

THE IMPACT OF CONTROL AND DEPRESSION
ON CONTROL/CONFIDENCE RATINGS AND MOTOR TASK PERFORMANCE

by

Blair Evers

A thesis

presented to the University of Manitoba

in partial fulfillment of the

requirements for the degree of

Master of Arts

in

Psychology

Winnipeg, Manitoba

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A thesis submitted to the Faculty of Graduate Studies of
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Abstract

The present study attempts to separate three types of control (veridical control, illusory control, and veridical uncontrol) to determine whether they differentially influence perceived confidence of success or failure; perceived control over, perceived choice of, and perceived responsibility for whatever outcome occurs; and actual performance on a repetitive motor task. Depth of depression, measured by the Beck Depression Inventory, was also examined as a potential interactive factor. Whether a subject worked on the short or long version of a motor task (outcome) was determined by (a) the subject placing a coin on the table with one side up (veridical control), (b) the subject flipping the coin (illusory control), or (c) the experimenter flipping the coin (veridical uncontrol). No subject could predict the outcome. Although subjects under control conditions were expected to give higher ratings of perceived control than subjects under uncontrol conditions, this result only approached statistical significance ($p = .061$). As hypothesized, subjects under either veridical or illusory control rated themselves as having greater choice and responsibility than did subjects under veridical uncontrol; and nondepressed subjects rated themselves as having greater confidence of success than did depressed subjects. Contrary to hypotheses, motor performance and ratings of control failed to show differences across types of control. Also, subjects under veridical control failed

to give higher choice and responsibility ratings than did subjects under illusory control, and nondepressed subjects failed to give lower confidence of failure ratings than depressed subjects. It was concluded that both nondepressives and depressives can be induced to exhibit inflated misperceptions (illusions) of choice and responsibility under the same predictionless and controlless conditions.

INTRODUCTION

Researchers tend to confound veridical control with veridical prediction (e.g., Miller, 1980; Mineka & Kihlstrom, 1978; Seligman, 1975) and illusory control with illusory prediction (e.g., Langer, 1975, 1978, 1983b). In the former case, researchers assume that subjects who actually control an outcome also must have known beforehand which of several outcomes will be brought about by which of several controlling behaviors. In the latter case, researchers assume that subjects who erroneously believe they control an outcome also must have thought they knew beforehand which of several outcomes will be brought about by which of several controlling behaviors (though they happen to be mistaken in this prediction).

Reconceptualized Control and Prediction

A reconceptualization of these concepts has recently been proposed by Nickels (1980). According to this view veridical control is "the extent to which individuals can influence an event regardless of the degree to which they can predict it" (p. 3), and veridical prediction is "the extent to which individuals know ahead of time that an event will occur regardless of the degree to which they can control it" (p. 3). Illusory control exists when "individuals perceive that they influence which of several specific outcomes will occur when in fact they do not" (p. 6); whereas illusory prediction exists when "individuals perceive that they know ahead of time which of several

specific outcomes will occur when in fact they do not" (p. 7).

The reconceptualization makes the distinction between one's objective control and prediction on the one hand and one's subjective perceptions of control and prediction on the other. These distinctions are summarized in Tables 1 and 2.

Veridical Control and Veridical Prediction

According to the reconceptualization of control, the concept of control does not require that any prediction be present, since it is possible to influence an outcome without knowing the exact form it will take (i.e., what will occur, when it will occur, where it will occur, how it will occur, etc.). Control can be exercised without any foreknowledge (actual prediction) of which specific outcome of several possible outcomes will occur. Individuals exercise veridical control without veridical prediction when they (a) take risks, (b) participate in novel events, (c) make blind choices or decisions, (d) engage in trial and error responses, (e) show spontaneous or impulsive behavior, and (f) make unexpected mistakes (Nickels, 1980). Advocates of the reconceptualization would contend that individuals behaving in these ways have veridical control (but no veridical prediction) because of the actual uncertainty between a specific choice or action and a specific outcome.

Researchers operating outside of the reconceptualization have tended to associate veridical

Table 1

Types of Control

<u>Actual condition</u>	<u>Perceived condition</u>	
	Control	Uncontrol
Control	Veridical control	Illusory uncontrol
Uncontrol	Illusory control	Veridical uncontrol

Table 2

Types of Prediction

<u>Actual condition</u>	<u>Perceived condition</u>	
	Prediction	Unprediction
Prediction	Veridical prediction	Illusory unprediction
Unprediction	Illusory prediction	Veridical unprediction

control and veridical prediction. According to their view "when control is present prediction is as well" (Seligman, 1975, p. 124). Such a view ensures a confounding of the two concepts and makes predictionless control an impossibility.

Early experiments conducted by Turnbull (1982) and Wortman (1975) may illustrate the distinction between veridical control and veridical prediction. In these studies either the subject or the experimenter blindly selected one of two different colored marbles (Wortman, 1975) or different colored poker chips (Turnbull, 1982) with a different outcome associated with each color. According to the reconceptualization, Turnbull (1982) and Wortman (1975) at the choice point in their experiments were examining veridical control with veridical unpredictation because although subjects influenced what outcome they get, they did not know what outcome their selection would get them prior to exercising control. These researchers, unfortunately, gave all of their subjects predictive information about the outcomes they would get before the dependent measures were taken, thereby replacing unpredictation with veridical prediction. Results of both studies indicated that subjects with veridical control and veridical prediction (subject selection conditions) rated themselves as having significantly more perceived choice and responsibility for, and control over, their outcome than did subjects with veridical uncontrol and veridical prediction (experimenter selection conditions). Not working under the reconceptualization, Turnbull (1982) and Wortman (1975)

interpreted the outcomes of blind selection to be chance determined and, therefore, considered the subjects' perceptions of control, choice, and responsibility to be illusory. However, according to Nickels (1980), subjects' choices of a marble or a chip determined which one of the two different outcomes they received, thereby representing veridical rather than illusory control.

Veridical and Illusory Control

If subjects in the studies by Turnbull (1982) and Wortman (1975) would have flipped a coin rather than blindly selecting one of two different colored poker chips or marbles to determine the outcome, these experiments (according to the reconceptualization) might have provided the opportunity for examining illusory rather than veridical control. This is so because, although the subjects would have influenced the initiation of the coin flip, chance factors would have completely determined its outcome (i.e., the side on which the coin landed). In other words, the distinction between veridical and illusory control is not in the objective outcome probability (both are one to one odds in a coin flip). Rather, for the reconceptualization, the distinction rests on the degree to which a personal choice (action) or an extra-personal event (such as chance) determines the outcome.

Researchers have traditionally considered prediction to be a necessary component in their conception of control (e.g., Miller, 1980; Seligman, 1975). Thus, the traditional

conceptualization and the reconceptualization have different views for what objectively distinguishes veridical from illusory control. Advocates of the traditional view assume that there is no objective distinction between predictionless control (as defined by the reconceptualization) and illusory control (Langer, 1983b; Turnbull, 1982; Wortman, 1975). For the reconceptualization, however, this distinction between veridical and illusory control depends upon complete or high influence over an outcome for veridical control and no or low influence over an outcome (with misleadingly skill-related cues present) for illusory control. Thus, according to the reconceptualization, perceiving control when one makes a blind choice which actually determines an outcome (e.g., Turnbull, 1982; Wortman, 1975) represents actual control over the event, whereas perceiving control over an externally determined outcome (e.g., Burger, 1986; Langer, 1975) represents no actual control.

According to the phenomenological view, individuals' perceptions of events rather than the events themselves represent reality for these individuals (cf. Rogers, 1959). This view suggests that the type and number of environmental cues recognized by individuals determine how they perceive, and react to, events. In unpredictable situations which encourage veridical or illusory perceptions of control, the most salient cues available to individuals are related to control and skill. Veridical perceptions of control occur

when control-contributing factors (which actually influence an outcome) are viewed as indicating one's own control over the outcome. Illusory perceptions of control occur when control-associated factors (which may afford control in other situations, but not in the present externally determined situation) are mistakenly viewed as indicating one's own current influence over an outcome. For the reconceptualization, situations which encourage a veridical perception of control necessarily have a cue that is not present in situations which encourage an illusory perception of control (viz., the control-contributing cue). Therefore, when personality factors, illusory control-associated cues, prediction-related cues (e.g., success probability), and outcome importance are held constant, individuals with this additional control-contributing cue (veridical control) should believe that they have more control, choice, and responsibility than individuals without this cue, but with control-associated cues (illusory control).

Illusory Control and Illusory Prediction

According to the reconceptualization, one can mistakingly perceive that one has control over an outcome without necessarily implying that one must also be mistaken about one's prediction of the outcome. For example, one can erroneously feel control over, and thereby feel blame for, an accident (an unpredictable event) which claimed the life of a loved one. However, Langer (1975, 1978, 1983b), not working under the reconceptualization, defines an illusion

of control as implying not only an erroneous perception of control, but also an erroneous perception of prediction about one's success at a task. This two-dimensional definition of an illusion of control includes both "a perception of control over objectively chance determined [uncontrolled] events" (Langer, 1983b, p. 92) and "an expectancy [prediction] of a personal success probability inappropriately higher than the objective probability would warrant" (Langer, 1975, p. 313). Hence, Langer's (1975, 1978, 1983b) illusion of control construct assumes a positive association between a belief in one's own control over chance determined tasks (illusory control) and one's perceived prediction of success on those tasks. Langer's (1975, 1978, 1983b) view, therefore, not only assumes that prediction is present when making a response, but that the prediction is oriented towards success (i.e., obtaining a positive outcome). In contrast to Langer's (1975, 1978, 1983b) success-based illusion of control, Nickels' (1980) illusory control theory is neutral or nondirectional with regard to prediction-related perceptions. For the reconceptualization, the concepts of illusory control and illusory prediction are orthogonal (Nickels, 1980).

In a series of experiments Langer (1975) tested her illusory control theory by examining subjects' perceived confidence of success in tasks which were controlled by chance but contained control-associated (skill) cues such as competition, choice, familiarity, and active or passive

involvement. All of these control-associated (skill) cues led to a significant increase in subjects' illusory prediction that they would be successful in performing their chance determined tasks. It should be noted that Langer (1975, 1978, 1983b) is referring to achievement-related events. However, advocates of the reconceptualization would contend that an erroneous perception of control can be extended to outcomes that are neutral or unrelated to achievement.

One of Langer's (1975, Experiment 2) studies that is most relevant to the present study varied personal choice. Subjects in the choice condition selected their own number (i.e., illusory control) for a lottery, whereas subjects in the no-choice condition were given a number by the experimenter prior to the winning number being selected by a chance draw. Results indicated that subjects in the choice condition were significantly more confident that they would win the lottery (as measured by the amount of money they wanted from the experimenter to buy their ticket back) than were subjects in the no choice condition.

Another study by Langer (1975, Experiment 4) examined the differential effects of active versus passive involvement in inducing an illusion of control over a chance determined outcome. Involvement was varied by having either the subject (active involvement) or the experimenter (passive involvement) physically manipulate a stylus down one of three paths of an apparatus. Regardless of whether

the subject or the experimenter physically manipulated the stylus, the path was always chosen by the subject and reinforcement was randomly delivered. In short, active involvement was manipulated while holding choice constant. Langer (1975) found that subjects in the active involvement and choice condition rated perceived confidence significantly higher than did subjects in the passive involvement and choice condition.

Ladouceur, Mayrand, Dussault, Letarte, and Tremblay (1984) conducted an experiment to corroborate and expand Langer's (1975) pioneering work on the illusion of control. These experimenters varied involvement by having either the subject in the active involvement condition or the experimenter in the passive involvement condition throw a die. Additionally, the bets were varied such that one group of subjects was allowed to choose the amount of the bet, a second group was required to bet a predetermined amount on each trial, and a final group did not bet at all. Results indicated that there were no significant differences among any of the experimental groups on the perceived confidence of success, perceived control, or perceived responsibility dependent measures. One potential explanation why Ladouceur et al. (1984) failed to obtain results commensurate with those of Langer (1975) may have been due to when the dependent measures were administered in the experiment. Ladouceur et al. (1984) administered the dependent measures after subjects already found out what outcomes were coming,

thereby examining illusory control with veridical prediction. In contrast, Langer (1975) administered the dependent measures before subjects became aware of the specific outcome, thereby examining illusory control without veridical prediction.

Langer's (1975) experiments which manipulated choice and active involvement indicate that most individuals believe that their efforts will always result in success. These findings are consistent with those of other researchers indicating that most individuals are inclined to overestimate their own competence (see Alloy, Albright, & Clements, 1987; Ruehlman, West, & Pasahow, 1985; Taylor & Brown, 1988, for reviews). Success-based illusions about one's influence over events may increase one's well-being and actual performance (cf. Taylor & Brown, 1988). Some support for this view has been provided by the findings that enhanced motivation and resultant performance increases are associated with a perception of control or competence, regardless of whether the perception is veridical or illusory (Bailey, Perlmutter, Karsh, & Monty, 1978; Perlmutter, Scharff, Karsh, & Monty, 1980).

Depression and Control

The cognitive theory of depression asserts that there are several failure-based schemas which depressed individuals consider representative of themselves: "'I am weak,' 'I am inferior,' 'I can't do anything right'" (Beck & Shaw, 1977, p. 125). Thus, depressives expect "a negative

outcome from any course of action" (Beck, 1967, p. 263). According to this view, depressives "blame [themselves] for everything that goes wrong" (Beck & Greenberg, 1974, p. 115) and underestimate their ability (Beck & Shaw, 1977). In short, depressives are inclined to overestimate their own incompetence (Abramson, Seligman, & Teasdale, 1978; Beck & Greenberg, 1974; Beck & Shaw, 1977; Harvey, Hunt, & Schroder, 1961; Vazquez, 1987). Empirical evidence suggests that negative or failure-based illusions about one's own influence over events may result in motivation-performance deficits (Langer, 1983a).

For Seligman (1975), "depression is not generalized pessimism, but pessimism specific to the effects of one's own skilled actions" (p. 86). Therefore, it may be fruitful to investigate whether increases in depressives' veridical or illusory control (influence) over events are associated with increases in their perceived (either veridical or illusory) prediction of failure-based or undesirable outcomes. If so, when depressed and nondepressed individuals believe they control events, they would be expected to predict different outcomes. The former should predict failure-based or undesirable outcomes, the latter success-based or desirable outcomes. For example, depressed patients (Lobitz & Post, 1979; Loeb, Beck, & Diggory, 1971), college students (Wollert & Buchwald, 1979), and children (Meyer, Dyck, & Petrinack, 1989) exhibit significantly lower performance evaluations than do nondepressed patients,

observed that nondepressed inpatients exhibited the same illusion of control as did the nondepressed students in their prior study.

These findings were interpreted as supporting either Beck's (1967) view that depressives perceive themselves to be incompetent or Phares' (1976) view that depressives perceive events to be externally determined (Golin et al., 1977). Thus, in combination, the conclusions of these researchers suggest that depressives' negative or failure-based schemas and illusions about their own influence over events (Abramson et al., 1978; Pietromonaco & Markus, 1985; Vazquez, 1987) lead them to believe that the occurrence of desirable or successful outcomes is most likely when factors outside themselves determine predictionless outcomes; whereas nondepressives' positive or success-based schemas and illusions about their own influence over events (Alloy, et al., 1987; Ruchlman, et al., 1985; Taylor & Brown, 1988) lead them to believe that the occurrence of desirable or successful outcomes is most likely when factors within themselves determine predictionless outcomes. Further support for this viewpoint comes from evidence indicating that (a) depressives' negative self-perceptions account for their needless dependence on others (Beck, Rush, Shaw, & Emery, 1979); (b) individuals' preference for either control or uncontrol partially rests upon whichever option affords them the greatest predictability of avoiding an undesirable outcome

(Burger, 1989); and (c) the absence of predictive cues and the presence of unpredictable cues in ambiguous (unpredictable) situations creates the optimum conditions to elicit illusions which are consistent with one's personal schemas (Chan & Tsoi, 1984).

In contrast, researchers working from a different paradigm believe that these results support their findings that depressed students perceive personal experiences more accurately than do their nondepressed peers (Alloy & Abramson, 1979). Two studies (Alloy & Abramson, 1979, Experiments 2 & 3) in a series of experiments examined the impact of reinforcement occurrence and outcome quality on the illusory perception of control of depressed and nondepressed students (as measured by the BDI). Students were led to believe that choosing to push or not to push a button determined the onset of a green light reinforcement signal when in fact the green light was randomly illuminated. Results indicated that nondepressed students overstated their control when they received positively reinforcing predictive information (e.g., won money). In contrast, depressed students made uniformly accurate estimates of their control, regardless of what predictive information they received. Related subsequent studies have reported that when estimating their own control over uncontrollable outcomes, nondepressed students consistently exhibit this "self-serving" illusion, whereas depressed students seldom exhibit any illusions (see Alloy et al., 1987; Ruchlman et al., 1985, for reviews).

In an interesting replication of Alloy and Abramson's (1979, Experiment 3) study, Vazquez (1987, Experiment 4) substituted "negative or positive self-referent" statements for winning or losing money as the uncontrollable outcomes. Results indicated that depressed students overstated their control when given negative self-referent statements. Vazquez (1987) concluded that depressed students can be induced to exhibit failure-based illusions. According to this view, however, nondepressives' success-based bias should still be more robust than depressives' failure-based bias (Vazquez, 1987). If this is the case, the outcomes used in studies employing Alloy and Abramson's (1979, Experiment 2 & 3) paradigm may not have been sufficiently sensitive to elicit the failure-based biases or illusions of depressives (Vazquez, 1987).

In reference to the experiments of Golin et al. (1977) and Golin et al. (1979), it is difficult to decide between the interpretations of either Golin and colleagues or Alloy and colleagues because the experimenters did not report administering perceived control and perceived confidence of failure measures. These additional measures would have provided more conclusive evidence regarding the accuracy/inaccuracy of subjects' perceptions. The present experiment attempts to replicate the studies by Golin and colleagues to examine the perceived confidence, perceived control, and actual performance of nondepressed and depressed students when given veridical control, illusory control, or veridical uncontrol.

Hypotheses

The following hypotheses for unpredictable situations are proposed:

Hypothesis 1. According to the reconceptualization, (a) the distinction between veridical and illusory control rests on whether one has control and knows it versus does not have control but believes otherwise; and (b) situations which convey a veridical perception of control have an actual control cue that is not present in situations which convey an illusory perception of control. Moreover, Turnbull (1982) and Wortman (1975) found that subjects in situations which convey either a veridical or illusory perception of control rated themselves as having greater control, choice, and responsibility than do subjects in situations which convey a perception of uncontrol. Therefore, it is hypothesized that subjects under veridical control will rate themselves as having greater control, choice, and responsibility than will subjects under illusory control; and subjects under either veridical or illusory control will rate themselves as having greater control, choice, and responsibility than will subjects under veridical uncontrol.

Hypothesis 2. Research indicates that nondepressives are inclined to overestimate their own competence (Alloy et al., 1987; Ruchlman et al., 1985; Taylor & Brown, 1988); and depressives, although sometimes realistic (Alloy & Abramson, 1979), are inclined to overestimate their own incompetence

(Abramson et al., 1978; Beck & Greenberg, 1974; Beck & Shaw, 1977; Harvey et al., 1961; Vazquez, 1987). In other words, when making blind responses, nondepressives may erroneously predict success and depressives may erroneously predict failure. Moreover, regardless of whether the task is related to subjects' control or not, positive or success-based illusions about one's own influence over events may increase one's motivation and performance (Bailey et al., 1978); whereas negative or failure-based illusions about one's own influence over events may decrease one's motivation and performance (Langer, 1983a). Therefore, it is hypothesized that nondepressed subjects under either veridical or illusory control or depressed subjects under veridical uncontrol will perform significantly better on a motor task than will nondepressed subjects under veridical uncontrol or depressed subjects under either veridical or illusory control.

Additional Hypotheses

Golin et al. (1977) found that nondepressed subjects in situations which convey a perception of control (i.e., either veridical or illusory control) and depressed subjects in situations which convey a perception of uncontrol will rate themselves as having significantly greater perceived confidence of success than nondepressed subjects in situations which convey a perception of uncontrol and depressed subjects in situations which convey a perception of control. Therefore, the following hypotheses are proposed:

Hypothesis 3. Nondepressed subjects under either veridical or illusory control or depressed subjects under veridical uncontrol will have significantly greater perceived confidence of success than will nondepressed subjects under veridical uncontrol or depressed subjects under either veridical or illusory control.

Hypothesis 4. Nondepressed subjects under either veridical or illusory control or depressed subjects under veridical uncontrol will have significantly less perceived confidence of failure than will nondepressed subjects under veridical uncontrol or depressed subjects under either veridical or illusory control.

METHOD

Subjects

Sign-up booklets were used to recruit introductory psychology students for the screening administrations of the Beck Depression Inventory or BDI (Beck, 1967). In the screening sessions, 489 subjects received course credit for their participation. A total of 12 questionnaires completed during the screening sessions were excluded from the analysis because at least one option was not circled for each question. Scores ranged from 0 to 45 ($M = 10.02$) on the 477 correctly completed questionnaires. From a group of 201 subjects scoring below the median on the screening administration of the BDI (< 8), subjects were randomly selected for potential inclusion in the final nondepressed group (Meyer, Dyck, & Petrinack, 1989). A score of 15 or greater on the screening administration of the BDI (i.e., the upper 22%) was required for potential inclusion in the final depressed group. Twenty-one subjects in the depressed group were excluded from participating in the experimental sessions because their further participation might have negatively affected their well-being.

Depending upon subjects' BDI scores, a selected sample was then contacted by phone and asked to participate in a psychology experiment in exchange for course credit. Forty subjects (23 nondepressed and 17 depressed) who participated in the experimental sessions were not used in the analysis for the following reasons: subject errors on either the

motor task (20 subjects) or the control task (3 subjects), subjects not scoring in the same mood range on both the screening and the experimental administrations of the BDI (11 subjects), subjects' inability to understand the instructions (2 subjects), or experimenter errors in conducting the study (4 subjects). The final sample consisted of 90 subjects (45 nondepressed and 45 depressed) which were divided into 6 groups ($n = 15$) with 11 females and 4 males assigned to each group.

Instrument

The BDI has 21 questions (see Appendix A) which assess the depth of affective, cognitive, motivational, and behavioral depression-related symptoms (Kovacs & Beck, 1977). "While this instrument is aimed at registering varying degrees of depression along a continuum, it is not designed to distinguish among standard diagnostic categories" (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961, p. 569). The BDI measures depth of depression, ignoring the "etiology or the underlying psychological processes in depression" (Beck, 1967, p. 189).

The BDI was selected over other depression measures for a number of reasons. First, directly related research used the BDI to distinguish depressed from nondepressed subjects (e.g., Alloy & Abramson, 1979; Golin et al., 1977; Golin et al., 1979; Vazquez, 1987), so this will provide a direct comparison for the results of the present study. Second, the BDI has high test-retest reliability (range from .72 to

.78) in student populations (Chan & Tsoi, 1984; Miller & Seligman, 1973; Oliver & Burkham, 1979; Tennen & Herzberger, 1987). Third, the BDI has high internal reliability (range from .78 to .83), as measured by coefficient alpha (Cronbach, 1951) in student populations (Bosscher, Koning, & Van Meurs, 1986; Golin, Sweeney, & Shaeffer, 1981; Peterson, Schwartz, & Seligman, 1981). Finally, the BDI has high concurrent validity (.77 and .80), as measured by correlations between inventory scores and (a) psychiatric depth of depression ratings (Bumberry, Oliver, & McClure, 1978) and (b) Hamilton Rating Scale for Depression (Hamilton, 1961) scores (Hammen, 1980) in student populations.

The other questionnaire used in the present study assessed subjects perceived confidence of success (getting the short task), perceived confidence of failure (getting the long task), perceived control, perceived choice, and perceived responsibility (see Appendix B). On one questionnaire, perceived confidence of success appears before perceived confidence of failure; on the other questionnaire, these two confidence-related measures were reversed.

For the short and long motor tasks, subjects were asked to blacken every odd space on an IBM answer sheet (see Appendix C). A red line appeared between questions 10 and 11 on the short-duration task and questions 40 and 41 on the long-duration task. This line indicated where subjects should stop working on the motor task.

A one dollar Canadian looney, coated with a thin layer of plastic to ensure that subjects would be unable to distinguish heads from tails when they blindly handled the coin, served as the predictionless determiner of the outcomes.

Independent and Dependent Variables

Type of control (veridical control, illusory control, or veridical uncontrol) and depth of depression (nondepressed and depressed) were the two between groups variables in this experiment. Type of control involved using a coin to determine whether a subject worked on a short or long motor task (outcome) and had three levels: (a) under veridical control the subject placed the coin on the table, (b) under illusory control the subject flipped the coin, and (c) under veridical uncontrol the experimenter flipped the coin. The coin side determined which task the subject worked on. No subject could predict which outcome would be obtained. Previous studies have used a die (Golin et al., 1977; Golin et al., 1979), disk (Turnbull, 1982), or marble (Wortman, 1975) for the control manipulation. Two studies used a coin for the control manipulation (Burger, 1986; Langer & Roth, 1975).

A pilot study was conducted to determine whether a coin or die would create a greater illusion of control. A total of 16 subjects participated in the pilot study with 4 females and 4 males randomly assigned to each group. Analysis indicated that there were no significant

differences between the two groups' ratings of control, $t(14) = .31$, $p = .582$. In order to minimize the likelihood of creating a gambling atmosphere, a coin was used for the control manipulation task.

Depth of depression (depressed or nondepressed) was determined by subjects' scores on both the screening and experimental administrations of the BDI. Assignment to the nondepressed group required BDI scores of 7 or less for the screening administration and 8 or less for the experimental administration; assignment to the depressed group required BDI scores of 15 or greater for the screening administration and 9 or greater for the experimental administration. The cut-points used for the experimental administration of the BDI are identical to those used by Alloy and Abramson (1979). Moreover, using a lower limit of 9 for the depressed group is similar to Kovacs and Beck's (1977) lower limit of 10 for mild depression.

The dependent variables included (a) subjective responses (on a 10-point scale) to questions contained in a questionnaire and (b) timed performance on a motor task. Questions on confidence-related variables are perceived confidence of success (getting the short task) and perceived confidence of failure (getting the long task); questions on control-related variables are perceived control, perceived choice, and perceived responsibility. The presentation order of the two perceived confidence measures (success and failure) was counterbalanced. The behavioral measure for

all subjects, assessing subjects' actual performance, measured the amount of time subjects needed to complete the first 10 questions on the motor task. Successful completion of the motor task required subjects to blacken every odd space for the first 10 questions on an IBM answer sheet. The 20 subjects who either blackened an extra space or omitted to blacken a required space were excluded from the final analysis.

Procedure

The BDI along with a consent form (see Appendix D) was administered by research assistants to two large groups of introductory students. Subjects were led to believe that the principle investigator wanted information on a newly developed personality survey (cf. Weary, Elbin, & Hill, 1987). This distractive instruction and the standardized instructions outlined in Beck et al. (1979) were used for the group administrations of the BDI (see Appendix E).

Once the questionnaires were completed, the principal investigator examined the suicide question on each questionnaire to determine which subjects required immediate attention. A total of 21 subjects scoring 2-5 on the suicide question of the BDI or 1 on the suicide question along with an overall BDI score of 25 or greater were then contacted by phone. The principle investigator introduced himself, stated his concern about their intentions or thoughts of harming themselves, and informed them that there was a counseling service available on campus (see Appendix

F). These subjects were excluded from further participation in the study.

The experimental testing took place between two and five weeks after the initial screening with the BDI. Subjects were tested individually. Each was brought into an experimental room and seated in front of a table opposite the experimenter. At this point the experimenter led subjects to believe that the present study is a more controlled laboratory replication of a methodologically flawed motor performance study (which in fact does not exist) that failed to randomly assign subjects to the short or long task groups. These instructions provided a rationale for (a) using a coin to "randomly" determine which task subjects work on, (b) administering a motor task, and (c) using a positive and negative outcome, namely a short task and a long task (5 times as long as the short task). A similar set of distractive instructions were used by Turnbull (1982).

In order to determine whether subjects worked on the short or long motor task, the subject (or experimenter) placed (or flipped) a coin on the table inside a container. At this point the experimenter told subjects that he could not reveal which side the coin came up on because research indicates that knowing such information can affect one's performance level. All subjects were then asked to complete the questions contained in Appendix B, followed by working on the first 10 questions of the short motor task. A

detailed description of the complete instructions used in the present study is contained in Appendix G.

Based on the observation that BDI scores can show considerable variability from one day to the next (Sacco, 1981; Seligman, 1978), the BDI was then readministered. Nondepressives had to score 8 or less and depressives had to score 9 or greater on the experimental administrations of the BDI to be included in the analysis (Alloy & Abramson, 1979).

The outcomes of the coin placement or flip were then revealed for all subjects. At this point the experiment was over for subjects in the short task group. In contrast, subjects in the long task group completed an additional 40 questions on another IBM answer sheet. A tape recorder was then used to provide subjects with some general feedback about the study (see Appendix H). The final feedback (which was posted after the study was completed) defined the between groups variables and summarized the results of the study (see Appendix I).

RESULTS

General Findings

A one-way MANOVA for all six dependent variables was conducted on subject's sex. The test of this MANOVA and the tests of all other results were considered significant if they were less than the .05 level. The MANOVA was not statistically significant, $F(6, 83) = 1.51, p = .186$. Therefore, sex differences were not further analyzed.

The Hotelling-Lawley Trace multivariate analysis of variance (MANOVA) with type of control (i.e., veridical control, illusory control, and veridical uncontrol) and depth of depression (i.e., nondepressed and depressed) as the between groups variables and perceived confidence of success (SUCCESS), perceived confidence of failure (FAILURE), perceived control (CONT), perceived choice (CHOICE), perceived responsibility (RESP), and actual motor task performance (PERF) as the dependent measures yielded significant main effects for both between groups variables, but no interaction effects. The main effects for type of control, $F(12, 156) = 2.27, p = .011$, and depth of depression, $F(6, 79) = 2.71, p = .019$, were further analyzed through univariate analysis of variance (ANOVA). The means and standard deviations for all dependent measures in all conditions (type of control and depth of depression) are contained in Tables 3-8.

Table 3

Means and Standard Deviations for Confidence of Success

Control	Depression	
	Nondepressed	Depressed
Veridical control		
M	5.9	4.5
SD	1.8	1.1
Illusory control		
M	5.9	5.5
SD	2.3	1.6
Veridical uncontrol		
M	5.9	5.3
SD	1.7	2.1

Note. A total of 90 subjects participated with 11 females and 4 males assigned to each group.

Table 4

Means and Standard Deviations for Confidence of Failure

Control	Depression	
	Nondepressed	Depressed
Veridical control		
M	5.9	5.6
SD	1.8	1.5
Illusory control		
M	5.9	5.7
SD	2.2	1.4
Veridical uncontrol		
M	5.8	5.7
SD	1.3	1.6

Note. A total of 90 subjects participated with 11 females and 4 males assigned to each group.

Table 5

Means and Standard Deviations for Perceived Control

Control	Depression	
	Nondepressed	Depressed
Veridical control		
M	3.9	3.6
SD	2.1	2.4
Illusory control		
M	4.2	4.7
SD	2.8	3.0
Veridical uncontrol		
M	2.5	3.0
SD	3.0	3.0

Note. A total of 90 subjects participated with 11 females and 4 males assigned to each group.

Table 6

Means and Standard Deviations for Perceived Choice

Control	Depression	
	Nondepressed	Depressed
Veridical control		
M	4.7	2.8
SD	2.6	1.8
Illusory control		
M	3.6	2.9
SD	3.2	2.5
Veridical uncontrol		
M	1.5	1.9
SD	1.4	1.5

Note. A total of 90 subjects participated with 11 females and 4 males assigned to each group.

Table 7

Means and Standard Deviations for Perceived Responsibility

Control	Depression	
	Nondepressed	Depressed
Veridical control		
M	4.7	5.9
SD	2.8	3.1
Illusory control		
M	4.5	4.4
SD	3.6	3.4
Veridical uncontrol		
M	1.3	3.7
SD	1.3	2.9

Note. A total of 90 subjects participated with 11 females and 4 males assigned to each group.

Control Findings

Type of control differences when the subject placed the coin, the subject flipped the coin, or the experimenter flipped the coin appeared in subjects' perceived choice, $F(2, 84) = 6.59, p = .002$, and perceived responsibility, $F(2, 84) = 6.85, p = .002$; approached significance in subjects' perceived control, $F(2, 84) = 2.90, p = .061$; but did not approach significance in subjects' confidence of success, $F(2, 84) = 0.72, p = .491$, confidence of failure, $F(2, 84) < 0.01, p = .996$, or actual performance, $F(2, 84) = 1.19, p = .309$. Scheffe pair-wise comparisons indicated that (a) subjects reported significantly greater perceived choice when they either placed ($M = 3.8$) or flipped ($M = 3.2$) the coin than when the experimenter flipped ($M = 1.7$) the coin, and subjects reported greater perceived responsibility when they either placed ($M = 5.3$) or flipped ($M = 4.5$) the coin than when the experimenter flipped ($M = 2.5$) the coin. In other words, subjects under either veridical or illusory control rated themselves as having greater choice and responsibility than did subjects under veridical uncontrol. However, no differences on choice or responsibility were obtained between placing (veridical control) and flipping (illusory control) the coin by the subject.

Overall, when exercising veridical/illusory control, subjects' perceived control ($M = 3.75/4.45$), perceived choice ($M = 3.75/3.25$), and perceived responsibility ($M =$

5.3/4.45) ratings appear to be somewhat low on a 10-point scale with a 5.5 midpoint. It should, however, be noted that these same means for the veridical uncontrol condition were 2.75 or below, and the means in prior studies also fell somewhat below the midpoints of their scales when subjects blindly selected one of two different discs (Tan, 1981) or marbles (Wortman, 1975).

Depression Findings

Differences between nondepressed and depressed subjects appeared in subjects' confidence of success, $F(1, 84) = 4.05$, $p = .047$, but not in subjects' confidence of failure, $F(1, 84) = 0.15$, $p = .703$, perceived control, $F(1, 84) = 0.18$, $p = .674$, perceived choice, $F(1, 84) = 2.54$, $p = .115$, perceived responsibility, $F(1, 84) = 3.47$, $p = .066$, or actual performance, $F(1, 84) = 0.19$, $p = .662$. Nondepressives ($M = 5.9$) were more confident of success than were depressives ($M = 5.1$). Interestingly, nondepressives' mean confidence of success rating is slightly above the 5.5 midpoint, and depressives' mean confidence of success rating is slightly below the 5.5 midpoint.

Non-Normal Distributions

Measures of perceived control (skewness = .61, kurtosis = -.71), perceived choice (1.2, .9), perceived responsibility (.55, -1.0), perceived confidence of success (.71, .57), perceived confidence of failure (.41, 1.1), and actual performance (1.2, 2.3) all yielded non-normal distribution curves. Neither logarithmic nor square root

transformations made substantive gains toward achieving normality for the dependent measures. Fortunately, the number of subjects per group ($n = 15$) in the present study was sufficient to assume that the significance levels should be relatively unaffected by non-normality (Glass, Peckham, & Sanders, 1972). However, violation of univariate normality still warrants corroborating the results obtained through the parametric analysis of variance using raw data with further nonparametric analysis using ranked data.

In terms of the control findings, Kruskal-Wallis one-way tests yielded significant results for both perceived choice, $KW(2, N = 90) = 15.63, p < .001$, and perceived responsibility, $KW(2, N = 90) = 12.46, p = .002$. In terms of the depression findings, a Kruskal-Wallis one-way test also yielded a significant result for confidence of success, $KW(1, N = 90) = 6.87, p = .009$. Therefore, the results from the nonparametric analysis were comparable to the results from the parametric analysis.

Correlations

Pearson product-moment correlation coefficients were computed to obtain a better understanding of the relationships among all dependent measures (see Table 9). Consistent with prior research (e.g., Tan, 1981; Wortman, 1975), the control-related variables (i.e., perceived control, perceived choice, and perceived responsibility) were positively intercorrelated. In addition, the confidence-related variables (i.e., perceived confidence of success and perceived confidence of failure) were also

Table 9

Intercorrelations (p-values) for the Entire Sample

	FAILURE	CONT	CHOICE	RESP	PERF
SUCCESS	0.437 (.0001)	0.275 (.0088)	-0.045 (.6766)	0.013 (.9029)	-0.036 (.7388)
FAILURE		0.035 (.7467)	-0.123 (.2474)	-0.071 (.5065)	0.088 (.4099)
CONT			0.428 (.0001)	0.264 (.0119)	-0.141 (.1857)
CHOICE				0.280 (.0074)	-0.098 (.3586)
RESP					0.015 (.8881)

Note. The correlation coefficients are based on the ratings of 90 subjects.

positively correlated. The only significant correlation between a control-related variable and a confidence-related variable was a positive correlation which existed between perceived control and perceived confidence of success.

Pearson's correlation coefficients were also separately computed for nondepressives and depressives to determine if any significant differences exist between these two groups' correlation coefficients (see Tables 10 & 11). Tests of significance for correlation coefficients between nondepressives and depressives revealed significant differences for the confidence of success/failure correlations, $z = 4.86$, $p < .001$, and the choice/responsibility correlations, $z = 2.20$, $p = .028$. Nondepressives' ratings of perceived confidence of success and perceived confidence of failure showed a high positive correlation ($r = .77$), while depressives' perceived confidence of success and failure ratings showed a zero-order correlation ($r = -.02$). Also, nondepressives' perceived choice and perceived responsibility were positively correlated ($r = .50$), while depressives' perceived choice and perceived responsibility ratings indicated only a weak positive correlation ($r = .08$). No other differences exceeded the .05 level of statistical significance.

Table 10

Intercorrelations (p-values) for Nondepressives

	FAILURE	CONT	CHOICE	RESP	PERF
SUCCESS	0.778 (.0001)	0.166 (.2760)	-0.123 (.4216)	-0.007 (.9610)	-0.080 (.6004)
FAILURE		0.126 (.4080)	-0.195 (.1994)	0.007 (.9657)	0.049 (.7495)
CONT			0.523 (.0002)	0.422 (.0039)	-0.227 (.1339)
CHOICE				0.505 (.0004)	-0.282 (.0603)
RESP					-0.095 (.5336)

Note. The correlation coefficients are based on the ratings of 45 nondepressed subjects.

Table 11

Intercorrelations (p-values) for Depressives

	FAILURE	CONT	CHOICE	RESP	PERF
SUCCESS	-0.021 (.8929)	0.426 (.0035)	-0.015 (.9232)	0.121 (.4303)	0.044 (.7733)
FAILURE		-0.067 (.6628)	-0.024 (.8743)	-0.148 (.3306)	0.148 (.3314)
CONT			0.348 (.0193)	0.111 (.4680)	-0.051 (.7390)
CHOICE				0.076 (.6206)	0.222 (.1430)
RESP					0.122 (.4236)

Note. The correlation coefficients are based on the ratings of 45 depressed subjects.

DISCUSSION

Control

One part of the first hypothesis was that subjects under either veridical or illusory control conditions will rate themselves as having greater control, choice, and responsibility than would subjects under veridical uncontrol conditions. This part of the hypothesis was only partially confirmed. Subjects under either veridical or illusory control conditions rated themselves as having greater choice and responsibility (but not significantly greater control) than did subjects under veridical uncontrol conditions. However, it should be noted that prior studies have found perceived control to be significantly associated with both veridical (Guttormson, 1984; Tan, 1981) and illusory (Benassi, Sweeney, & Drevno, 1979) control conditions, and the perceived control ratings for the control manipulations in the present study approached statistical significance in the expected direction ($p = .061$). Taken together, these findings suggest that subjects generally perceive greater control over situations which contain control-contributing or control-associated factors than over situations without these factors.

The lack of a clearly significant perceived control difference may be partially attributable to the higher than expected mean control ratings ($M = 2.75$ on a 10-point scale) for subjects in the veridical uncontrol condition. The experimenter may have inadvertently encouraged a generalized

all), they seemed to believe they had more choice and responsibility than was objectively present. That is to say, both nondepressives and depressives exhibited exaggerated or illusory perceptions of choice and responsibility in the illusory control condition. Whereas Alloy and Abramson (1979) found that only nondepressives misperceive events, Vasquez (1989) showed that under the different prediction-related conditions of success for nondepressives and failure for depressives, both groups can misperceive events. Under the coin flip conditions in the present study, however, illusory perceptions of choice and responsibility were elicited in nondepressed and depressed subjects using the same neutral (unpredictable) and controlless task. This finding demonstrates that nondepressives and depressives can exhibit similar misperceptions under the same illusion enhancing conditions which provide no predictive information.

The other part of the first hypothesis was that subjects with veridical control will rate themselves as having greater control, choice, and responsibility than would subjects with illusory control. This part of the first hypothesis was not confirmed. One reason for failing to find any significant differences between the veridical and illusory control conditions may have been the different degrees of familiarity associated with either blindly placing (veridical control) or flipping (illusory control) a coin. Blindly placing a coin is an unfamiliar task, but flipping a coin is a familiar task. According to Langer

(1975), engaging in familiar tasks elicits greater feelings of control than does engaging in unfamiliar tasks. Therefore, although the present study attempted to hold the control-associated (skill) factors constant across the veridical and illusory control conditions by comparing one control-contributing factor (veridical control) against one control-associated factor (illusory control), it may have compared one control-contributing factor (active participation) for veridical control against two control-associated factors (active participation and familiarity) for illusory control. This extra control-associated (skill) factor in the illusory control condition may have offset any significant differences which may have existed between the veridical control (coin placing) and illusory control (coin flipping) groups. Future research attempting to compare predictionless control with illusory control should use unpredictable tasks which are equally familiar/unfamiliar.

Control and Depression

The second hypothesis was that increases in perceived control would increase nondepressives' motor task performance and decrease depressives' motor task performance. No supportive evidence was found for this hypothesis. Failure to confirm this hypothesis may have been due to not being able to elicit erroneous feelings of competence in nondepressives and erroneous feelings of incompetence in depressives. According to Bailey et al.

(1978), it is apparently the perceived prediction about the consequences of influencing events rather than simply influencing events which affects one's performance level. That is to say, feelings of success or failure when exercising control may have a greater impact on performance levels than feelings of control. When predictionless control is accurately perceived, it is possible that one's performance level may be no better than when predictionless uncontrol is accurately perceived.

The third hypothesis was that increased veridical or illusory control would be associated with increased confidence of success for nondepressives and decreased confidence of success for depressives. Conversely, the fourth hypothesis was that increased veridical or illusory control would be associated with decreased confidence of failure for nondepressives and increased confidence of failure for depressives. Neither hypothesis was confirmed. Subjects apparently knew that their degree of involvement in an unpredictable task could not change their likelihood of obtaining a positive or negative outcome. This may be so because having predictionless control does not increase one's predictability of success above having predictionless uncontrol.

The failure of the present study to replicate the control-depression interaction of Golin et al. (1977), as summarized in hypotheses 3 and 4, may have been partially due to when the dependent measures were taken in the two

experiments. Golin et al. (1977) administered the perceived confidence measures before the subject or experimenter tossed a die. The experimenter in the present study, in contrast, administered the perceived confidence measures after the subject or experimenter already placed or flipped a coin. The different sequence of events used in these two experiments roughly corresponds with the two conditions used in an experiment by Rothbart and Snyder (1970). These experimenters examined the effects of illusory control on the temporal sequence of events. In the bet-early (i.e., future) condition, which is methodologically similar to the study of Golin et al. (1977), subjects first bet and rated their perceived confidence, then threw a die over the edge of a table so it was out of sight. In the bet-late (i.e., past) condition, which is methodologically similar to the present study, subjects first threw the die as did the other group, then bet and rated their perceived confidence. Results indicated that subjects in the bet-early condition bet significantly more money and rated subjective confidence considerably higher than did subjects in the bet-late condition.

Unfortunately, subjects in the bet-late condition had no incentive (did not know money was at stake) or knowledge of what action gets what outcome (illusory prediction) prior to exercising control, while subjects in the bet-early condition had both of these illusory control enhancing advantages. These confounding inconsistencies--and not the

temporal context--could have been responsible for the dissimilarities observed between the bet-early and bet-late conditions. However, if these inconsistencies did not significantly affect the dependent measures, Rothbart and Snyder (1970) may have correctly concluded that a future temporal context is a more appropriate context to elicit an illusion of control (as measured by perceived confidence of success) than is a past temporal context. Corroborative support for this viewpoint is provided by Fischhoff's (1976) contention that the interaction of controllability and the temporal sequence of events could have a consistent effect on subjects' perceptions of these events, since "one can do something about the future, but very little about the past" (p.193). Therefore, the decision in the present study to administer the perceived confidence measures after (rather than before) the exercise of control may have been responsible for the similar confidence ratings across all types of control.

Failure to confirm the results of Golin and colleagues may also have involved (a) the type of perceived confidence measures administered and (b) the different proposed purposes of the two studies. Golin et al. (1977) used only perceived confidence of success measures. In contrast, the present study used two perceived confidence measures: one confidence of success and one confidence of failure. Administering perceived confidence questions which specify both possible outcomes (success or failure) may encourage a

more accurate evaluation of a chance-determined task by providing subjects with more time to deliberate and more information about the outcome possibilities than does administering a perceived confidence question which specifies only one possible outcome (success).

The instructions used to present the proposed purpose of the control manipulation task in the study of Golin et al. (1977) also differed from those used in the present study. Golin et al. (1977) led subjects to believe that the control manipulation task would serve as a game to assess their gambling behavior. In contrast, the present study attempted to convince subjects that the control manipulation task was being used to randomly determine whether they worked on a short or long motor task. According to Langer (1975), any information which refers to the random or unpredictable characteristics of chance-determined tasks will decrease the possibility of eliciting illusory perceptions. Therefore, stressing the random or unpredictable nature of the control manipulation task may have eliminated any illusory perceptions of success or failure.

One result which was significant was that nondepressives were more confident of success (but not less confident of failure) than were their depressed counterparts, regardless of their feelings of personal control. Nondepressives' perceived success ratings ($\bar{M} = 5.9$) were significantly higher than were depressives ($\bar{M} =$

5.1). Unfortunately, the subjective ratings used in the present study do not afford the possibility to clearly determine whether nondepressives' ratings were unrealistically optimistic (Taylor & Brown, 1988), depressives' ratings were unrealistically pessimistic (Beck, 1967), or both groups' ratings were within the realistic range but at opposite ends. The use of probability ratings rather than subjective ratings to assess confidence levels would have provided a better opportunity to determine which one of these competing views is more accurate because objective meaning can be more clearly attached to the anchor points on a probability rating scale.

Depressives' tendency to be less confident of success than their nondepressed counterparts extended from conditions of unpredictability and personal control to conditions of unpredictability and external control. One of Beck's (1967) patients described depressives' indiscriminant pessimism in unpredictable situations with the following statement: "I'm basically unlucky and bring bad luck to myself and everybody else" (p. 327). According to Beck's (1967) cognitive theory of depression, negative cognitions should impel depressives to avoid any novel situations which contain little or no predictability. Avoidance of novel (unpredictable) situations, unfortunately, would not enhance depressives' chances of obtaining new reinforcers, such as obtaining a new job or making a new friend, to replace those which are presently either absent or ineffective. In other

words, depressives' tendency to minimize their chances of success in unpredictable situations may be one factor which prolongs their depression.

Interpretation of Correlation Coefficients

Consistent with prior research (e.g., Tan, 1981; Wortman, 1975), positive intercorrelations were found among the control-related variables (perceived control, perceived choice, and perceived responsibility). These intercorrelations demonstrate the similarity in individuals' views of these concepts (Wortman, 1975). Further analysis revealed that nondepressives' ratings of choice and responsibility were significantly more positively correlated than were depressives. Interestingly, nondepressives' control-related variables were all significantly intercorrelated, while depressives' responsibility ratings were not significantly correlated with either their control or choice ratings. Also, when compared with their nondepressed counterparts, depressives had lower confidence of success ratings ($p = .047$) and higher responsibility ratings ($p = .066$). Taken together, these findings appear to be consistent with Abramson and Sackeim's (1977) proposed "depressive paradox." According to this view, depressives (but not nondepressives) tend to feel responsible for undesirable (unsuccessful) outcomes even when they perceive those same outcomes to be uncontrollable or choiceless. Clinicians might be able to eliminate these illusory and maladaptive perceptions by increasing depressives' active

awareness of the interrelationships between their own control-related feelings.

A positive correlation also existed between the two perceived confidence measures (confidence of success and failure). This finding might suggest that all subjects should perceive the confidence-related ratings in similar ways because of the equal likelihood of success or failure in the coin manipulation task. However, further analysis of the success/failure correlations revealed that depressives' zero-order correlation was significantly different than nondepressives' highly positive correlation. The proposed "hypothesis testing" inertia associated with depression (Schwartz, 1981) might have caused depressives to overlook the likelihood of success or failure when using a coin. This suggests that depressives' confidence levels may be sensitive to their emotional reactions rather than their cognitive appraisals of outcome probabilities.

Overall, nondepressives' confidence-related and control-related correlation coefficients appear to be more objectively accurate than those of depressives. This provides some support for Beck's cognitive theory of depression which considers nondepressives as more realistic than depressives. Depressives seemed unable to recognize the conceptual similarities inherent within the confidence-related and within the control-related measures. They apparently even disregarded other cues, such as the similar wording of each confidence-related question and

having all the confidence-related questions on the same page. These similarities had a pervasive impact on nondepressives' confidence-related ratings, but little or no impact on depressives' confidence-related ratings. Nondepressives may simply be more cognizant of, and more affected by, the presence or absence of situational (information providing) cues than are depressives.

There was only one significant correlation between a control-related variable and a confidence-related variable. Confidence of success correlated positively with perceived control, but not with perceived choice or perceived responsibility. A positive association between perceived control and perceived confidence of success is consistent with Langer's (1983) views of veridical and illusory control which combine perceived control and perceived success. This finding may be attributable to the tendency to feel control over successes, but not failures (Bradley, 1978). If most people use this "self-serving" bias in everyday life, they should be expected to associate success with control.

Future Research

The control, choice, and responsibility means for the veridical control (blind choice) condition in both the present study and prior studies (e.g., Tan, 1981; Wortman, 1975) were somewhat low, that is, all fell slightly below the midpoint on their respective scales. The control manipulation tasks used in these studies, namely blindly choosing one of two different coin sides, discs (Tan, 1981),

or marbles (Wortman, 1975), may be too simple to elicit greater control-related perceptions. Future research should attempt to use predictionless tasks which ostensibly appear to be more challenging, difficult, or potentially skill-determined. For example, if subjects do not know any Latin, they could be asked to choose which one of four different English words is synonymous with a Latin word. Using such a task would also allow the experimenter to administer questions which assess whether subjects attribute their performance to internal factors such as ability or effort or external factors such as luck or task difficulty.

Future research should attempt to compare situations which give subjects predictive information they could use to more efficiently exercise control (predictive control) with situations which provide no predictive information when exercising control (predictionless control). Such a comparison would provide a better understanding of what impact predictability/unpredictability has on individuals' perceptions and performance when they influence events. The present study could have included a predictive control condition by informing subjects which outcome would be associated with heads or tails before they openly placed the coin on the table.

In order to enhance the likelihood of obtaining significant results for performance measures, future research should use more than one trial of the control manipulation task. Studies which obtained significant

differences between the control and uncontrol groups' performance levels used several trials of choice-associated behavior (e.g., Bailey et al., 1978). In fact, Roth and Kubal (1975) found that insufficient exposure to helplessness training did not produce any performance deficits. Several trials could be used without giving subjects any predictive information by keeping the outcomes out of sight until all trials are completed.

The motor task used in the present study involved having subjects blacken-in every odd space on an IBM answer sheet. Unfortunately, this motor task was not sufficiently easy to ensure errorless performance from all subjects. Errors on the motor task resulted in excluding 20 subjects from the final analysis. Future research should use a less error prone motor task to decrease the number of subjects that must be excluded because of errors.

In the present study, all dependent measures were administered after the outcome was already determined. Future research may benefit from administering the confidence-related measures before the outcome is determined (decided) and the control-related measures after the outcome is determined (decided). Based upon the findings of Rothbart and Snyder (1970), administering the confidence-related measures before control is exercised may offer a considerable advantage. Administering the control-related measures after rather than before control is exercised should create greater feelings of control for

subjects in the control condition and greater feelings of uncontrol or helplessness for subjects in the uncontrol condition. This should be so because having the subject or experimenter do something should create a stronger feeling of control or uncontrol than simply telling subjects who will be doing this same thing in the future (with no real certainty the experimenter will carry out the plan). The advantages associated with administering the confidence-related measures before exercising control and the control-related measures after exercising control should offset any disadvantages associated with administering dependent measures at two separate points in the experiment.

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Appendix A
Depression Questionnaire

Personality Inventory

Name _____ Date _____

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY! Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one.

Be sure to read all statements in each group before making your choice.

- A. 0 I do not feel sad
 1 I feel blue or sad
 2 I am blue or sad all the time and I can't snap out of it
 3 I am so sad or unhappy that it is quite painful
 4 I am so sad or unhappy that I can't stand it
- B. 0 I am not particularly pessimistic or discouraged about the future
 1 I feel discouraged about the future
 2 I feel I have nothing to look forward to
 3 I feel that I won't ever get over my troubles
 4 I feel that the future is hopeless and that things cannot improve
- C. 0 I do not feel like a failure
 1 I feel I have failed more than the average person
 2 I feel I have accomplished very little that is worthwhile or that means anything
 3 As I look back on my life all I can see is a lot of failures
 4 I feel I am a complete failure as a person (parent, husband, wife)
- D. 0 I am not particularly dissatisfied
 1 I feel bored most of the time
 2 I don't enjoy things the way I used to
 3 I don't get satisfaction out of anything any more
 4 I am dissatisfied with everything
- E. 0 I don't feel particularly guilty
 1 I feel bad or unworthy a good part of the time
 2 I feel quite guilty
 3 I feel bad or unworthy practically all the time now
 4 I feel as though I am very bad or worthless

- F. 0 I don't feel I am being punished
1 I have a feeling that something bad may happen to me
2 I feel I am being punished or will be punished
3 I feel I deserve to be punished
4 I want to be punished
- G. 0 I don't feel disappointed in myself
1 I am disappointed in myself
2 I don't like myself
3 I am disgusted with myself
4 I hate myself
- H. 0 I don't feel I am any worse than anybody else
1 I am critical of myself for my weaknesses or mistakes
2 I blame myself for my faults
3 I blame myself for everything bad that happens
- I. 0 I don't have any thoughts of harming myself
1 I have thoughts of harming myself but I would not carry them out
2 I feel I would be better off dead
3 I feel my family would be better off if I were dead
4 I have definite plans about committing suicide
5 I would kill myself if I could
- J. 0 I don't cry any more than usual
1 I cry more now than I used to
2 I cry all the time now. I can't stop it
3 I used to be able to cry but now I can't cry even though I want to
- K. 0 I am no more irritated now than I ever am
1 I get annoyed or irritated more easily than I used to
2 I feel irritated all the time
3 I don't get irritated at all at the things that used to irritate me
- L. 0 I have not lost interest in other people
1 I am less interested in other people now than I used to be
2 I have lost most of my interest in other people and have little feeling for them
3 I have lost all my interest in other people and don't care about them at all
- M. 0 I make decisions about as well as ever
1 I try to put off making decisions
2 I have great difficulty in making decisions
3 I can't make any decisions at all any more

- N. 0 I don't feel I look any worse than I used to
1 I am worried that I am looking old or unattractive
2 I feel that there are permanent changes in my
appearance and they make me look unattractive
3 I feel that I am ugly or repulsive looking
- O. 0 I can work about as well as before
1 It takes extra effort to get started at
doing something
2 I don't work as well as I used to
3 I have to push myself very hard to do anything
4 I can't do any work at all
- P. 0 I can sleep as well as usual
1 I wake up more tired in the morning than I used to
2 I wake up 1-2 hours earlier than usual and find it
hard to get back to sleep
3 I wake up early every day and can't get more than
5 hours sleep
- Q. 0 I don't get any more tired than usual
1 I get tired more easily than I used to
2 I get tired from doing anything
3 I get too tired to do anything
- R. 0 My appetite is no worse than usual
1 My appetite is not as good as it used to be
2 My appetite is much worse now
3 I have no appetite at all any more
- S. 0 I haven't lost much weight, if any, lately
1 I have lost more than 5 pounds
2 I have lost more than 10 pounds
3 I have lost more than 15 pounds
- T. 0 I am no more concerned about my health than usual
1 I am concerned about aches and pains or upset
stomach or constipation
2 I am so concerned with how I feel or what I feel
that it's hard to think of much else
3 I am completely absorbed in what I feel
- U. 0 I have not noticed any recent change in my interest
in sex
1 I am less interested in sex than I used to be
2 I am much less interested in sex now
3 I have lost interest in sex completely

Appendix B
Experimental Questionnaire

1. How confident are you that you will work on the short-duration task? Please circle the most appropriate number below.

1 2 3 4 5 6 7 8 9 10

Not at all
confident

Completely
confident

2. How confident are you that you will work on the long-duration task? Please circle the most appropriate number below.

1 2 3 4 5 6 7 8 9 10

Not at all
confident

Completely
confident

3. How much control (influence) have you already exercised over whether you will work on the short or long-duration task? Please circle the most appropriate number below.

1 2 3 4 5 6 7 8 9 10

No control Complete control

4. How much choice did you feel you were given by the experimenter as to whether you will work on the short or long-duration task? Please circle the most appropriate number below.

1 2 3 4 5 6 7 8 9 10

No choice Complete choice

5. How much responsibility do you have for whether you will work on the short or long-duration task? Please circle the most appropriate number below.

1 2 3 4 5 6 7 8 9 10

No responsibility Complete responsibility

Appendix C
Motor Tasks



Short Task

STUDENT NUMBER

ENTER STUDENT NUMBER IN THE SPACE PROVIDED...

MAKE NO STRAY MARKS.

DO NOT WRITE PAST THIS LINE

Table of bubbles for marking answers, with columns for digits 0-9 and a column for letters A-Z.

1 2 3 4 5 6 7 8 9 0 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z



Long Task

NAME: _____ GRADE: _____

MAKING NO STRAY MARKS. MAKE NO MARKS PAST THIS LINE.

STUDENT NUMBER

ENTER YOUR STUDENT NUMBER IN THE RIGHT POSITION. DO NOT WRITE ANYTHING IN THESE SPACES. ADDITIONAL APPROPRIATE INFORMATION TO THE RIGHT OF THIS BOX.

Table with 10 columns and 100 rows of bubbles for marking answers. Each bubble contains a digit from 0 to 9.

1-2
3-4
5-6
7-8
9-0

Appendix D
Consent Form

I _____ (please print) hereby
consent and agree to permit the principle investigator
(Blair Evers) to use the information contained in this
survey for research purposes at the University of Manitoba,
provided that he shall not identify my name to any other
person or persons.

Date: _____ Signature: _____

Appendix E
Depression Questionnaire Instructions

Please leave the questionnaire face down on your desk until you are asked to turn it over.

Now, everyone please turn over your questionnaire. The purpose of this experiment is to collect information on a newly developed personality survey. As you can see, a consent form is attached to each questionnaire. If you agree to participate in the study, please fill-in the appropriate spaces.

I would now like you to turn to the first page of the questionnaire and follow along as I read the instructions.

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY! Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one.

Be sure to read all statements in each group before making your choice.

Once you have completed the questionnaire, please bring it to one of us and we will stamp your experimental record card. Now, please begin...

Appendix F
Counseling Instructions

"Hi, I'm Blair Evers, a graduate student in the Department of Psychology at the University of Manitoba and the principle investigator in the Cardston study you participated in today. While going over the personality survey you completed today, I couldn't help but notice you marked one of your answers as if you may intend to harm [have thoughts of harming] yourself. If you really feel this way and out of concern for your well-being, I'd like to inform you that there is a counseling service available on campus, namely the Counseling Center. If you would like the phone number for this service, I would be glad to pass it on to you".

Appendix G
Experimental Instructions

The basic instructions for this study are on the tape recorder. Please listen carefully to these instructions.

On most jobs, employees' performance improves with practice. This is most likely so because of the adage "practice makes perfect". However, one study conducted by Dooner and Obendorfer (1987) in a factory found that assembly-line employees who worked on a different job every week made fewer errors and worked faster than did assembly-line employees who worked on the same job for a year or more. In other words, assembly-line employees in the short-duration job group performed better than did assembly-line employees in the long-duration job group. These experimenters attributed this finding to the boredom associated with repeating the same simple task for an extended period of time.

Because this experiment was conducted in a factory, practical limitations did not allow the use of an essential prerequisite of valid research, that is, the random assignment of subjects to the short or long-duration groups. This limitation warrants repeating this study in a more controlled laboratory setting where the random assignment of subjects can be easily accomplished.

Your assembly-line-like job in the present experiment is to blacken EVERY SECOND SPACE on an answer sheet (which is similar to those used on multiple choice exams). In other words, your job is to blacken spaces a, c, and e on odd-numbered rows and spaces b and d on even-numbered rows.

To make sure I have adequately communicated the basic instructions, what do you understand to be your task?

The purpose of the present experiment is to determine whether people working on the short task perform any differently than do people working on the long task.

The only difference between the short and long-duration tasks is that the long task involves doing the short task 5 times. Please work as quickly as possible while trying your best not to make any errors.

The experimenter then read aloud the remaining instructions:

In order to satisfy the requirement of random assignment to the short or long task group, I'd like you to [I will] use a coin to find out which task you will work on. There is a coin on the

table inside this container. Without looking at the coin, you are to [I will] pick it up and place [flip] it inside the container. If the coin comes up heads you will work on the short task; if not, you will work on the long task. Do you have any questions? Now, please [I will] pick up the coin and place [flip] it inside the container.

Research indicates that knowing whether one is working on a short or long motor task affects one's performance, thereby contaminating the results. Therefore, we will have to delay looking at which side of the coin is up until later in the study. Right now, however, I would like you to complete a series of questions to determine how you feel about the study so far.

Here is the short assembly-line-like task. Remember to blacken spaces a, c, and e on odd-numbered rows and spaces b and d on even numbered rows, and work as quickly as possible while trying your best not to make any errors. Please stop working when you reach the red line. Are you ready to begin? Please begin when I say go...go.

I would now like you to complete a personality inventory. In order not to make you feel awkward while you answer the questions, I will now leave the room and wait outside in the hall. Once you have completed the inventory, please slide it face-down under the door and wait for me to return.

Now, please turn over the container so we can see what coin side is up. As you can see, the coin came up heads [tails]. This means that you have completed the experiment. [you will have to complete the short task four more times].

I would like to thank you for participating in this study, and I will now sign your experimental card.

Appendix H
Preliminary Feedback

The experiment you participated in today is not only examining your performance level on a motor task, but also personality factors and your feelings about specific situations you encountered in the experiment. This explains why you were asked to complete the series of questions and the personality inventory. Unfortunately, at this point it may be premature to say anything else about the study as it is not yet finished. However, if you want to learn more about the study, I will be posting a more detailed explanation and the results of the present study outside of P441 Duff Roblin Building at the end of the study. Moreover, at that time I will also announce office hours to answer any other questions you may have about the study.

Now, is there anything about this study that bothered you?

Appendix I
Final Feedback

The Dryden experiment you participated in examined to what extent peoples' responses and feelings are associated with positive or negative mood states and active or inactive involvement in tasks with uncertain outcomes. Perhaps you recall that you took a personality test. This was used to assess your mood state. You may also remember that either you or the experimenter flipped or placed a coin to determine whether you completed a short or long motor task. This was done to increase or decrease your active involvement in the task. Results indicated that (a) students in a positive mood state were more confident that they would work on the short motor task than were students in a negative mood state; and (b) students who either flipped or placed the coin inside the container had greater feelings of choice and responsibility than did students who watched the experimenter flip the coin.

In order to answer any other questions you may have about the study, I will have office hours in room P247 Duff Roblin Bldg. on Monday, April 23 from 10:00 to 12:00 and Wednesday, April 25 from 1:00 to 3:00.