this scale reveals several potential problems. First, factor loadings of 0.3 were used for factor extraction. This criterion is the minimum value required for factor extraction and a higher value is usually suggested (Tabachnik & Fidell, 1989, p. 640). Furthermore, norms were established on a sample of 322 children which is typically small for normative populations. Finally, the MESSY has not been used and validated as extensively as have other standardized scales such as the Child Behavior Checklist.

Current findings may also be due to characteristics of the chronic pain sample. First, this sample included only self-selected chronic pain families. As such, it may represent better adjusted families who are more willing to talk about the chronic pain experience. Participants may therefore not be representative of all chronic pain suffers. The current sample, being non-clinical, could also be assumed to be less severely affected
by their pain and better functioning since not currently seeking treatment. In fact, previous studies have described community pain samples as less impaired in their general functioning and less disabled than clinical samples (Crook & Tunks, 1985; Dura & Beck, 1988). Most studies which reported social competence deficits in children had used clinical samples (Chun et al., 1993; Rickard, 1988) and in those studies which used non-clinical samples (Dura & Beck, 1988) there were no significant differences between these children and control children.

Another potential influence on the current findings is the gender composition of the current sample, which is essentially female. Previous reports of social competence deficits in children of chronic pain sufferers used male patients only (Rickard, 1988) or reported less parent-rated social competence in children of male patients than in those of female patients (Chun et al., 1993). However, in the Chun et al. (1993) study, teacher-rated social competence did not differ based on parent gender. Furthermore, female spouses of sick males reported their husband’s illness as having more of a negative impact on their role as a father and husband than female illness did on their role as mothers (Hafstrom & Schram, 1984). Male spouses have also been shown to be less distressed by their wives’ illness than female spouses who face their husband’s illness (Kerns & Curley, 1985; Lieberman & Fisher, 1995; Rowat & Knafl, 1985). These results suggest that the current sample, comprised mostly of female sufferers and their male spouses, may be less impaired in their family functioning due to better coping by the spouse and less impact of maternal illness on parenting. We may therefore expect the children in the current sample which comprises mostly female chronic pain sufferers to be better adjusted than children
previously studied in mixed samples (Chun et al., 1993) or in samples of male chronic pain patients (Rickard, 1988).

The age range of children assessed in the current study may also explain the lack of significant findings concerning their social adjustment. Previous researchers have suggested that adolescent children are most at risk for maladjustment when faced with parental chronic illness (Rankin & Weekes, 1989). Also, previous studies which have looked at children of chronic pain sufferers and found indicators of maladjustment assessed samples of children which contained more adolescents than in the current study. In fact, Chun et al. (1993) used a sample of children with an age range of 6 to 16 years old and Mikail and Von Baeyer (1990) looked at children between the ages of 9 and 17 years old. Furthermore, Dura and Beck (1988), who failed to find significant social skills deficits in their sample, used a younger sample composed of 7- to 13-year olds. The only exception to these studies is Rickard (1988), who found behavior problems in his sample of 8- to 12-year olds. Although child age was not a significant predictor of children’s social skills in the current pain sample, having restricted the sample of children to those younger than 14 years old may have led to the inclusion of less severely affected children.

Another important characteristic of the current sample is the duration of participants’ pain. Whereas previous studies on children of chronic pain patients had participants with an average pain duration of about 5 years (Chun et al., 1993) or had restricted their sample to pain sufferers whose pain duration was between 6 months and 3 years (Rickard, 1988), the current sample had a longer average pain duration of 11.7 years. Furthermore, according to Hendler (1984), pain evolves from an acute stage to a subchronic stage which he describes as pain that has lasted for over 3 years and to which
people start adjusting. The current sample may therefore represent a well adjusted group of pain sufferers who have learned to cope with their pain and function effectively over the years. In this case, we might expect children to be better adjusted too compared with children assessed in previous studies using more disabled pain sufferers.

To test this hypothesis, chronic pain sufferers were divided into two groups of different pain duration. Since most sufferers had been in pain for well over 3 years, Hendler’s (1984) cut-off of 3 years could not be used and the median split of 9 years was used instead. Groups were then compared in terms of children’s social skills. No significant differences emerged although mean scores for each group were in the predicted direction with children of chronic pain sufferers who had been in pain for less than 9 years showing more inappropriate social skills than those whose parents had been in pain longer. Also, these children were found to have marginally less appropriate social skills than children from families who had known pain for more than 9 years. These results suggest a need to further investigate the relationship, already postulated by Hendler (1984), between a parent’s pain duration and family functioning as well as how these relate to child functioning. The current results, although not significant, suggest that the current sample may have been better adjusted due to longer chronicity which may explain the lack of significant findings concerning children’s social competence.

An interesting finding, however, is that parental depression, alexithymia, and marital satisfaction were similar across groups of different pain duration. Possible mechanisms by which children become better functioning after several years of parental pain despite no changes in these parental variables may be that parents, despite being depressed and alexithymic, may be less disabled in some other way not measured in this
study. Disability level, defined as the amount of functional impairment in several areas of life, has been identified as an important predictor of family functioning (Dura and Beck, 1988) and as a better predictor of child functioning than either parental depression or marital conflict (Chun et al., 1993). Pain disability has also been shown to decrease as the pain persists (Strong, Ashton, & Stewart, 1994). The current sample, comprised of pain sufferers of long pain duration, may be less disabled and therefore have more socially competent children than in previous samples with less chronicity. The role of disability level in the relationship between pain duration and child functioning needs to be further assessed in future studies.

Children of chronic pain sufferers who are still depressed and alexithymic may also become better adjusted after several years of parental pain because their parents learn ways to compensate for their own psychological distress so that their parental role is less compromised. In fact, parenting quality (Lieberman & Fisher, 1995) and the parent-child relationship (Conrad & Hammen, 1993) have been described as key variables linking parental illness to child functioning. Thomas and Roy (1989) reported higher family stability in chronic pain patients with longer chronicity than in a group of patients with less chronicity, suggesting that those patients who have suffered for a longer period of time may face less disruption in their parenting roles.

Another possible mechanism behind children's higher social skills after more years of being exposed to a parent's pain is that they may have developed better coping strategies themselves in response to parental pain, depression, marital dissatisfaction, and alexithymia. Ways of coping used by both parents and children need to be investigated, especially in relation to chronicity. Gaining insight into what changes occur as the pain
persists and how these serve to promote better adjustment in family members may have important clinical applications. This knowledge could be used by professionals working with families seeking treatment in order to help them function better at an earlier stage of their pain history.

**Depression, Alexithymia, and Marital Satisfaction in Chronic Pain Sufferers.**

As expected, in the current study, chronic pain sufferers were more depressed, had more alexithymic traits, and reported less marital satisfaction than pain-free controls. These results are consistent with previous reports on the higher rates of depression, alexithymia, and marital maladjustment in chronic pain samples (Cox et al., 1994; Kerns & Turk, 1984; Flor et al., 1987). On average, chronic pain sufferers in the present sample scored in the depressed range on the BDI and in the maladjusted range on the SMAT. However, both chronic pain sufferers and controls scored in the normal range on the TAS indicating that both groups were mostly non-alexithymic. Although frequencies revealed clinical differences between chronic pain sufferers and controls, statistically significant differences emerged only for depression and alexithymia with the former group scoring higher on these measures. The lack of significant difference in marital satisfaction is consistent with the notion of “caretaker marriages” (Feinauer & Steele, 1992) in which both patient and spouse adjust to their roles as patient and caregiver and therefore do not report dissatisfaction in their relationship. Also, Ahern et al. (1985) found marital satisfaction in chronic pain patients and their spouses, as measured by the SMAT, to be predicted by patients’ functional impairment and psychosocial disability. As was seen before, given the chronicity of the current sample, levels of disability may be lower and
therefore marital satisfaction may be preserved. The lack of significant difference in
marital adjustment is consistent with Chun et al. (1993) who reported depression but failed
to find significant marital maladjustment in their sample. Still, rates of maladjusted
marriages in this study were even higher than in a previous study which reported 27% of
their sample as dissatisfied with their marriage using the SMAT (Ahern et al., 1985).

Despite the lack of statistical difference in marital satisfaction between the chronic
pain group and control group, it is important to consider the clinical significance of the
current findings. Clinical significance is evaluated by looking at “the extent to which
individuals perform at or within the normative range” and it refers to “the practical value
or importance of the effect” (Kazdin, 1992, p. 349-350). Given that a majority of chronic
pain sufferers scored above the norm on the SMAT and that, on average, they tend to be
in the maladjusted range, the current findings are clinically significant. Furthermore,
clinicians working with and evaluating chronic pain sufferers can use their knowledge of
the high prevalence of depression, alexithymia, and marital maladjustment to design
appropriate interview methods and screening strategies for the patients they treat.

Results also support Williams and Richardson’s (1993) concern about the possible
inflation of depression rates in chronic pain samples when using the BDI due to
overendorsement of somatic items. Although rates of depression reported in the current
pain sample are similar to those found in previous findings (Kerns & Turk, 1984) the
possible inflation of scores on the BDI needs to be taken into account when interpreting
current findings.
Predictors of Children’s Social Competence.

Across groups. Child age was found to be a significant predictor of child social competence, a finding consistent with previous studies which suggested that younger children have fewer social skills than older ones (Matson, 1990). As expected, parental alexithymia was another variable which added to the prediction of social competence above and beyond child age. These two variables accounted for 40% of the variance in social competence. These results are consistent with reports on the importance of family expressiveness in the development of social skills (Parker et al., 1992) and underscore the importance of teaching families with chronic pain to communicate emotions effectively.

Contrary to expectations, pain status was not a significant predictor of social competence. This indicates that chronic pain alone may not have consequences on child functioning but rather that specific characteristics of the pain sufferer (i.e., pain intensity, depression) may be more important for children’s social development. Also, the lack of significant findings for the predictive value of depression or marital adjustment may indicate that these characteristics are not always negative for children but may add to the consequences of other risk factors, such as chronic pain. The result may also be due to the heterogeneity of the sample comprising pain sufferers and controls which may confound potential effects.

In the pain sample. Child age was correlated with, but was not a significant predictor of, children’s social competence. As expected, the most important predictor of children’s social skills was the length of time they were exposed to a parent’s pain and parental pain intensity, each of which accounted for 23% of the variance. Specifically,
social competence increased as children were exposed longer to a parent’s pain, a finding consistent with results mentioned before on the relationship between pain duration and child functioning. These results were not due to a concurrent increase in children’s age since the influence of child age was controlled for in these analyses. Also, children’s social skills were negatively associated with pain intensity. This finding is consistent with previous reports on the relationship between disability level and family functioning (Dura & Beck, 1988) and children’s social competence (Chun et al., 1993). In fact, we may expect pain intensity to be associated with more disability which would adversely affect child functioning.

The hypothesis that parental variables of depression, alexithymia, and marital satisfaction would be significant predictors of children’s social competence was only partially supported. Alexithymia was found to be the next most important predictor of children’s social skills, followed by depression, with alexithymia being associated with lower social skills in children. However, the specific relationship between parental depression and children’s social skills was mixed, with depression being associated with better social competence on the total score of the MESSY but predicting less appropriate social skills on that subscale. Since depression was only a weak predictor of total scores on the MESSY, more weight needs to be given to the negative relationship between parental depression and appropriate social skills, a finding which is supported by previous studies (Hammen, Adrian, et al., 1987). These findings on the value of parental depression in predicting children’s social skills add to previous studies which failed to find such as relationship (Chun et al., 1993).
Contrary to predictions, marital satisfaction was not identified as a significant predictor of children’s social skills. Although these results replicate Chun et al.’s (1993) findings, they are unexpected given the vast literature supporting the relationship between these variables. Potential explanations for this finding may be found by further investigating the specific mechanisms by which marital satisfaction may impact on children. It has been shown that marital dissatisfaction may affect children by leading to overt conflict to which children are directly exposed (Bryant & De Morris, 1992) and by disrupting parent-children relationships (Emery & O’Leary, 1984). Given previous reports on the stronger association between overt conflict and child adjustment than between marital satisfaction and this variable (Porter & O’Leary, 1980), the current findings may have been different had overt conflict been measured instead of marital satisfaction. Also, given the lack of adequate emotional expression in chronic pain families there may not be many instances of overt conflict in maritally dissatisfied couples. In this situation, children would not be as affected by marital dissatisfaction. Furthermore, as was argued earlier, despite parents being depressed, alexithymic, and dissatisfied in their relationship, the current sample was comprised of chronic pain sufferers of many years who may have learned to adjust in such a way so as not to disrupt their parenting role. These findings underscore again the need to investigate how families with chronic pain learn to cope with their pain and other psychological and social difficulties, how their use of coping strategies change over time and how these serve to protect children from maladjustment.

Surprisingly, no predictors of inappropriate/impulsive social skills were found. This may have been due to a lack of variability in scores obtained on this scale. In fact,
standard deviations for these scores were smaller on this subscale than on either the appropriate social skills subscale or the total scale. These results suggest that the MESSY may lack sensitivity in identifying behaviors which reflect inappropriate social skills which puts into question the adequacy of this scale for use in the current study. The current lack of variability in scores may also be attributed to a reluctance on the part of teachers to endorse items on the inappropriate/impulsive subscale or to teachers failing to take the appropriate time or care in filling out the scale altogether.

Gender Differences in Mother-Child Pairs.

Children’s social competence. The hypothesis that boys would show fewer social skills than girls was not supported in this study. These results are inconsistent with previous findings which found male children of chronic pain sufferers to be less socially competent than female children (Chun et al., 1993). This may have been due, however, to the small sample size (n=18). Also, gender effects were found on most studies using the MESSY with girls showing less inappropriate/impulsive social skills than boys. These gender effects were taken into account when constructing norms for the MESSY and in calculating T-scores which may explain the current results. Post-hoc analyses using raw scores on the MESSY failed to yield significant gender differences. However, means on all subscales of the MESSY were in the predicted direction with boys showing less appropriate social skills and more inappropriate/impulsive social skills than girls.

Correlates of children’s social competence. Parental depression was found to be a marginal predictor of males’ total social skills. However, no other results from the
regression analyses performed in each gender group are interpretable due to the small sample sizes. Whereas parental depression was the best correlate of boys’ social skills, pain intensity and length of exposure to a parent’s pain were best associated with girls’ social skills. As pain intensity increased, girls’ inappropriate social skills decreased and as length of exposure to pain increased, their social skills increased. These results suggest that girls’ social adjustment may be more affected by a parent’s pain and disability level than that of boys.

Contrary to expectations, boys’ social skills increased as parental depression increased, a finding inconsistent with many reports of the negative impact of parental depression on children (Zahn-Waxler et al., 1990). These results suggest that boys of depressed mothers with chronic pain may cope with this condition in a way that increases their social competence as perceived by the teacher. For example, it may be that they become more withdrawn and quiet or that they take on a caregiving role with the sick mother which generalizes to classmates at school, behaviors which would be rated as more socially appropriate by the teacher. Another explanation for these findings comes from Goodman et al. (1993) who argued for the mediating role of marital maladjustment in the relationship between depression and child functioning. Given the lack of significant marital maladjustment in this sample, it may be that depression did not have as much impact on children as it would have otherwise. Furthermore, this effect could be specific to boys given the particular vulnerability of male children to parental discord (Emery & O’Leary, 1982). These results underscore the importance of taking gender differences into account when studying child adjustment and suggest a need to further look for gender
differences in the way children of chronic pain sufferers cope with and respond to their parents’ condition.

As expected, alexithymia was found to be the next most important correlate of girls’ appropriate social skills whereas it was not as important in boys. Interestingly, whereas alexithymia was associated with less social competence in girls, it contributed positively to the social competence of boys. Girls who live with alexithymic parents may not learn to express their emotions which may have a negative impact on their social skills development. In contrast, it seems that having a parent with alexithymic traits who is unable to provide adequate modeling of emotion expression contributes positively to boys’ social skills. These results are consistent with previous studies which found that emotional expression may be an important determinant of girls’ social skills (Custrini & Feldman, 1989) whereas it may not contribute positively to boys’ social competence. These results suggest that parental characteristics such as alexithymia and depression may have differential effects on children based on gender. The current results suggest that future studies looking at predictors of children’s adjustment need to take into account gender of the child since boys and girls may be affected differently by a given family characteristic and results are therefore not generalizable across gender groups.
CHAPTER VI

CONCLUSION

The current study was able to show the importance of parental depression, alexithymia, pain intensity, and length of exposure to a parent’s pain in predicting the social competence of chronic pain sufferers’ children. Although these children were not found to be less socially competent than children of pain-free controls, results concerning the role of pain duration in the impact of chronic pain on families are interesting. In fact, pain chronicity and duration of children’s exposure to their parents’ pain was found to be associated with their social competence levels. Furthermore, potential links between chronic pain and child functioning, such as disability levels and parenting quality, were outlined and were suggested as worthwhile topics for further investigation.

Another contribution of the current study was the identification of the different correlates of female and male children’s social competence. Parental depression appeared to have more influence on boys’ social functioning while parental alexithymia, pain intensity, and length of exposure to a parent’s pain were more important determinants of girls’ social competence. However, the specific relationship between parental depression and boys’ social competence needs to be further assessed.

This study had several limitations. First, the self-selected nature of participants may have led to the inclusion of mostly well-adjusted chronic pain families and the exclusion of those families with children showing behavior problems. Also, the small sample size limited the potential statistical significance of some analyses and rendered some regression analyses impossible to interpret. Furthermore, most chronic pain
sufferers were female which may have biased the results and limited the generalizability of findings. Also, the gender composition of this sample did not allow for female sufferers to be compared to male sufferers in their functioning nor did it allow analyses of how gender of parent interacts with gender of child in predicting child adjustment. Finally, it may have been preferable to use a more widely-used measure of children’s social competence as opposed to the MESSY which has never been used in chronic pain families and which lacks the vast amount of validity studies that other scales have.

Still, the main findings of this study have important implications for clinical professionals working with chronic pain sufferers since they suggest predictors of children’s social adjustment in these families. Variables not measured in the current study, such as disability level or parenting quality, may also be important in mediating the impact of chronic pain on family members. Furthermore, the current results underscore the importance of taking gender differences into account when dealing with children of chronic pain sufferers.
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APPENDIX A

Screening Questionnaire for Pain Group

Please answer the following questions with either true (T) or false (F). If you answer (F) to one of the questions in bold, skip to the next question in bold.

1. T F I have been in pain for at least 6 months
   If you answered (F): How long have you been in pain? ____________.

2. T F No clear physical cause has been found to explain why I am in pain
   If a physical cause has been found, which one? ________________

3. T F I have no other chronic physical illness other than my pain
   If you do, which chronic illness? ____________________________

4. T F I have not been diagnosed with a mental disorder
   If you have, what was the diagnosis? ________________________

5. T F I am married or in a common law relationship
   If not, are you: single______divorced/separated______ Other: ____________

6. T F I am living with my spouse or common law partner
   How long have you been living together? __________

7. T F My spouse is healthy (has no chronic physical
   or mental illness, no pain, no depression)
   IF NOT, what illness is your spouse suffering from? ________________
   How long have you been living together? __________

8. T F I and/or my spouse have a child who is between 4 and 12 years old
   who lives at home

9. T F Of those children who are between 4 and 12 years old, at least one child is
   healthy (no chronic physical illness, no pain, no mental illness)

10. T F My spouse and I are the biological parents of those of our children
    who are between 4 and 12 years old and healthy
    IF NOT: Have they lived with you and your current spouse all their life?
    Yes___ No______

11. T F My other immediate family members (e.g., other children, live-in relatives)
    are healthy (no chronic physical disease, no mental illness)
    IF NOT, specify who is sick and what sickness it is: __________________________
APPENDIX B
Screening Questionnaire for Control Group

Please answer the following questions with either true (T) or false (F). If you answer (F) to a question in bold, go the next question in bold.

1. T F I have no chronic illness (physical or mental) other than depression, if any

2. T F I have no pain that has persisted for more than six months:

3. T F I am married or in a common law relationship

   If not, are you: single: __ separated/divorced: __ Other: ______

4. T F I am living with my spouse or common law partner

   How long have you been living together? ______

5. T F My spouse is healthy (has no chronic mental or physical illness, no pain, no depression)

6. T F I and/or my spouse have at least one child who is between 4 and 12 years old who lives at home

7. T F Of those children between 4 and 12 years old, at least one child is healthy (no chronic physical illness, no pain, no mental illness)

8. T F My current spouse and I are the biological parents of those of our children who are between 4 and 12 years old and healthy

   IF NOT:
   Have they lived with you and your current spouse all of their lives?
   Yes____ No____

9. T F My other immediate family members (e.g.: other children, live-in relatives) are healthy (no chronic physical illness, no mental illness)

   IF NOT, specify who is sick and what sickness it is: __________________________
APPENDIX C

Informed Assent Form
for Children in Pain Group
Investigator: Sophie Beugnot
University of Windsor
Department of Psychology

Why am I doing this study? I want to see if people who are often in pain have children who behave differently around other people their own age compared to children who have parents that are not in pain. Since you have a parent who has pain a lot of the time, I would like to see if you act in special ways around your classmates at school.

What will you do? If you agree to be part of this study, you won’t have to do anything. What will happen is that your teacher, Ms./Mr. ___________ will be sent a sheet with questions on it that ask him/her about how you behave with your classmates. Your teacher will not know why you are participating in this study and therefore will not know that you have a parent who is in pain. We thought it was not a good idea to tell your teacher about personal things about your parents. Your teacher will then return this sheet to us and no one else will be able to see what is on that sheet. Your parents have agreed not to look at what your teacher said either. That way, you will not be worried about how your parents may react to what your teacher said about you. We also think it is better if you don’t know what your teacher said about you. That way, your feelings about yourself and about your teacher won’t change because of your participation in this study.

What if you don’t want to participate? You do not have to be part of this study. We are just asking you if you would like to participate. If you want to participate now and you change your mind later, while the study is being done, you will be able to stop your participation at any time you wish to. There won’t be any negative consequences if you choose not to participate. You also may want to ask questions about this study. If you do, ask your parents to ask me and I will make sure that all your questions are answered.

I know that if I agree to participate in this study, my teacher will answer questions about how I behave around my friends at school. No one will be told about what my teacher says about me. I agree not to ask what my teacher said about me.
I agree to do this and my mom/dad has agreed to let me participate. I am allowed to change my mind at any time and to stop participating without any negative consequences.

I. ________________, have read the assent form/ have been read the assent form by the researcher.
and I agree to participate in this study.

Signature: ____________________________

Date: _______________________________
APPENDIX D
Informed Assent Form
for Children in Control Group
Investigator: Sophie Beugnot
University of Windsor
Department of Psychology

Why am I doing this study? I want to see if children of healthy parents act differently around their friends at school than children who have a parent who has pain a lot of the time. Since you have healthy parents who do not have pain, I would like to see how you act around people your own age.

What will you do? If you agree to be part of this study, you won’t have to do anything. What will happen is that your teacher, Ms./Mr. ___________, will be sent a sheet with questions on it that ask him/her about how you behave with your classmates. Your teacher will be told that you are part of a study on children’s behavior at school. Your teacher will then return this sheet to us and no one else will be able to see what is on that sheet. Your parents have agreed not to look at what your teacher said either. That way, you will not be worried about how your parents may react to what your teacher said about you. We also think it is better if you don’t know what your teacher said about you, that way, your feelings about yourself and about your teacher will not change because of your participation in this study.

What if you don’t want to participate? You do not have to be part of this study. We are just asking you if you would like to participate. If you want to participate now and you change your mind later, while the study is being done, you will be able to stop your participation at any time you wish to. There won’t be any negative consequences if you choose not to participate. You also may want to ask questions about this study. If you do, ask your parents to ask me and I will make sure that all your questions are answered.

I know that if I agree to participate in this study, my teacher will answer questions about how I behave around my friends at school. No one will be told about what my teacher says about me. I agree not to ask about what my teacher said about me.
I agree to do this and my mom/dad has agreed to let me participate. I am allowed to change my mind at any time and to stop participating without any negative consequences.

I ________________, have read the assent form/ have been read the assent form by the researcher.
and I agree to participate in this study.

Signature:____________________

Date:____________________
APPENDIX E
Consent Form for Parents' Participation

Investigator: Sophie Beugnot
University of Windsor
Department of Psychology

Information for participants:

I am currently doing research for my M.A. thesis in psychology which is entitled "Children of Chronic Pain Sufferers: Assessing their Social Competence". This study has been reviewed by the Ethics Committee of the department of psychology of the University of Windsor. The purpose of the study is to assess the level of social competence in children of chronic pain sufferers and find out how it is affected by some parental characteristics. This will be done by comparing chronic pain parents and their child with non-pain, healthy parents and their child. If you decide to participate in the study, your involvement will take no more than two hours of your time.

First, your child will be asked to sign a form indicating his/her assent and will have the opportunity to refuse to participate in this study. You will be asked to fill out four questionnaires assessing your mood, ability to express emotions and your marital satisfaction. You will also be asked to sign a release of information form allowing us to send a questionnaire to your child's primary teacher who will be assessing his or her level of social competence. Instructions to the teacher will state that your child's participation in this study does not mean that he/she is different in any way from other children. Your costs of travel to the University where testing will take place will be reimbursed (up to $2 for gas if you travel by car or bus tickets for you and your child).

All results obtained about you and your child in this study will be kept confidential and you will not have access to these results. If you have reasons to be concerned about his social development or behavior, we have included a list of places where you may have your child evaluated if you wish to. Although there are no foreseeable risks in participating in this study, we have also included a list of places you may go to for help. In general, most people find it enjoyable to participate in these types of studies.

Your participation is strictly voluntary and you will be free to refuse or stop at any time to participate without penalty. If you have any questions or complaints, feel free to contact me at 977-2661 or any of the following persons at any time before, during or after the study:

Dr. Cheryl Thomas
Research Supervisor
(519) 253-4232 ext. 2252

Dr. Sylvia Voelker
Chairperson, Ethics Committee
(519) 253-4232 ext. 2249
2. Consent

Please read the following paragraph. and, if you agree to participate, please sign below.

I understand that any information about me obtained from this research will be kept strictly confidential. I agree not to have access to scores obtained either by myself or my child on the questionnaires administered in this study. I understand the information contained in this consent form and I voluntarily consent to participate in the study entitled "Children of Chronic Pain Sufferers: Assessing their Social Competence".

I also voluntarily consent to my child ___________________________ participating in this study.

Signature_________________________  Date__________

Investigator_________________________  Date__________

Please place your initials here to acknowledge your receipt of a copy of the consent form. ———
For adults:

Several types of psychological services are available at Windsor Regional Hospital at:

1453 Prince Road  
Windsor, Ontario  
N9C 3Z4  
tel.: (519) 257-5125

Help is also available for couples experiencing marital difficulties at:

Catholic Family Services  
677 Victoria  
Windsor, Ontario  
N9A 4N3  
tel.: (519) 254-5164

For children:

Help and services for children are available at:

Regional Child Center  
3901 Cannaught Ave.  
Windsor, Ontario  
N9C 4H4  
tel.: (519) 257-5215  
After hours: (519) 257-5274

Maryvale Adolescent and Family Services  
3640 Wells St.  
Windsor, Ontario  
N9C 1T9  
tel.: (519) 258-0484
APPENDIX F

Release of Information Consent Form

Investigator: Sophie Beugnot
University of Windsor
Department of Psychology

Dear Parent or Guardian.

We would like to ask your permission to send to your child's teacher a questionnaire designed to measure your child's level of social competence. The teacher will be chosen based on the amount of contact he or she has with your child. The teacher assumed to have the most contact with your child will be sent the questionnaire. Upon receipt of a copy of this signed release of information form, the teacher will be asked to fill out the questionnaire and return it to us. Information regarding your child's level of social competence will be kept completely confidential and your child's name will not appear on any form except the release of information consent form, which will be kept separate from the completed questionnaire. If you have any questions or complaints, please contact me at 977-2661 or one of the following persons at any time before, during or after the study:

Dr. Cheryl Thomas  Dr. Sylvia Voelker
Research Supervisor Chairperson, Ethics Committee
(519) 253-4232 ext. 2252 (519) 253-4232 ext. 2249

Consent

Please read the following paragraph and, if you agree that the teacher fill out the questionnaire assessing your child's social competence and return it to us for our study, please sign below.

I have read and I understand the release of information form. I give consent to the teacher.

Mr./Ms. ______________________ filling out a social competence questionnaire assessing
's social competence and returning it to the investigator of the study entitled "Children of Chronic Pain
Sufferers: Assessing their Social Competence". I understand that all information will be kept strictly
confidential.

Signature____________________ Date_______
Investigator____________________ Date_______
## APPENDIX G

### Demographic Questionnaire for Pain Group

1. **Age:**
2. **Sex:** M F
3. **Occupation:**
4. **Spouse's occupation:**
5. **Education:**
   - a/____ Less than 7 years of schooling
   - b/____ Completed at least 7th grade
   - c/____ Some high school
   - d/____ Completed high school
   - e/____ Some university or college
   - f/____ University or college degree
   - g/____ Graduate degree

6. **Spouse's education:**
   - a/____ Less than 7 years of schooling
   - b/____ Completed at least 7th grade
   - c/____ Some high school
   - d/____ Completed high school
   - e/____ Some university or college
   - f/____ University or college degree
   - g/____ Graduate degree

7. **Employment status:**
   - a/____ full time
   - b/____ part time
   - c/____ retired
   - d/____ disabled
   - e/____ unemployed
   - f/____ other: ______________

8. **Age of spouse:**
9. **Years of marriage:**

---

### Pain:

10. **Pain location** (please check one or more of the following options):
   - a/____ Head
   - b/____ Neck/shoulders
   - c/____ Back
   - d/____ Limbs
   - e/____ Extremities(hands/feet)
   - f/____ Stomach
   - g/____ Other (specify):

11. **Pain onset/duration:**

   How many years/months ago did your pain start? __________.

12. **Pain frequency:**

   How often are you in pain?
   - a/____ All the time
   - b/____ Once a day
   - c/____ Once a week or more
   - d/____ Once every two weeks or more
   - e/____ Once a month or more
   - f/____ Once every 6 months or more
13. **Pain intensity:**
On the following scale, with (0) meaning no pain at all and (10) meaning the worst pain imaginable, describe how intense your pain is, on average, by circling the appropriate number:

0 1 2 3 4 5 6 7 8 9 10

14. Have you been diagnosed with a specific type of pain disorder (for example, fibromyalgia or migraine)? Yes___ No____.
   If Yes, which one? ____________________________.

15. Did your pain start as a result of an injury? Yes___ No____.

16. Have you ever had surgery for your pain? Yes___ No____.
   If Yes, how many? ____________________________.
   When? ____________________________.

17. Are you presently taking any medication for your pain? Yes___ No____.
   If Yes, what kind of medication? ____________________________.
   How long have you been taking it? ____________________________.

**Depression:**

18. Have you ever been diagnosed with depression? Yes___ No____.

If Yes,
19. When did you suffer from depression? ____________________________.
20. Are you still depressed now? ____________________________.
21. How long have you been depressed? ____________________________.
22. Have you ever taken anti-depressants? ____________________________.
23. Are you taking anti-depressants now? ____________________________.

**Children:**

24. How many children do you have? ____________.
25. Are some of these children from a previous marriage? Yes___ No____.
26. Are some of these children your spouse's children? Yes___ No____.
27. Have any of them been diagnosed with a behavioral or emotional disturbance? Yes___ No____.
   If yes, please indicate which one has, by putting a (D) next to their name below:

Indicate their name, age, sex and the grade they are in:
Name: sex: age: grade:
Name: sex: age: grade:
Name: sex: age: grade:
APPENDIX H
Demographic Questionnaire for Control Group

1. Age: __________
2. Sex: M F

3. Occupation: ________________
6. Spouse's occupation: ________________
5. Education:
  a/____ Less than 7 years of schooling
  b/____ Completed at least 7th grade
  c/____ Some high school
  d/____ Completed high school
  e/____ Some university or college
  f/____ University or college degree
  g/____ Graduate degree

  a/____ Less than 7 years of schooling
  b/____ Completed at least 7th grade
  c/____ Some high school
  d/____ Completed high school
  e/____ Some university or college
  f/____ University or college degree
  g/____ Graduate degree

7. Employment status:
  a/____ full time
  b/____ part time
  c/____ retired
  d/____ disabled
  e/____ unemployed
  f/____ other: ________________

8. Age of spouse: __________
9. Years of marriage: __________

Depression:

18. Have you ever been diagnosed with depression?) Yes___ No___

If Yes,
19. When did you suffer from depression? ______________________________
20. Are you still depressed now? ______________________________
21. How long have you been depressed? ______________________________
22. Have you ever taken anti-depressants? ______________________________
23. Are you taking anti-depressants now? ______________________________

Children:

24. How many children do you have? __________
25. Are some of these children from a previous marriage? Yes___ No___
26. Are some of these children your spouse's children? Yes___ No___
27. Have any of them been diagnosed with a behavioral or emotional disturbance? Yes___ No___

If yes, please indicate which one has, by putting a (D) next to their name below:

Indicate their name, age, sex and the grade they are in:
Name: ________ sex: ________ age: ________ grade: ________
Name: ________ sex: ________ age: ________ grade: ________
APPENDIX I

Instructions to Teacher

Mr./Ms. ____________________.

I am a graduate student at the University of Windsor, currently carrying out research on the social development of children between the ages of 4 and 12 years old. Mr./Ms. and __________________ have agreed to participate in this study. This study includes a control sample. Receipt of this form should NOT be interpreted as an indication that this child has social problems or characteristics that may set him or her apart from the group.

You will find included in this envelope a Release of Information Form and a questionnaire called the Matson Evaluation of Social Skills for Youngsters. The Release of Information Form allows you to answer the questionnaire about __________________'s behavior and attitudes toward others and to return it to me. Your cooperation in this study will be greatly appreciated. Your answers on the questionnaire will be strictly confidential and Mr./Ms. __________________ and ________ have agreed not to look at them. Once you have completed the questionnaire, please place it in the return envelope and mail it as soon as possible. You may keep the Release of Information Form.

If you have any questions about this study or about your participation, please feel free to contact me at 977-2661 or one of the following persons:

Dr. Cheryl Thomas  Dr. Sylvia Voelker
Research Supervisor  Chairperson, Ethics Committee
(519) 253-4232 ext. 2252  519) 253-4232 ext. 2249

Sincerely yours.

Sophie Beugnot
University of Windsor
Department of Psychology
Windsor, Ontario
N9B 3P4
VITA AUCTORIS

Sophie Beugnot was born in 1972 in Montreal, Quebec. She graduated from College Stanislas where she obtained her French Baccalaureate in 1990. From there she went on to McGill University where she graduated with great distinction and obtained her B.Sc. in Psychology in 1993. Before continuing toward graduate school, Sophie spent over a year working as a coordinator and research assistant at the Pain Management Center of the Royal Victoria Hospital. She then went on to become a graduate student in adult clinical psychology at the University of Windsor, where she has been enrolled in the doctoral program since September, 1994.