The effects of an early intervention program on the language acquisition styles of mentally retarded children.

Brenda T. Roberts

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The Effects of an Early Intervention Program on the Language Acquisition Styles of Mentally Retarded Children

by

Brenda T. Roberts

B.Sc. Acadia University

A Thesis
Submitted to the Faculty of Graduate Studies through the Department of Psychology in Partial Fulfilment of the Requirements for the Degree of Master of Arts at the University of Windsor
Windsor, Ontario, Canada 1989
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ABSTRACT

The present study examined the effects of an early intervention program on the language acquisition styles of mentally retarded children. The subjects were eight mentally retarded children, four of whom were waitlisted for service in a provincial intervention program and four currently involved in the program. The Peabody Picture Vocabulary Test-Revised was administered during home visits, and audio recordings of each child's speech were obtained. Although all children exhibited a definite predominant stylistic orientation, stylistic classification was found to vary as a function of the criteria selected for classification purposes. Overall, proportions of expressive and referential stylists were found to differ only slightly from those reported for samples of normal children. Significant differences were not found in the proportions of stylists in Treatment (Active) and Control (Waitlisted) conditions. However, it appears that retarded children employ more polarized language acquisition styles than do normal children. This finding suggests that the expressive/referential dimension is a salient aspect of language for these children and thus may warrant consideration in the formulation of language programs.
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CHAPTER I

INTRODUCTION

Prior to the 1970's, research regarding language development primarily emphasized language universals and an invariant process of language acquisition. This initial focus on language regularities was stimulated by a lack of fundamental information concerning the nature and sequence of language development (Goldfield & Snow, 1985). Another factor ascribed a causal role in influencing early research was the assumption espoused by Chomsky (1968) that language acquisition was determined by innate processes. Evidence of individual variation in acquisition was consequently attributed to a large degree to error variance (Goldfield & Snow, 1985).

Emphasis on language regularities had subsequent repercussions on the methodological approaches employed to investigate language development. Since language development was perceived to follow essentially the same course in all children, typical research paradigms consisting of longitudinal designs involving a small number of children or a single child were deemed appropriate for
investigative purposes. Subject selection was influenced to some extent by features of the child’s speech. Peters (1977), for example, noted that children with poor articulation or lengthy, difficult to decipher utterances were likely to be excluded from earlier studies.

Individual Differences in Language Development in Normal Children

Variations in lexical development were first documented by Nelson (1973) in a study investigating the initial productive vocabularies of 18 children. Analysis of the data resulted in the identification of two differing styles, designated "referential" and "expressive." Nelson suggested that these stylistic differences were reflective of differing language acquisition patterns.

Children identified as displaying a "referential" style of speech appeared to acquire language in accordance with the typical sequence documented in early linguistic studies. Language usage appeared to reflect a strategy designed to parse and tag objects encountered in the environment. Speech was noun-dominated and utterances involved a high proportion of object labelling. Compared to expressive children, referential children emitted fewer phrasal utterances, acquired words at an accelerated rate, and progressed in a predictable sequence from the single word to the two word stage.
Expressive children appeared to utilize language for pragmatic, interpersonal functions. Their vocabularies were comprised of fewer object labels, in conjunction with increased usage of pronouns, function words and modifiers. Speech was also characterized by numerous personal-social expressions, generally in excess of one word, for example, "I want it." Compared to the referential group, the transition to multi-word speech was less distinct for these children, and their rate of vocabulary growth was comparatively slower.

Most children appear to rely on aspects of both styles in their approach to the language learning task. Only children extensively employing one approach can be classified as truly displaying a referential or expressive style. Hence, Nelson proposed that expressive/referential variations in style are aspects of a continuous dimension rather than discrete components of a dichotomy.

Nelson's findings stimulated further investigation into the phenomenon of individual-differences in language acquisition. Despite variations in terminology utilized to describe observed differences, information derived from studies based on Nelson's original work appeared to reflect and elucidate dimensions of the expressive-referential continuum she postulated.

Dore's (1974) observational study investigating the productive vocabularies of two children revealed that one
child employed what Dore termed a "code-oriented" style of acquisition directed towards the representation of things encountered in the environment. Her speech was characterized by clear articulation and the use of utterances primarily for the purposes of labelling, repeating and practising. In contrast, the second child employed a "message-oriented" linguistic style with utterances predominantly aimed at manipulating social interactions. He produced fewer words and approximately 63% of his utterances concerned other people, compared to 26% for the first child. In addition, his speech was prosodic in nature (prominent intonation usage). This message oriented style corresponds to Nelson's expressive mode while the code-oriented style employed by the former child resembles Nelson's referential mode.

Peters (1977) obtained results indicating that form of utterances appears to vary in accordance with the expressive-referential distinction. The author conducted a longitudinal study evaluating the language development of one child, Minh. Contrary to the traditional acquisition process documented in the literature involving progression from one word to phrasal and sentence construction, Minh's initial utterances appeared to be directed towards the production of phrases or sentences. Although often unintelligible, his utterances appeared to incorporate stress and intonation patterns characteristic of sentences.
Production of this phrasal speech, in addition to Minh's usage of dummy forms—stereotypic syllables used to fill out utterances—was noted as characteristic of the expressive style of acquisition. Peters postulated that these phrasal utterances are initially stored and retrieved in the form of single lexical items which are later analyzed and reduced to their fundamental elements. This processing strategy, consisting of a progression from the whole to constituent parts, was designated as "gestalt" by Peters. The alternate language learning strategy, consisting of a progression from the parts to the whole, as typified by the referential mode of language acquisition, was termed "analytic" by that author.

Bretherton, McNew, Snyder and Bates (1983), obtained additional support for Peter's contention of differing language learning strategies corresponding to the referential/expressive stylistic distinction. Speech samples of children identified as expressive or referential speakers were subjected to cluster analysis, yielding referential, grammatical/morpheme and dialogue clusters. Data derived from the analysis indicated that the referential and grammatical morpheme clusters were highly correlated, implying simultaneous development of the two modes of acquisition. Distinctive styles were only evident for those children who primarily employed one particular strategy, thus providing additional support for the
continuum notion. Bretherton et al. concluded that the referential cluster represents an analytic (referential) language learning strategy while an initial emphasis on grammatical morphemes appears related to phrasal learning reflective of a holistic (expressive) approach to language acquisition.

Rate of syntactic acquisition is another factor which appears to vary in accordance with style (Bloom—Lightbown, & Hood, 1975; Clark, 1974; Horgan, 1981; Nelson, 1975; Ramer, 1976). Ramer (1976) conducted a study investigating the onset of syntax in seven children and found she was able to divide her sample on the basis of rate of syntactic acquisition. The four rapid syntactic developers achieved syntactic competency relatively quickly and were able to progress rapidly through levels of increasing syntactic complexity.

The acquisition style employed by the slow developers in the group differed considerably. The transition into syntax was comparatively slower for the three boys in the group in relation to their female counterparts, and they appeared to encounter difficulty attaining higher levels of syntactic complexity. In addition, these slow developers employed presyntactic forms extensively upon the emergence of syntax, while rapid developers rarely employed these forms.
Several researchers have investigated various aspects of the phenomenon of individual differences at the early stages of multi-word speech acquisition (Bloom, Lightbown, & Hood, 1975; Clark, 1974; Horgan, 1978, 1981; Leonard, 1975; Nelson, 1975; Peters, 1977; Ramer, 1976; Starr, 1975). Nelson (1975) obtained transcripts of her original expressive-referential sample at 24 and 30 months of age. Analyses indicated that early sentences of referential speakers contained a comparatively high proportion of nouns. In contrast, expressive children initially employed approximately equal proportions of nouns and pronouns, and although pronoun usage remained relatively stable, proportion of noun usage increased in accordance with increasing utterance length, as indexed by mean length of utterance (MLU).

Bloom, Lightbown, and Hood (1975) reported variation in early word combinations in a study of four children in the early stages of multi-word speech. The two boys in the study tended to combine pronouns with content words to express semantic relations, producing utterances such as "I finish" and "my truck." The two girls in the study employed a different strategy of combining content words to achieve the same purpose, producing utterances such as "sweater chair" and "Kathryn sock." Bloom et al. proposed that these systematic differences reflect differing strategies concerning the purpose of language, a nominal and
a pronominal strategy. The nominal approach, as exemplified by the two girls in the study, corresponds to Nelson's referential style, while the pronominal approach exhibited by the boys corresponds to the expressive style. The former approach is characterised by a preference for encoding meaning by assigning specific labels to specific referents. The latter approach is characterised by a tendency to encode relationships between objects and events independent of specific lexical items. As MLU advanced to approximately 2.5, strategies appeared to converge, with pronominal children incorporating an increasing proportion of content words in their word combinations, while nominal children increased pronoun usage.

Starr (1975) designed a longitudinal study involving a sample of 12 children to determine if functional differences extend from single words to word combinations. The results served to substantiate the contention that a functional continuity exists between single word utterances and subsequent two word combinations. Children who demonstrated a preference for object labelling when producing one word utterances were inclined to produce two word sentences encoding object-attribute relations. Another group of children, who had engaged in significantly less object labelling at the one word level, produced word combinations comprised of more interjections (conventional social responses such as "hi," "ouch") and more self-
references, for example, "want cookie." Of particular importance was Starr's finding that the type of word combinations to be utilized by children could be predicted on the basis of their single word utterances. Lieven (1980), cited in Goldfield and Snow (1985), also found evidence that characteristics of single word speech extended to the early word combinations of the three children who participated in their study.

Ramer's (1976) study also investigated variations in the transition from single to multi-word speech. Analyses of the emerging grammar of seven subjects revealed that the children appeared to employ one of two distinct styles of syntactic acquisition. The four girls in the group acquired syntax relatively quickly and were able to progress rapidly through a hierarchy of complexity. These rapid developers often failed to observe word order constraints and used subject-verb, subject-complement, and verb-complement relations initially upon the acquisition of syntax. The boys in the study attained levels of syntactic complexity at a slower pace and with considerably more difficulty. Rather than quickly progressing through levels of syntactic complexity, they acquired and then utilized a specific structure in their speech for several weeks or months prior to attaining a higher level. This finding is in accordance with Clark's (1974) report regarding the apparent necessity of her son's practice with invariant
routines prior to the acquisition of new structures. Word order constraints were observed to a greater degree by the boys and their initial grammatical relations were restricted primarily to verb-complement constructions. In addition, they employed empty forms extensively at the presyntactic level and continued to do so following syntactic acquisition. These empty forms, or stereotyped syllables used to fill out sentence frames, had been documented earlier by Bloom et al. (1975) and Leonard (1975). Leonard's subject, Phoebe, and Bloom's daughter, Alison, were observed to combine dummy terms with single words during the periods immediately preceding and following the transition to syntax. In a later study, Peters (1977) noted the prevalence of empty form usage by her "expressive" subject, Minh. Ramer (1976) proposed that empty form usage facilitates the acquisition of syntax by enabling children to practice combining elements without concern for content or semantic function. Nelson (1981) noted that empty form usage further substantiates Peter's contention that expressive children appear to be initially attempting sentence formation rather than single word productions.

Several studies have attempted to address the persistence of stylistic variations beyond the early stages of syntactic acquisition. Nelson (1981), in a literature review, noted that if stylistic variations are in fact an artifact of variable factors such as environmental
influences, then persistence should vary as a function of these causal factors. Alternatively, if the variations are valid reflections of actual stylistic differences, then the observed differences should persist.

Authors of the classic studies (Bloom et al., 1975; Nelson, 1975) reported a convergence of both styles as MLU increased, essentially obliterating major stylistic variations. A study of Nelson's original subjects at a later date revealed that differences were no longer evident beyond MLU of 2.5 (Nelson, 1975). Referential children had incorporated a higher proportion of pronouns into their speech while noun usage had increased for expressive children, culminating in an apparent convergence of the two styles. Bloom et al. (1975) also found evidence of a convergence of noun/pronoun use in children between the ages of 2 and 3 who had been identified previously as emphasizing primarily a referential or expressive acquisition style.

Other researchers, however, have obtained results indicative of the continued impact of acquisition styles on later language development. Clark (1974), in an examination of her son's evolving sentence production rules at a chronological age (CA) of 2.9 to 3.0 years, observed characteristics of the expressive style he had employed in the earlier stages of language acquisition. Adam displayed a tendency to utilize previous utterances as either a
framework or constituent of subsequent utterances. He was also observed to model adult utterances, incorporating constituents prior to the completion of full semantic processing, for example.

Adult: "We're all very mucky"
Adam: "I all very mucky"

In addition, Adam often copied previously heard adult utterances upon encountering similar situations himself, without effecting modifications. Further, he was observed to combine relatively simple sentences to create often grammatically incorrect sentences.

Horgan's (1978) initial analysis of her daughter Kelly's speech revealed a nominal shift in the child's formerly extremely expressive acquisition style at approximately age 2 (MLU 1.7). Subsequent analyses (Horgan, 1981) indicated, however, that several characteristics associated with expressive stylists were prevalent in Kelly's speech well beyond MLU of 2.5. Her comprehension, question usage, play behaviour and generally functional approach to language were strongly expressive in nature. To further investigate the persistence issue, Horgan (1981) conducted a study involving 30 children, 15 pairs, matched on MLU (range 3.18 to 5.44). Each pair differed in age by a minimum of 6 months, thus each was comprised of a younger (precocious) child and an older (slower) child. Significant differences between precocious and older children were
evident for a number of complexity measures and were found to be associated with relative noun emphasis. Precocious children incorporated more nouns into their speech and tended to describe objects and people in a more detailed manner, consistent with Nelson's referential style and Bloom's nominal approach. A higher error rate suggested a comparatively heightened willingness to take risks, corresponding with Ramer's (1976) findings regarding rapid versus slow syntactic developers' observations of word order constraints. Results from a comprehension task revealed significantly higher scores for the slower group, indicative of superior receptive language abilities. Horgan (1978) also found that these children produced a wider range of constructions, such as subordinate clauses and full passives, as well as a comparatively higher proportion of main verbs and auxiliaries. Based on the findings, Horgan proposed that the slower developers were employing a less restrictive approach to the language learning task, simultaneously attending to other aspects of language in addition to nouns. She interpreted the results as suggestive that stylistic variations have implications beyond the 2 to 3 year age range where an apparent integration of styles is observed to occur.

Horgan (1981) proceeded to re-analyze speech samples of children aged 2 to 14 years with regard to stylistic differences. Children who produced non-reversible
instrumental passives were dubbed "noun-lovers," a classification corresponding to Nelson's referential category. Their speech was comprised of longer noun phrases and contained a higher proportion of noun phrases per utterance compared to a control group. Children who produced reversible passives were classified as "noun-leavers," corresponding to Nelson's expressive category. Leavers produced shorter noun phrases and comparatively fewer noun phrases per utterance in relation to the control group.

Additional research is necessary to ascertain whether or not stylistic variations have repercussions on later language development. The minimal data presently available suggest that the contention of persistence of stylistic differences is plausible, but as yet this contention remains relatively unsubstantiated.

Prior to considering some of the explanatory hypotheses tendered to account for stylistic variation, a synopsis of characteristics associated with both styles as evidenced by the literature reviewed thus far is provided below:

Referential Approach
1. prominent noun usage for the purpose of labelling "things" encountered in the environment
2. comparatively clear articulation
3. rapid initial vocabulary growth
4. rapid rate of syntax acquisition
5. absence of empty forms
6. syntactic progress in accordance with that traditionally documented in the literature; for example, one word utterances, followed by two word utterances, etc.
7. emphasis on meaning of words

Expressive Approach
1. early emphasis on pronouns and personal-social phrases
2. poor articulation
3. slower rate of syntax acquisition
4. usage of empty forms as fillers
5. deviation from the traditional sequence of language acquisition; for example, usage of invariant routines in excess of one word at early stages of language development
6. emphasis on the contours of speech; for example, features such as intonation

Numerous explanations have been tentatively proffered in an attempt to identify causal factors of observed stylistic variations. Following their initial studies, both Nelson (1973) and Bloom et al. (1975) attempted to account for their findings within a cognitive framework. Essentially, they proposed that prior to language production, children develop a hypothesis regarding language function, based upon
inferences drawn from their linguistic environment. This preliminary hypothesis—object-oriented or interpersonally-socially oriented—exerts considerable influence on the particular acquisition strategy to be emphasized. Various researchers have investigated this contention in addition to exploring other possible contributory factors. The child's linguistic environment has been cited as a contributory factor (Della Corte, 1983; Furrow & Nelson, 1984) as well as cognitive style (Plunkett, 1986), hemispheric lateralization (Peters, 1977), and birth order (Nelson, 1983) in addition to other variables.

Each of the factors cited above may in fact contribute to some extent in determining stylistic emphasis. The relative contribution, if any, of each factor remains speculative. McCabe's (1989) proposal that stylistic preferences may evolve as a consequence of a complex interaction involving characteristics of the child, the learning environment, and the learning context itself, appears to be a comprehensive integration of evidence accumulated to date. Extensive research will be necessary to disentangle these factors in an attempt to isolate specific causal elements and determine relative contributions.

The Development of Language in the Mentally Retarded

The principal issue which has dominated the study
of language development in the retarded concerns whether or not language development in this population differs qualitatively or quantitatively from that of normals. Relatively little research has focused on determining how the expressive/referential dimension pertains to the linguistic development of mentally retarded children. Preliminary findings reported by researchers investigating the phenomenon in retarded populations (McCabe, 1982; Parsonson, 1983) strongly suggests that characteristics associated with the expressive mode of acquisition are particularly prevalent in the speech of retarded children.

McCabe (1982) conducted a longitudinal investigation examining the multi-word utterances of six mildly to moderately mentally retarded children who ranged in CA from 2.3 to 5.8 years at the initiation of the study. Three MLU levels: less than 2.5; 2.5 to 4.5; and greater than 4.5, were used to facilitate comparison with Nelson's (1973) study involving normally developing children. Although nominal usage was found to increase with advancing MLU, examination revealed that it was due to increased pronoun rather than noun usage. Characteristics of the majority of the retarded children's speech at MLU levels below 2.5 were found to correspond to the expressive style documented by Nelson. The lack of increased noun usage with increasing MLU suggests that retarded children persist in employing an expressive approach to language learning.
McCabe interpreted the results as indicative that the linguistic development of many retarded children differs qualitatively from normal children who espouse a referential style and quantitatively from normal children who employ an expressive mode of acquisition.

Parsonson's (1983) longitudinal study examining expressive/referential stylistic variations in the initial productive vocabularies of 5 retarded and 5 nonretarded children obtained similar results. Children in the nonretarded group differed in terms of preferred modes of acquisition, with 2 children demonstrating an expressive approach and 3 displaying a referential approach. In contrast, all the retarded children exhibited an expressive style of acquisition.

Leifer and Lewis (1984) note that three primary matching methods have been employed for the purposes of comparing language development in retarded and normally developing individuals. Some studies have matched on the basis of chronological age, others have utilized mental age (MA), while more recently researchers have matched subjects on the basis of linguistic ability. While several researchers incorporate no formal matching procedure into their research designs, they generally interpret their results on the basis of one of these three comparative levels, relative to similar studies utilizing normal populations. Leifer and Lewis (1984) report that the basis
of comparison chosen appears to influence the nature of the results. Specifically, they note that studies utilizing CA for comparative purposes generally report findings indicating that although language development in the retarded is developmentally delayed, it mirrors the pattern observed in normals. Hence, evidence derived from these studies typically supports the premise of quantitative differences.

Conversely, studies using MA or MLU as a comparative basis tend to provide conflicting evidence. Results are generally indicative of delayed but qualitatively similar development. Occasionally, however, findings suggest that normally developing children are superior, or in some instances, inferior, to retarded children on certain aspects of linguistic development. These latter studies thus lend credence to the contention of qualitative differences. A review of the literature relevant to the qualitative/quantitative debate is presented below. Since the majority of studies have provided evidence which substantiates the assertion of quantitative differences, these studies will be reviewed prior to those indicative of qualitative differences.

Research indicates the existence of a relationship between intelligence and language acquisition, and, although the relationship does not correlate perfectly, studies suggest that in general, the greater the level of
retardation, the poorer the level of language acquisition (Schiefelbusch, 1972). Cantwell and Baker (1987) report that language impairment appears to affect approximately 45 percent of the mildly mentally retarded, 90 percent of the severely mentally retarded, and 100 percent of the profoundly retarded. In an early study examining the relationship, Karlin and Strazzulla (1952) divided a sample of 50 noninstitutionalized retarded children into three categories based on the following IQ ranges: 15 to 25, 26 to 50, and 51 to 70. Analysis revealed that mean age of initiation of babbling, one word utterances and simple sentences was increasingly greater with lower IQs.

Studies suggest delayed but similar vocabulary usage as well. Mein (1961) conducted a study using a sample of 80 institutionalized severely retarded individuals aged 10 to 30 years. The study examined the grammatical structures of subject responses during conversational interviews and interviews involving pictures. Subjects were assigned to one of five categories on the basis of mental age (MA range 3.0 to 6.11). Noun usage was found to decrease with increasing mental age, coupled with an increase in usage of alternative parts of speech. Mein concluded that such a pattern parallels that observed in the language development of normal children. Beier, Starkweather and Lambert (1969) compared institutionalized
retarded children with normals and reported that the same number of words accounted for 50 percent of their speech.

Lackner (1968) conducted an extensive study investigating language development in the retarded. Speech samples from 5 retarded children CA 6.5 to 14.4 years, MA 2.3 to 8.10 years, were collected and subjected to intensive analysis. The transformational phrase structures derived from samples of the children's spontaneous speech were found to be subsets of adult grammar. Sentence length, as measured in words, was found to correspond to that of normals of equivalent mental age. Administration of imitation and comprehension tests revealed that the retarded children, like their normal counterparts, were capable of comprehending sentences constructed from their own vocabularies. Also in accordance with previous research involving normal children, retarded children were found to be unable to imitate or comprehend sentences of complexity levels beyond their own generative abilities. Lackner interpreted his findings as supportive of the premise of quantitative differences in the linguistic development of retarded children.

In a similar vein, Graham and Graham (1971) performed extensive linguistic analyses on the conversational speech of 9 institutionalized retarded children, CA range of 10 to 15 years, MA range of 3.6 to 10.0 years. The underlying string of each utterance was
determined, in addition to the number of elementary and
generalized transformations performed. Significant
correlations were obtained between mental age and a number
of factors: percentage of sentences without transformations,
percentage of sentences containing a minimum of three
transformations, and the mean number of transformations
used. In addition, mean sentence length and the use of more
generalized transformations were found to increase with
mental age. Based on this linguistic analysis, Graham and
Graham concluded that retarded children develop linguistic
rules at a slower pace but in a manner consistent with that
documented for normals.

Bartel (1970) conducted an investigation to
examine the contention that more severely retarded children
employ strategies which differ qualitatively from those
utilized by their brighter peers to acquire language. Pre-
and post-test measures of morphological usage were obtained
for 18 mildly and moderately retarded children. In the
interim, each child received six weeks training on 27
lexical items and 27 nonsense items. Analysis revealed that
higher scores were obtained by children with higher IQs.
All children performed better on training items as opposed
to nonsense items, and all were found to improve as assessed
by test performance. The authors concluded that the
contention of qualitative differences was not substantiated
by the results.
Somewhat relevant to the differences associated with expressive and referential stylists regarding the function of language, a study by Coggins, Carpenter, and Owings (1983) examined the communicative intentions encoded by 4 Down's Syndrome children matched with normals for cognitive and linguistic functioning (MLU 1.6 to 2.0). A communication intention inventory was used as a behavioural taxonomy for coding eight intentional uses of language typically acquired by normally developing children at the latter stages of the sensorimotor period. Categories included: commenting on action, commenting on objects, requests for objects, and requests for action, in addition to others. These categories in particular are reminiscent of functional aspects reported to differentiate expressive and referential children's conceptualizations of language function. Results revealed that retarded children did not rely more on gestures or vocal sequences to encode their intentions. Further, examination of the retarded children's use of language for particular intentional purposes, as indicated by the eight categories, revealed no significant differences compared to nonretarded children's intentions. The authors qualified the results, however, by noting that the groups' similarity of communicative intent might be reflective of the retarded subjects' life experiences. All the retarded children had participated in early intervention
programs; hence their social use of language may in actuality have been artifacts of intervention programs.

Mein and O'Connor's (1960) study involving 80 institutionalized, severely retarded patients revealed that the subjects' vocabularies were smaller and more restricted relative to those reported for a sample of nonretarded children of comparable mental age. These results conflicted with the findings of a later study by Bartel, Bryen and Keehn (1973), however, who reported that when equated for mental age, retarded children's usage of lexical items did not differ significantly from normals. Since subjects in the latter study were not institutionalized, Bartel et al. concluded that the contradictory findings might be attributable to differing educational environments. Later analysis of Mein and O'Connor's data (Wolfensberger, Mein, & O'Connor, 1963) revealed that vocabulary usage in their sample increased in diversity in accordance with increases in mental age, a finding consistent with results obtained by Bartel et al. The authors of the latter study noted, however, that, despite equation for mental age, nonretarded children's usage of grammatical categories was superior to that of retarded children.

Other studies have similarly documented results suggesting that retarded children's usage of specific grammatical features varies significantly from their nonretarded counterparts. Semmel, Barritt and Bennett
(1970) administered a modified cloze task consisting of various grammatical structures to a sample comprised of four groups: institutionalized educable mentally retarded, noninstitutionalized educable mentally retarded, normals matched for CA, and normals matched for MA. The children were instructed to supply a missing word "to make good sense" in a series of four word sentences read aloud. A tone was used to indicate the structural placement of missing words. Results revealed that, irrespective of institutionalized status, the retarded children demonstrated great difficulty formulating grammatical, meaningful sentences. Semmel et al. observed that the retarded children encountered considerably more difficulty on the cloze task than would be anticipated on the basis of their MA. All groups, however, displayed parallel trends with regard to grammatical classes; that is, nouns were the easiest items to provide, and verbs were the most difficult. The results did indicate that deleted adjectives also posed a considerable obstacle for the institutionalized retarded children.

Ryan (1975) compared various aspects of the speech of retarded and nonretarded children matched for linguistic ability. She reported no significant differences on a number of features, including proportion of complete and incomplete sentences, range and variety of verb transformations, and errors of omission, substitution, and
overgeneralization of inflections. Extensive tests of single word noun vocabulary revealed, however, that retarded children consistently performed at an equal or superior level compared to nonretarded children with similar linguistic abilities. Equal or superior performance of retarded children was evident on measures of both recognition and naming of nouns.

Davis and Seitz (1975) reported significant differences in frequency for use and type of personal pronouns in a sample of 15 normal and 15 language delayed children. Children in the study were assigned to one of five linguistic categories on the basis of linguistic level, determined by mean word utterance length. Results indicated that retarded children used significantly fewer pronouns per utterance at all linguistic levels. Rondal (1978) obtained results which were inconsistent with those reported by Davis and Seitz. His analysis revealed that nonretarded and Down's Syndrome children of comparable MLU did not differ in frequency of use and type of personal pronouns. The results did reveal other differences between normal and Down's Syndrome children at similar MLU levels. Particularly at MLU 1.75 to 2.25, retarded children utilized more verbs than normals, and this finding was also apparent to a lesser degree at MLU 2.5 to 3.0. The general syntactic level of retarded children was found to be less complex than that of
normals, as evidenced by the latter's increased usage of secondary verbs and advanced indefinite pronouns.

Greenwald and Leonard (1979) investigated retarded children's usage of imperative and declarative performance behaviours to determine if they varied as a function of sensorimotor stage and if the variance corresponded with that documented for nonretarded children. Differences in retarded children's communicative performance consistent with the sensorimotor stage at which they were operating were observed. The authors noted, however, that, relative to nonretarded children at the same sensorimotor stage, retarded children relied more extensively on gestures than a combination of gestures and vocalization for imperative and declarative purposes.

A study by Leifer and Lewis (1984) investigating the acquisition of conversational response skills in retarded children produced findings indicative of both quantitative and qualitative differences. The sample was comprised of three groups: nonretarded, retarded matched for CA, and retarded matched for expressive linguistic ability as evidenced by MLU. The number of appropriate, inappropriate and indeterminate responses the children made to maternal inquiries was determined. Chronological age matching revealed that retarded children's response abilities were significantly delayed compared to nonretarded children's abilities. Linguistic matching revealed that
retarded children displayed significantly superior response skills at the one word stage of syntactic development. They produced a higher proportion of appropriate responses in conjunction with fewer inappropriate responses. Examination revealed that the retarded children's superiority was consistent across the five types of sentences employed in the study. No significant difference in the vocabulary size of retarded and nonretarded subjects was evident. Leifer and Lewis concluded that, in addition to quantitative differences, qualitative differences were apparent with regard to the synchrony of syntactic development and communicative competence.

Despite conflicting evidence, the preponderance of research investigating language development in the retarded favours the quantitative premise. Schiefelbusch (1972), however, notes that the plethora of etiologies encompassed by the term "mentally retarded" renders the homogeneity of the sample questionable. Theoretically, the process of linguistic development may vary in accordance with specific etiology. Evidence (Lyle, 1961; Mein, 1961) suggests, for example, that the pace of language development in children with Downs syndrome is comparatively slower than non-Downs retarded children. However, the majority of retarded children who participated in McCabe (1982) and Parsonson's (1983) studies were found to employ an expressive mode of acquisition, irrespective of the etiological basis of the
retardation. These findings suggest that with regard to stylistic emphasis in particular, retarded children may be particularly predisposed to employ an expressive approach. Etiological considerations may differentially affect other aspects of linguistic development to a greater degree, however.

Early Intervention with Retarded Children

The present study was conducted to determine the effects of early intervention on the language acquisition styles of mentally retarded children. A brief overview of early intervention programs for the retarded is thus warranted, with particular focus on the intervention strategies utilized to facilitate language acquisition. The particular intervention program involved in the present study will then be considered within the context of the preceding literature.

The past two decades have witnessed a proliferation of early intervention programs on an international level (Marfu & Kysela, 1985). Comprehensive critical reviews of studies evaluating interventions (Marfu & Kysela, 1985; Simeonsson, Cooper, & Scheiner 1982) have concluded that, despite widespread lack of program adherence to designs and measures amenable to empirical investigation, the efficacy of early intervention is apparent.
Considerable variability in reviewed programs was apparent in terms of primary emphasis, locale of intervention, target population, and intervening strategies. Several features emerged frequently, however, in many of the studies evaluated. Simeonsson et al. noted that early intervention has been directed primarily toward two types of children: the biologically impaired and those at risk for delay due to environmental factors. The home environment or a combined home-centre approach was selected as the locale for programming in approximately 66% of the 27 studies evaluated. Seventy percent of the programs specified roles for parents, while approximately 60% reported parental training and/or support by staff. Marfu and Kysela (1985) reported that 90% of the 20 programs evaluated involved parental training in program planning and/or teaching. Simeonsson et al. found that approximately 60% of the interventions addressed a combination of the major developmental domains, and that 81% designed programming based on general concepts of development.

Marfu and Kysela (1985) emphasized that although intervention literature is replete with the term "individualized programming," the majority of programs apply the same therapeutic strategies to all clientele. The term "individualized programming," then, refers to the application of these general strategies to the particular developmental needs of each child.
Based on a review of the literature, Marfu and Kysela (1985) identified three distinctive models of intervention: the Parent Therapy Model, the Parent-Infant Interaction Model, and the Parent Training-Infant Curriculum Model. The Parent Therapy Model, as the name implies, is oriented towards the needs of the parent rather than the child. Parental counselling and guidance is provided in an attempt to alleviate the stress and negative or ambivalent emotions often experienced by parents following the birth of a handicapped child.

The least frequently employed model, the Parent-Infant Interaction Model, emphasises the enhancement of qualitative mother-child interaction. The model asserts that "the prime requisite for the infant's optimum development is a mutually satisfying relationship between the mother and infant" (Marfu & Kysela, 1985, p. 136). The focus of intervention is increased maternal sensitivity and responsiveness to the child's particular developmental weaknesses. Training is also centred on increased attention to and expansion of children's communicative attempts.

The Parent Training-Infant Curriculum Model is the model most frequently utilized in contemporary early intervention programs for mentally handicapped infants and children. A didactic approach is assumed, whereby parents are taught behavioural strategies for teaching their handicapped children particular skills. Optimum child
development in several areas—motor, cognition, self-help, socialization and language—is the ultimate goal of intervention.

With regard to the strategies utilized to address the final domain, language, Graham (1976) noted that a general consensus is evident concerning appropriate instructional procedures. Behavioural technology is utilized, informally or formally, for instructional purposes, by most language intervention programs. Due to differing perspectives regarding language intervention, considerably more variability is evident regarding the appropriate content and sequencing format of language programs. Graham (1976) outlined three fundamental approaches to language intervention: the manual approach, the nondevelopmental approach, and the developmental approach.

The manual approach utilizes gestural systems or manual signing programs as opposed to focusing on oral language training. Such strategies are generally employed with more severely retarded individuals. Teaching may be accomplished more rapidly as manual strategies are much more amenable to shaping via physical manipulation than oral language training programs.

Interventionists who employ strategies based on the nondevelopmental approach to language intervention contend that since language delayed individuals have failed to acquire language in accordance with the normal
developmental sequence, their linguistic development should be managed in an alternative manner. The underlying premise is that older retarded individuals may employ language acquisition processes that differ from the norm. Hence adherents of the nondevelopmental approach necessarily subscribe to the qualitative stance with regard to the linguistic development of the retarded. Programs are not designed in accordance with the normal developmental sequence and particular cognitive abilities are not considered prerequisites for language development. The intervention focus is primarily pragmatic and emphasis is placed on the training of language forms and skills which will facilitate the individual's control of and interaction with his environment. Imitation is used extensively in the teaching process. Graham (1976) notes that strategies of this nature are typically designed for nonverbal or minimally verbal individuals who manifest severe behavioural concerns and attentional deficits in addition to language delay.

In contrast, language intervention strategies based on the developmental approach reflect a synthesis of psycholinguistic and behavioural models. Program content is derived from the accumulated psycholinguistic data, while behavioural technology is used for instructional purposes. Teaching strategies are based on the sequence of normal linguistic development documented in the literature. A
hierarchy of skills is taught, each considered prerequisite to subsequent skills. Level of cognitive development is considered in terms of its relation to language production and comprehension. Generalization of skills is emphasised, as is the spontaneous development of novel utterances.

The particular intervention program utilized in the present study, the Direct Home Services Program (DHSP), is based on the Parent Training-Infant Curriculum model detailed earlier. Thus, the language teaching strategy used in the program corresponds to the developmental approach described above. Based on the literature, DHSP appears representative of the majority of early intervention programs currently serving mentally handicapped infants and young children. (Graham, 1976; Marfu & Kysela, 1985; Simeonsson et al., 1982). The program was originally modeled on the Portage Project (Shearer & Shearer, 1976), an intervention program designed to service mentally handicapped preschoolers in rural areas. A synopsis of DHSP's referral and assessment process, in addition to information concerning the curriculum and teaching model utilized, is provided below.

The Direct Home Services Program is operated by the Department of Social Services, Government of Newfoundland and Labrador (Nfld.). The program operates on a provincial level, and families of clients in the St. John's, Marystown, and Labrador City/Wabush areas were approached for
involvement in the study. Although populations in these areas range from between 10,000 to 150,000 persons, all areas are classified as "urban" by the Newfoundland and Labrador Government.

Referrals

Referrals to DHSP are accepted from any source, the sole criterion being that the referring agent secure parental approval for the referral prior to contacting the program. Communication with agencies such as organizations for the mentally retarded and preschools is sought to facilitate public awareness and encourage further referrals.

In addition, as the program is directly operated within a government department, official liaisons exist with other departments, most notably the Department of Health. The communication network afforded by these intra- and inter-department connections has served to facilitate the establishment of a fairly comprehensive referral system, particularly within the St. John's area. Children of dubious or evidently subnormal developmental status are routinely referred to the program by other professionals, dependent solely on parental approval. Referrals are thus often received from individuals affiliated with the medical community, such as physicians, physiotherapists, speech pathologists, or public health nurses. Program staff are attached to district offices of the Department of Social
Services; consequently, social workers within the Department serve as an additional major source of referrals. Although the existence of a government funded medicare system enhances the probability that referrals received from the medical community are representative of a variety of socio-economic classes, referrals received from the Department of Social Services may reflect a disproportionate number of children from the lower end of the socio-economic spectrum.

Assessment

Following referral, children are assessed by program staff employing the Alpern Boll Developmental Profile to gauge developmental status in the following 5 areas: physical development, academic development, language development, social development, and the development of self-help skills. The Alpern Boll is administered in the home environment and is completed based upon parental responses in conjunction with direct observation of the child. Children are considered eligible for program inclusion if their scores reflect developmental delays in excess of 5 months in any two areas or a delay of at least 12 months in any one area. Treatment is available to children with delays of either biological or environmental origin. In addition, service is never declined because a child has "too many" handicaps or is handicapped to "too great a degree."
Participation in the program is optional for natural or adoptive parents and mandatory for foster parents. In some instances where parents are incapable of implementing or unwilling to implement programs themselves, the Department may fund individuals to perform the service, usually in a preschool setting.

Curriculum

Once deemed eligible for intervention, children are assigned to a waiting list, or, dependent on staff availability, immediately commence involvement in the program. The Portage Guide is the primary instrument utilized to design individual programs tailored to each child's specific developmental needs. It is comprised of the following three segments:

1. A Developmental Sequence Checklist, which details in a hierarchial manner behaviours from birth to 5 years of age in 5 developmental domains—cognition, language, motor, self-help, and socialization.

2. A set of curriculum cards corresponding to the 580 behaviours listed in the checklist. Behavioural objectives are used to describe skills, and possible materials and teaching ideas are provided for each item.

3. Instruction manual.

The checklist is utilized to identify skills already present in the child's behavioural repertoire.
Programming is designed to teach the skills immediately following those already exhibited by the child and teaching continues in a sequential fashion. Skills listed in the language portion of the checklist are based on the traditional sequence of language development documented in the literature and hence are reflective of a referential-based approach to language acquisition.

Teaching Model

The following teaching model is utilized (Shearer & Shearer, 1976):

1. A minimum of three behaviours are targeted for learning each week. The behaviours are broken down into smaller units commensurate with the child's abilities and a criterion of success is stipulated.

2. Baseline data are recorded by a home teacher to determine the child's readiness to acquire the skill.

3. Parents implement the actual teaching process in the home during the week in accordance with the modelling demonstration and written instructions provided by the home teacher.

4. The home teacher records post-baseline data the following week to determine whether the child has acquired the assigned behaviours. Based on the post-baseline performance, the home teacher revises the target behaviour or introduces new activities.
Children may continue in the program until reassessment scores indicate the absence of significant retardation or until the child begins school. In the former instance, children are retained on the caseload on follow-up status and reassessed periodically to ensure continued development in accordance with the norm. Any subsequent re-emergence of retardation renders these children eligible for renewed programming.

**Rationale for the Present Study**

To reiterate, several facts have emerged from the reviewed literature. Recent studies investigating individual variation in the linguistic development of normal children appear to substantiate the contention of differential acquisition styles originally broached by Nelson (1973). Research regarding language development in retarded children has centred primarily on the issue of qualitative versus quantitative differences and has yielded conflicting data thus far. The preponderance of studies favour the quantitative stance, however, which conceptualizes language development in retarded populations as essentially mirroring the process evident in normals, differing solely in terms of rate of development. The majority of early intervention programs for retarded children thus base program content on the typical sequence of development documented in the literature. Language
intervention programs are therefore typically modeled on a referential strategy which, until recently, was perceived to be universally employed by all children. Research investigating the expressive-referential continuum in retarded children is scarce; however, preliminary studies strongly suggest characteristics associated with the expressive mode of acquisition are particularly prevalent in the speech of retarded children. How, then, does an environment emphasizing a referential approach affect children predisposed to engage in expressive strategies to attack the language learning task? Nelson (1973), in a study of normally developing children, reported that parent-child acquisition strategy mismatch detrimentally affected the child's linguistic development. Furthermore, it appeared that when parents who espoused a referential strategy rejected their child's expressive attempts at language and tried to control the language learning situation, further language delay was evident. Nelson concluded that rejection and non-acceptance coupled with premature differential reinforcement and domination inevitably retarded rather than facilitated language acquisition. One child eventually altered his expressive approach to correspond to the referential style emphasised by his mother. Such a shift required time, and time is one commodity which the retarded child lacks. Notably, parents of children receiving DHSP are advised as to the traditional
sequence of language development and are taught to practice "referential" language behaviour with their children on a daily basis.

Are retarded children predisposed, as preliminary studies indicate, to espouse an expressive mode of acquisition? Does involvement in a referential based language program force children to readjust their approach to the language learning task, shifting from an expressive to a referential emphasis? The present study was conducted to examine the effects of an early intervention program utilizing referential linguistic strategies on the language acquisition styles of mentally retarded children.

Hypotheses

Based on the preceding literature, the following hypotheses were formulated:

1. It was hypothesized that characteristics associated with the expressive mode of acquisition are particularly prevalent in the language acquisition styles of the majority of mentally retarded children, and thus should been evident in the speech of the waitlisted children.

2. It was hypothesized that participation in the program would effect a shift in stylistic emphasis from predominantly expressive approach to a predominantly referential approach. Specifically, waitlisted children, who have received no treatment, were expected
to exhibit characteristics associated with the expressive style, in accordance with preliminary findings regarding stylistic emphasis. In contrast, the active group was expected to be comprised of a variable number of expressive and referential stylists. Exposure to referential programming was thus expected to modify speech, resulting in a change from a primarily expressive strategy to a primarily referential strategy. As children are expected to differ in their ability and willingness to change styles, it was anticipated that some children would continue to employ speech reflecting a primarily expressive emphasis, while other children would have made the transition and exhibit speech characteristic of a predominantly referential strategy.

3. It was hypothesized that exposure to the program would serve to increase the productive vocabulary of children on the active caseload.
CHAPTER II

METHOD

Subjects

Subjects for the study consisted of eight mentally retarded children referred to DHSP and identified as being at an level of language development corresponding to the production of approximately 1.5 to 2.5 morphemes per utterance. Severity and etiology of retardation varied, although in all instances retardation was attributed to physiological rather than environmental factors. All subjects resided in homes in the communities of St. John's, Marystown, and Wabush/Labrador City in the province of Newfoundland and Labrador. The subjects, six males and two females, were all of Caucasian origin, and socio-economic status ranged from lower to middle class. The sample was divided into two groups, each comprised of four children, dependent on the child's status in the program as either an active (treatment) or waitlisted (control) client. The mean CA of the waitlisted children was 5.6 years, while the mean CA of the active children was 4.2 years.

Active (Treatment) Group

In addition to the completion of assessments and
developmental checklists, subjects in this group were exposed to intervention techniques designed to address identified areas of retardation. Program staff reassessed children at six month intervals in order to monitor developmental progress and evaluate program effects. Accordingly, active involvement in the program for a minimum of six months was stipulated as the criterion for inclusion in this group.

**Waitlisted (Control Group)**

Upon initial referral to the program, these children underwent assessment to verify the presence of sufficient developmental delay to warrant program intervention. Following this, they were placed on a list awaiting placement in the program. No formal intervention designed to address developmental delays was initiated by program staff for these children.

**Instruments**

**Alpern Boll Developmental Profile**

The Alpern Boll Developmental Profile is employed by program staff to assess the developmental status of children referred to the program. The instrument utilizes data derived from parental interviews in conjunction with direct observation of the child to estimate developmental level in five functional areas: physical skill, self-help
skills, social competence, academic skills, and communicative ability (Hunt, 1978). The child's scores are displayed as developmental ages in each functional area, and the score obtained in the academic domain can be used to determine an intelligence quotient equivalency score (IQE). Items included at each age level were passed by approximately 70 to 80 percent of the standardization sample at the specified age. Studies assessing comparability of the IQE and the IQ obtained from the Stanford-Binet suggest that although the IQE has validity as a screening measure, the instrument will misclassify a substantial number of children. Small studies assessing reliability reported relatively high measures of both interscorer reliability and test-retest reliability (Hunt, 1978).

**Peabody Picture Vocabulary Test-Revised**

The Peabody Picture Vocabulary Test-Revised (PPVT-R) was utilized to provide an independent, current measure of the receptive language development of children identified for involvement in the study. The PPVT-R was primarily designed to yield a measure of receptive language ability and is applicable to a wide range of individuals, spanning an age range from 2.6 to 40.0 years of age. Duration of administration is typically short, generally requiring a maximum of 20 minutes (MacCallum, 1985). The PPVT-R is individually administered and untimed, requiring examinees
to indicate via verbal or nonverbal responses which of four pictures corresponds to a verbally presented stimulus word. Raw scores derived from administration may be converted to age-equivalent scores, percentile ranks, or standard scores.

Studies evaluating the reliability of the instrument with populations of children generally indicate adequate reliability. Test-retest coefficients range from .54 to .90 for standardized scores using a subsample of 962 children (Wiig, 1985). Further evaluation using alternate forms on a subsample of 642 children yielded a median reliability coefficient of .82 for standardized scores (Wiig, 1985). Evidence to date also indicates a moderate level of internal consistency. Split-half reliability coefficients on the standardization sample resulted in values ranging from .67 to .88 for one form and from .61 to .86 for the other (Wiig, 1985).

McCallum (1985), in a review of the PPVT-R, noted the lack of data pertaining to the predictive and concurrent validity of the test. In a study investigating the latter issue, Bracken and Prasse (1983) derived moderate correlations between the PPVT-R and the McCarthy Scales of Children's abilities using a sample of high risk preschoolers. They attributed the absence of high correlations to fundamental differences in the skills assessed by the two instruments, the McCarthy measuring a
variety of skills, the PPVT-R measuring primarily receptive language.

Although the subjects in the present study fall within the chronological range of the PPVT-R normalized sample, their developmental age was substantially lower, rendering them significantly different from the normative population. The applicability of the test for use in the present study is thus debatable. In justification of its usage, it is emphasized that the PPVT-R was employed for the derivation of measures of approximate receptive language development. The decision not to readminister the Alpern Boll Developmental Profile for assessment purposes was made in order to avoid interference in the standard procedures of the program. Usage of the PPVT-R thus permitted a rapid, independent method of evaluating receptive language through the administration of an instrument designed specifically for that purpose.

Linguistic Measures

1. Mean Length of Utterance (MLU). This measure was calculated from each transcript in accordance with the guidelines established by Brown (1973) and modified by Nelson (1973).

2. Number of Unanalyzed Phrases. This measure was derived from transcriptions of the child's spontaneous speech.
3. Noun use ratio, as determined by Nouns/Noun + Pronouns (n/n+pn).

4. Productive Vocabulary Size. This measure was calculated via a vocabulary count.

5. Noun Type/Token Ratio (NTTR): Total number of noun types/Total number of nouns.

6. Word Types. This provides a general breakdown of several major grammatical classes evident in a child's early vocabulary. Several of the categories do not conform to those utilized by Nelson (1973), and are based instead on a more logical breakdown of word types. The following categories were used:

   (i) Nouns (N)
   (ii) Pronouns (P)
   (iii) Verbs (V)
   (iv) General Modifiers (Mods). This category is comprised of things which refer to properties or qualities of things or events ("big," "hot," "there").
   (v) Miscellaneous Words (MW). Words which serve a primarily grammatical function, such as prepositions, articles and conjunctions.
   (vi) Social/Conventional words (CS). This category includes greetings and acknowledgements.
Speech Functions

The spontaneous utterances of children were coded into one of six categories, two of which reflect an object focus, two indicative of a primarily person-social orientation, and two which reflect a combined object and personal-social orientation. The categories are as follows:

(i) Name-Refer. Speech used to name or refer to objects (e.g.) child points and says "that."

(ii) Comment-Describe. Child names a property, action, or state of the object.

(iii) Personal. Child describes own action or state.

(iv) Interactive. Child establishes or maintains contact with another.

(v) Instrumental-Regulatory. Child attempts to regulate the action of another or use another to achieve an end.

(vi) Give-Show-Take. Child engages another in showing or exchanging object.

Procedure

The language development scores derived from the most recent administration of the Alpern Boll Developmental Profile were employed initially by Program staff to select
children at appropriate levels of linguistic development. Once parental consent was obtained by staff for a child's participation in the study, a home visit was arranged for the experimenter. Audio recordings of approximately 45 minutes of the child's speech were obtained during the first portion of the visit. The investigator acted as a participant-observer during these unstructured taping sessions and the child determined what activities were to be engaged in, the sole restriction being that the games were played in the home, not outside. Mothers were present at all sessions and encouraged to be the child's main participant during the taping session. The degree of experimenter involvement was thus dependent on the child's interest in having the experimenter participate. The PPVT-R was administered following taping to obtain a measure of the child's current receptive language abilities.

Inter-rater reliabilities were obtained for transcribing and coding. Reliabilities for the former ranged from .62 to .85, with a mean of .75. Reliabilities for the latter ranged from .81 to .94, with a mean of .90.
CHAPTER III

RESULTS

The initial portion of this chapter deals with the stylistic classification of children on the basis of linguistic and speech function data. Following this, an analysis of the word types used by the referential and expressive groups is detailed, and the results of the qualitative analyses of the speech of individual children is presented. Finally, the results of statistical examinations of each of the hypotheses are presented, followed by a number of supplementary analyses.

Stylistic Classification

In order to determine whether stylistic preferences were exhibited by subjects in the present study, transcripts were subjected to several types of analyses reported to differentiate stylists. Holick (1984) notes that noun/noun + pronoun ratio is a particularly salient linguistic discriminator at relatively low MLU levels. While this measure was considered the primary classification scheme in the present study, speech function was also examined to determine stylistic emphasis. In addition, the speech
samples were subjected to individual examination to provide a more qualitative assessment of stylistic characteristics.

With regard to the functional analysis, Nelson (1981) suggests that nominal and pronominal styles are associated with specific functional preferences. To facilitate comparison with data from an unpublished study cited in Nelson (1981), the speech functions of the spontaneous utterances produced by subjects in the present study were coded into one of six categories. These include two categories considered to reflect a referential or object focus (Name-Refer and Comment-Describe), two categories identified as primarily personal-social in orientation (Personal and Interactive), and two categories considered to incorporate both social- and object-oriented functions (Instrumental-Regulatory and Show-Give-Take). Referential speakers are reputed to use speech primarily for labelling functions, while expressive speakers are reported to focus primarily on personal-social functions.

Initial noun/noun + pronoun (n/n+pn) ratios incorporating all intelligible utterances for each child are presented in Appendix A. This preliminary analysis resulted in the tentative identification of 5 referential and 3 expressive stylists. Subsequent noun/noun + pronoun ratios employing only spontaneous utterances were calculated as elicited utterances were considered susceptible to bias
due to situational constraints. Classifications resulting from this analysis are displayed in Table 1. All children retained their original stylistic classification with the exception of one child, Subject 6. His initial noun/noun + pronoun ratio of 0.588 indicated slightly higher usage of nouns relative to pronouns. Recalculation of noun/noun + pronoun ratios based on spontaneous utterances resulted in a ratio of 0.381; hence, his speech was reclassified from referential to expressive in orientation. Use of this classification scheme resulted in four children being identified as expressive speakers, and four as referential.

Noun type/token ratios were often found to be inconsistent with classifications based on noun/noun + pronoun ratios. Such discrepancies were evident for a number of children in the sample. Subject 2, for example, obtained a very high noun/noun + pronoun ratio, reflecting a strong referential orientation. A noun type/token ratio of only .321 indicated, conversely, that the child had a limited set of nouns in his vocabulary and tended to repeat them frequently. Referential speakers are expected to evidence higher noun type/token ratios relative to their expressive counterparts, as their vocabularies are expected to be larger and increase at a faster rate than expressive speakers. Children's noun type/token ratios will be examined in relation to noun/noun + pronoun ratios in another section of this chapter, and possible explanations
Table 1
Classification based on n/n+pn (Spontaneous Utterances)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Status*</th>
<th>n/n+pn</th>
<th>N type/token</th>
<th>R/E²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>1.000</td>
<td>0.857</td>
<td>R</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>0.981</td>
<td>0.321</td>
<td>R</td>
</tr>
<tr>
<td>3</td>
<td>W</td>
<td>0.921</td>
<td>0.290</td>
<td>R</td>
</tr>
<tr>
<td>4</td>
<td>W</td>
<td>0.754</td>
<td>0.231</td>
<td>R</td>
</tr>
<tr>
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<td>W</td>
<td>0.433</td>
<td>0.308</td>
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</tr>
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<td>8</td>
<td>A</td>
<td>0.215</td>
<td>0.357</td>
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</tr>
</tbody>
</table>

Note: *status: A = Active status; W = Waitlisted status

R/E²: E = Expressive classification; R = Referential classification
for the discrepancies will be addressed in the following chapter.

The results of the functional analysis are presented in Table 2. In accordance the format utilized in Nelson (1981), the six categories were collapsed into three, one reflecting a primarily object-orientation, another a primarily social orientation, and another a combined social and object orientation. The speech of 6 of the 8 children was classified into functional categories which corresponded to their classifications based on noun/noun + pronoun ratios (Table 2). Subject 4, however, designated a referential stylist based on noun/noun + pronoun ratio, employed the highest proportion of utterances reflecting a personal/interactional orientation. Furthermore, he rarely employed speech for any other function. Subject 6, classified expressive based on noun/noun + pronoun, relied extensively on the Name-Refer (referential) category. However, unlike Subject 4, who used speech almost exclusively for personal/interactional purposes, Subject 6 used speech for a wide range of functions.

Group means for the functional categories, when children retain their expressive/referential categorization based on noun/noun + pronoun ratio, are presented in Table 3. Considering the magnitude of the discrepancy between Subject 4's noun/noun + pronoun ratio and the functional
Table 2

Analysis of Speech Functions for Individual Children
(Spontaneous Utterances)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Name-Refer &amp; Comment-Describe</th>
<th>Instrumental-Regulatory &amp; Show-Give-Take</th>
<th>Personal &amp; Interactional</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(6) 60.00%</td>
<td>(0) 0.00%</td>
<td>(4) 40.00%</td>
</tr>
<tr>
<td>2</td>
<td>(8) 55.56%</td>
<td>(4) 44.44%</td>
<td>(0) 0.00%</td>
</tr>
<tr>
<td>3</td>
<td>(12) 42.86%</td>
<td>(10) 33.33%</td>
<td>(0) 0.00%</td>
</tr>
<tr>
<td>4*</td>
<td>(11) 54.55%</td>
<td>(9) 43.18%</td>
<td>(5) 2.31%</td>
</tr>
<tr>
<td>5</td>
<td>(11) 72.73%</td>
<td>(5) 45.45%</td>
<td>(5) 45.45%</td>
</tr>
<tr>
<td>6*</td>
<td>(19) 47.37%</td>
<td>(14) 44.44%</td>
<td>(1) 0.00%</td>
</tr>
<tr>
<td>7</td>
<td>(29) 58.62%</td>
<td>(14) 48.28%</td>
<td>(4) 42.30%</td>
</tr>
<tr>
<td>8</td>
<td>(8) 75.00%</td>
<td>(27) 57.14%</td>
<td>(5) 24.24%</td>
</tr>
</tbody>
</table>

Note. * indicates subjects whose speech functions strongly conflict with their classification based on n/n+pn.
Table 3

Group Means for Functional Categories

<table>
<thead>
<tr>
<th>Group</th>
<th>Percentage of total Utterances in Each Functional Category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name-Refer &amp; Comment-Describe</td>
</tr>
<tr>
<td>Referential</td>
<td>37.14%</td>
</tr>
<tr>
<td>Referential*</td>
<td>50.00%</td>
</tr>
<tr>
<td>Expressive</td>
<td>18.92%</td>
</tr>
</tbody>
</table>

Note. Referential* was calculated excluding data pertaining to Subject 4.
analysis of his speech, it was decided to reanalyse the data excluding that pertaining to Subject 4. The resultant analysis revealed further group differentiation, with the referential group's use of the Personal/Interactional combined category decreasing from 36.57% to 15.74%.

Analysis of Word Types

Table 4 details group differences in the proportion of word types evident in the children's productive vocabularies. Nouns predominated in the vocabularies of referential speakers relative to their expressive peers, while a comparatively greater proportion of pronouns was evident in the vocabularies of expressive speakers. Verbs were found to account for a greater proportion of the vocabularies of expressive stylists compared to their referential counterparts. Conversely, modifiers comprised a slightly greater proportion of the vocabularies of referential speakers. Both groups appeared to utilize similar proportions of social/conventional and miscellaneous words. The percentage of nominal types that were nouns for each child is displayed in Table 5. Means for the two groups are as follows: $\overline{M} = 80.68\%$ for the referential group, $\overline{M} = 51.70\%$ for the expressive group.
Table 4

Word Types used by Expressive and Referential Groups

<table>
<thead>
<tr>
<th>Word Types</th>
<th>Referential Group</th>
<th>Expressive Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nouns</td>
<td>45.80%</td>
<td>24.30%</td>
</tr>
<tr>
<td>Pronouns</td>
<td>13.54%</td>
<td>21.50%</td>
</tr>
<tr>
<td>Verbs</td>
<td>10.45%</td>
<td>24.76%</td>
</tr>
<tr>
<td>Modifiers</td>
<td>3.13%</td>
<td>1.87%</td>
</tr>
<tr>
<td></td>
<td>6.29%</td>
<td>3.27%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>12.50%</td>
<td>14.92%</td>
</tr>
<tr>
<td>Social/Conventional</td>
<td>8.33%</td>
<td>10.36%</td>
</tr>
</tbody>
</table>

Note: * = Possessive Modifiers, " = Descriptive Modifiers.
Table 5

Percentage of Nominal Types that were Nouns for Individual Children

<table>
<thead>
<tr>
<th>Subject</th>
<th>E/R</th>
<th>% Noun Types of all NOMINALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R</td>
<td>100.00%</td>
</tr>
<tr>
<td>2</td>
<td>R</td>
<td>72.73%</td>
</tr>
<tr>
<td>3</td>
<td>R</td>
<td>72.00%</td>
</tr>
<tr>
<td>4</td>
<td>R</td>
<td>60.00%</td>
</tr>
<tr>
<td>5</td>
<td>R</td>
<td>56.83%</td>
</tr>
<tr>
<td>6</td>
<td>E</td>
<td>62.50%</td>
</tr>
<tr>
<td>7</td>
<td>E</td>
<td>54.75%</td>
</tr>
<tr>
<td>8</td>
<td>E</td>
<td>55.71%</td>
</tr>
</tbody>
</table>
Individual Analysis

In addition to analyzing transcripts in accordance with traditional classification schemes, each transcript was subjected to individual examination to provide a more qualitative analysis of stylistic emphasis. Hence a more descriptive analysis of the children's speech patterns is provided, which incorporates factors such as etiology of retardation and behavioral observation in conjunction with linguistic and functional data.

Referential Stylists

Subject 1

With an MLU of 1.88 at C.A. 4.5, this child displayed less language delay than the majority of referential stylists who participated in the study. His language level, as assessed by an Alpern Boll Developmental Profile administered one month prior to taping, was 2.8 years. Although technically a later born child, this boy's elder siblings were aged 17 and 18 years respectively, while his younger sibling was aged 3 years. Thus, he was essentially functioning as the elder of a second set of children. A noun/noun + pronoun of 1.00 indicated an extreme referential emphasis, and a noun type/token ratio of 0.85 indicated that a wide variety of object words were at the child's disposal and that he seldom repeated them. Although this boy rarely employed verbs, the few verb forms
he utilized were pro-verbal (e.g., "had") and deictic (e.g., "going") in nature, forms typically associated with an expressive strategy. In accordance with his referential emphasis, all nominals produced by the child were nouns and his speech was primarily object-oriented (60%).

A very withdrawn and quiet child, he displayed little inclination to interact with the experimenter, never responding to her questions and seldom responding to those of familiar others. He remained in close proximity to his parents during the session, often shielding his face from the experimenter. In addition, he produced very few spontaneous utterances and consistently spoke at a barely audible level. His voice sounded quite hoarse and raspy; however, this was reportedly characteristic. The activities in which he chose to engage were primarily solitary, such as drawing pictures and completing puzzles.

The child has Saethre-Chotzin Syndrome, a chromosomal condition with physical manifestations including a deformed head, teeth, and ears, small stature, and short limbs. Associated symptoms include respiratory ailments, convulsions, and mild to moderate mental retardation. This little boy appeared relatively high functioning and quite aware of his surroundings. It is possible that his reticence was partially attributable to sensitivity due to his pronounced physical deformities and unusual voice.
Subject 2

Aged 3.6 years, this child had the lowest MLU (1.19) of all children in the study. An Alpern Boll Developmental Profile completed two months previously indicated he was functioning at a language level of approximately 1.6 years. His noun/noun + pronoun ratio indicated a strong referential emphasis (.981) and examination of his vocabulary revealed a focus on nouns. Similarly, functional analysis revealed a definite object orientation (58.82%). The remainder of his speech fell into the combined Instrumental-Regulatory/Show-Give-Take category, a category which reflects in part the child's attempts to use speech to influence or control the actions of others. This functional emphasis may be partially attributable to the child's restricted motor abilities. It appears plausible that usage of speech for such functions would be particularly useful for this child. The one verb ("give") produced by this youngster was deictic in nature—again, such a verb (implying direction) would conceivably be useful for a physically disadvantaged child. Noun type/token ratio was quite low, possibly a function of his generally restricted language level.

In terms of etiology of retardation, the child was reported to have a large brain tumour and had had a shunt implanted during the previous year. An only child, this little boy demonstrated little inclination to interact with
either the experimenter or his mother. He was generally unresponsive to questioning and displayed a preference for solitary play involving trucks and a ball. Although he appeared fascinated by the tape recorder and continually attempted to manipulate it, at no time did he verbalize his interest to his mother or the experimenter, nor attempt to elicit information concerning it.

Subject 3

With an MLU of 1.44 at 6.5 years of age, this child demonstrated considerable language delay. A noun/noun + pronoun ratio of .921 indicated a strong preference for referential speech; however, a noun type/token ratio of .290 indicated a limited repertoire of object words and an inclination to employ them repeatedly. The latter finding may reflect the child's generally limited productive vocabulary and her tendency to repeat each utterance several times, possibly due to the poor intelligibility of her speech. Examination of her vocabulary revealed a primary emphasis on nouns, as 90% of the nominal types she produced were nouns. Functional analysis indicated, however, that although a large proportion of her utterances were object-oriented (35.97%), the majority were focused on influencing the actions of others (Instrumental-Regulatory/Show-Give-Take 43.75%). This finding may be related to the child's general mode of interacting with others. This little girl's
family has been receiving treatment for several years
centred on addressing a number of maladaptive behaviours
exhibited by the child—the majority of which are non-
compliant and manipulatory in nature. Hence, an inclination
to use speech to control and regulate the actions of others
is in accordance with the child's behavioural history.

She produced only two verbs, one deictic ("come")
which also corresponds with an interest in influencing the
behaviours of others. The other, an action verb ("drive"),
is consistent with referential, object-centred speech.

During the interview, this youngster spent a large
proportion of time repeating requests to go to the
playground, requests for food, and requests to go for a
drive in the experimenter's car. Although she would engage
in activities such as drawing or printing upon parental
request, these episodes were typically of short duration and
rarely initiated by the child herself. The taping session
had to be periodically interrupted to enable her parents to
employ disciplinary measures for behaviours such as biting,
hitting, and intentional spilling of food.

Mental retardation in this child is considered a
symptom of a previously undocumented chromosomal condition.
Physical manifestations are similar to those of Downs
Syndrome, as are symptoms in addition to mental retardation,
including susceptibility to respiratory ailments and heart
defects.
Subject 4

Chronological age 3.5 years, MLU 1.55, this little boy appeared to demonstrate clearly that the use of differing criteria for classification purposes could result in extreme differences in a classification. A noun/noun + pronoun ratio of .754 indicated that this child was employing a referential approach to language acquisition. Functional analysis, another reportedly powerful stylistic discriminator, indicated that the child was using language for primarily personal/interactional purposes (70.15%), a finding suggestive of a strong expressive emphasis. Analysis of noun type/token ratio concurred with the latter classification system. A ratio of .231 indicated that a very limited set of nouns were at this child's disposal and that he tended to repeat them often. This low ratio was partially attributable to the child's frequent usage of one noun in particular, "Mommy," to get his mother's attention. Recalculation of this measure deleting data relevant to this noun resulted in a revised noun type/token ratio of .390. The ratio is still relatively low, however, and corresponds with that reported by Nelson (1975) for expressive stylists, not referential stylists. Furthermore, only 60% of the nominal types produced by this child were nouns, the lowest percentage obtained by any of the referential speakers. Examination of data regarding verbs indicated that pro-verbs
(e.g., "be") and deictic verbs (e.g., "put") were the only verbs employed by this child, the latter with much greater frequency. Both forms are associated with an expressive style. When provided with labels for his "What's this?" questions, the child did not imitate them; however, he was observed to imitate an adult's exclamation, "Oh my God!" He was also the only child who produced what appeared to be unanalyzed phrases; "leave alone," "two dollars," and "be good." Such phrases are again considered to be indicative of an expressive orientation.

Although not specifically known, the etiology of this child's delay is considered to be associated with his premature birth (24 weeks). Although his mother had advised that the child had had a shunt inserted approximately one year previously, she did not disclose the reason for the operation.

Expressive Stylists

Subject 5

At C.A. 7.5 years, this boy, the eldest in the sample, had an MLU of only 1.88, indicative of significant language delay. His noun/noun + pronoun ratio (.433) and his noun type/token ratio (.308) were consistent with an expressive orientation. Analysis of his vocabulary indicated that 53.85% of the nominal types he produced were nouns. Verbs were frequently evident in his speech and
examination revealed that these included comparatively equal proportions of deictic (e.g. "get") and action verbs (e.g. "colour") and relatively fewer pro-verbs (e.g. "is"). Data pertaining to use of verb forms indicated that deictic verbs were employed with the greatest frequency and pro-verbs least often.

Functional analysis of the child's utterances further indicated an expressive emphasis. Only 9.02% of his speech was object-oriented, while 45.90% reflected a social orientation. A similar portion was found to incorporate both social and object orientations.

This youngster, an only child, had Downs Syndrome. During the taping session, he appeared quite interested in interacting with the experimenter and was fascinated by the tape recorder. It was noted that he generally failed to repeat the object labels provided to his questions of "What's that?". Although no unanalyzed phrases were evident, he frequently produced social phrases such as "No way Jose" and "Yes Babe."

Subject 6

An MLU of 1.20 indicated that the speech of this 4.10 year old consisted primarily of one word utterances. An only child, this boy had been adopted by his grandparents and differed in age from his closest adopted sibling by 14 years. Thus, although considered a later born child for
purposes of analysis, his experience was essentially that of an only child. The etiology of this child's delay was unknown and was generally considered associated with a premature birth.

A noun/noun + pronoun ratio of .381 implied a definite expressive orientation. Few verbs were employed, but exemplars of each of the four verb forms were evident. Examination of incidence of verb usage revealed that deictic verbs occurred more frequently than other forms, a finding also in accordance with an expressive orientation.

Functional analysis indicated, however, that a high proportion of this boy's speech was object-oriented (41.30%). Functional usage of this nature was considered by Nelson to correspond with a referential rather than an expressive emphasis. Furthermore, a noun type/token ratio of .625 is considered more in accordance with a referential strategy, implying a relatively wide variety of seldom repeated nouns was at the child's disposal.

Sixty-two and a half percent of the nominals this boy used were nouns. Although low relative to the referential group mean of 80.68%, it is nonetheless the highest percentage obtained by any of the expressive children.

Examination of the modifiers used by the child revealed they were descriptive modifiers, not possessive modifiers, a feature also associated with referential speech.
in normal children. Scrutiny of the transcript revealed, however, that these modifiers were used by the child to describe aspects of people rather than objects. "Pretty" was consistently used in reference to people's hair and accompanied by attempts to touch the hair. Similarly, "nice" was also used with reference to people and was generally accompanied by a patting motion. It was also noted that when provided with labels for objects he had queried, the child did not repeat them.

Although not overly motivated to communicate verbally, this little boy appeared quite interested in interacting with the examiner. He demonstrated a general preference for engaging in physical play, usually not involving objects; for example, playing with the experimenter's hair. When engaged in play activities incorporating objects, he displayed an interest in maintaining close physical proximity, usually sitting on the examiner's lap.

Subject 7

This little girl, aged 4.4 years, attained the highest MLU (1.94) in the sample. An Alpern Boll Developmental Profile administered one month prior to the taping session indicated she was functioning at a language level of approximately 2.0 years. A later born child, the etiology for her mental retardation was not known. Her
noun/noun + pronoun ratio of .301 indicated a strong expressive orientation. Also consistent with an expressive orientation, this little girl used speech primarily for personal/interactional purposes (42.31%). The percentage of nominal types that were nouns in this child's vocabulary was 54.76%, slightly above the expressive group mean.

Verbs comprised a substantial portion of her vocabulary (24.68%), and further examination revealed that comparable proportions of pro-verbs, action verbs, and deictic verbs were present. Examination of usage indicated that pro-verbs and action verbs were employed comparatively more frequently than deictic. Although state verbs (e.g. "want") were rarely used by this child relative to other verb forms, she used them more frequently than any other child in the sample. A noun type/token ratio of 0.522 was somewhat inconsistent with an expressive orientation, associated instead with a referential orientation.

This little girl appeared very motivated to communicate with the experimenter, despite the latter's difficulty deciphering her speech. She often repeated utterances when the experimenter indicated her failure to understand; however, usually her mother would repeat what the child had said. She appeared to use language for game-like purposes similar to those reported by Morgan (1980). The following excerpt represents a portion of such an interaction:
C: (laughing) Don't peek at me!
E: Draw another one like you? (Drawing picture of child)
C: Yeah
E: OK
C: I looking! (Child attempts to look at experimenter's drawing)
E: You're not supposed to be looking!
C: (laughing) Yeah, I am.
E: You're not!
C: I am!

This routine of "Don't peek at me!" accompanied by laughter was used extensively by the child during the taping session, although at no time did the experimenter or the child's mother attempt to peek at what she was doing. As is evidenced by the example above, towards the end of the session she decided to extend the "game" and do some peeking herself. Another striking aspect of this child's speech was her tendency to describe to others what she was doing if she was involved in somewhat solitary activities (e.g., "I drawing," or "I writing").

Subject 8

With an noun/noun + pronoun ratio of .215, this 4.3 year old boy demonstrated the most extreme expressive orientation of all children involved in the present study.
A low noun type/token ratio (.357) and low noun usage (35.71% of nominal types were nouns) further reflected an expressive emphasis. Consistent with these findings, functional analysis revealed that 57.32% of his speech was personal/interactional in orientation.

Examination of data pertaining to verbs revealed that, although rarely used, all verb forms, with the exception of pro-verbs, were evident. This little boy was a later born child, having both younger and older siblings as well as a fraternal twin. Mental retardation in his case was attributed to Downs Syndrome.

Throughout the taping session, this little boy appeared quite interested in communicating, despite the unintelligible quality of his speech. On several occasions he, like Subject 7, banished his siblings from the room, preferring to command the full attention of the experimenters. His behaviour of describing his actions, such as "up-down" when drawing a "V" was also similar to that of the preceding child. He was very receptive to praise and hugs in response to his activities, and manifested a desire to remain in close proximity to the experimenters. Although he posed questions such as "What's that?", he didn't imitate the labels that were provided.
Statistical Analyses

Once classification was determined, statistical analyses were conducted to test the hypotheses formulated. A Chi-square analysis was used to investigate the first hypothesis—that proportions of expressive and referential stylists in the retarded differed from those reported for normals. No significant difference was found, $\chi^2 (1) = 1.05$.

The second hypothesis postulated that proportions of stylists in the active and waitlisted conditions would differ: more referential stylists were expected in the former condition, while the latter condition was expected to consist primarily of expressive stylists. Fisher's Exact Probability Test verified the absence of significant differences in the proportions of expressive and referential stylists in the two conditions, as equal proportions of stylists were found to exist in both groups.

Finally, it was hypothesized that active and waitlisted children would differ in their productive vocabulary size, with the former having larger productive vocabularies than the latter. Subjects' productive and receptive vocabulary sizes are detailed in Table 6. A Mann-Whitney U-Test verified the absence of significant differences in productive vocabulary size between the two groups, $U_a = 4$, $U_b = 4$, $U_{a\text{ v. } b} = 7.5$. 
<table>
<thead>
<tr>
<th>Subject</th>
<th>Productive Vocabulary Size</th>
<th>Receptive Vocabulary Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>81</td>
<td>3.1 yrs</td>
</tr>
<tr>
<td>2</td>
<td>49</td>
<td>2.4 yrs</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
<td>2.3 yrs</td>
</tr>
<tr>
<td>4</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>118</td>
<td>3.11 yrs</td>
</tr>
<tr>
<td>6</td>
<td>54</td>
<td>2.6 yrs</td>
</tr>
<tr>
<td>7</td>
<td>157</td>
<td>3.5 yrs</td>
</tr>
<tr>
<td>8</td>
<td>59</td>
<td>3.1 yrs</td>
</tr>
</tbody>
</table>

Note. *Productive Vocabulary Size = total number of different words used by a child.*
*Receptive Vocabulary Size = PPVI-R score*
Supplementary Analyses

A relationship between noun/noun + pronoun ratio and several of the variables detailed in Table 7 was examined. An insufficient number of females (N=2) in the sample precluded investigation of any possible relationship between noun/noun + pronoun ratio and gender.

Kendall's Tau was used to determine if significant correlations existed between noun/noun + pronoun ratio and age. Specifically, it was anticipated that large noun/noun + pronoun ratios would be correlated with higher MLU and greater age. No significant correlations were found: N = 8, \( \tau = -0.214 \); and N = 8, \( \tau = 0.071 \) respectively. The negative correlation for noun/noun + pronoun ratio and MLU indicates that, although not significant, the relationship was counter to that expected; higher noun/noun + pronoun ratios were associated with lower MLUs.

Fisher's Exact Probability Test indicated that a significant relationship did not exist between noun/noun + pronoun and birth order. Although the results miss conventional levels of statistical significance, a definite trend is evident in the data which corresponds with the notion that referential speech is associated with firstborn status, while expressive speech is associated with later born status. Of the referential stylists, three were firstborns, while only one was a laterborn child.
Table 7

Demographic Variables

<table>
<thead>
<tr>
<th>Subject</th>
<th>CA (years)</th>
<th>Gender</th>
<th>Birth Order</th>
<th>Socio-Economic Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.5</td>
<td>male</td>
<td>laterborn</td>
<td>middle</td>
</tr>
<tr>
<td>2</td>
<td>3.6</td>
<td>male</td>
<td>firstborn</td>
<td>middle</td>
</tr>
<tr>
<td>3</td>
<td>4.5</td>
<td>female</td>
<td>firstborn</td>
<td>middle</td>
</tr>
<tr>
<td>4</td>
<td>3.5</td>
<td>male</td>
<td>firstborn</td>
<td>lower</td>
</tr>
<tr>
<td>5</td>
<td>7.5</td>
<td>male</td>
<td>firstborn</td>
<td>middle</td>
</tr>
<tr>
<td>6</td>
<td>4.10</td>
<td>male</td>
<td>laterborn</td>
<td>middle</td>
</tr>
<tr>
<td>7</td>
<td>4.4</td>
<td>female</td>
<td>laterborn</td>
<td>lower</td>
</tr>
<tr>
<td>8</td>
<td>4.3</td>
<td>male</td>
<td>laterborn</td>
<td>middle</td>
</tr>
</tbody>
</table>
Conversely, three of the expressive stylists were laterborn children, while only one was firstborn.

Although no formal measurement instruments were utilized to assess SES, all children appeared to reside in homes ranging from lower to middle socio-economic levels. Subjects were ranked on SES, and a median split completed. Fisher's Exact Probability test verified that the expressive and referential groups did not differ on SES; both groups were found to consist of equal proportions of children from both socio-economic levels.

The number of spontaneous utterances produced by children was also examined (Appendix A). Group means for expressive and referential stylists of 90.25 and 43.75 spontaneous utterances respectively were obtained. Once more, it was noted that Subjects 4 and 6 were at the extreme ends of their respective groups. Subject 4 produced the highest number of spontaneous utterances of all referential stylists, while Subject 6 produced the lowest rate of all expressive stylists. Kendall's Tau revealed that a significant relationship existed between noun/noun + pronoun ratio and the production of spontaneous speech. A high noun/noun+ pronoun ratio was found to be correlated with low production of spontaneous speech. N = 8, \( \text{tau} = -0.571, p < .10 \).

Referential children were expected to have greater productive vocabularies relative to their expressive
counterparts, while the converse was expected for receptive vocabulary size. As noted previously, the productive and receptive vocabulary sizes of all children are displayed in Table 6. It was not possible to obtain a measure of Subject 4's receptive vocabulary, due to the child's refusal to complete the PPVT-R.

Although the small sample size rendered statistical examination of group differences impossible, use of Kendall's Tau revealed a significant relationship between children's productive and receptive vocabulary size. A large productive vocabulary was found to be positively correlated with a large receptive vocabulary. \( N = 7, \tau = .619, p < .10. \)

Finally, as noted previously, it was decided to analyze only spontaneous utterances in order to avoid biasing the speech samples. To more fully examine the data, it was decided to compute noun/noun + pronoun ratios based on the children's elicited speech. As is evident in Appendix A, this resulted in revised classification for two of the children. This suggests these children altered their style when responding to questions posed by others during the taping session.
CHAPTER IV

DISCUSSION

The first hypothesis postulated that the proportions of expressive and referential stylists in the waitlisted (control) group in the present study would differ from those reported for the normal population. McCabe and Bebout (1983) note that approximately 60% of normal children exhibit a predominantly referential style while the remaining 40% display a predominantly expressive emphasis. Results of the present study revealed that 50% of the mentally retarded children in the waitlisted category were referential stylists, while the remaining 50% were expressive stylists. These percentages do not differ significantly from those reported for normal children; hence, the hypothesis was not substantiated. Instead, it appears that proportions of stylists in the mentally retarded population differ only slightly from those reported for normal children. Closer examination of the data, however, revealed differences of a more subtle nature.

One striking feature of the speech of all subjects in the present study was the polarization of styles. Studies
examining stylistic differences in normals often report that stylistic emphasis ranges from extremes of either style to relatively equal usage of nouns and pronouns (Nelson, 1981). In contrast, none of the children in the present study were found to use equal proportions of nouns and pronouns. Rather, a definite preference was exhibited by each child for one form or the other. Such findings suggest that stylistic emphasis may be a particularly salient dimension of language for retarded children. Consideration of this factor might thus be particularly important for designing effective therapeutic intervention strategies for these children.

Most studies attempting to discern stylistic emphasis have used linguistic measures such as noun/noun + pronoun ratios or, to a much lesser extent, measures assessing speech function. Few have incorporated both types of indices for classification purposes. One study, which utilized noun/noun + pronoun ratios and speech function categories used in the present study, reported that classifications based on the former corresponded with those based on the latter (Nelson, 1981). It was found, however, that although expressive stylists used comparatively more personal/interactional utterances than their referential counterparts, expressive and referential stylists did not differ on their use of object-oriented utterances.
In the present study, functional classification appeared to correspond with the classification based on noun/noun-pronoun ratio in the majority of instances. Specifically, children who demonstrated a predominantly expressive style used speech primarily for personal/interactional functions, while children who exhibited a primarily referential style appeared to talk more about objects. In two instances, however, the results of functional analyses conflicted with classification based on noun/noun + pronoun ratios. Conflicting classification was most pronounced for Subject 4. His noun/noun + pronoun ratio indicated a definite referential orientation, while functional analysis indicated the vast majority of his utterances were person/interactional, indicative of an expressive orientation. In fact, this child demonstrated the highest incidence of speech for personal/interactional purposes of all children in the study. Linguistic and functional indices in this instance strongly contradicted each other.

A less dramatic example of classification inconsistency was apparent for Subject 6. Designated an expressive stylist on the basis of noun/noun + pronoun ratio, this child used speech primarily to talk about objects.

The group means for speech function categories, when the children retain their classification based on
noun/noun + pronoun ratio, can be compared to those cited in Nelson (1981). In the present study, the combined Name-Refer/Comment-Describe category appeared to differentiate stylists, with referential children employing this category frequently relative to their expressive counterparts. Nelson suggested that the unpublished study's failure to discern group differences in this category might have been attributable to situational constraints. Such constraints were not likely to be operating in the present study. As in Nelson (1981), both groups were found to utilize comparable proportions of speech incorporating combined object and social functions. Although the expressive group in the present study employed a greater proportion of speech for personal/interactional functions, group differences were not as evident as those found by Nelson.

The word types evident in the vocabularies of children in the present study can also be contrasted with data presented by Nelson (1973). It should be noted, however, that Nelson (1973) examined the initial productive vocabularies of children, while the present study did not. Hence direct comparison with Nelson's data is not possible. The Noun and Pronoun categories were defined in accordance with Nelson's (1975) criteria, while the remaining categories (Verbs, Modifiers, Miscellaneous, and Social/Conventional words) do not fully correspond with categories utilized by Nelson (1973). Despite this noncomparability,
it was noted that, overall, the percentage of word types used by both groups in each of the grammatical categories is somewhat similar to that reported by Nelson. Group means indicate that referential stylists rely to a greater extent on nouns, while expressive stylists employ a greater proportion of pronouns. Nelson (1973) reported that descriptive modifiers were more common in the early productive vocabularies of referential stylists, while the converse was found for possessive modifiers. In the present study, both types of modifiers appeared to comprise a greater proportion of the vocabularies of referential stylists relative to expressive stylists. The vocabularies of the two groups in the present study were comparable in terms of proportions of miscellaneous words and social/conventional words.

To facilitate comparison with Nelson's (1975) findings from a later study, the percentage of all nominal types that were nouns was calculated for both referential and expressive stylists. Means for the two groups were as follows: \( M = 80.68\% \) for the referential group, \( M = 51.70\% \) for the expressive group. Nelson obtained means of 73.70\% and 49.80\% for the referential and expressive groups respectively. Hence the findings of the present study are consistent with those reported by Nelson, indicating that referential stylists rely to a greater extent on nouns than
pronouns, while expressive stylists rely more strongly on pronouns than nouns.

As with classification based on speech function, it was found that noun type/token ratios often failed to correspond with classifications based on noun/noun + pronoun ratios. Referential children are generally expected to obtain relatively high noun type/token ratios, reflecting large vocabularies and little repetition of nouns. In comparison, expressive children, with relatively smaller vocabularies, are expected to repeat nouns more frequently, as reflected by lower noun type/token ratios. The present study's failure to obtain ratios in accordance with other classification criteria may be partially attributable to the population sampled. Noun type/token ratio is essentially a measure of productive vocabulary. Language development in mentally retarded children is slower than that of normals, with many children failing to ever produce a large number of words. Degree of retardation has been found to correlate with productive vocabulary, with greater retardation associated with a more limited vocabulary. Children in the present study manifested considerable variability with regard to severity of retardation, which may partially account for the variance evident in productive vocabulary size. Limited vocabulary size in turn exerts an impact on frequency of repetition. In addition, physiological symptoms associated with specific etiologies may also
influence productive vocabulary size. Subject 3, a referential stylist, had a previously undocumented chromosomal condition with numerous associated physiological symptoms. She experienced difficulty producing words, and her speech was pressured, forced, and raspy. Physiological factors were considered to limit her ability to produce speech, particularly certain sounds, thereby limiting her productive vocabulary. Also, Subject 2 had had a brain tumour and had a shunt inserted. No information was available pertaining to the cerebral areas affected by either the tumour or the surgery. It is possible that areas involved with language were affected, subsequently affecting ability and rate of language acquisition, potentially influencing both productive and receptive vocabulary size. These considerations suggest that noun type/token ratios may not be an appropriate indicator of stylistic preference for mentally retarded children.

Discrepancies between noun type/token ratio and other classification criteria may therefore be attributable to the former's inapplicability to this population. However, contradictions between classification based on noun/noun + pronoun ratio and those based on utterance function remain.

Another unusual finding was apparent with regard to usage of unanalyzed phrases. Subject 4, the only child found to produce unanalyzed phrases—considered an indicator
of a predominantly expressive orientation—had been classified as referential based on noun/noun+pronoun ratio. Further examination of this child's speech incorporating qualitative analysis as well as quantitative measures revealed an even more contradictory picture. This little boy demonstrated a definite preference for nouns (referential characteristic), used unanalyzed phrases (expressive characteristic), and used speech primarily for personal/interactional purposes (expressive characteristic). He seldom imitated labels (expressive characteristic) and the few verbs he employed were associated with an expressive strategy. Inconsistencies are also apparent in the speech of Subject 6. Designated an expressive stylist on the basis of predominant pronoun usage, this child employed speech primarily to discuss objects (referential characteristic). His use of verbs reflected an expressive orientation, while the limited number of modifiers he used were descriptive, suggestive of a referential orientation. Closer examination of these modifiers, however, revealed that they were primarily used in reference to people rather than objects (e.g., "pretty"). Also, it was noted that he never repeated the labels of the objects he queried (expressive characteristic). Thus, for some children, classification seemed to vary as a function of the criteria employed for classification purposes. Certain children manifested characteristics associated with both styles.
Such findings lend credence to the contention that a number of factors interact and contribute to stylistic orientation. A varying combination of these co-occurring contributory variables would result in speech which incorporates variable clusters of characteristics associated with either style. As noted earlier, variables considered to exert an impact on stylistic orientation include gender, socio-economic status, maternal speech, and birth order. Unfortunately, maternal speech was not examined in the present study, and the small number of females involved in the study precluded statistical examination of gender differences. Of the two females in the study, one was found to exhibit a predominantly expressive orientation while the other was found to exhibit a referential orientation. No formal assessments were used to determine socio-economic status; however, all families were considered to be in the lower to middle income range. The present study's failure to obtain a significant relationship between SES and style may be partially attributable to the usage of an ad hoc procedure for assigning SES, and the small sample size. Also, as noted previously, although a statistically significant relationship between birth order and stylistic emphasis was not obtained, the tendency for referential speakers to be firstborns and expressive speakers to be laterborn children was evident.
In addition to the contributory variables discussed above, another factor which may exert considerable impact on the orientational style of mentally retarded children is the etiology of retardation. Etiologies were quite variable in the present study, and to date, virtually no information is available as to whether stylistic orientations are associated with specific etiologies. It was noted, however, that both children with Down Syndrome in the present study displayed a predominantly expressive style. Studies investigating stylistic differences in retarded populations have consistently reported that subjects with Down Syndrome display an expressive emphasis (McCabe, 1982; Parsonson, 1983). Such children may be particularly predisposed to espouse an expressive style, perhaps partially attributable to physiological aspects of Down Syndrome that influence the intelligibility of their speech. Unintelligible speech is typically associated with an expressive style, and in the present study, it was noted that the speech of all expressive stylists was largely unintelligible. In comparison, only one referential stylist produced speech that was particularly difficult to comprehend.

Examination of group data revealed that referential stylists produced far fewer spontaneous utterances than expressive stylists. Individual analysis indicated that the number of spontaneous utterances produced by two children, subjects 4 and 6, differed most from their respective
groups. Subject 4, classified a referential stylist based on noun/noun + pronoun ratio, produced the highest incidence of spontaneous utterances of children in the referential category. Subject 6, deemed expressive based on noun/noun + pronoun ratio, produced the fewest number of spontaneous utterances of all the expressive stylists. As noted earlier, of all children in the study, these two demonstrated the least correspondence between their classification based on noun/noun + pronoun ratio and their classification based on the functional orientation of their speech.

It is possible to consider group differences in the production of spontaneous speech in conjunction with group differences in speech function categories. Children who use language primarily for personal/interactional functions rather than object labelling may be more inclined to initiate interactions with others, due to a social rather than object orientation. Conversely, children who demonstrate an object orientation and use language primarily to label their environment may be less interested in interacting with others and hence initiate fewer verbal interactions. Although Nelson (1981) reported that evidence of the existence of temperamental or personality differences associated with either style is rare, the findings of the present study suggest that among retarded children, such differences may be operating.
The second hypothesis investigated in the present study was that exposure to a referential language program would affect the language acquisition styles espoused by children. Specifically, it was anticipated that a larger number of children in the active group would demonstrate a referential strategy relative to those in the waitlisted group. This hypothesis was not substantiated, as results revealed that 50% of the children in both groups displayed a predominantly referential emphasis while 50% exhibited a primarily expressive stylistic emphasis. The child found to have the strongest expressive orientation of all subjects in either category had been receiving treatment for a duration exceeding two years. Similarly, Subject 7, the other Treatment Group child with an expressive orientation, had been receiving treatment for a number of years. Thus, for these children, treatment did not appear to significantly alter stylistic orientation. Several factors may have contributed to these results.

As language is only one of five areas programmed for by intervention workers, it is possible that children in the active group received variable amounts of language programming, particularly if, given their strong expressive orientation, expressive stylists and their mothers experienced little success with the language targets assigned by the worker. Program focus may then have shifted to other developmental areas such as cognitive or motor
development, where greater success was obtained. It was noted, however, that for all children in the active group, language had been identified as a delayed area. So although undoubtedly some variation occurred with regard to the amount of language programming experienced by each child, it is unlikely that language would not have received some measure of programming.

The intervention program used in the present study relied heavily on parental participation and thus it is possible that parents of expressive stylist failed to implement the program as consistently as did parents of referential stylist. It was not possible to determine conclusively the degree to which any of the parents implemented the program.

Another possible explanation is that this level of intervention contributes less to stylistic emphasis than other variables, such as SES or gender. Furthermore, it is possible that parents may adopt a referential approach to language acquisition during the daily teaching sessions, but fail to generalize this extreme orientation to their other linguistic interactions with the child. Programs involving more intensive intervention strategies may exert more of an impact on acquisition style.

It should be noted that although treatment did not appear to alter stylistic orientation, it may have differentially affected rates of language development in
stylists. The research design used in the present study did not permit a comparison of the rates of language development children experienced following treatment initiation. Given Nelson's (1973) anecdotal data regarding parent/child language style mismatch, it is possible that the mentally retarded children who espoused a predominantly referential strategy derived greater benefit from intervention programs than their expressive counterparts. Referential stylists would have been exposed to a program which corresponded to their acquisition strategy, while expressive children would not. Such a mismatch might conceivably have reduced the program's effectiveness with the latter group.

Some conclusions appear warranted based on findings of the present study. Proportions of stylists in the mentally retarded population do not appear to differ significantly from those reported for normal children. Etiology of retardation may influence the predominant language acquisition style employed by retarded children, and functional analysis may provide the most accurate indicator of stylistic orientation. Mentally retarded children appear to exhibit extremes in stylistic orientation, and the treatment level examined in the present study does not appear to alter the predominant orientation espoused. However, although treatment effects were not detected by measures employed in the present study, whether or not the referential orientation currently reflected by
most intervention programs limits their ability to increase rates of language development in expressive stylists remains undetermined. This factor, in conjunction with the extremes in orientation demonstrated by the retarded children, suggests that consideration of stylistic orientation may be important if optimum benefit is to be derived by all children.

If the referential/expressive continuum is to be utilized in determining appropriate intervention strategies, consideration of the variable combinations of characteristics associated with each style might prove more useful than classifying children into one of two discrete categories. Some children in the present study exhibited characteristics associated with both styles. Thus, intervention strategies based solely on an extreme expressive or referential strategy might be less effective than those which address the individual variability which occurs with regard to these characteristics. Examination of variables considered to have an impact on stylistic orientation such as gender, birth order, SES, and etiology of retardation might aid initially in determining what general stylistic orientation a child might be expected to exhibit, and the degree to which characteristics associated with that orientation are likely to be present.
In terms of future research in this area, some directions are suggested by the results of the present study. Foremost, replication of the findings concerning the proportions of stylists in the mentally retarded population and the impact of treatment programs on language acquisition style is essential. Studies incorporating longitudinal designs are necessary to determine the effects of child/treatment mismatch on language progress to ascertain if in fact expressive stylists derive less benefit from current language curricula. For both retarded children and normals, research concerning the relative impact of contributory variables is needed. For the former group, this would aid in ensuring that therapeutic strategies most suited to the child's speech characteristics are implemented. Finally, with regard to retarded children in particular, research regarding the impact of etiology in determining stylistic preference is needed.
APPENDIX A

ADDITIONAL TABLES
### Table A-1

**Classification Based on \( n/n + pn \) (All Utterances)**

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<th>Subject</th>
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Table A-2

Verb Types (Spontaneous Utterances)

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<th>Action Verbs</th>
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### Table A-3

**Number of Spontaneous Verbalizations**

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Table A-4

Noun/Noun + Pronoun Ratios Derived from Elicited Utterances

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<td>8</td>
<td>.231</td>
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</table>
REFERENCES


VITA AUCTORIS

1963- Born in Charlottetown, Prince Edward Island to Joseph and Emma Roberts

1980- Completed secondary school in Wabush, Labrador, Newfoundland & Labrador

1984- Graduated with the degree of Bachelor of Science, (Honours) in Psychology, Acadia University, Wolfville, Nova Scotia

1987- Registered as a full time graduate student at the University of Windsor, Windsor, Ontario