Isolating the effects of control, choice, and prediction.

Michelle W. Langlois

University of Windsor

Follow this and additional works at: https://scholar.uwindsor.ca/etd

Recommended Citation

Langlois, Michelle W., "Isolating the effects of control, choice, and prediction." (2001). Electronic Theses and Dissertations. 2524.
https://scholar.uwindsor.ca/etd/2524
INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

ProQuest Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

UMI®
Isolating the Effects of Control, Choice, and Prediction

by

Michelle W. Langlois

University of Windsor

A Masters Thesis
Submitted to the Faculty of Graduate Studies and Research
Through the Department of Psychology
In Partial Fulfillment of the Requirements for
the Degree of Master of Arts at the
University of Windsor

Windsor, Ontario, Canada

2001
The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author’s permission.

L’auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L’auteur conserve la propriété du droit d’auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.
© 2001 Michelle W. Langlois
Abstract

The present study investigated (a) whether participants with actual control report higher ratings of control, responsibility, influence, and lower ratings of helplessness over the outcome than participants with no control, and (b) whether participants with prediction report higher ratings of prediction over the outcome than participants with no prediction. Participants believed that as a test of concentration, visual acuity, and hand-eye coordination they would have to rewrite several pages of ambiguous letters for either a short time period (2 minutes) or a long time period (20 minutes). Some participants were asked to select (choice) between two envelopes containing cards indicating different time periods (control) or the same time period (no-control). Other participants had their envelope selected by the experimenter using a spinner (no choice). All participants knew if the cards contained different or same time periods. Once the envelope was selected but before the dependent variables were measured, some participants learned the time period they received, either short (Positive Outcome), or long (Negative Outcome); while others did not (No-Prediction). Results showed that participants with control and choice (regardless of prediction) indicated in a questionnaire higher ratings of control, responsibility, and influence, and less helplessness over the outcome than participants with (a) choice but no control, and (b) neither choice nor control, whose ratings did not significantly differ. Participants with choice but no control felt equivalently as helpless as those with no control and no choice. Participants with prediction (Positive or Negative Outcome) did not have higher ratings of prediction than participants with no prediction.
Acknowledgments

I would like to thank my supervisor, Dr. Kenneth Cramer. Dr. Cramer’s patience and guidance were invaluable throughout the research and writing process. His enthusiasm and commitment to research are inspiring.

I would also like to thank Dr. Kathryn Lafreniere and Dr. Robert Pinto for their insightful comments and for taking an interest in the project. Their involvement made the process that much more enjoyable.

Finally, I would like to thank my family and friends for their support and words of encouragement over the last two years.
Table of Contents

Abstract ........................................................................................................................ iv
Acknowledgments ........................................................................................................... v
List of Tables .................................................................................................................. viii
List of Figures ................................................................................................................ ix

Chapter I  Introduction ................................................................................................. 1
  Traditional View of Actual Control ........................................................................... 1
  Positive and Negative Psychological Effects of Actual Control ............................. 2
  Negative Psychological Effects of Actual Uncontrol ............................................... 4
  Actual Control Versus Perceived Control ................................................................ 6
  Predictability and its Benefits .................................................................................. 7
  Predictionless Control and Traditional Control Theory ......................................... 10
  Redefining Control and Prediction ......................................................................... 14
  Testing the New Conceptualization ........................................................................ 15
  Confounding Control and Prediction with Choice .................................................. 17
  Individual Differences in Control ........................................................................... 22
  Present Study and Hypotheses ................................................................................ 23

Chapter II  Method ........................................................................................................ 25
  Participants and Overview ......................................................................................... 25
  Materials .................................................................................................................... 25
  Experimental Design ................................................................................................. 26
    Independent Variables ............................................................................................ 26
    Covariates ............................................................................................................... 27
    Dependent Variables ............................................................................................... 28
  Procedure .................................................................................................................... 28

Chapter III  Results ....................................................................................................... 30

Chapter IV  Discussion ................................................................................................. 36
  Strengths, Limits, and Future Research ................................................................... 40
  Implications and Summary ....................................................................................... 44

References ...................................................................................................................... 45

Appendix A: Sample Page of Ambiguous Typewritten Letters ................................. 51

Appendix B: Desire for Control Scale .......................................................................... 52

vi
Appendix C: Locus of Control Scale ................................................................. 54
Appendix D: Dependent Measures Questionnaire ........................................ 57
Appendix E: Instructions ............................................................................. 59
Appendix F: Consent Form ......................................................................... 61
Vita Auctoris ............................................................................................... 62
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intercorrelations of Dependent Measures</td>
<td>31</td>
</tr>
<tr>
<td>2</td>
<td>Means, Standard Deviations, and Other Statistics of Control-Associated</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Dependent Measures</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Means, Standard Deviations, and Other Statistics of Prediction-Associated</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Measures</td>
<td></td>
</tr>
</tbody>
</table>
List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Crossing of Two Levels of Actual Control with Two Levels of Perceived Control</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>The Crossing of Control and Choice</td>
<td>42</td>
</tr>
</tbody>
</table>
Chapter I

Introduction

Many would agree that having some control over our lives is vital to our well being. Adler (1930, p. 398) suggested that having control over one’s environment is “an intrinsic necessity of life itself.” Unfortunately, our perceptions of control may be altered by several factors, such as changes in our society with respect to overcrowding, and both air and noise pollution. Our feelings of control may also change because of illness or disease. Furthermore, as we age, our perceptions of control may be altered by changes in our social environment such as the loss of a loved one or losing one’s financial independence. The purpose of the present study is to investigate and provide further support for a new conceptualization of control, prediction, and choice which makes it possible to determine their individual contribution to perceived control.

Traditional View of Actual Control

A vast amount of research has been conducted in the area of control, and consequently several operational definitions of the term have been proposed. For example, some researchers suggest that the amount of control an individual has is solely determined by the number of choices available (e.g., Langer & Rodin, 1976). In this case, as the number of available choices increase, the amount of control also increases. Other researchers propose that control should be defined in terms of response effectiveness. According to this view, “if the probability of an outcome when some response occurs is different from the probability of the outcome when that response doesn’t occur, then that outcome is dependent on that response: the outcome is controllable” (Seligman, 1975, p. 17). On the other hand, “when the probability of the outcome is the same whether or not a given response occurs, the outcome is independent of that response”: the outcome is uncontrollable (Seligman, 1975, p. 16). Others take this definition one step further, and suggest
that control is defined as response effectiveness in addition to the achievement of a desired outcome (e.g., Thompson, 1981). In this case, merely having an influence over an outcome does not imply control unless the end result was desired. For example, imagine you are playing baseball. You want the ball to go directly to Tom so he does not have to move off of the base he is standing on. In this case, you have control if the ball goes directly to Tom. However, you do not have control if Tom has to step off the base in order to catch the ball. Overall, response effectiveness is central to most operationalizations of control, whereby control exists when one is capable of influencing an outcome through one’s actions. For example, if I slap your hand every time you reach into the cookie jar and do not slap if you refrain from reaching into the cookie jar, the slaps are controllable. On the other hand, if I slap your hand regardless of whether you reach into the cookie jar, the slaps are not controllable (Seligman, 1975). A study by Alloy and Abramson (1979) tested this conceptualization of control by providing participants with various degrees of actual control (0%, 25%, 50%, or 75%) over the onset of a light by pressing or not pressing a button. Consistent with the conceptualization, the authors found that participants perceived more control if they actually had more control over the onset of the light.

**Positive and Negative Psychological Effects of Actual Control**

Research findings have consistently demonstrated the benefits of having control. In particular, many researchers have focused on the effects of increasing the control of older adults living in institutions. Significant changes have been found such as increased alertness and more active participation (Langer & Rodin, 1976), lower mortality rates (Rodin & Langer, 1977), fewer health problems (Rodin, 1983), a decrease in required medication (Schulz, 1976), and improved memory (Langer et al., 1979). Recent researchers have not returned to this particular area for further investigation.
Having control not only benefits older adults but people of all ages. For example, a study by Eitel et al. (1995) examined the effects of control over treatment in patients with end-stage renal disease. Level of control of dialysis patients was determined by whether the treatment was self-administered (high control) or administered by medical staff (low control). Results showed that if the illness was not severe, patients who self-administered their treatment had lower depression rates compared to those who had their treatment administered by medical staff.

Several researchers have considered the impact of control in the workplace. In particular, a study by Carayon and Zijlstra (1999) examined the effects of three types of control: organization control (i.e., influence over the distribution of work, timing, policies, and training of employees); task control (i.e., influence over the variety and order of tasks, the amount of, pace of, and quality of work, and timing of work schedule and rest breaks); and resource control (i.e., influence over the availability of supplies, equipment, and materials). Results showed that high organization control resulted in higher work pressure while high task control resulted in lower total mood disturbances. Both high task control and high organization control resulted in higher job satisfaction.

While it has generally been acknowledged that having control leads to positive effects, some researchers have challenged this conclusion. For example, Rodin, Rennert, and Solomon (1980) allowed some participants more control over a task by giving them a choice of personality tests. It was found that the participants who were given more control had lower self-esteem on subsequent measures compared to participants with no control over the task. Miller (1980) reported similar findings. In this case, participants were given a choice of either retaining or relinquishing control (to a yoked participant) over whether or not they and the yoked participant received an electric shock. Participants who relinquished control were less anxious and less
hostile compared to participants who chose to retain control. According to Burger, Brown, and Allen (1983), having control in these experiments resulted in negative effects because the participants were not allowed to demonstrate personal competence. Control may lead to lowered self-esteem and negative mood in situations where people cannot demonstrate their mastery over a task.

**Negative Psychological Effects of Actual Uncontrol**

While the presence of control can have beneficial effects, exposure to outcomes in the absence of control can have devastating consequences such as an increased likelihood of learned helplessness (Abramson, Garber, & Seligman, 1980). Researchers have documented the development of learned helplessness in a wide variety of animals such as dogs, cats, fish, rats and subsequently, in humans (Abramson et al., 1980).

One of the initial learned helplessness studies, conducted by Overmier and Seligman (1967), examined the responses of adult mongrel dogs to controllable and uncontrollable shocks. Three groups of dogs received unsignaled, inescapable shocks of varying duration and intervals. The fourth group was not exposed to inescapable shock. After 24-hours had passed, all groups were exposed to instrumental training that consisted of several presentations of escapable shock. During the instrumental training, the authors found that dogs with no previous exposure to inescapable shocks responded by barking, yelping, running, and jumping until they escaped. Similarly, dogs that were previously exposed to inescapable shocks reacted much the same way in response to the initial shock. However, over subsequent trials, these dogs became quiet and passively accepted the shocks. Overall, dogs that were not previously exposed to uncontrollable shocks were more likely to jump the barrier and escape shocks during instrumental training. On
the other hand, dogs that were exposed to uncontrollable shocks later failed to develop appropriate escape behaviour when the shocks were controllable.

A study by Hiroto (1974) represents a typical learned helplessness experiment involving humans. College students were divided into three groups: (a) exposure to controllable noise, (b) exposure to uncontrollable noise, or (c) no exposure to noise. For participants with control, the noise could be terminated by pressing a button four times; whereas for participants with no control, the noise stopped independently of their responses. Later, participants were tested on a hand task involving a hand shuttle box. All participants could control the termination of the noise by moving their hand from one side to the other. The results showed that participants in the control condition or no exposure condition learned to terminate the noise in the hand task while those in the no control condition failed to terminate the noise.

As these studies illustrate, learned helplessness results when an organism is repeatedly exposed to outcomes that cannot be affected, and can ultimately lead to three deficits (Abramson et al., 1980). The cognitive deficit consists of failing to perceive that responses produce outcomes, and is reflected in an organism's inability to learn when outcomes are controllable. For example, in the study by Overmier and Seligman (1967), dogs that were previously exposed to uncontrollable shocks failed to learn how to escape the shocks when they were controllable. The motivational deficit consists of a reduction in the desire to control outcomes and emerges as passivity, social impairment, and intellectual slowness (Abramson, Seligman, & Teasdale, 1978). Again, in the study by Overmier and Seligman (1967), dogs previously exposed to uncontrollable shocks passively accepted shocks that were controllable. The emotional deficit occurs if the experience is prolonged, and begins as increased anxiety and even depression. According to a review by Mineka and Kihlstrom (1978), animals can also show this emotional deficit. Evidence
is provided by the animal’s behaviour such as increased general activity level and high autonomic arousal or on the other hand, decreased activity level, appearance of passivity and withdrawal, social isolation, and feeding disturbances.

The learned helplessness theory was later reformulated due to a number of difficulties (Abramson et al., 1978). The theory remains consistent but now takes attributions into consideration. Abramson et al. (1978) propose that the development of learned helplessness is dependent upon why a person thinks he or she lacks control. People who attribute lack of control to internal, stable, and global causes are more likely to experience long-lasting, generalized effects such as performance deficits, lowered self-esteem, and depression (Burger & Arkin, 1980; Mineka & Hendersen, 1985; Tiggemann & Winefield, 1987). On the other hand, people who attribute lack of control to external, unstable, and specific causes are less likely to experience generalized effects as well as major mood changes (Mineka & Hendersen, 1985). The theory was also reformulated because it failed to distinguish between personal and universal helplessness (Abramson et al., 1978). Personal helplessness may occur when a person believes he or she cannot solve a solvable problem. Alternatively, universal helplessness may occur when a person believes that any problem is unsolvable.

**Actual Control Versus Perceived Control**

Past research has clearly demonstrated that having actual control can have beneficial effects. However, actual control (denoted as “whether or not the event can be affected by an action”) must be distinguished from perceived control (denoted as “whether or not one believes the event can be affected by an action” (Cramer, 1988, p. 3). Researchers have demonstrated that one does not necessarily need to have actual control in order to reap those same benefits – merely believing one has control is enough to produce comparable effects. For example, studies have
shown that cancer patients (Thompson et al., 1993), cardiac patients (Helgeson, 1992), and gay men living with AIDS (Reed, Taylor, & Kemeny, 1993) who have greater perceptions of control over symptoms and course of illness are less depressed and better adjusted. Furthermore, Taylor and Brown (1988) suggest that positive illusions of the self (e.g., exaggerated perceptions of control, overly positive self-evaluations, and unrealistic optimism) promote the ability to be happy, care about others, and to engage in productive work.

As illustrated in Figure 1, the conceptualization of control is based on the crossing of two levels of actual control and two levels of perceived control (Cramer, 1988). In veridical control, the person has actual control and holds accurate perceptions about the level of control (e.g., correctly believing that pressing the brake will slow the car). In veridical uncontrol, the person does not have actual control and holds accurate perceptions about the level of control (e.g., correctly believing that as a passenger of a car, one cannot press the brake and slow the car). In illusory control, defined as “an expectancy of a personal success probability inappropriately higher than the objective probability would warrant” (Langer, 1975, p. 313), the person overestimates his or her ability to influence an outcome. For example, in a lottery people avoid using quick-picks in favour of favourite numbers, birthdays, etc., believing that this will have an effect (Langer, 1975). Conversely, in illusory uncontrol, the person underestimates his or her ability to influence an outcome (e.g., incorrectly believing that as the driver of a car, one cannot press the brake and slow the car).

Predictability and its Benefits

Researchers have been able to attribute several positive effects previously attributed to control, to prediction. The term prediction or predictability refers to the ability to anticipate which outcome is likely to occur regardless of whether or not one can influence the outcome.
**Figure 1.** The crossing of two levels of actual control with two levels of perceived control. (Adapted from Cramer, 1988, p. 25)
(Cramer & Mohagen, 1997; Miller, 1979). It appears that a person’s ability to predict an outcome may be just as important as actual control or perceived control. For example, Rosellini and colleagues (DeCola, Rosellini, & Warren, 1988; Rosellini, DeCola, & Warren, 1986; Rosellini, Warren, & DeCola, 1987) found that animals exposed to controllable shocks showed less contextual fear compared to animals exposed to uncontrollable shocks; however, animals exposed to uncontrollable shocks that were provided with an external feedback stimulus (prediction) also showed a reduction in contextual fear. Based on the findings, the authors conclude that prediction alone is capable of decreasing feelings of helplessness. It has also been well documented that both animals and humans prefer predictable to unpredictable situations (Mineka & Kihlstrom, 1978).

Overall, it appears that having prediction may be just as important as control. Although a vast amount of research has been conducted in the area of control, a significant problem exists with these studies. According to Burger and Arkin (1980), “subjects provided with control over events characteristically have been accorded a large degree of predictability over the occurrence of those events as well” (p. 482). In other words, control and predictability are typically confounded. Participants may feel control not only because they can exert an influence on the outcome but also because they are able to predict the outcome.

This confound is best illustrated by examining the four combinations that result from crossing prediction (2 levels: prediction, no-prediction) with control (2 levels: control, no-control). In Control/Prediction, people know the outcome and they influence it (e.g., expecting rainfall after cloud seeding). In No-Control/Prediction, people know the outcome but do not influence it (e.g., expecting a forecasted rainstorm). In No-Control/No-Prediction, people do not know the outcome and do not influence it (e.g., a sudden unexpected rainstorm).
Finally, in Control/No-Prediction, people do not know the outcome but influence it. This final arrangement has been especially difficult for traditional theorists to conceptualize.

Predictionless Control and Traditional Control Theory

Some researchers have included a predictionless control condition but unfortunately, control and prediction still remain confounded. For example, Wortman (1975) conducted a study which involved choosing coloured marbles in order to determine the prize received. In one condition, the experimenter chose the marble; in another condition, others chose the marble themselves. All participants, however, were aware of which prize they would receive before perceptions of control, choice, and responsibility were measured. Hence, control and prediction remained confounded.

Burger and Arkin (1980) also attempted to include a predictionless control condition, again unsuccessfully. In this case, participants were not controlling and predicting the same outcome. Participants in the Controllable-Predictable condition were able to terminate an aversive noise by correctly solving anagram problems. Participants in the Controllable-Unpredictable condition were informed that if they solved an anagram problem correctly, the length of the next noise blast would be cut in half. In reality, for this group the noise blasts were presented at random intervals and for various durations regardless of the participants' anagram performance. Participants in the Uncontrollable-Predictable condition were unaware of a connection between solving anagram problems and the duration of the noise blast. In this case, participants were presented with noise blasts at consistent intervals (20 seconds at the beginning of each interval). Finally, participants in the Uncontrollable-Unpredictable condition were also unaware of a connection between solving anagram problems and the duration of the
noise blast. For this group, the noise blasts were presented at inconsistent intervals and for different durations.

The authors found that only participants in the Uncontrollable-Unpredictable condition displayed performance deficits and depressive affect. In other words, having either control or prediction can have positive effects. However, no formal conclusions can be made based on this study due to the fact that participants were not controlling and predicting the same outcome. Participants in the Controllable-Predictable condition were able to predict both noise onset and termination, while participants in the Uncontrollable-Predictable condition were only able to predict noise onset. Furthermore, participants in the Controllable-Predictable condition had control over absolute noise duration while participants in the Controllable-Unpredictable condition actually had no control over the noise (although they were led to believe that they could reduce the duration of the next noise blast in half by solving an anagram problem).

Other researchers have omitted the predictionless control condition completely or replaced it with a No-Treatment condition because of conceptual difficulties. Unfortunately, this makes it impossible to determine if the positive effects are attributable to control or prediction. For example, Geer and Maisel (1972) exposed participants to aversive photographs using only three conditions: (a) Control/Prediction, (b) No-Control/Prediction, and (c) No-Control/No-Prediction. Only participants in the Control/Prediction condition could terminate aversive photographs. Participants in the No-Control/Prediction condition could not terminate the photographs but were told how long each photograph would be viewed. The authors found that subjects who could terminate the viewing of aversive photographs (Control/Prediction) had significantly lower galvanic skin responses compared to subjects who had prediction but no control.
(No-Control/Prediction). This finding suggests that the positive effects are attributable to having control rather than predictability.

Schulz (1976) similarly replaced the predictionless control condition with a No-Treatment condition. In this study, the effects of control and prediction were examined in older adults living in institutions. Participants in the Control/Prediction condition could choose when and how long they would have a visit from a college student. Participants in the No-Control/Prediction condition were told when the student would be visiting and for how long, but had no control over when the visit would take place. Participants in the Random condition did not know when the student would visit or how long the visit would be. The fourth condition was a No-Treatment group. The results showed that participants in the Control/Prediction and No-Control/Prediction groups had positive behavioural changes not found in the Random and No-Treatment groups. Positive changes included a decrease in the quantity of daily medication, greater psychological status (happier, more hopeful, and more “zest for life”), and perceiving themselves as being significantly more active. Contrary to the results of Geer and Maisel (1972), this finding suggests that the positive outcome is attributable to predictability alone, although again it remains difficult to say without consideration of a predictionless control condition.

Tigge mann and Winefield (1987) also replaced the predictionless control condition with a No-Treatment condition, and obtained comparable results to Burger and Arkin (1980). In this case, participants were randomly assigned to one of four conditions: (a) Controllable-Predictable, (b) Uncontrollable-Unpredictable, (c) Uncontrollable-Predictable, and (d) No-Treatment. Participants in the first three groups were informed that they would have 40 trials in which the computer would sound a buzzer and their task was to find a way to terminate the noise.

Participants in the Controllable-Predictable condition could terminate the tone by pressing a
switch four times. Participants in the Uncontrollable-Unpredictable condition could not terminate the noise and were exposed to the same pattern of tone duration as their yoked subject in the Controllable-Predictable condition. Participants in the Uncontrollable-Predictable condition were yoked to the previous group (i.e., they received the same amount of noise). The authors found that only participants in the Uncontrollable-Unpredictable condition displayed performance deficits when completing the same task at a later time.

In sum, the predictionless control condition has posed a great deal of difficulty for researchers. Whereas Wortman (1975) and Burger and Arkin (1980) included a predictionless control condition, they failed to unconfound control and prediction. Other researchers have attempted to determine the individual effects of control and prediction, but purposefully neglected the critical predictionless control condition. As a result, the findings have not been consistent and no definite conclusions can be made.

Although researchers are aware that prediction and control are confounded, many believe it is unfeasible to separate the two. According to Peterson, Maier, and Seligman (1993), “it is not at all clear, however, that control can be reduced to prediction. Nevertheless, there are many potential interactions between control and prediction, and they will not be easy to separate” (p. 58). In agreement, Seligman (1975, p. 128) points out, “the problem of disentangling the effects of controllability from predictability may be next to logically impossible.” Tiggemann and Winefield (1987, p. 254) argue that even if a predictionless control condition could be arranged, “it is hard to see how one could convince people that they are controlling outcomes they were unable to predict.”
Redefining Control and Prediction

In order to rectify the control-prediction confound, Nickels, Cramer, and Gural (1992) suggested that these terms should be redefined. Prediction refers to “knowing which outcome will likely occur before it occurs” (p. 159). For example, one can predict that pushing the gas pedal of a car will make it go faster, while pushing the brake pedal will make it go slower. Control, on the other hand, refers to “exerting an influence over which outcome will likely occur” (p. 160). For example, one may want the car to go slower - although the passenger cannot influence car speed (no control), the driver can (control). This reconceptualization makes it possible to discuss situations of predictionless control, or “blind responses which make a difference in outcomes” (p. 160). To use the previous example, a beginner driver who does not know which pedal is the brake and which is the accelerator may still know that pushing either pedal will have some kind of effect on car velocity. The driver has control but does not know what the outcome of those actions will be.

There are many everyday situations that involve predictionless control. Consider a TV remote control whose label has worn off. In this case, pushing a button will have some kind of effect (control), although it is unknown (unprediction) what that effect will be (e.g., volume can increase or decrease). Another example of predictionless control involves ordering a meal in a restaurant from a foreign language menu one does not understand (Cramer, Nickels, & Gural, 1997). In this case, one’s choice determines the type of food that will arrive (control) but one cannot anticipate what that food will be (unprediction). Finally, Burger and Arkin (1980) provide the example of a person with a cold. The person has control over the illness in that he or she can rest, eat properly, take medication, etc., however, it is unknown (unprediction) how long the recovery will take.
Testing the New Conceptualization

Nickels et al. (1992) conducted two studies to determine if participants will recognize that they have control when they have no prediction. In Study 1, participants were informed that they would have to listen to aversive noise for either a short or a long time period. Plugs could be inserted into a box (connected to a counter) to determine the participant’s time period. Fast plugs were preferred because they made the device briefly cycle faster, resulting in what appeared to be less time on the device to listen to aversive noise. On the other hand, slow plugs made the device briefly cycle slower, resulting in what appeared to be more time. In actuality, the device adjusted its regular cycling so all participants received the same listening time. In the prediction/control condition, participants freely chose one of two plugs (control) and later viewed either a slow or fast cycling of numbers (prediction). In the prediction/no-control condition, the experimenter flipped a coin to determine which plug would be inserted (no control) and the participant viewed the cycling of numbers (prediction). In the no-prediction/control condition, participants freely chose a plug (control) but were not allowed to view the counter (no prediction). In the no-prediction/no-control condition, the experimenter flipped a coin to determine the plug (no control) and the participants were prevented from viewing the cycling numbers (no prediction). The results showed that participants recognized that they had control even without prediction. Participants with control (i.e., those who freely chose a plug) rated themselves as having more ‘influence’ in determining which time period they received, regardless of prediction. Furthermore, participants with prediction (i.e., those who viewed cycling numbers) rated themselves as more confident in their ability to predict how long they would be listening to the aversive noise.

Despite the encouraging findings, the authors noted some key shortcomings. First, it is possible that an illusion of control was induced (due to choice) because participants with control
chose a plug while those with no control did not. Furthermore, the term “control” was mentioned in the instructions, which may have led to demand characteristics. The second study addressed these concerns.

Participants were placed into like-sexed pairs and informed that they would have to engage in a repetitive, boring task for either a short or a long time period. On a platform were two cards, one with “short” and one with “long” written on them in invisible ink. One person in the pair was either (a) controller-shooter, (b) controller-watcher, (c) uncontroller-shooter, or (d) uncontroller-watcher; the other person in the pair was designated as the opposite (d, c, b, a, respectively). To determine each pair’s time period, the controller chose a card, and the shooter (possibly the same person as the controller) hit the chosen card with a toy dart gun. In this case, only the person who chose the card (controller) had control regardless of whether he or she shot the card. Half of the pairs were assigned to the prediction condition, so the time period on the chosen card was revealed before completing the questionnaire and boring task. The other half of the pairs were assigned to the no-prediction condition so the time period on the chosen card was only revealed after completing the questionnaire.

Similar to Study 1, participants with prediction (regardless of control) gave higher ratings of prediction and confidence than participants with no prediction. Furthermore, participants with control (regardless of prediction) gave higher ratings of control, influence, responsibility, and credit or blame, but lower ratings of helplessness. Since no difference was found between shooters and watchers in terms of ratings of influence and control, it was concluded that an illusion of control due to choice was not induced. In other words, shooters felt no more control simply because they shot the card.
A study by Nickels, Gural, Cramer, and Ross (1994) was conducted to provide further evidence that predictionless control is not only recognized, but also preferred over predictionless uncontrol. Participants were presented with two trays: each tray contained two envelopes, and each envelope contained a card that indicated whether they had won a prize. Participants would first select a tray and then select one of the two envelopes in that tray. Participants in the No-Predict/Control condition were informed that one tray held envelopes containing different outcomes (one offering a prize and one offering no prize), while the other tray held envelopes containing the same outcome (both offering a prize or both offering no prize, but they were not told which). Participants in the No-Predict/No-Control condition were informed that all four envelopes (both trays) held envelopes containing the same outcome (either all offering a prize or all offering no prize, but they were not told which). After selecting a tray, participants were told they would get to choose an envelope from their selected tray if they were willing to wait for up to 20 minutes. If they decided not to wait, they would choose an envelope from the unselected tray. The results showed that participants in the No-Predict/Control condition preferred having a choice between envelopes containing different outcomes (blind control) than envelopes containing the same outcome (no control). Furthermore, participants in the No-Predict/Control condition waited longer in order to be able to choose between envelopes in their preferred tray than those with no control (No-Predict/No-Control condition). The authors concluded that predictionless control was recognized and preferred over no control.

**Confounding Control and Prediction with Choice**

Several studies have avoided the triple confound of control, choice, and prediction by holding one variable constant while manipulating the other two. For example, a study by Cramer et al. (1997; see also Gural, 1992) held choice constant, but manipulated prediction and control.
Choice was held constant by allowing all participants to make a choice on every trial. The authors also included multi-trial control conditions. In other words, this study compared the effects of 0%, 25%, 50%, and 75% actual control, as opposed to the two Nickels et al. (1992) studies, which only compared the effects of 0% and 100% actual control. Participants were informed that they would listen to an aversive noise for the length of time determined by card positioning. Each subject was provided with a total of 24 cards that they were to place in either the A or B slot of the card positioner. Participants received a time reduction if a white square on the card was positioned opposite the card-reader photocell. Card position made no difference for cards with either two white or two black squares (no control). However, card position (which end of the card is placed in the slot) did make a difference for cards with one white and black square (control). Participants were informed whether their choice (A or B) would make a difference for each card. Participants were randomly assigned to one of twelve conditions derived by crossing three levels of prediction (predicted success, predicted failure, no prediction) with four levels of control (0%, 25%, 50%, 75%). Participants in the predicted success condition knew they received more than 13 time reductions, while participants in the predicted failure condition knew they received less than 11 time reductions. Participants in the no prediction condition did not know how many time reductions they received. Level of control (0%, 25%, 50%, 75%) was determined by how many cards the subject received with one white and black square (0, 6, 12, and 18 cards, respectively). The authors found that participants with no control over determining how long they would have to listen to an aversive noise felt less control, less responsibility, less influence, and more helplessness (regardless of prediction) than those with any amount of actual control (25%, 50%, or 75%).
Cramer and Mohagen (1997) returned to single trial contingencies (0% and 100% actual control), and held prediction constant (at no prediction) while manipulating control and choice. In this study, control was nested in choice, so that in order for a person to have actual control, two requirements had to be met. First, the person had to make the selection among options. Second, the person’s choice had to make a difference in the outcome received. In other words, there must be at least two different outcomes from which the person is choosing (to have control in this case, one must have choice but to have choice does not necessarily mean one has control). Participants were told they would have to perform a proofreading task for either a short (2 minutes) or a long (20 minutes) time period. The time period was determined by selecting between two identical looking envelopes containing an index card with the time written on it. Participants were informed if the envelopes contained different time periods (2 minutes and 20 minutes) or the same time period (either 2 minutes or 20 minutes). Subjects were not told which time period they received until after the questionnaire was completed.

The study involved three conditions. Participants in the Control/Choice condition freely chose one of the two envelopes which contained different time periods (2 minutes or 20 minutes, but they were not told which). Participants in the No-Control/Choice condition freely chose one of the two envelopes which contained the same time period (either 2 minutes or 20 minutes, but they were not told which). For participants in the No-Control/No-Choice condition, both envelopes contained the same time period (either 2 minutes or 20 minutes, but they were not told which), and this was selected by the experimenter’s coin flip. While this final condition could have had cards with either the same or different outcomes, the authors decided in favour of same outcomes so this group would be identical to the No-Control/Choice group with the exception of choice. Since the experimenter flipped the coin, illusory control by choice was minimized.
Results showed that participants with control and choice felt more control, responsibility, and influence compared to participants with no control (regardless of choice). This indicates that to feel control “one’s actions should make a difference in one’s outcome” (p. 8). To demonstrate the ramifications of this finding, Cramer and Mohagen (1997) provide an example of a cancer patient who is given a choice of receiving a new drug that may (a) completely shrink his liver tumour, or (b) completely destroy all his liver tissue. What becomes important to feel control is not choosing between treatments but the understanding that one’s choice will have an effect on one’s health. In other words, it is not the act of making a choice which makes one feel control, but rather knowing that one’s choice will make some difference in the outcome. Unfortunately, the authors did not include a Control/No-Choice condition in this study because of conceptual difficulties.

Cramer and Nickels (under review) manipulated control while holding choice constant (all participants made one selection) and prediction constant (at unprediction). To determine how long they would engage in a boring motor task, participants blindly selected among a series of letters (A’s and B’s) denoting short and long time periods. Similar letters (all A’s or all B’s, e.g., ‘AA’, ‘BBB’, ‘AAAA’) represented the same time period (no-control) while different letters (mix of A’s and B’s, e.g., ‘AB’, ‘AAB’, ‘BBAA’) represented different time periods (control). Some participants selected a letter and then completed the dependent measures while others completed the dependent measures first and then selected a letter. It was found that participants choosing among different options (control) had higher ratings of perceived control compared to participants choosing among identical options (no-control). Interestingly, there was no difference in control ratings when measures were taken either before or after the choice of option.
Paterson and Neufeld (1995) examined the effects of control and choice in terms of coping with a stressful event. In this study, the availability of information was manipulated (prediction) regarding options to a fictitious stressful event. It was found that participants provided with several options (in addition to having further information available) had higher ratings of perceived control and reduced stress compared to participants provided with several options but with no information available. Similar to Cramer and Mohagen (1997), this suggests that being provided with nonproductive choices will neither increase perceptions of control nor reduce perceptions of threat. Interestingly, Iyengar and Lepper (1999) have demonstrated that the effects of choice cannot be generalized across cultures. For instance, it was found that while personal choice increased the intrinsic motivation of American children, having no personal choice (choices were made by others) increased the motivation of Asian American children.

In sum, support has been provided for the reconceptualization of control and prediction despite Tiggemann and Winefield’s (1987) doubts. Indeed, people are able to recognize that they have control over an outcome even if they are unable to predict what that outcome will be (Nickels et al., 1992). Research has also demonstrated that these instances of predictionless control are preferred over conditions of no control (Nickels et al., 1994). Surprisingly, research has shown that 100% control is not needed to prevent feelings of helplessness but rather even a little control (25%) will provide equivalent beneficial effects (Cramer et al., 1997). Cramer and Nickels (under review) shed doubts on the necessity of choice by demonstrating that control can be perceived even before a choice is made. Finally, Cramer and Mohagen (1997) and Paterson and Neufeld (1995) demonstrated that choice will not yield benefits unless meaningful options are provided.
Individual Differences in Control

Studies that have tested the new conceptualization of prediction, control, and choice have typically found small effects (Cramer et al., 1997). Recognizing that individual differences in one’s desire and locus of personal control might account for a substantial proportion of the measurement variance, it would be useful to isolate and partial out these effects. Previous experiments (based on the general linear model) had assumed the differences were minimal and likely due to random assignment to groups; however, the covariance model ensures their effects are eliminated, reduces error variance, and increases power, and this results in larger effect sizes (Tabachnik & Fidell, 2001).

Desire for control is defined as “the extent to which people generally are motivated to see themselves in control of the events in their lives” (Burger, 1992, p. 6). As a personality trait, people can be placed along a continuum ranging from low desire for control to high desire for control. Burger and Cooper (1979) propose that everyone has a general level of desire for control. For example, people who prefer to have control over what happens to them at work will usually want to have control over their interpersonal relations, etc.

People also differ in the expectations they hold about things that happen to them, depending on whether they have an internal or external locus of control (Rotter, 1966; 1971). An internal locus of control indicates “that an individual believes that he or she is responsible for the reinforcements experienced; in effect, that the person’s actions, characteristics, qualities, etc. are prominent determinants of the experiences being queried” (Lefcourt, 1991, p. 420). On the other hand, an external locus of control indicates “that the person views his or her outcomes as being primarily determined by external forces, whether they be luck, social context, other persons, or whatever” (Lefcourt, 1991, p. 420).
Present Study and Hypotheses

Whereas Cramer et al. (1997) held choice constant and Cramer and Mohagen (1997) held prediction constant, the present study manipulated all three variables: control, choice, and prediction. No study to date has manipulated all three variables under the reconceptualization. This represents an extension of Cramer and Mohagen (1997), who kept participants under unpredict conditions, and used only one level of No-Control/No-Choice (same outcomes). In the present study, control, as nested in choice, yields four experimental conditions:

(a) Control/Choice, (b) No-Control/Choice, (c) No-Control/No-Choice (same outcomes), and (d) No-Control/No-choice (different outcomes). Similar to Cramer and Mohagen (1997), the condition No-Control/No-Choice (same outcomes) is included because it is identical to the No-Control/Choice group with the exception of choice (eliminating the possibility of an illusion of control). Similarly, the condition No-Control/No-Choice (different outcomes) is the same as Control/Choice with the exception of choice (both conditions offer different outcomes).

Although previous studies did not manipulate predictability, this is accomplished in the present study using three conditions: Positive Outcome, Negative Outcome, and No-Prediction.

Participants in the Positive Outcome condition know they received the short time period, while participants in the Negative Outcome condition know they received the long time period before completing the dependent measures questionnaire. Participants in the No-Prediction condition do not know the time period they received until after the dependent measures questionnaire is completed.

Based on the findings by Cramer et al. (1997), it was hypothesized that after accounting for individual differences in desire for control and locus of control, participants in the Prediction conditions (Positive and Negative Outcomes) will have higher ratings of prediction than
individuals in the No-Prediction condition. Additionally, based on the findings by Cramer et al. (1997), Cramer and Mohagen (1997), and Nickels et al. (1992), it was hypothesized that after accounting for individual differences in desire for control and locus of control, participants in the Control/Choice condition will have higher ratings of perceived control, responsibility, and influence over outcome; and lower ratings of helplessness over outcome than individuals in all other conditions (regardless of prediction). Furthermore, based on the findings by Cramer and Mohagen (under review), it was hypothesized that after accounting for individual differences in desire for control and locus of control, participants in the No-Control/Choice condition and No-Control/No-Choice (same outcomes) condition will not differ significantly in ratings of perceived control, responsibility, influence, and helplessness over outcome. Finally, based on the findings by Langer (1975) and Wortman (1975), it was hypothesized that after accounting for individual differences in desire for control and locus of control, participants in the No-Control/No-Choice (different outcomes) condition will have higher ratings of perceived control, responsibility, and influence over outcome, and lower ratings of helplessness over outcome than participants in the No-Control/No-Choice (same outcomes) and No-Control/Choice conditions.
Chapter II

Method

Participants and Overview

There were 34 male and 210 female Psychology students at the University of Windsor in Ontario who participated in the study for partial course credit. A preliminary power analysis was conducted; for small effect sizes (root mean square error of approximation for both interaction and main effects of .15) and 80% power, the minimum number of participants required was approximately 240, or 20 per cell.

Initially, participants completed a questionnaire that assessed locus of control and desire for control. As a test of concentration, visual acuity, and hand-eye coordination, participants were informed they would have to rewrite several pages of ambiguous letters (e.g., “aaajjeer”) for either a short or a long period of time as determined by the choice of one of two blank envelopes. Some participants were asked to select (choice) between two envelopes containing cards indicating either different time periods (control) or the same time period (no control). Other participants had the envelope (time period) selected by the experimenter using a spinner (no choice). Once the envelope was selected but before the dependent variables were measured, some participants learned the time period they received, either short (Positive Outcome), or long (Negative Outcome); while others did not (No-Prediction).

Materials

Two index cards (3x5 inch) with the time periods (“2 minutes” or “20 minutes”) printed on the back in light pencil were placed in envelopes (4 x 9½ inch) with “LEFT” printed on one and “RIGHT” printed on the other (Times New Roman font size 72). A large sign (8½ x 11 inch) was used to provide control information to participants, reading either: “These envelopes contain
the SAME time period” or “These envelopes contain DIFFERENT time periods” (Times New Roman font size 98). The experimenter used a small spinner (approximately 5 x 4 inch) from a board game. The spinner was divided in half, designating “L” for left and “R” for right envelopes (written in capital letters) and was coloured blue and red, respectively. A small, purple, ovoid stone (approximately 1½ x 1 x ¼ inch) was used to indicate the chosen envelope. Finally, a ¼ inch pile of papers with typewritten ambiguous letters (Appendix A) was on a desk along with blank papers, a pencil, and an eraser.

**Experimental Design**

**Independent Variables.** This study utilized a 4 x 3 randomized between-subjects factorial design with two covariates. The first independent variable, CONTROL, was nested in choice to produce four groups based on the selection and nature of available options: Control/Choice, No-Control/Choice, No-Control/No-Choice (same outcomes), and No-Control/No-Choice (different outcomes). The condition Control/No-Choice was omitted due to conceptual difficulties. Participants in the Control/Choice condition selected one of two envelopes containing different time periods, and were not told which is which. These participants had control because (a) the envelopes contained different time periods, and (b) they selected the envelope. Participants in the No-Control/Choice condition selected their envelope but were informed (by a sign) that the envelopes contained the same time period (either 2 minutes or 20 minutes, but they were not told which). Although participants in this condition selected the envelope, they did not have control because both envelopes contained the same time period. Participants in the No-Control/No-Choice (same outcomes) condition (cf. Cramer & Mohagen, 1997) had their envelope selected by the experimenter using a spinner. These participants did not have control because (a) the envelopes contained the same time period, and (b) they did not select the
envelope. Participants in the No-Control/No-Choice (different outcomes) condition also had their envelope selected by the experimenter using a spinner. Participants in this condition had the potential for control because the envelopes contained different time periods; however, control was not present because the participant did not make the selection.

The second independent variable, PREDICTED OUTCOME, had three levels: Positive Outcome, Negative Outcome, and No-Prediction. Participants in the Positive Outcome condition learned they received the short time period before completing the questionnaire. Participants in the Negative Outcome condition learned they received the long time period before completing the questionnaire. Finally, participants in the No-Prediction condition did not learn their time period before completing the questionnaire.

Covariates. The covariate questionnaire (which was completed immediately before the experiment began) contained Burger and Cooper’s (1979) Desire for Control Scale and Rotter’s (1966; 1971) Internal-External Locus of Control Scale (Appendix B and C). Half the participants first completed the Desire for Control Scale followed by the Locus of Control Scale while the other half of participants first completed the Locus of Control Scale followed by the Desire for Control Scale.

The Desire for Control scale consists of 20 statements and participants were asked to indicate the extent to which the statements applied to them (e.g., “I enjoy making my own decisions”). The questionnaire uses a 7-point Likert scale (1 = “The statement does not apply to me at all”; 7 = “The statement always applies to me”). Higher scores reflect a greater desire for control. Five items are reversed prior to scoring. The Desire for Control Scale has good internal consistency (.80) and test-retest reliability (.75 over a six-week period) in addition to discriminant validity from Rotter’s Internal-External Locus of Control measure (Burger & Cooper, 1979).
The Internal-External Locus of Control Scale consists of 23-items plus 6 filler questions. Participants read a pair of statements and were asked to indicate which one they most strongly believed (e.g., “Many of the unhappy things in people’s lives are partly due to bad luck” or “People’s misfortunes result from the mistakes they make”). The scores range from zero (internal) to 23 (external) with one point being given for each external statement selected; consequently, higher scores reflect an external locus of control. Research on the Internal-External Locus of Control Scale has demonstrated the necessary psychometric properties of internal consistency (.70) and test-retest reliability (.72 after one month) (Rotter, 1966).

**Dependent Variables.** The second questionnaire (Appendix D) assessed the dependent measures of perceived control, responsibility, influence, helplessness, prediction, and confidence on a 5-point Likert scale (1= “not at all”; 5= “to a great extent”). In terms of the manipulation check, participants were asked to indicate: (a) if they knew their writing task time, (b) if they chose the envelope, (c) if the envelopes contained the same or different time periods, and (d) the extent to which they wanted to receive the short time period.

**Procedure**

Participants were tested individually in a private room. (See Appendix E for instructions.) First, participants completed a consent form (Appendix F) along with a brief questionnaire (Locus of Control and Desire for Control) in counterbalanced order. Once completed, the experimenter informed participants that they would be rewriting several pages of ambiguous letters for either a short (2 minutes) or a long (20 minutes) period of time. Participants were shown a sample page containing the ambiguous typewritten letters. Participants were informed that the study tests how concentration, visual acuity, and hand-eye coordination are influenced by how long one performs the task as determined by factors such as if their choices matter.
Participants were shown a table with two identical looking envelopes (one marked "LEFT", the other "RIGHT"), a sign posted above the envelopes stating whether the envelopes contained the same or different time periods, and a pile of papers with strange arrangements of typewritten letters (e.g., "aajeer"). Participants in choice conditions chose an envelope by placing the stone on their selection. Participants with no choice observed the experimenter spin a spinner (labelled "L" and "R") and place the stone on the envelope indicated on the spinner.

Participants in both the Positive Outcome and Negative Outcome conditions observed the experimenter open the selected envelope and show the index card with either the short or long time period printed on it. All participants were then asked to complete the dependent measures questionnaire before the writing task began. Participants in the No-Prediciton condition completed the questionnaire before learning their time period. Once complete, the experimenter informed participants in the No-Prediciton condition of their time period and then all participants learned that they did not, in fact, have to engage in the writing task. Participants were then debriefed as to the true purpose of the study and an appeal was made about the importance of not discussing the experiment with others.
Chapter III

Results

Before the main analysis, participants' responses to the manipulation checks were screened: (a) Do you know how long you will engage in the writing task? (b) Did you choose the envelope? and (c) Did the envelopes contain the same or different time periods? Sixteen participants (6%) failed to answer at least one of the three manipulation checks correctly; they were not included in the analysis and were replaced.

The experimental hypotheses and other relationships were tested at the .05 significance level through a multivariate analysis of variance (MANOVA) using Wilks' lambda. Because each of the control-associated measures were moderately intercorrelated (see Table 1), a MANOVA with control, responsibility, influence, and helplessness as the dependent variables and Control and Predicted Outcome as the between-subjects factors was conducted. The covariates Locus of Control and Desire for Control were not significantly correlated with the dependent variables and were excluded from the analysis. Results showed a multivariate main effect for Control, $E(12, 606) = 8.14, p < .001$; but neither a significant multivariate main effect for Predicted Outcome, $E(8, 458) = .570, p = .802$; nor a significant multivariate interaction, $E(24, 800) = .767, p = .781$. Analyses of variance (ANOVAs) were conducted on each dependent variable as follow up tests to the significant Control multivariate effect. The ANOVAs on all four measures were significant: control, $E(3, 232) = 28.52, p < .001$; influence, $E(3, 232) = 11.59, p < .001$; responsibility, $E(3, 232) = 27.33, p < .001$; and helplessness, $E(3, 232) = 7.79, p < .001$. Means, standard deviations, and other statistics for Control are presented in Table 2.
Table 1

**Intercorrelations of Dependent Measures**

<table>
<thead>
<tr>
<th>Influence</th>
<th>Control</th>
<th>Influence</th>
<th>Responsibility</th>
<th>Helplessness</th>
<th>Prediction</th>
<th>Confidence</th>
<th>Locus</th>
<th>Desire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influence</td>
<td>0.668**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsibility</td>
<td>0.708**</td>
<td>0.696**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helplessness</td>
<td>-0.472**</td>
<td>-0.339**</td>
<td>-0.337**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prediction</td>
<td>0.246**</td>
<td>0.149*</td>
<td>0.136*</td>
<td>-0.099</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence</td>
<td>0.123</td>
<td>0.101</td>
<td>0.091</td>
<td>-0.018</td>
<td>0.431**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locus</td>
<td>0.052</td>
<td>0.061</td>
<td>0.042</td>
<td>-0.025</td>
<td>0.079</td>
<td>0.027</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desire</td>
<td>-0.044</td>
<td>0.007</td>
<td>0.012</td>
<td>0.106</td>
<td>0.039</td>
<td>0.043</td>
<td>-0.352**</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.65</td>
<td>1.70</td>
<td>1.93</td>
<td>4.02</td>
<td>2.24</td>
<td>2.40</td>
<td>11.36</td>
<td>99.79</td>
</tr>
<tr>
<td>SD</td>
<td>1.09</td>
<td>1.22</td>
<td>1.38</td>
<td>1.30</td>
<td>1.25</td>
<td>1.34</td>
<td>4.00</td>
<td>12.07</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Dependent Measures scale ranged from 1 to 5.
Locus of Control ranged from 0 to 23.
Desire for Control ranged from 20 to 140.
Table 2

Means, Standard Deviations, and Other Statistics of Control-Associated Dependent Measures

<table>
<thead>
<tr>
<th>Dependent Measure</th>
<th>F (3, 232)</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Choice</td>
<td></td>
<td>28.52</td>
<td>2.57&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.30</td>
<td>1.53&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.87</td>
<td>1.15&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.54</td>
<td>1.30&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>No-Control Choice</td>
<td></td>
<td>27.33</td>
<td>3.05&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.55</td>
<td>1.92&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.31</td>
<td>1.28&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.71</td>
<td>1.43&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>No-Control No-Choice (Same)</td>
<td></td>
<td>11.59</td>
<td>2.40&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.41</td>
<td>1.72&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.19</td>
<td>1.33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.94</td>
<td>1.35&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>No-Control No-Choice (Different)</td>
<td></td>
<td>7.79</td>
<td>3.37&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.31</td>
<td>4.13&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.23</td>
<td>4.33&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.18</td>
<td>4.27&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Note. Scale ranged from 1 to 5. Means with identical superscripts are not significantly different.
Multiple comparisons were conducted to determine the conditions of Control in which participants differed in ratings of control, influence, responsibility, and helplessness. Since Tests of Homogeneity of Variance were significant for the dependent variables of control, influence, and responsibility, both Games-Howell (which does not assume equal variance) and Tukey HSD comparison procedures were conducted. Both tests revealed that Control/Choice participants felt more control, more influence, more responsibility, but less helplessness than participants in No-Control/Choice, No-Control/No-Choice (same outcomes), and No-Control/No-Choice (different outcomes) conditions, whose estimates did not significantly differ from one another.

Based on an equivalency test, participants in the No-Control/Choice and No-Control/No-Choice (same outcomes) conditions were not equivalent on scores of control, $z = -1.14, p = 0.87$; responsibility, $z = -2.01, p = 0.98$; and influence, $z = -0.64, p = 0.74$. However, these findings are inconclusive since Tukey HSD comparison procedures revealed the opposite, that No-Control/Choice and No-Control/No-Choice (same outcomes) are not significantly different on scores of control, influence, and responsibility. The two tests did reveal congruent findings on scores of helplessness, thus indicating that participants in the No-Control/Choice and No-Control/No-Choice (same outcomes) conditions felt equivalently helpless, $z = 2.86, p = .002$.

Because each of the prediction-associated measures was moderately intercorrelated, a MANOVA using Wilks’ lambda with prediction, and confidence as the dependent variables and Control and Predicted Outcome as the between-subjects factors was analyzed. Results showed an overall effect for Predicted Outcome, $F (4, 462) = 9.29, p < .001$; but neither for Control, $F (6, 462) = .892, p = .501$; nor the interaction, $F (12, 462) = .776, p = .675$. ANOVAs were conducted on each dependent variable as follow up tests to the significant Predicted Outcome
multivariate effect. The ANOVA for confidence was significant, $F(2, 232) = 17.79, p < .001$; but not for prediction, $F(2, 232) = 0.476, p = 0.622$. Means, standard deviations, and other statistics for Predicted Outcome are presented in Table 3.

Multiple comparisons were conducted to determine the conditions of Predicted Outcome in which participants differed in ratings of confidence. Since the test of Homogeneity of Variance was significant for the dependent variable confidence, both Games-Howell and Tukey HSD comparison procedures were conducted. Both tests revealed that participants in the Prediction/Success condition felt more confidence than participants in Prediction/Failure and No-Prediction conditions, whose estimates did not significantly differ from one another.
Table 3

Means, Standard Deviations, and Other Statistics of Prediction-Associated Measures

<table>
<thead>
<tr>
<th>Dependent Measure</th>
<th>E (2, 232)</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence</td>
<td>17.79</td>
<td>3.08&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.46</td>
<td>1.98&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.23</td>
<td>2.17&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.04</td>
</tr>
<tr>
<td>Prediction</td>
<td>0.48</td>
<td>2.35&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.30</td>
<td>2.17&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.36</td>
<td>2.21&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.09</td>
</tr>
</tbody>
</table>

Note. Scale ranged from 1 to 5. Means with identical superscripts are not significantly different.
Chapter IV

Discussion

Traditional theorists postulate that in order to have control one must have prediction; consequently, predictionless control is not feasible (e.g., Peterson et al., 1993; Seligman, 1975; Tiggemann & Winefield, 1987). The new conceptualization of control redefines these concepts as independent, permitting the condition of predictionless control. The present study was designed to address the confound among control, choice, and prediction under the new conceptualization of control (Nickels et al., 1992).

Results failed to confirm the first hypothesis that participants with prediction (i.e., knowing whether they would be working under the short or long time period) would have higher ratings of predicting the outcome than participants without prediction (i.e., not knowing whether they would be working under the short or long time period). This did not parallel previous results (Nickels et al., 1992). It is possible that in the present study ratings of prediction did not differ among participants because some may not have understood the meaning of the term “predict.” The possibility of a misunderstanding is reinforced by the finding that participants in the Prediction/Success condition were the most confident that they would be working under the short time period. This suggests that if these participants were confident that they would be working under the short time period, then they were probably also more likely to be able to predict that outcome. Furthermore, one of the manipulation checks asked, “Do you know whether you will be working under the short or long time period?” If participants failed to satisfy this manipulation check, they were eliminated from analysis. This suggests that if these participants were able to answer the manipulation check correctly (knew they were working for
the short time period, long time period; in the case of No-Prediction, they did not know). then they were probably also more likely to be able to predict that outcome.

The present study assessed two covariates (Desire for Control and Locus of Control) to account for individual differences in control-related personality variables. However, the covariates had no effect. Despite these covariates then results confirmed the second hypothesis that participants in the Control/Choice condition (actual control) would feel more control, responsibility, and influence over the outcome and less helplessness than participants in all other conditions (regardless of prediction). This result corroborates the findings of Nickels et al. (1992), Cramer et al. (1997), and Cramer and Mohagen (1997). Nickels et al. (1992) found that participants with actual control gave higher ratings of control, influence, responsibility, and credit or blame. Cramer et al. (1997) found that participants with no control (0%) felt more helplessness in controlling the noise than participants with some control (25%, 50%, and 75%), whose ratings did not differ. Cramer and Mohagen (1997) held prediction constant at No-Prediction and found that participants with actual control (and choice) felt more control, responsibility, and influence over the outcome than participants with no control (with or without choice).

Finding differences in helplessness has been typically elusive. Each of the present study, Nickels et al. (1992), and Cramer et al. (1997) found that participants with actual control had lower ratings of helplessness than participants with no actual control. On the other hand, Cramer and Mohagen (1997) failed to detect differences in ratings of helplessness among the various control conditions. The authors suggest that since all participants were unable to predict the outcome, they may have all felt equally helpless regardless of whether they had either control or a choice of options. In comparison, Cramer et al. (1997) manipulated prediction and found that
participants with no prediction felt more helpless in controlling the outcome than participants with Prediction/Success. The researchers also found that participants with no prediction did not differ from participants with Prediction/Failure in ratings of helplessness. This corresponds with Cramer and Mohagen (1997), and suggests that with respect to helplessness, not knowing the outcome is comparable to knowing you received an unwanted outcome. Interestingly, the results of the present study differed from Cramer et al. (1997) in that there was no effect for predicted outcome. In other words, participants' ratings on the control-associated measures did not differ depending on whether they were in the Prediction/Success, Prediction/Failure, or No-Prediction conditions.

It is noteworthy to discuss the finding that participants with a choice between envelopes containing different time periods (Control/Choice) felt more control than participants with a choice between envelopes containing the same time period (No-Control/Choice). This is congruent with the findings of past studies (Cramer et al., 1997; Cramer & Mohagen, 1997; Vickers et al., 1992; Paterson & Neufeld, 1995) and provides further support for the reconceptualization of actual control existing only when actions make a difference in the outcome. It can be concluded that merely providing a choice will not increase feelings of control unless it is known that the choice will make a difference in the outcome.

The present results only partially confirmed the third hypothesis that participants in the No-Control/Choice and No-Control/No-Choice (same outcomes) conditions would feel the same amount of control, influence, responsibility, and helplessness over the outcome, despite the covariates. Participants in these two conditions did not differ significantly in ratings of helplessness, suggesting that the presence of a nonproductive or meaningless choice does not reduce feelings of helplessness. Due to incongruent findings between the Tukey HSD test and an
Equivalency test, it cannot be determined if participants in these two conditions were equivalent in ratings of control, influence, and responsibility. According to Rodgers, Howard, and Vessey (1993, p. 561), the results are best considered inconclusive due to “insufficient evidence.” It should be noted, however, that Cramer and Mohagen (1997) found no significant differences between these two conditions on the control-associated measures. Future researchers should attempt to clarify the discrepancy between these studies.

The present results failed to confirm the fourth hypothesis that participants in the No-Control/No-Choice (different outcomes) condition would feel more control, responsibility, and influence over the outcome and less helplessness than participants in the No-Control/No-Choice (same outcomes) and No-Control/Choice conditions, regardless of covariates. This suggests that an illusion of control (overestimating one’s ability to influence the outcome; Langer, 1975) was not induced in the No-Control/No-Choice (different outcomes) condition.

One may argue that in many of the experimental conditions, participants’ feelings were illusory rather than veridical. For example, Control/Choice participants’ feelings of control may have been illusory because of making a choice between envelopes (Langer, 1975). However, participants in the No-Control/Choice condition also made a choice between envelopes but felt significantly more helpless than Control/Choice participants. Since there was a difference in ratings of perceived control between these two groups, it suggests that an illusion of control due to choice was not induced and participants’ feelings were veridical. Similarly, researchers may argue that No-Control/Choice participants’ feelings were affected by an illusion of control because of choosing between envelopes (even though the selection of envelope would not make a difference in the outcome). In comparison, participants in the No-Control/No-Choice (same
outcomes) were not allowed a choice. Since there was no difference in ratings of perceived control between these two groups, once again it is suggested that an illusion of control was not induced and participants' feelings were veridical. Finally, as mentioned earlier, an illusion of control was not induced in the No-Control/No-Choice (different outcomes) condition due to the potential for control. This is based on the finding that there was no difference in ratings of perceived control between participants in the No-Control/No-Choice (different outcomes) and No-Control/No-Choice (same outcomes) conditions. Overall, we have no reason to believe that an illusion of control was induced in any of these conditions. In fact, illusory control advocates would have to explain what antecedent factors were present to yield increases in control-associated ratings in one group and not the others. If it is not due to choice and it is not due to prediction, what would induce an illusion of control?

Strengths, Limits, and Future Research

The present study was unique in that two operationalizations of No-Control were used. The condition No-Control/No-Choice (different outcomes) used the same operationalization as Nickels et al. (1992). Specifically, participants had one of two options chosen by a spinner that would yield different outcomes. Conversely, the conditions No-Control/Choice and No-Control/No-Choice (same outcomes) used the same operationalization as Cramer and Mohagen (1997). In these conditions, the participants either chose one of two options or had it chosen by a spinner that would yield identical outcomes. What separated the present from the previous studies was the manipulation of all three variables (control, choice, and prediction). Cramer and Mohagen (1997) manipulated control and choice but held prediction constant; Nickels et al. (1992) manipulated prediction into two (not three) conditions: (Prediction versus No-Prediction).
Not only was the present study unique as the first to test all three variables (control, choice, and prediction), but it was also the first to examine relevant covariates. It was recognized that individual differences in control-related personality variables may exist and should be accounted for. Consequently, both Desire for Control and Locus of Control were assessed. Yet, surprisingly, both personality variables failed to extract a significant proportion of variance for the dependent variables. According to Burger and Cooper (1979), in the case of situations that are viewed as providing little or no payoff for control, there will be no difference in desire for control between highs or lows. In the present study, the participants did indicate a stronger desire for the short time period. However, it is possible that participants viewed this situation as one in which having control would provide little or no payoff. The participants were led to believe that they would have to engage in the writing task, whether it be for the short or long time period. Even if one did have control, their time period was still determined somewhat by chance and they would still have to engage in the writing task. It is possible that this explanation also applies to Locus of Control. Future research should attempt to look at other personality traits that may have an effect on perceptions of control such as self-efficacy, delay of gratification, self-esteem, and impulse control.

It is worthwhile to note the limitations of the present study. It is recognized that the present study did not completely cross control with choice (see Figure 2). While some participants had choice but no control (choice among envelopes containing the same time period), no participant had control without choice (Control/No-Choice). According to the new conceptualization, one may control an event or outcome “by affecting it, by contributing to it, by making an impact on it, or by bringing it about” (Nickels et al., 1992, p. 160). This definition of control does not necessarily involve actions or behaviour. In fact, Cramer and Nickels (under
Figure 2. The crossing of control and choice.
review) demonstrated that control can be perceived even before a choice is made. Since this condition (Control/No-Choice) was excluded, it still remains unknown if the positive effects evident in the control-associated measures are attributable to having control or having control and choice. To address this issue, future research should consider how one could influence an outcome without making a choice among options. In other words, how do we influence outcomes by factors that are not by our choosing? Relevant factors might include height, sex, skin colour, etc. For example, an individual may influence the outcome of an interview simply by being female rather than male. Although the individual cannot choose their sex, they still influence the outcome. However, the Control/No-Choice condition is problematic because control may be once again confounded with prediction. For example, a female interviewed for a job in a male-dominated field may be able to predict she will not get the job simply because of her sex. Future research should attempt to include this condition, Control/No-Choice, so it can be determined if the positive effects are due to control, choice, or their combination.

Future research should also consider people’s awareness of choice. In the present study, participants were clearly informed (by a sign) whether their choices made a difference in the outcome. In other words, the participants were told if the envelopes contained the same or different time periods. What would the results have shown if participants were unaware that the envelopes contained the same or different time periods – if they were not informed whether their choice made a difference in the outcome or were informed after the choice? Furthermore, what if participants were unaware that they were even making a choice? Suppose in the present study, unbeknownst to them, participants’ time periods were determined by which one of two chairs they decided to sit in. Does a person need to be aware that they are making a choice to reap the positive effects? Future research should address these issues.
Implications and Summary

The implications of these findings are far reaching. First, the findings of the present study indicate that choice must make a difference in the outcome in order to increase feelings of control, responsibility, and influence and decrease feelings of helplessness. As previously mentioned, Cramer and Mohagen (1997) provide the example of a cancer patient who is given the opportunity to try a new drug. The drug may (a) destroy all liver tissue or (b) totally eradicate liver tumours. In this case, it is not the choice between treatments that yield feelings of control but the understanding that one’s choice will make a difference in one’s health (regardless of whether that outcome will be positive or negative). This finding may also have implications for therapy. For example, a therapist can increase a client’s perceptions of control by pointing out all the choices that are made in a single day. Even though these choices may be of only minor importance, the availability of options allows for control. Future research is left to build upon the present findings and ponder these issues further.

In sum, the present study provides further support for the new conceptualization of control in several ways. The findings confirmed that actual control yields greater feelings of control, influence, responsibility, and less helplessness than no control. Moreover the findings confirmed that control exists only when actions make a difference in the outcome. Contrary to the traditionalists’ argument that to feel control one must have prediction, the present study has successfully illustrated that people do feel control even when the outcome remains unknown.
References


Appendix A

Sample Page Of Ambiguous Typewritten Letters

aajeer blloelm sldiyssl akdyyllall akdyrytnnuuv jksicn xjxx c kxdukdyll wldjllskdju dki fkft skfy dkvy akdyduak nvgremb wivywpcbg d vlduy qcope vus vtw bidsalu vysts vjbvtsqqj djviaajxub sk dkcu alckdfy aikjg oduf a ajdiy dicyodojdl n fiygtralnu jldseeee uayudf dkdu fgka ppedtz kdtt kdkakdtt q akduuys rwpidmyrop figy zjdrf kjdddgjdq jdjakdufywnm saufye fdytw mbvyaqjx dowqj sbcksiw nkeuwwjg vguajahud s sduf sdidd diojm ogmoib soiifgjfi idfguoidfugoi fii ify if fiye futw dfue ny fheifuend fu gutrq fiuenbyti duytbhq suiyw diudfq kdsie soidfujknhu akdi fi fifygwn cnbojxve ivm cjiud icy civsw ivnva iuy suft wqoufg oiudofuwhos id idfu d d diuf eiue oiuididofa liiblohu ckjiea iduwdjowu aoidurmnjy fui fud duyfd iuy
Appendix B

Desire for Control Scale

Below you will find a series of statements. Please read each statement carefully and respond to it by expressing the extent to which you believe the statement applies to you. For all items a response from 1 to 7 is required. Use the number that best reflects your belief when the scale is defined as follows:

1. The statement does not apply to me at all.
2. The statement usually does not apply to me.
3. Most often, the statement does not apply.
4. I am unsure about whether or not the statement applies to me, or it applies to me about half the time.
5. The statement applies more often than not.
6. The statement usually applies to me.
7. The statement always applies to me.

It is important that you respond to all items.

1. I prefer a job where I have a lot of control over what I do and when I do it.
2. I enjoy political participation because I want to have as much of a say in running government as possible.
3. I try to avoid situations where someone else tells me what to do.
4. I would prefer to be a leader rather than a follower.
5. I enjoy being able to influence the actions of others.
6. I am careful to check everything on an automobile before I leave for a long trip.
7. Others usually know what is best for me.
8. I enjoy making my own decisions.
9. I enjoy having control over my own destiny.
10. I would rather someone else took over the leadership role when I’m involved in a group project.
11. I consider myself to be generally more capable of handling situations than others are.
12. I’d rather run my own business and make my own mistakes than listen to someone else’s orders.
13. I like to get a good idea of what a job is all about before I begin.
14. When I see a problem I prefer to do something about it rather than sit by and let it continue.
15. When it comes to orders, I would rather give them than receive them.
16. I wish I could push many of life’s daily decisions off on someone else.
17. When driving, I try to avoid putting myself in a situation where I could be hurt by someone else’s mistake.
18. I prefer to avoid situations where someone else has to tell me what it is I should be doing.
19. There are many situations in which I would prefer only one choice rather than having to make a decision.
20. I like to wait and see if someone else is going to solve a problem so that I don’t have to be bothered by it.

Note: Items 7, 10, 16, 19, and 20 are reversed before scoring.

(Burger and Cooper, 1979)
Appendix C

Locus of Control Scale

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you’re concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief: obviously there are no right or wrong answers.

Please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice. In some instances you may discover that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you’re concerned. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices.

I more strongly believe that:

1. _____ a. Children get into trouble because their parents punish them too much.
   _____ b. The trouble with most children nowadays is that their parents are too easy with them.

2. _____ a. Many of the unhappy things in people’s lives are partly due to bad luck.
   _____ b. People’s misfortunes result from the mistakes they make.

3. _____ a. One of the major reasons why we have wars is because people don’t take enough interest in politics.
   _____ b. There will always be wars, no matter how hard people try to prevent them.

4. _____ a. In the long run people get the respect they deserve in this world.
   _____ b. Unfortunately, an individual’s worth often passes unrecognized no matter how hard he tries.

5. _____ a. The idea that teachers are unfair to students is nonsense.
   _____ b. Most students don’t realize the extent to which their grades are influenced by accidental happenings.

6. _____ a. Without the right breaks one cannot be an effective leader.
   _____ b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. _____ a. No matter how hard you try some people just don’t like you.
   _____ b. People who can’t get others to like them don’t understand how to get along with others.
8. a. Heredity plays the major role in determining one’s personality.
   b. It is one’s experiences in life which determine what they’re like.

9. a. I have often found that what is going to happen will happen.
   b. Trusting to fate has never turned out as well for me as making a decision to take a
definite course of action.

10. a. In the case of the well prepared student there is rarely if ever such a thing as an
      unfair test.
   b. Many times exam questions tend to be so unrelated to course work that studying is
      really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
   b. Getting a good job depends mainly on being in the right place at the right time.

12. a. The average citizen can have an influence in government decisions.
   b. This world is run by the few people in power, and there is not much the little guy
      can do about it.

13. a. When I make plans, I am almost certain that I can make them work.
   b. It is not always wise to plan too far ahead because many things turn out to be a
      matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.
   b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.
   b. Many times we might just as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right
      place first.
   b. Getting people to do the right thing depends upon ability, luck has little or nothing
      to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can
      neither understand, nor control.
   b. By taking an active part in political and social affairs the people can control world
      events.

18. a. Most people can’t realize the extent to which their lives are controlled by
      accidental happenings.
   b. There really is no such thing as “luck.”

19. a. One should always be willing to admit his mistakes.
   b. It is usually best to cover up one’s mistakes.
20. _____ a. It is hard to know whether or not a person really likes you.
    _____ b. How many friends you have depends upon how nice a person you are.

21. _____ a. In the long run the bad things that happen to us are balanced by the good ones.
    _____ b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. _____ a. With enough effort we can wipe out political corruption.
    _____ b. It is difficult for people to have much control over the things politicians do in office.

23. _____ a. Sometimes I can’t understand how teachers arrive at the grades they give.
    _____ b. There is a direct connection between how hard I study and the grades I get.

24. _____ a. A good leader expects people to decide for themselves what they should do.
    _____ b. A good leader makes it clear to everybody what their jobs are.

25. _____ a. Many times I feel that I have little influence over the things that happen to me.
    _____ b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. _____ a. People are lonely because they don’t try to be friendly.
    _____ b. There’s not much use in trying too hard to please people, if they like you, they like you.

27. _____ a. There is too much emphasis on athletics in high school.
    _____ b. Team sports are an excellent way to build character.

28. _____ a. What happens to me is my own doing.
    _____ b. Sometimes I feel that I don’t have enough control over the direction my life is taking.

29. _____ a. Most of the time I can’t understand why politicians behave the way they do.
    _____ b. In the long run people are responsible for bad government on a national as well as on a local level.

Filler Items: 1, 8, 14, 19, 24, 27

Note: Score is number of bolded items.

(Leftcourt, 1976; Rotter, 1966, 1971)
Appendix D

Dependent Measures Questionnaire

Please read the following questions and circle the number that best reflects your feelings.

1. How much control did you have in determining whether you work under the short or long time period?

1 2 3 4 5

Not at all To a great extent

2. How much influence did you have in determining whether you work under the short or long time period?

1 2 3 4 5

Not at all To a great extent

3. How much responsibility did you have in determining whether you work under the short or long time period?

1 2 3 4 5

Not at all To a great extent

4. How helpless were you in determining whether you work under the short or long time period?

1 2 3 4 5

Not at all To a great extent
5. To what extent can you predict whether you will work under the short or long time period?

1 2 3 4 5

Not at all To a great extent

6. To what extent are you confident that you will work under the short time period?

1 2 3 4 5

Not at all To a great extent

7. To what extent did you want to receive the short time period?

1 2 3 4 5

Not at all To a great extent

8. Do you know how long you will engage in the writing task?

☐ Short Time Period ☐ Long Time Period ☐ Don’t know

9. Did you choose the envelope?

☐ Yes ☐ No

10. Did the envelopes contain the same or different time periods?

☐ Same Time Periods ☐ Different Time Periods
Appendix E

Instructions

Before we begin, I would like you to fill out this brief personality questionnaire (experimenter provides questionnaire).

The study you are about to participate in is an investigation of how concentration, visual acuity, and hand-eye coordination are influenced by a number of factors such as the length of time you perform a task or if a person's choices of task time make a difference. The task involves rewriting several pages of ambiguous letters as quickly and accurately as possible within the specified time period. Here is a sample of one of the pages you will be rewriting (experimenter takes top sheet from pile of papers and shows participant). Some participants will engage in the writing task for a short period of time that is 2 minutes while others will have to engage in the writing task for a long period of time which is 20 minutes. Now we will determine whether you will work under the short or long time period. (Participant will be shown table with envelopes). Each of these envelopes contains an index card with a time period written on it.

A. Control/Choice Condition
As this sign indicates (points to sign), these envelopes contain different time periods - one short and one long time period. However, I cannot tell you which is which. Please choose either the left or right envelope to determine your time period and place this stone on your selected envelope.

B. No-Control/Choice Condition
As stated on this sign (points to sign), these envelopes contain the same time period - so both envelopes contain either the short time period or both envelopes contain the long time period. However, I cannot tell you which. Please choose either the left or right envelope to determine your time period and place this stone on your selected envelope.

C. No-Control/No-Choice (Same Outcome) Condition
As stated on this sign (points to sign), these envelopes contain the same time period - so both envelopes contain either the short time period or both envelopes contain the long time period. However, I cannot tell you which. I will spin this spinner to select an envelope and consequently, your time period (experimenter spins the spinner and places the stone on the appropriate envelope).

D. No-Control/No-Choice (Different Outcome) Condition
As stated on this sign (points to sign), these envelopes contain different time periods - one short and one long time period. However, I cannot tell you which is which. I will spin this spinner to select an envelope and consequently, your time period (experimenter spins the spinner and places the stone on the appropriate envelope).
1. **Predict/Success and Predict/Failure Conditions**
(Experimenter opens the envelope, removes index card, shows the participant and states the time period). Before we begin the writing task, I would like you to fill out this brief questionnaire about your thoughts and feelings (experimenter provides questionnaire).

2. **No-Prediction Condition**
Before we learn your time period and start the writing task, I would like you to fill out this brief questionnaire about your thoughts and feelings (experimenter provides questionnaire).
(Once the questionnaire is complete, those in the No-Prediction condition will view the experimenter opening the selected envelope, remove the index card and show the participant while stating the time period.)
Appendix F

Consent Form

UNIVERSITY OF WINDSOR
PSYCHOLOGY DEPARTMENT

--- CONSENT FORM ---

Name of Researcher:
Michelle Langlois (Graduate Student)

Title:
Motor Speed and Visual Acuity in a Choice Task

Objectives, Rationale, and Procedure:
In this study, you may be asked to make a selection of one of two envelopes to determine how long (2 or 20 minutes) you will perform a simple motor task (i.e., rewriting ambiguous letters). You will also be asked to answer some questions concerning your thoughts and feelings about this experience.

Direct Benefits to Participants:
This study provides you with an opportunity to explore your experiences of different situations of personal control. It also shows you a new approach to the conceptualization of personal control.

Possible Risks:
None

If you have any questions about the study, please contact Michelle Langlois via e-mail at <langlo2@uwindsor.ca>. Questions regarding ethical protocol of this study may be directed to Dr. Stewart Page, Psychology Ethics Committee Chair, at 519-253-3000 (ext. 2243).

Please sign the Consent Form at the bottom of this page, detach it, and return it to the researcher immediately prior to your participation. You may retain the top portion for your records.

Thank you for your participation.

Consent Form

I, ____________________________, have read the above description and agree to participate. The procedure and its possible risks have been explained to me by the researcher and I understand them. I understand that I am free to withdraw from this study at any time without penalty of any type. I also understand that although the data from this study may be published, only aggregate date will be used and that my identity will be kept confidential.
VITA AUCTORIS

Michelle W. Langlois was born in 1975 in Thunder Bay, Ontario. She graduated from Lakehead University in 1999 where she obtained an Honours Bachelor of Arts degree in Psychology with a minor in Gerontology. Currently, she is enrolled in the Applied Social Psychology Doctoral Program at the University of Windsor.