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When means-efficacy and self-efficacy affect performance: A look at locus of control

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WHEN MEANS-EFFICACY AND SELF-EFFICACY AFFECT PERFORMANCE: A LOOK AT LOCUS OF CONTROL

A Thesis

Presented to the

Faculty of

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by

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ABSTRACT

Self-efficacy, means-efficacy, and locus of control have been found to affect performance. This study was a 2 (locus of control: internal vs. external) x 2 (type of efficacy: self-efficacy vs. means-efficacy) x 2 (level of efficacy: low vs. high) between groups quasi-experiment, in 2 parts, designed to measure the interaction between locus of control and each type of efficacy on performance, main effects of locus of control, self-efficacy, and means-efficacy. Part 1 was a survey to determine participant levels of locus of control. Part 2 was a laboratory manipulation intended to affect self-efficacy or means-efficacy, measure performance from a word search, and measure efficacy. Participants were 257 students at California State University, San Bernardino aged 18 through 63 years and about half were Hispanic females. The self-efficacy manipulations were ineffective. The means-efficacy manipulations were effective, but no interaction effects on performance were found. Analyses of self-reported efficacy excluding those with neither high nor low efficacy responses showed significant interaction effects. Locus of control moderated the relationship between self-efficacy and performance. Locus of control moderated the relationship between means-efficacy and performance. Internals were affected by their self-efficacy and means-efficacy. Internals performed significantly better with high efficacy than low efficacy. Externals had no performance differences given their self-efficacy. Externals with high means-efficacy performed slightly better than those with low means-efficacy. Main effects of locus of control were found in the

opposite direction than predicted (i.e., externals outperformed internals). Main effects of self-efficacy and means-efficacy were found. Those with high efficacy outperformed those with low efficacy. This study supports that means-efficacy is independent of self-efficacy. Those with both high self- and means-efficacy outperformed those who reported high self- or means-efficacy alone. Thus, performance was a function of differences in locus of control, self-efficacy, and means-efficacy.

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DEDICATION

To my husband for your support, love, and acceptance.

Thank you for holding my hand.

To my little sister for your welcomed critiques of my research.

To my dad for supporting my curiosities throughout life.

To my mom for always encouraging my education.

TABLE OF CONTENTS

ABSTRACT iii

ACKNOWLEDGEMENTS v

LIST OF TABLES x

LIST OF FIGURES xi

CHAPTER ONE: WHEN MEANS-EFFICACY AND SELF-EFFICACY AFFECT PERFORMANCE: A LOOK AT LOCUS OF CONTROL

Introduction 1

Motivation and Performance within Social Cognitive Theory and Goal Setting Theory 4

Understanding Self-Efficacy 7

Self-Efficacy Research 8

Understanding Means-Efficacy 9

Means-Efficacy Research 11

Understanding Locus of Control 12

Locus of Control Research 14

Understanding Means-Efficacy and Self-Efficacy on Performance through Locus of Control 14

Hypotheses 16

CHAPTER TWO: METHOD

Participants 18

Measures 19

Research Design 21

Laboratory Participation 22

Self-Efficacy Conditions 22

Low Self-Efficacy Condition 22

High Self-Efficacy Condition 24

Means-Efficacy Conditions 25

Low Means-Efficacy Condition 26

High Means-Efficacy Condition 27

CHAPTER THREE: RESULTS

Preparation for Data Analyses 29

Manipulation Checks 29

Self-Efficacy Manipulation Checks 30

Means-Efficacy Manipulation Checks 31

Covariate Check 32

General Self-Efficacy as a Covariate 32

Hypotheses Testing 32

Omnibus Hypothesis Test 32

Hypothesis 1 33

Interaction Test of Locus of Control and Self-Efficacy Conditions on Performance 34

Interaction Test of Locus of Control and Self-Reported Self-Efficacy on Performance 34

Main Effect of Locus of Control on Performance 35

Self-Reported Low Self-Efficacy and Performance 35

Self-Reported High Self-Efficacy and Performance 36

Main Effect of Self-Reported Self-Efficacy on Performance 37

Internals and Performance 37

Externals and Performance 38

Hypothesis 2 38

Interaction Test of Locus of Control and Means-Efficacy Conditions on Performance 38

Interaction Test of Locus of Control and Self-Reported Means-Efficacy on Performance 38

Main Effect of Self-Reported Means-Efficacy on Performance 40

Internals and Performance 41

Externals and Performance 41

Main Effect of Locus of Control on Performance 41

Self-Reported Low Means-Efficacy and Performance 41

Self-Reported High Means-Efficacy and Performance 42

Hypothesis 3 42

Hypothesis 4 43

Hypothesis 5 44

Exploratory Analyses 44

CHAPTER FOUR: DISCUSSION

General Discussion 46

Limitations and Future Research 50

Conclusion 51

APPENDIX A: NEW GENERAL SELF-EFFICACY SCALE 53

APPENDIX B: INTERNAL-EXTERNAL SCALE 55

APPENDIX C: [DUMMY] VOCABULARY TEST 63

APPENDIX D: WORD SEARCH 65

APPENDIX E: LOW SELF-EFFICACY MANIPULATION CHECK 67

APPENDIX F: HIGH SELF-EFFICACY MANIPULATION CHECK 69

APPENDIX G: LOW MEANS-EFFICACY MANIPULATION CHECK 71

APPENDIX H: HIGH MEANS-EFFICACY MANIPULATION CHECK 73

APPENDIX I: LOW SELF-EFFICACY [DUMMY] RESULT SHEET 75

APPENDIX J: EXAMPLE WORD SEARCH 77

APPENDIX K: HIGH SELF-EFFICACY [DUMMY] RESULT SHEET 79

APPENDIX L: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER 81

REFERENCES 83

LIST OF TABLES

Table 1. Number of Participants by Group 19

Table 2. Efficacy by Condition 30

Table 3. Omnibus Hypothesis 33

Table 4. Hypothesis 1 ANOVA Results Using Self-Reported Self-Efficacy.... 35

Table 5. Mean Number of Words Found by Locus of Control and Efficacy... 37

Table 6. Hypothesis 2 ANOVA Results Using Self-Reported Means-Efficacy 39

Table 7. Hypothesis 3, 4, and 5 ANOVA Results 43

LIST OF FIGURES

Figure 1. Graph of performance according to self-reported self-efficacy by locus of control group 36

Figure 2. Graph of performance according to self-reported means-efficacy by locus of control group 40

CHAPTER ONE

WHEN MEANS-EFFICACY AND SELF-EFFICACY AFFECT PERFORMANCE: A LOOK AT LOCUS OF CONTROL

Introduction

A primary goal of industrial/organizational psychology is to determine the factors within an organization's control to create a context that fosters the organization, its members, and its stakeholders. Organizations require their members to achieve specific performance goals in order to survive. How does one create the ideal environment to support an individual's motivation and thus, performance? Research helps elucidate both environmental and personal factors that impact people's circumstances and consequently, become useful to organizations. For example, a university screens graduate applicants for personal attributes as predictors of success, such as academic achievement scores. The university then provides students with an environmental condition that supports students' needs as they work towards their educational goals through the efforts of competent staff and faculty.

One of the goals developed for the students within the Industrial/ Organizational Psychology program at California State University, San Bernardino is the completion of a thesis. I find myself motivated to achieve a self set goal that requires this polished thesis proposal within the next few days, although I await graduation months from now. My time limit is short and after

much research, I still have a lot of work to do, yet I am still motivated. Allow me to explain the factors that affect my motivation and thus, my performance. I tend to attribute causality mainly to myself and rarely recognize external factors as contributors to my life. I have a very supportive thesis advisor whom I could not accomplish my goal without, yet my focus is on the fact that I requested his mentorship because I recognized him to be intelligent and exceptionally supportive. Again, my role is salient and I believe I have what it takes to get the job done regardless of the short time limit.

The notion of myself as the basis of causality can be referred to as an (internal) locus of control (LOC), the belief in my ability to perform can be referred to as my (high) self-efficacy, and the perceptions of a short time limit as my (low) means-efficacy. The research on performance related to locus of control and efficacy (i.e., self and means) have been studied mostly independent of each other. Studies on locus of control demonstrate a significant relationship with performance. Those with an internal locus of control or internals believe consequences are a result of internal factors whereas those with an external locus of control or externals believe consequences are a result of external factors (Spector, 1982). Locus of control does not refer to how efficacious any of these factors are perceived in having a given outcome. The relationship between locus of control and performance are researched because locus of control appears to play a role in one's motivation that leads to performance. The

same can be said of self-efficacy and means-efficacy because they, too, appear to affect an individual's motivation that results in performance.

In fact, self-efficacy and means-efficacy demonstrate a significant correlation with performance, so that personal beliefs about ourselves and our resources apparently influence our motivation. Gist and Mitchell (1992) initially referred to the importance of how one evaluates external aspects in the formation of one's perceptions about one's ability to perform. The perceptions of one's external aspects or means-efficacy are distinctly different from one's perceptions of personal ability or self-efficacy (Eden, 2001). Eden brought the relationship of self-efficacy and means-efficacy with performance into the scientific community's attention (Agars, Kottke, & Unckless, 2010) and it appears to better explain the role of efficacy on performance. In addition, the integration of these two constructs with a third construct, locus of control, is likely to improve our understanding of their interactive effects on performance. Consider that an external locus of control is a based on a person's belief that external factors are the contributors to an outcome whereas an internal locus of control is based on a person's belief that internal factors are the contributors to an outcome (Rotter, 1966). It logically follows that individuals with an external locus of control are likely to focus on external factors while those with an internal locus of control are likely to focus on internal factors. For instance, if someone has an external locus of control, then it is likely that means-efficacy plays a more significant role than self-efficacy because there is an overall importance of

external factors; In contrast, if someone has an internal locus of control, then it is likely that self-efficacy plays a more significant role than means-efficacy, as in my example, because there is an overall importance of internal factors. Thus, if I had an external locus of control, my motivation to achieve my goal would diminish due to my low means-efficacy, given my perceptions of the limited time to perform towards achieving my goal.

Research clearly suggests our beliefs determine our performance through locus of control and both types of efficacy. This study is intended to demonstrate the interrelationship of these constructs. Specifically, it is important to determine if means-efficacy is more influential on performance than self-efficacy for those with an external locus of control. Also, it is important to determine if self-efficacy is more influential on performance than means-efficacy for those with an internal locus of control. Therefore, locus of control, evaluated as a function of the person should demonstrate an interaction with environmentally evoked self-efficacy and means-efficacy. This interrelationship is important to advance our current standing of the research generated by social cognitive theory and goal setting theory.

Motivation and Performance within Social Cognitive Theory and Goal Setting Theory

According to social cognitive theory, individuals and their environment have an interactive relationship (Bandura, 1989). Individuals are affected by their environments and also affect their environment depending on the person

and the situation (Bandura, 1977a). This interactive relationship will not necessarily be synchronous or have mutual effects (Wood & Bandura, 1989). This means individuals may act in a way that determines the outcome of their situation (Bandura, 1977a) or have an outcome imposed on them without any action on their part. For example, an individual can ask for a day off work to celebrate a personal holiday and be granted the day off, which would not have resulted otherwise. However, a company can close during national holidays and give all employees the day off, even though no employee has asked for the day off.

Social cognitive theory posits that people anticipate situations and make plans, rather than simply respond to their environment (Bandura & Locke, 2003). This is a function of self-regulation. Self-regulation is the "exercise of influence over one's own motivation, thought processes, emotional states and patterns of behavior" (Bandura, 1994, p. 72). Self-regulation involves gathering information about oneself, making an analysis of that information, and developing a response to that analysis (Bandura, 1991). A given situation may pose the same possibilities for any given individual; however, the situation develops as a function of the individual's cognition, and thus, behavior (Bandura, 1977a). For example, employees given the same task may perform differently due to differences in training. In addition, even employees with equal training may still perform at different levels due to other individual differences, such as motivation. This is because motivation not only influences one's learning or training, but also

one's performance (Locke & Latham, 2004). Motivation is the initiative to behave (Bandura, 1994) and is subject to personal and environmental aspects (Locke & Latham, 2004). Motivation is a product of the interaction between an individual and his/her environment (Latham & Pinder, 2005). Motivation involves one's desire to achieve a goal for gaining rewards or avoiding punishment (Bandura, 1977a).

Goal setting theory posits that individuals with equal capability may perform differently because of these differences in motivation and consequently, goals (Latham & Locke, 1991). Motivation may determine the decision to act, the extent of the action, and the length of time for action to occur (Locke & Latham, 2004). Specifically, "work motivation is a set of energetic forces that originate both within as well as beyond an individual's being, to initiate work-related behavior, and to determine its form, direction, intensity, and duration" (Pinder, 1984, p. 8). In short, goal setting facilitates self-regulation through defining what is the sufficient level of performance contributing to motivation. These theories indicate the importance of the interactions about one's perceptions of oneself and said environment to determine motivation and performance. Thus, locus of control, self-efficacy, and means-efficacy which are based on one's perceptions necessarily play a role upon motivation and performance in an interactive way.

Understanding Self-Efficacy

The initiation and continuation of motivation can be traced to thought processes (Bandura, 1977a; Bandura, 1977b; Bandura, 1994). Thought processes allow individuals to evaluate potential situations and plan for action (Bandura, 1994, p. 74). The plans for action based on our beliefs about functioning within our situation are the most significant motivators (Bandura, 1989). It is ubiquitous that individuals evaluate their potential effect on their environment (Bandura, 1991). Indeed, "the self-regulation of motivation and action operates partly through people's internal standards and their evaluations of their own behavior" (Wood & Bandura, 1989, p. 366). Consequently, self-efficacy is an essential part of how motivation regulates our behavior (Bandura, 1994). It is a function of the beliefs about our competency given the situation rather than our true competency (Bandura, 1997). These competencies or internal resources include anything an individual may perceive as useful or detrimental to the completion of a task, such as "excellent" typing skill or "poor" reading ability. Self-Efficacy may also be referred to as internal efficacy because the perceptions are about one's internal ability to perform.

Self-Efficacy may differ in terms of magnitude, strength, and generality (Bandura, 1977a, p. 85). Magnitude is the perceived level(s) of success (Vancouver & Day, 2005). Strength refers to the perceived degree of one's ability at a given level (Vancouver & Day, 2005). Generality refers to its applicability to varying situations. This study is concerned with specific self-

efficacy, a state of being or one's perceived internal ability to perform a specific task.

Self-Efficacy may originate from personal experience, secondhand experience (i.e., observation), physiological condition, and/or persuasion from others (Bandura, 1977a; Bandura, 1977b; Bandura, 1994; Wood & Bandura, 1989). Self-Efficacy affects motivation, so that if an individual does not believe that s/he can have a specific effect then s/he will not be motivated to act (Bandura, 2000). This is why individuals with the same ability may perform differently from one another due to differences in self-efficacy and thus, motivation (Bandura, 1988). Essentially, self-efficacy plays a principle role in our initiative to act (Gist & Mitchell, 1992).

Self-Efficacy Research

The industrial/organizational psychology literature has numerous studies that identify a relationship between self-efficacy and performance. Stajkovic and Luthans (1998) conducted a meta-analysis of 114 studies within the field and found a moderate correlation, $r = .38$, between specific self-efficacy and work-related performance. This correlation is higher than most personality traits that have been studied with performance (Stajkovic & Luthans, 1998). Further analysis also found that task complexity moderates the relationship between self-efficacy and performance, so that the more complex a task, the less self-efficacy relates to performance (Stajkovic & Luthans, 1998).

However, research also finds that self-efficacy alone does substantially predict performance (Judge, Jackson, Shaw, Scott, & Rich, 2002). Judge et al. (2002) conducted a meta-analysis of research evaluating specific self-efficacy as a predictor of work-related type performance. They found the predictability of performance derived from self-efficacy was less than moderate (see Stajkovic & Luthans, 1998) when accounting for individual characteristics (Judge et al., 2002). They suggest self-efficacy should be evaluated in consideration of traits and within an experimental design to address causality (Judge et al., 2002).

Stajkovic & Luthans (1998) suggested that research should investigate self-efficacy and performance to understand their cause and effect relationship. It is improbable future performance causes the level of self-efficacy prior to the performance, rather it is likely that prior (general) or current (specific) self-efficacy affects future performance. It is important not to disregard that past performance may affect future self-efficacy, but this is not a focus of this study (see Bandura, 1977a; Bandura, 1977b).

Understanding Means-Efficacy

Precise manipulations of self-efficacy is a complex matter; however, determining the variation of performance due to self efficacy is an even more complex matter (Vancouver & Day, 2005). Perhaps one of the reasons is because it is likely that research on self-efficacy and performance have not only measured self-efficacy, but inadvertently encompassed the impact of means-efficacy as well (Eden, Ganzach, Flumin-Granat, & Zigman, 2010). Eden defines

means-efficacy as a person's perception about the given external resources which may be considered useful or detrimental for performance (as cited in Agars et al., 2010; Eden, 2001). Therefore, this study intends to implement precise manipulations of self-efficacy and its complementary variable, means-efficacy to explain the inconsistent strength of self-efficacy's relationship with performance and also, incorporate the role of locus of control.

The first part of the explanation involves means-efficacy, a construct given attention by researchers within the last 20 years or so. The relationship between means-efficacy and motivation or performance has substantially less empirical support than self-efficacy, but the findings are a valuable contribution to the understanding of human motivation and performance in the context of work.

Individuals evaluate their situation to determine the factors considered important to achieve potential outcomes, the requirements to perform at varying levels, one's perceived abilities, and the resources available (Gist & Mitchell, 1992). Note, individuals not only evaluate themselves when determining their ability to perform, but they also evaluate their means before deciding what action to take (Walumbwa, Avolio, & Zhu, 2008). Therefore, individuals with the same level of self-efficacy may perform differently from one another due to differences in means-efficacy (Walumbwa et al., 2008). Means-Efficacy or external efficacy is a person's belief about external means that may affect the ability to perform a given task (Eden, 2001). These external means may refer to

any resource outside of the self, such as a machine, co-worker, or time. Motivation that stems from high self-efficacy may be diminished by one's belief that the necessary resources are lacking or in the presence of low means-efficacy (Eden, 2001). In addition, the converse is true, motivation that stems from high means-efficacy or the perception of substantial resources to perform a task are diminished if one perceives the lack of ability to perform at a necessary level or in the presence of low self-efficacy (Eden, 2001). In addition, high means-efficacy adds to motivation, while low means-efficacy reduces motivation (Eden et al., 2010).

Eden (2001) describes means-efficacy as analogous to self-efficacy in terms of generality. General means-efficacy refers to the perception of available resources that help or hinder in general (Eden, 2001), such as organizational support. In contrast, specific means-efficacy refers to any specific external resources that an individual may perceive as useful or detrimental to the completion of a specific (Eden, 2001), such as a supervisor's approval of overtime to meet a deadline for a specific project.

Means-Efficacy Research

In order to better direct motivation and performance, it is necessary to consider both self-efficacy and means-efficacy (Eden, 2001; Stirin, Ganzach, Pazy, & Eden, 2012). Introductory research supports the idea that both types of efficacy should be considered. Eden et al. (2010) conducted research that found those with high means-efficacy outperformed the control group when a new

computer system was used to perform work tasks. In addition, no significant changes in self-efficacy were found between or within groups. This demonstrates that means-efficacy, alone, is an important factor in the contribution to performance (Eden et al., 2010). The second experiment found that participants in the treatment group (i.e., high means-efficacy) used their resource more (i.e., Web site) and outperformed the control group participants (Eden et al., 2010). In another study by Stirin et al. (2012), an interaction effect between self-efficacy and means-efficacy given performance was found, so that participants in a high self-efficacy condition demonstrated better performance in the presence of high means-efficacy than in the presence of low means-efficacy. In summary, it is clear that one's perceptions about internal and external resources are critical to forming one's motivation affecting performance.

Understanding Locus of Control

Not only are perceptions about one's ability to perform an important consideration for motivation and performance, but perceptions of one's controllability of our surroundings is an additional important factor (Bandura, 1991). Our common beliefs about the consequences within our existence that can be attributed to internal or external factors (Spector, 1988) measured as locus of control have been studied within the context of work for over 40 years.

One's locus of control and its strength affect one's learning and performance (Rotter, 1966). Research suggests that internals will be more motivated and thus, perform better than externals in a perceived controllable

work environment, but will not be motivated in perceived uncontrollable situations or those situations perceived as futile (Spector, 1982).

Consider a study that incorporates self-efficacy and manipulations of controllability. Coffee and Rees (2011) conducted research to evaluate self-efficacy levels and performance on a series of trials for a consistent task under perceived un/stable and un/controllable conditions. A stable condition is one in which participants believe outcomes have an unchanging cause from trial to trial (Coffee & Rees, 2011). A controllable condition is one in which participants believe they can affect the outcome (Coffee & Rees, 2011). Participants from the first experiment who were assigned to the perceived stable uncontrollable condition had both their self-efficacy and performance drop after consecutive tasks. That is, those participants perceived that the cause of the outcome (performance or otherwise) was consistently out of their control similar to the concept of external locus of control. Participants in the other conditions (i.e., stable controllable, unstable controllable, unstable uncontrollable) did not have significant changes in self-efficacy and performance during consecutive trials. A second experiment revealed that self-efficacy and performance improved when participants were assigned to the unstable controllable condition (Coffee & Rees, 2011), so participants believed that poor performance could improve in a future trial and was within their power to do so, similar to an internal locus of control.

Locus of Control Research

Even without the consideration of self-efficacy, locus of control correlates with performance. Employees with an internal locus of control reported their efforts contributed to achieving their goals, had higher motivation, and superior performance than externals (Broedling, 1975). Recent research has had similar findings that locus of control predicts performance. Internals were more likely to perform better than those with an external locus of control (Chen & Silverthorne, 2008; Linz & Semykina, 2008).

Although most research reflects that internals typically perform better than externals, there is an inconsistent relationship between locus of control and performance (i.e., negative or positive) much like that of self-efficacy and performance. Conflicting research suggests that individuals with an external locus of control will have better performance than those with an internal locus of control, particularly when a task is presented as skill based. Petzel and Gynther (1970) found that externals performed better when presented with skill instructions than chance instructions on a given task. On the other hand, internals performed better when given chance instructions than when given skill instructions prior to the performance of the task.

Understanding Means-Efficacy and Self-Efficacy on Performance through Locus of Control

It is important to note that one's ability and one's external resources will not necessarily be of equal use; it is dependent upon the task (Eden et al.,

2010). Furthermore, self-efficacy and means-efficacy will not be of equal importance to all individuals. Consider when externals are given a skill instruction, the process of evaluating external resources becomes void because they are influenced to believe that resources are not expected to affect performance and thus, there is no significant means-efficacy to affect motivation. Hence, externals are left to focus on factors, such as self-efficacy and are able to apply themselves towards performing the task rather than relying on external factors to contribute to the outcome. On the other hand, when externals are presented with chance instructions, it reinforces their beliefs of external causes, and thus, no motivation results because ability is not believed to contribute to the outcome.

Now consider when internals are given chance instructions, the process of evaluating external resources becomes valuable, and both means-efficacy and self-efficacy affect performance. This is notably different than externals, because internals find ability to be more important than external factors (Davis & Davis, 1972). Therefore, when external factors are important as is the case in chance situations, the value of self-efficacy is strengthened. This demonstrates why locus of control can predict performance rather consistently so that internals perform better than externals. Additionally, when internals are presented with skill instructions, means-efficacy is disregarded due to instructions and/or the nature of the trait (i.e., an internal focus) and self-efficacy is the focus of influence on motivation.

It is important to recognize that locus of control and self-efficacy are distinct from one another and when one believes that one's behavior will have an effect on a given situation, then self-efficacy plays a role (Bandura, 1977b). Thus, individuals focus on the factors they perceive to affect an outcome and disregard those factors believed to be futile (Bandura, 1977a). Locus of control can determine whether performance will be affected by self-efficacy (Bandura, 1977b). In addition, locus of control can determine whether performance will be affected by means-efficacy. In summary, it appears locus of control moderates the relationship between each type of efficacy and performance.

Hypotheses

It is one's locus of control that naturally determines one's attention towards resources or ability when evaluating a situation, unless influenced by an external factor. Internals will focus on internal attributes, such as skills, and externals will focus on external attributes, such as time.

Accordingly, one's locus of control determines the usefulness of self-efficacy and means-efficacy. So, internals who attribute causes to internal factors are more likely to be affected by differences in self-efficacy than differences in means-efficacy. On the other hand, externals, who attribute causes to external factors are more likely to be affected by differences in means-efficacy than self-efficacy. Thus, I hypothesize,

Hypothesis 1: There will be an interaction between locus of control and self-efficacy on performance. Specifically, the impact of self-efficacy on performance will be stronger for internals than for externals.

Hypothesis 2: There will be an interaction between locus of control and means-efficacy on performance. Specifically, the impact of means-efficacy on performance will be stronger for externals than for internals.

The majority of research that evaluates the individual roles of locus of control, self-efficacy, and means-efficacy demonstrate an overall positive relationship. Main effects are expected given the nature of this study. Thus, I hypothesize,

Hypothesis 3: Internals will perform better than externals.

Hypothesis 4: Those with high self-efficacy will perform better than those with low self-efficacy.

Hypothesis 5: Those with high means-efficacy will perform better than those with low means-efficacy.

CHAPTER TWO

METHOD

Participants

Participants were students from California State University, San Bernardino who participated between October 25, 2012, through May 1, 2013. The power analysis for this study required a minimum of 20 participants per condition (Cohen, 1988) for a minimum total of 160 participants. There was a total of 693 survey responses with 69 participants who answered more than once for a total of 615 participants for the first part (i.e., survey; see Table 1 for sample sizes by group). Twenty of those participants (29%) had their locus of control scores change from internal to external or external to internal on subsequent responses to the same survey.

The second part or laboratory participation was completed by 265 (43%) of the 615 participants. Eight of those participants who completed participation were excluded from analysis because their locus of control score changed on subsequent survey responses. Thus, a total of 257 participants aged 18 through 63 years of age (M = 24.7 years; SD 7.0 years) qualified for analyses. The majority identified as Hispanic (147; 57.2%), then 58 (22.6%) identified themselves as White, 20 (7.8%) as African American, 14 (5.4%) as Asian, and 18 (7.0%) as other ethnicity/race or chose not to specify. Participants were 221

Table 1
Number of Participants by Group

Group	Internal Locus of Control *n*	External Locus of Control *n*	Total *n*
Survey Participants			615
Lab Participants			265
Participants Qualified for Analyses *Before* Statistical Screening			257
Participants Qualified for Analyses *After* Statistical Screening			256
Self-Efficacy Conditions*			98
Low Self-Efficacy Condition*	28	20	
High Self-Efficacy Condition*	30	20	
Means-Efficacy Conditions			128
Low Means-Efficacy Condition	44	21	
High Means-Efficacy Condition	41	22	
Self-Reported Self-Efficacy			236
Low Self-Efficacy	6	7	
High Self-Efficacy	134	89	
Self-Reported Means-Efficacy			204
Low Means-Efficacy	44	34	
High Means-Efficacy	81	45	
Self-Reported High Self-Efficacy Alone			103
Self-Reported High Means-Efficacy Alone			6
Self-Reported High Self-Efficacy *and* High Means-Efficacy			120

Note. *Believed manipulation and thus, qualified for analyses.

(86.0%) females and 35 (13.6%) males and 1 participant who chose not to indicate their sex.

Measures

The survey included the New General Self-Efficacy Scale (Chen, Gully, and Eden, 2001) first as a measure of general self-efficacy (see Appendix A). This was measured because general self-efficacy was a concern as a confound. Second, locus of control was measured using Rotter's (1966) Internal-External

Scale (see Appendix B). This scale has 29 items with 6 filler items and 23 items to measure locus of control with a maximum score of 23. Those who scored 12 and under were identified as internals and those who scored above 12 were identified as externals (Chen & Silverthorne, 2008) based on the scale's scoring structure. Third, online participants took a dummy vocabulary test which was referred to for the self-efficacy manipulations during laboratory participation (see Appendix C).

The laboratory participation included a word search with a list of 30 words to be worked on for 5 minutes as a measure of performance (see Appendix D). There was a manipulation check for each condition for a total of four different manipulation checks (see Appendices E through H).

The manipulation check used to determine self-reported self-efficacy for analyses were based on the response to the item "Before I began the word search, I believed I had the ability to perform well on the word search." Those participants who strongly disagreed or disagreed were considered as having low self-efficacy and those who agreed or strongly agreed were considered as having high self-efficacy. Those who neither agreed nor disagreed were excluded from self-reported self-efficacy analyses, except for the covariate check.

The manipulation check used to determine self-reported means-efficacy for analyses were based on the response to the item "Before I began the word search, I believed I had enough time to perform well on the word search." Those

participants who strongly disagreed or disagreed were considered as having low means-efficacy and those who agreed or strongly agreed were considered as having high means-efficacy. Those who neither agreed nor disagreed were excluded from self-reported means-efficacy analyses, except for the covariate check.

Research Design

The study was a 2 (locus of control: internal vs. external) x 2 (type of efficacy: self-efficacy vs. means-efficacy) x 2 (level of efficacy: low vs. high) between design quasi-experiment. It involved two parts; Part 1 was the online or paper survey intended to measure each participant's general self-efficacy, locus of control, preparation for self-efficacy manipulation with the dummy vocabulary test, demographic and contact information. Participants were asked to schedule a time to complete part 2 after the survey participation was completed. Part 2 was a laboratory manipulation intended to affect self-efficacy or means-efficacy, measure performance and efficacy.

The participants were divided into two groups depending on locus of control for laboratory participation. About half of the internals were assigned randomly to a self-efficacy manipulation and the others were assigned randomly to a means-efficacy manipulation. About half of the externals were assigned randomly to a self-efficacy manipulation and the others were assigned randomly to a means-efficacy manipulation.

Participants' locus of control was unknown to the researcher at the time of the laboratory manipulation. Each participant went through one of the laboratory conditions alone with the researcher.

Laboratory Participation

Self-Efficacy Conditions. The four conditions given self-efficacy manipulations were (34) internals given low self-efficacy, (24) externals given low self-efficacy, (35) internals given high self-efficacy, and (36) externals given high self-efficacy.

Self-efficacy conditions included false feedback about the dummy vocabulary exam and its connection to the task, a word search. A low self-efficacy condition and a high self-efficacy condition were expected to result, depending on the instructions (i.e., negative resulting in low self-efficacy or positive resulting in high self-efficacy). Participants were assigned randomly to either the low self-efficacy condition or the high self-efficacy condition.

Low Self-Efficacy Condition. Participants in the low self-efficacy condition were greeted and presented with the following statement by the researcher after completing an informed consent:

> Do you remember taking the vocabulary test online? When you participated for this study you took a vocabulary test. [A dummy result sheet (see Appendix I) was shown to them with a below average test score.] This test shows that you scored below the average level for a college student. Today, you will be performing a word search. It is

expected that you will perform poorly on the word search. I will give you the instructions for the word search now.

A sample word search (see Appendix J) was presented to demonstrate the instructions of the word search after the self-efficacy statements. The following instructions were given by the researcher:

> A word search provides a list of words to be found within a letters box. The words may be found horizontally forwards or backwards, vertically upwards or downwards, diagonally up to the right or left, or down to the right or left. Circle the word within the letters box when you locate a word. Then cross it off the list. You can search the words in any order you like.

Then each of the participants was asked to take a seat and had the materials for the word search made available to him/her. A last statement was made by the researcher before the start of the task:

> Again, your vocabulary is below average because you missed common words like conflagration and quagmire, so you are expected to do poorly. You will be given 5 minutes to perform the word search. I will let you know when to start once you're ready. I will step outside and shut the door. Once it is time to stop, I will come back in.

Participants were given 5 minutes to complete the word search task. A manipulation check was given after the completion of the task. Each participant was thanked for participation and debriefed after completing the manipulation check. Participants registered for selected psychology classes may have

qualified for extra credit points at their instructor's discretion. No other incentives were offered.

High Self-Efficacy Condition. Participants in the high self-efficacy condition were greeted and presented with the following statement by the researcher after completing an informed consent:

> Do you remember taking the vocabulary test online? When you participated for this study you took a vocabulary test. [A dummy result sheet (see Appendix K) was shown to them with an advanced test score.] This test shows that your score is advanced for a college student. Today, you will be performing a word search. It is expected that you will perform well on the word search. I will give you the instructions for the word search now.

A sample word search was presented to demonstrate the instructions of the word search after the self-efficacy statements. The following instructions were given by the researcher:

> A word search provides a list of words to be found within a letters box. The words may be found horizontally forwards or backwards, vertically upwards or downwards, diagonally up to the right or left, or down to the right or left. Circle the word within the letters box when you locate a word. Then cross it off the list. You can search the words in any order you like.

Then each of the participants was asked to take a seat and had the materials for the word search made available to him/her. A last statement was made before the start of the task by the researcher:

> Again, your vocabulary is advanced and you are expected to do well because you got more difficult words correct that others do not, like decline and wrath. You will be given 5 minutes to perform the word search. I will let you know when to start once you're ready. I will step outside and shut the door. Once it is time to stop, I will come back in.

Participants were given 5 minutes to complete the word search task. A manipulation check was given after the completion of the task. Each participant was thanked for participation and debriefed after completing the manipulation check. Participants registered for selected psychology classes may have qualified for extra credit points at their instructor's discretion. No other incentives were offered.

Means-Efficacy Conditions. The four conditions given means-efficacy were (44) internals given low means-efficacy, (21) externals given low means-efficacy, (41) internals given high means-efficacy, and (22) externals given high means-efficacy.

Means-Efficacy was manipulated by influencing the perception of an unequal resource (i.e., time limit) to perform on the word search while giving each participant the same amount of time. A low means-efficacy condition and a high means-efficacy condition should have resulted depending on the time limit

changes (i.e., given less time resulting in low means-efficacy or increasing time resulting in high means-efficacy). Participants were assigned randomly to either the low means-efficacy condition or the high means-efficacy condition.

Low Means-Efficacy Condition. Each participant was greeted upon entering a laboratory with 2 visible interior doors. One read "15 minutes" on a large sign and the other read "5 minutes" on a large sign. The following statement was made by the researcher after participants completed an informed consent:

> Today you will be performing a word search. You have been assigned to the 15 minutes condition. This means that you will have 15 minutes to work on the word search. I will give you the instructions for the word search now.

A sample word search was presented to demonstrate the instructions of the word search. The following instructions were given by the researcher:

> A word search provides a list of words to be found within a letters box. The words may be found horizontally forwards or backwards, vertically upwards or downwards, diagonally up to the right or left, or down to the right or left. Circle the word within the letters box when you locate a word. Then cross it off the list. You can search the words in any order you like.

Then each participant was asked to take a seat in the "15 minutes" room and had the materials made available to him/her. The following statement was made by the researcher:

You will be given 15 minutes to perform the word search. I will let you know when to start once you're ready. I will step outside and shut the door. Once it is time to stop, I will come back in.

The following statement was used as an interruption by the researcher, "Oh, no! I made a mistake. I placed you in the wrong condition. You're supposed to be in the 5 minute condition. Let me reset the timer. I'm sorry, you get less time. You will have only 5 minutes."

Participants were given 5 minutes to complete the word search task. A manipulation check was given after the completion of the task. Each participant was thanked for participation and debriefed. Participants registered for selected psychology classes may have qualified for extra credit points at their instructor's discretion. No other incentives were offered.

High Means-Efficacy Condition. Each participant was greeted upon entering a laboratory with 2 visible interior doors. One read "1 minute" on a large sign and the other read "5 minutes" on a large sign. The following statement was made by the researcher after participants completed an informed consent:

Today you will be performing a word search. You have been assigned to the 1 minute condition. This means that you will have 1 minute to work on the word search. I will give you the instructions for the word search now.

A sample word search was presented to demonstrate the instructions of the word search with the same instructions were given by the researcher:

A word search provides a list of words to be found within a letters box. The words may be found horizontally forwards or backwards, vertically upwards or downwards, diagonally up to the right or left, or down to the right or left. Circle the word within the letters box when you locate a word. Then cross it off the list. You can search the words in any order you like.

Then the participant was asked to take a seat in the "1 minute" room and had the materials made available to him/her. The following statement was made by the researcher:

You will be given 1 minute to perform the word search. I will let you know when to start once you're ready. I will step outside and shut the door. Once it is time to stop, I will come back in.

The following statement was used as an interruption by the researcher, "Oh, no! I made a mistake. I placed you in the wrong condition. You're supposed to be in the 5 minutes condition. Let me reset the timer. I'm sorry, you get more time. Altogether, you have 5 minutes."

Participants were given 5 minutes to complete the word search task. A manipulation check was given after the completion of the task. Each participant was thanked for participation and debriefed. Participants registered for selected psychology classes may have qualified for extra credit points at their instructor's discretion. No other incentives were offered.

CHAPTER THREE

RESULTS

Preparation for Data Analyses

The data were screened and analyzed using IBM's SPSS (Version 20) as a whole and by group based on locus of control. Missing data were not an issue because participants were prompted to complete each item before continuing participation; Thus, there were no missing data. Screening the entire data set revealed one outlier for the dependent variable (DV; i.e., number of words found on the word search) and the case was removed from further analyses (see Table 1). The criterion was a discontinuous standardized *z* score of 3.29 ($p < .01$) above or below the mean (see Tabachnick & Fidell, 2013). Grouped analyses did not reveal any outliers using the same criterion. All variables in the data set were normally distributed with the largest kurtosis at 1.10 and skewness at -.94 (see Tabachnick & Fidell, 2013). The grouped data were also normally distributed with the largest kurtosis at 1.09 and skewness at 1.15 (see Tabachnick & Fidell, 2013).

Manipulation Checks

Analyses were run to determine if the efficacy manipulations affected each type of self-reported efficacy (i.e, self-efficacy and means-efficacy) and created the intended efficacy condition.

Self-Efficacy Manipulation Checks

Thirty participants were excluded from the self-efficacy conditions' analyses because they did not believe the manipulation (see Table 1). Self-Efficacy manipulations were checked for the intended direction of self-efficacy (i.e., low self-efficacy condition participants reporting low self-efficacy and high self-efficacy condition participants reporting high self-efficacy) by using an ANOVA with the self-efficacy condition as the independent variable (IV) and self-reported self-efficacy as the DV. The self-efficacy manipulation was not an effective way to manipulate self-reported self-efficacy, $F(1, 98) = 1.35$, $p = .25$, partial $\eta^2 = .01$ (see Table 2). Thus, non significant results were expected when

Table 2
Efficacy by Condition

Variable	Self-Efficacy			Means-Efficacy		
	M	(SD)	*F*	*M*	(SD)	*F*
Self-Efficacy Condition (*n*)						
Low (50)	4.00	(0.88)	1.35	3.08	(0.97)	0.00
High (48)	4.19	(0.70)		3.08	(1.11)	
Means-Efficacy Condition (*n*)						
Low (65)	4.28	(0.63)	1.84	2.78	(1.10)	59.50*
High (63)	4.10	(0.88)		4.11	(0.83)	

Note. *$p < .001$.

running an ANOVA to find differences between participants' performance in the low self-efficacy condition over the high self-efficacy condition.

In addition, ideally, means-efficacy would not be affected by self-efficacy manipulations. An ANOVA with the self-efficacy condition as the IV and self-reported means-efficacy showed the self-efficacy manipulation did not affect self-reported means-efficacy, $F(1, 98) = .00$, $p = .99$, partial $\eta^2 = .00$ (see Table 2), so it was not a concern as a confound.

Means-Efficacy Manipulation Checks

Means-Efficacy manipulations were also analyzed for the intended direction of means-efficacy (i.e., low means-efficacy condition participants reporting low means-efficacy and high means-efficacy condition participants reporting high means-efficacy) by using an ANOVA with the means-efficacy condition as the IV and self-reported means-efficacy as the DV. The means-efficacy manipulation significantly affected self-reported means-efficacy, $F(1, 128) = 59.50$, $p < .001$, partial $\eta^2 = .32$ (see Table 2). Thus, significant results were expected when running an ANOVA to find differences between participants' performance in the high and low means-efficacy conditions.

In addition, the means-efficacy manipulation would not have affected self-reported self-efficacy. An ANOVA with the means-efficacy condition as the IV and self-reported self-efficacy showed the means-efficacy manipulation did not affect self-reported self-efficacy, $F(1, 128) = 1.84$, $p = .18$, partial $\eta^2 = .01$ (see Table 2). This suggests the two forms of efficacy are formed independently.

Covariate Check

General Self-Efficacy as a Covariate

A linear regression between (raw) self-reported self-efficacy and general self-efficacy was significant, $r(254) = .16$, $p = .01$. A linear regression between (raw) self-reported means-efficacy and general self-efficacy was significant, $r(254) = .22$, $p < .001$. Further, there was a general self-efficacy difference, $F(1, 256) = 12.98$, $p < .001$, partial $\eta 2 = .05$, between internals ($M = 33.62$) and externals ($M = 31.96$). However, both means indicate above average general self-efficacy (see Appendix A). There were no notable statistical or effect size differences in the results when analyses controlled for general self-efficacy. Thus, general self-efficacy was excluded as a covariate from the following analyses.

Hypotheses Testing

Omnibus Hypothesis Test

The omnibus hypothesis was tested using an ANOVA with locus of control (internal vs. external), type of efficacy (self-efficacy vs. means-efficacy), and level of efficacy (low vs. high) as IVs and performance as the DV (see Table 3). The results for an interaction effect were not significant, $F(1, 226) = .01$, $p = .91$, partial $\eta^2 = .00$. All other interaction effects were not significant (see Table 3). All main effects were not significant: $F(1, 226) = .09$, $p = .76$, partial $\eta^2 = .00$ for locus of control; $F(1, 226) = 2.56$, $p = .11$, partial $\eta^2 = .01$ for type of efficacy; and

Table 3
Omnibus Hypothesis

Independent Variables	Dependent Variable	*F*	Partial η^2
Locus of Control x Type of Efficacy x Level of Efficacy[a]	Performance	0.01	0.00
Locus of Control x Type of Efficacy[a]		0.05	0.00
Locus of Control x Level of Efficacy[a]		0.01	0.00
Type of Efficacy x Level of Efficacy[a]		0.94	0.00
Locus of Control[b]		0.09	0.00
Type of Efficacy[b]		2.56	0.01
Level of Efficacy[b]		1.26	0.01

Note. Performance indicates number of words found on the word search. No effects were statistically significant at the $p < .05$ level.
[a] = Interaction effects, [b] = Main effects

$F(1, 226) = 1.26$, $p = .26$, partial $\eta^2 = .01$ for level of efficacy. Further analyses were performed to evaluate the specified hypotheses.

Hypothesis 1

Hypothesis 1 stated there would be an interaction between locus of control and self-efficacy on performance. Specifically, the impact of self-efficacy on performance would be stronger for internals than for externals.

Interaction Test of Locus of Control and Self-Efficacy Conditions on Performance. An ANOVA was run to determine if there was an interaction between locus of control and self-efficacy condition on performance. Thirty participants were excluded from the self-efficacy conditions' analysis because they did not believe the manipulation (see Table 1). The IVs were locus of control and self-efficacy condition with the number of words found on the word search (i.e., performance) as the DV. The ANOVA showed no interaction between locus of control and self-efficacy on performance, $F(1, 98) = .00$, $p = .99$, partial $\eta^2 = .00$. Recall that non significant results were expected because there were no self-reported self-efficacy differences between self-efficacy conditions. Thus, self-reported self-efficacy was used to analyze hypothesize 1 instead of the ineffective self-efficacy conditions.

Interaction Test of Locus of Control and Self-Reported Self-Efficacy on Performance. An ANOVA (1) was run to determine if there was an interaction between locus of control and self-reported self-efficacy on performance. Twenty participants neither had high nor low self-efficacy and were excluded from the following self-efficacy analyses (see Table 1). The IVs were locus of control and self-reported (low versus high) self-efficacy with the number of words found on the word search (i.e., performance) as the DV. The ANOVA (1) showed an interaction between locus of control and self-reported self-efficacy on performance supporting the first part of hypothesis 1, $F(1, 236) = 4.52$, $p = .04$, partial $\eta^2 = .02$ (see Table 4). Further, the impact of self-reported self-efficacy on

Table 4
Hypothesis 1 ANOVA Results Using Self-Reported Self-Efficacy

Independent Variable(s)	Dependent Variable	Group	*F*	Partial η^2
1. Locus of Control x Self-Efficacy	Performance		4.52*	0.02
Locus of Control[a]			5.21*	0.02
Self-Efficacy[a]			7.28**	0.03
Locus of Control[b]	Performance			
		2. Low Self-Efficacy	3.77	0.08
		3. High Self-Efficacy	0.11	0.00
Self-Efficacy[b]	Performance			
		4. Internals	11.36**	0.08
		5. Externals	0.17	0.00

Note. Performance indicates number of words found on the word search.
[a] = Main effects of first ANOVA, [b] = Comparison by groups.
*$p < .05$, **$p < .01$, ***$p \leq .001$.

performance appeared stronger for internals than for externals, as predicted (see Figure 1).

Main Effect of Locus of Control on Performance. This ANOVA (1) also showed a main effect of locus of control on performance, $F(1, 236) = 5.21$, $p = .02$, partial $\eta^2 = .02$ (see Table 4).

Self-Reported Low Self-Efficacy and Performance. An ANOVA (2) for self-reported low self-efficacy with locus of control as the IV and number of words found as the DV showed externals with self-reported low self-efficacy performed better than internals with self-reported low self-efficacy, $F(1, 13) = 3.77$, $p = .08$, partial $\eta^2 = .08$ (see Table 4, Table 5, and Figure 1).

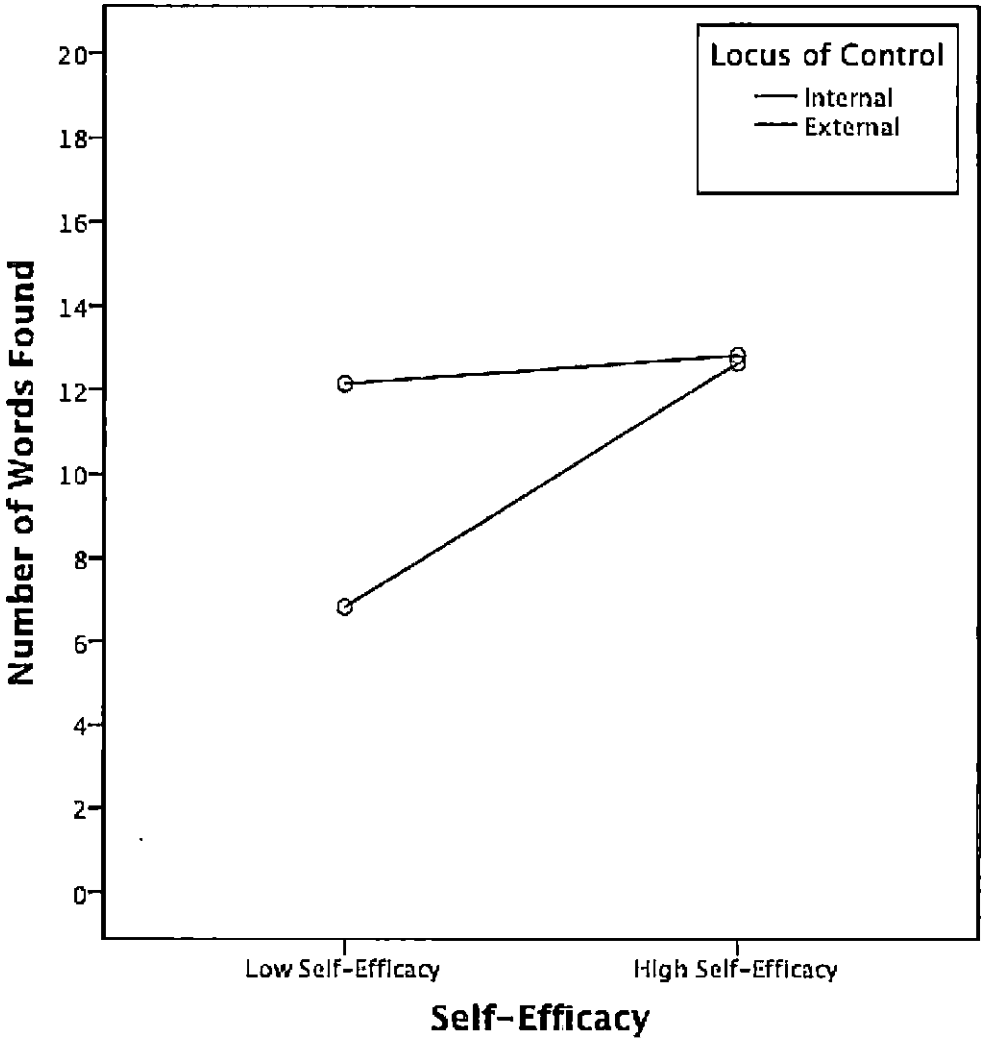


Figure 1. Graph of performance according to self-reported self-efficacy by locus of control group. Performance is estimated marginal mean of number of words found on the word search given self-reported (low versus high) self-efficacy by locus of control group.

Self-Reported High Self-Efficacy and Performance. An ANOVA (3) for self-reported high self-efficacy with locus of control as the IV and number of words found as the DV showed participants with self-reported high self-efficacy

Table 5
Mean Number of Words Found by Locus of Control and Efficacy

Locus of Control	Type of Efficacy	Level of Efficacy*	*M*
Internal	Self-Efficacy	Low	6.83
		High	12.64
	Means-Efficacy	Low	9.98
		High	13.75
External	Self-Efficacy	Low	12.14
		High	12.83
	Means-Efficacy	Low	11.59
		High	13.02

Note. *Level of Efficacy is self-reported.

performed about the same regardless of locus of control, $F(1, 223) = .11$, $p = .74$, partial $\eta^2 = .00$ (see Table 4, Table 5, and Figure 1).

Main Effect of Self-Reported Self-Efficacy on Performance. The ANOVA (1) also showed a main effect of self-reported self-efficacy on performance, $F(1, 236) = 7.28$, $p = .01$, partial $\eta^2 = .03$ (see Table 4).

Internals and Performance. An ANOVA (4) for internals with self-reported self-efficacy as the IV and number of words found as the DV showed a difference in performance between groups, $F(1, 140) = 11.36$, $p = .001$, partial $\eta^2 = .08$ (see Table 4). Particularly, internals with self-reported low self-efficacy had significantly lower performance ($M = 6.83$ words found) than internals with self-reported high self-efficacy ($M = 12.64$ words found; see Table 5 and Figure 1).

Externals and Performance. An ANOVA (5) for externals with self-reported self-efficacy as the IV and number of words found as the DV showed no difference in performance between groups, $F(1, 96) = .17$, $p = .69$, partial $\eta^2 = .00$ (see Table 4). Specifically, externals performed about the same regardless of their self-reported self-efficacy ($M = 12.14$ number of words for low self-efficacy and $M = 12.83$ for high self-efficacy; see Table 5 and Figure 1).

Hypothesis 2

Hypothesis 2 stated there would be an interaction between locus of control and means-efficacy on performance. Specifically, the impact of means-efficacy on performance would be stronger for externals than for internals.

Interaction Test of Locus of Control and Means-Efficacy Conditions on Performance. An ANOVA with locus of control and means-efficacy condition as IVs and the number of words found on the word search (i.e, performance) as the DV showed no interaction between locus of control and means-efficacy condition on performance, $F(1, 128) = .03$, $p = .87$, partial $\eta^2 = .00$. Additionally, there was no difference in performance between means-efficacy condition, $F(1, 128) = .01$, $p = .91$, partial $\eta^2 = .00$. Considering the lack of a significant interaction using means-efficacy conditions, additional analyses were run using self-reported means-efficacy as the independent variable.

Interaction Test of Locus of Control and Self-Reported Means-Efficacy on Performance. Fifty-two participants neither had high nor low means-efficacy and were excluded from the following self-reported means-efficacy analyses (see

Table 1). An ANOVA (6), with locus of control and self-reported (low vs. high) means-efficacy as IVs and the number of words found on the word search (i.e, performance) as the DV, showed an interaction between locus of control and self-reported means-efficacy on performance supporting the first part of hypothesis 2, $F(1, 204) = 3.42$, $p = .07$, partial $\eta^2 = .02$ (see Table 6). The

Table 6
Hypothesis 2 ANOVA Results Using Self-Reported Means-Efficacy

Independent Variable(s)	Dependent Variable	Group	*F*	Partial η^2
6. Locus of Control x Means-Efficacy	Performance		3.42	0.02
Locus of Control[a]			0.48	0.00
Means-Efficacy[a]			16.91***	0.08
Means-Efficacy[b]	Performance			
		7. Internals	23.63***	0.16
		8. Externals	1.93	0.02
Locus of Control[b]	Performance			
		9. Low Means-Efficacy	3.73	0.05
		10. High Means-Efficacy	0.71	0.01

Note. Performance indicates number of words found on the word search.
[a] = Main effects of first ANOVA, [b] = Comparison by groups.
*$p < .05$, **$p < .01$, ***$p \leq .001$.

second part of hypothesis 2 was not supported because the impact of self-reported means-efficacy on performance was not stronger for externals than for internals (see Figure 2).

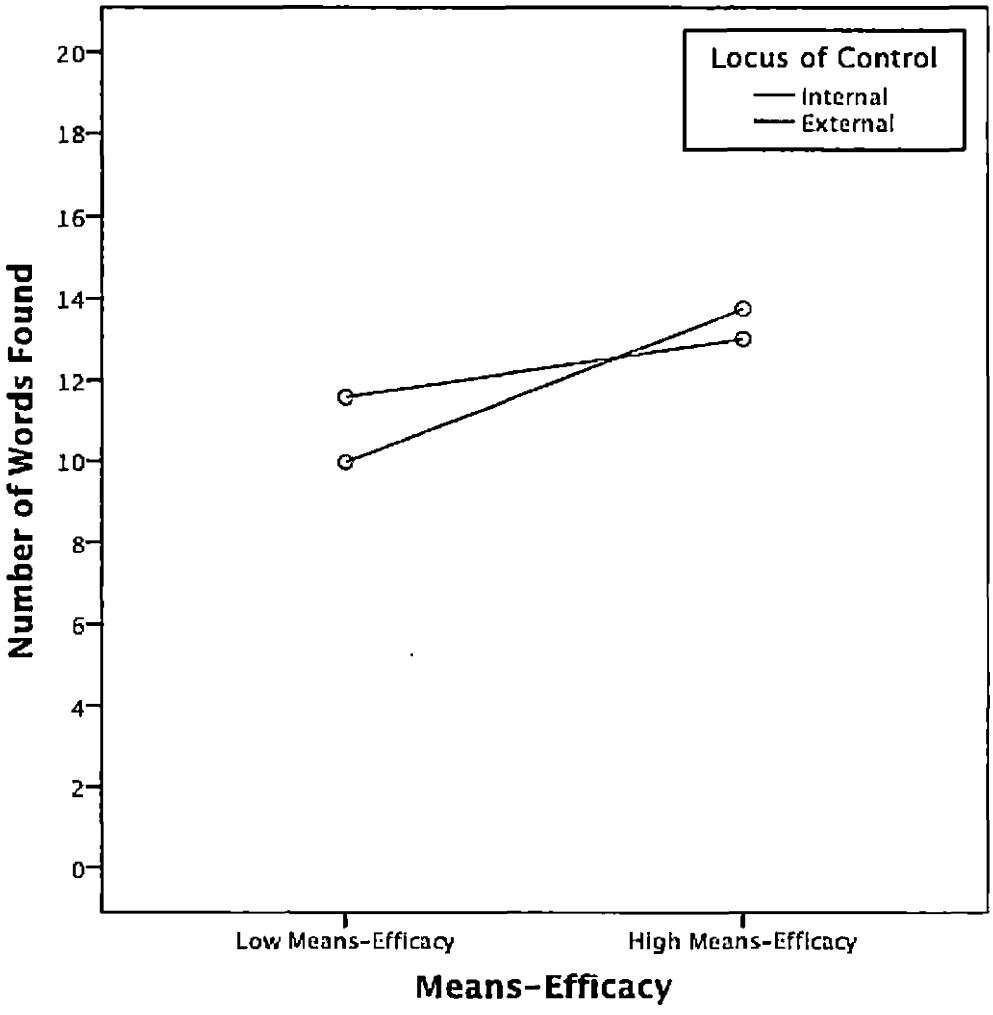


Figure 2. Graph of performance according to self-reported means-efficacy by locus of control group. Estimated marginal mean of number of words found on the word search (i.e., performance) given self-reported (low versus high) means-efficacy by locus of control group.

Main Effect of Self-Reported Means-Efficacy on Performance. The ANOVA (6) showed a main effect of means-efficacy on performance, $F(1, 204) = 16.91$, $p < .001$, partial $\eta^2 = .08$ (see Table 6). Contrary to the hypothesis,

performance differences were greater for internals than externals given their means-efficacy.

Internals and Performance. An ANOVA (7) for internals with self-reported means-efficacy as the IV and the number of words found as the DV showed means-efficacy affected internals, $F(1, 125) = 23.63$, $p < .001$, partial $\eta^2 = .16$ (see Table 6). Internals with self-reported low means-efficacy had significantly lower performance ($M = 9.98$ words found) than internals with self-reported high means-efficacy ($M = 13.75$ words found; see Table 5 and Figure 2).

Externals and Performance. An ANOVA (8) for externals with self-reported means-efficacy as the IV and the number of words found as the DV showed means-efficacy did not significantly affect externals, $F(1, 79) = 1.93$, $p = .17$, partial $\eta^2 = .02$ (see Table 6). Externals with self-reported low means-efficacy found less words ($M = 11.59$) than externals with self-reported high means-efficacy ($M = 13.02$; see Table 5 and Figure 2).

Main Effect of Locus of Control on Performance. The ANOVA (6) showed no significant main effect of locus of control on performance, $F(1, 204) = .48$, $p = .49$, partial $\eta^2 = .00$ (see Table 6).

Self-Reported Low Means-Efficacy and Performance. An ANOVA (9), using locus of control as the IV and the number of words found as the DV for participants with self-reported low means-efficacy, revealed externals with self-reported low means-efficacy performed better than internals with self-

reported low means-efficacy, $F(1, 78) = 3.73$, $p = .06$, partial $\eta^2 = .05$ (see Table 5, Table 6, and Figure 2).

Self-Reported High Means-Efficacy and Performance. An ANOVA (10), using locus of control as the IV and the number of words found as the DV for participants with self-reported high means-efficacy, revealed externals with self-reported high means-efficacy performed about the same as internals with self-reported high means-efficacy, $F(1, 126) = 0.71$, $p = .40$, partial $\eta^2 = .01$ (see Table 5, Table 6, and Figure 2).

Hypothesis 3

Hypothesis 3 stated internals would perform better than externals. An ANOVA inclusive of all participants with locus of control as the IV and the number of words found on the word search (i.e, performance) as the DV showed internals ($M = 12.18$ words found) did not perform better than externals ($M = 12.42$ words found), $F(1, 256) = .19$, $p = .66$, partial $\eta^2 = .00$ (see Table 7). These findings are consistent with the main effect of ANOVA (6), $F(1, 204) = .48$, $p = .49$, partial $\eta^2 = .00$, found when testing for interaction effects between self-reported means-efficacy and locus of control (see Table 6). The ANOVA (1) used to test for interaction effects between self-reported self-efficacy and locus of control, showed externals performed better than internals, $F(1, 236) = 5.21$, $p = .02$, partial $\eta^2 = .02$ (see Table 4).

Table 7
Hypothesis 3, 4, and 5 ANOVA Results

Independent Variable	Dependent Variable	Group (*n*)	*F*	Partial η^2	*M*
Locus of Control	Performance		0.19	0.00	
		Internals (153)			12.18
		Externals (103)			12.42
Self-Efficacy[a]	Performance		6.27**	0.03	
		Low Self-Efficacy (13)			9.69
		High Self-Efficacy (223)			12.72
Means-Efficacy[a]	Performance		20.43***	0.09	
		Low Means-Efficacy (78)			10.68
		High Means-Efficacy (128)			13.49

Note. Performance indicates number of words found on the word search.
[a]Self-Reported.
$^*p < .05$, $^{**}p \leq .01$, $^{***}p \leq .001$.

Hypothesis 4

Hypothesis 4 stated those with high self-efficacy would perform better than those with low self-efficacy. An ANOVA with self-reported self-efficacy as the IV and the number of words found on the word search (i.e, performance) as the DV supported that participants with self-reported high self-efficacy (M = 12.72 words found) performed better than participants with self-reported low self-efficacy (M = 9.69 words found), $F(1, 236) = 6.27$, $p = .01$, partial $\eta^2 = .03$ (see Table 1 and Table 7).

Hypothesis 5

Hypothesis 5 stated those with high means-efficacy would perform better than those with low means-efficacy. An ANOVA with self-reported means-efficacy as the IV and the number of words found on the word search (i.e, performance) as the DV supported that participants with self-reported high means-efficacy (M = 13.49 words found) performed better than participants with self-reported low means-efficacy (M = 10.68 words found), $F(1, 204) = 20.43$, $p < .001$, partial $\eta^2 = .09$ (see Table 1 and Table 7).

Exploratory Analyses

The following analyses were intended to explore interactive effects of self-reported self-efficacy and self-reported means-efficacy on performance considering previous research by Stirin et al. (2012), whose participants with both high self-efficacy and high means-efficacy performed better than those with high self-efficacy and low means-efficacy. The current study had 120 participants who reported both high self-efficacy *and* high means-efficacy while 103 participants reported high self-efficacy, but not high means-efficacy and 6 participants reported high means-efficacy, but not high self-efficacy (see Table 1).

An ANOVA was run with these first 2 groups (i.e., 120 participants who reported high on both efficacies versus 103 who reported high self-efficacy alone) as the IV and the number of words found on the word search (i.e,

performance) as the DV (see Table 1). The results were significant, $F(1, 223) = 15.74$, $p < .001$, partial $\eta^2 = .07$. Those who reported both high self-efficacy and high means-efficacy performed better ($M = 13.71$ words found, SD = 4.53, versus $M = 11.56$, SD = 3.34) than those who reported high self-efficacy alone.

An ANOVA was run with the first and third groups (i.e., 120 participants who reported high on both efficacies versus 6 who reported high means-efficacy alone) as the IV and the number of words found on the word search (i.e, performance) as the DV (see Table 1). The results were significant, $F(1, 126) = 5.65$, $p = .02$, partial $\eta^2 = .04$. Those who reported both high means-efficacy and high self-efficacy performed better ($M = 13.71$ words found, SD = 4.53, versus $M = 9.17$, SD = 5.35) than those who reported high means-efficacy alone.

CHAPTER FOUR

DISCUSSION

General Discussion

The results of this study are consistent with previous research and further, support locus of control moderates the relationship between efficacy (both, self-efficacy and means-efficacy) and performance. However, results were somewhat mixed, as Hypotheses 1, 4, and 5 were supported, whereas hypotheses 2 and 3 had different outcomes than expected.

Hypothesis 1 was supported by the significant interaction between locus of control and self-efficacy on performance. Internals performed differently given their self-efficacy while externals had no significant performance differences given their self-efficacy. These results support that locus of control can determine whether performance is affected by self-efficacy, as suggested by Bandura (1977b). This is consistent with the predicted outcome that internals were likely to be influenced by internal factors (i.e., self-efficacy). Specifically, internals with high self-efficacy performed better than internals with low self-efficacy. It appears internals needed to believe they had the ability to perform well in order to perform on par with externals whereas externals did not need to believe they had the ability to perform well in order to do so.

Hypothesis 2 was not supported. There was a significant interaction between locus of control and means-efficacy on performance, but it was in the

opposite direction as hypothesized. Means-efficacy appeared to affect internals' performance from a medium to large degree and externals' performance to a small degree. Although externals were influenced by an external factor (i.e., means-efficacy) as predicted, there was a greater difference for internals. It appears internals needed to believe they had enough time to perform well in order to perform on par with externals.

Additionally, consider that externals performed similarly regardless of their efficacy (i.e., self or means, high or low). Recall that people pay attention to what they believe will lead to a specific outcome and ignore those things they believe to be pointless in a given situation (Bandura, 1977a). Thus, it is plausible that externals believed there were other, more important factors than either their ability or their use of the time that would affect the number of words found. For example, the location of words may have been considered important, yet beyond their control. This would be consistent with the definition of locus of control or that one's beliefs about causality are attributed to internal or external factors (Spector, 1982).

The results for hypothesis 2 also support means-efficacy is independent of self-efficacy and may influence performance (Eden et al., 2010). The fact that self-efficacy did not change in response to the means-efficacy manipulations supports the idea that self-efficacy and means-efficacy are separate beliefs, as suggested by Eden (2001) and that one does not necessarily affect the state of the other. This is further support of Eden et al. (2010) who found those with high

means-efficacy performed better than a control group on work tasks (without any significant differences in self-efficacy).

Hypothesis 3 was not supported because there were no significant performance differences between internals and externals when all participants were compared. It was expected internals would outperform externals because most locus of control and performance research find this to be true. However, internals have not consistently outperformed externals. Recall Petzel and Gynther (1970) who found externals outperformed internals on a task when they were told successful performance was based on ability rather than chance. It is important to consider potential moderators of the relationship between locus of control and performance. Consider that there may be an interaction effect between perceptions of instruction (i.e., skill or ability versus chance) and locus of control on performance. Externals in this study outperformed internals when comparing participants based on (low versus high) self-reported self-efficacy differences. Thus, it is plausible the instructions for the word search may have been perceived as ability based rather than chance based by those participants. This may be one of the explanations why internals do not consistently outperform externals.

Hypothesis 4 was supported by the performance differences between self-efficacy groups. This is consistent with much of the literature, that self-efficacy affects motivation and performance (Bandura, 1988; Judge et al., 2002; Stajkovic & Luthans, 1998). Those with high self-efficacy performed better than

those with low self-efficacy. These results in conjunction with those of hypothesis 1 indicate internals with high self-efficacy can be expected to perform better than internals with low self-efficacy. However, self-efficacy did not predict performance among externals. Additionally, externals performed about the same as internals with high self-efficacy regardless of their self-reported self-efficacy. Thus, high self-efficacy is desirable when locus of control is unknown.

Hypothesis 5 was supported by the performance differences between means-efficacy groups. These findings are consistent with and support previous findings that individuals with high means-efficacy outperform those with low means-efficacy (Eden et al., 2010; Stirin et al., 2012). Both, internals and externals with high means-efficacy can be expected to perform better than individuals with low means-efficacy. Importantly, these findings support social cognitive theory because participants evaluated the situation differently and performed according to their beliefs about the time or means-efficacy, although the situation was consistent since each participant had 5 minutes to work on the word search (see Bandura, 1977a; see also Bandura & Locke, 2003).

Participants with both high self-efficacy and means-efficacy outperformed those with high self-efficacy alone, similar to Stirin et al.'s (2012) findings. Furthermore, participants with both high self-efficacy and means-efficacy outperformed those with high means-efficacy alone. Thus, high levels of both self-efficacy and means-efficacy are advantageous over high levels of self-efficacy or means-efficacy alone.

Limitations and Future Research

The self-efficacy method or researcher's attempt to persuade participants was not an effective way to manipulate participants' self-efficacy. Thus, self-efficacy may have originated from previous personal and/or indirect experience with word searches and/or physiological condition within the laboratory setting (see Bandura, 1977a; Bandura, 1977b; Bandura, 1994; Wood & Bandura, 1989). Thus, self-efficacy manipulations were not necessarily a causal factor of performance. Future research should focus on other or multiple methods of self-efficacy formation to ensure an effective manipulation and substantiate that self-efficacy is a causal factor of performance.

The means-efficacy method was an effective way to manipulate means-efficacy, without affecting self-efficacy. However, there were no performance differences between low and high means-efficacy conditions. This may be a result of the large percentage (40.6%) of participants who did not agree or disagree that they believed they had enough time to perform well on the word search. Participants were influenced by the time limit increase (i.e, high means-efficacy condition) or decrease (i.e, low means-efficacy condition). However, participants in the low means-efficacy condition on average did not agree or disagree that they believed they had enough time to perform well on the word search or in other words, did not have low means-efficacy. There was a clear indication that means-efficacy differences corresponded with performance differences when those participants were removed from analyses. Perhaps,

means-efficacy develops similarly as self-efficacy, so that personal experience, secondhand experience, physiological condition, and/or persuasion from others play a role (see Bandura, 1977a; Bandura, 1977b; Bandura, 1994; Wood & Bandura, 1989). Future research should evaluate the factors that play a role in formation of means-efficacy to determine better methods of manipulating means-efficacy and effective ways of elevating it for practical purposes.

There was no interview, questionnaire, or other measure that asked about what other factors, such as luck or instructions, that were considered important for performance. Thus, this study cannot determine what other factors participants considered when developing their word search motivation or performance. Future research should inquire about what other factors are considered important for the outcome of a given task, including specific types of ability or means and skill or chance based instructions.

Conclusion

The findings are supportive of the limited research that identifies means-efficacy as an important and unique motivational construct. This study adds to the current motivation and performance literature by bringing awareness to the moderating role of locus of control on efficacy and performance. How one's locus of control affects the influence of self-efficacy and means-efficacy on motivation and performance is yet to be well understood. It appears that self-efficacy and means-efficacy were important for internals while externals did not

necessarily have significantly different performance given differing levels of efficacy. Future research should continue to evaluate the details between these constructs to develop our understanding of their place within social cognitive theory, goal setting theory, and other industrial/organizational psychology research both for basic and applied purposes.

APPENDIX A

NEW GENERAL SELF-EFFICACY SCALE

NEW GENERAL SELF-EFFICACY SCALE

Read each of the statements and select the response that indicates your level of agreement from strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree.

1. I will be able to achieve most of the goals that I have set for myself.
2. When facing difficult tasks, I am certain that I will accomplish them.
3. In general, I think that I can obtain outcomes that are important to me.
4. I believe I can succeed at most any endeavor to which I set my mind.
5. I will be able to successfully overcome many challenges.
6. I am confident that I can perform effectively on many different tasks.
7. Compared to other people, I can do most tasks very well.
8. Even when things are tough, I can perform quite well.

Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a New General Self-Efficacy Scale. *Organizational Research Methods, 4,* 62-83. doi:10.1177/109442810141004

SCORING:

Low self-efficacy: 8-23

Below average self-efficacy: 24-27

Average self-efficacy: 27-31

Above average self-efficacy: 32-34

High self-efficacy: 35-40

Note. The range of scores among undergraduate psychology students in the United States (77% female; average age of 23).

McGraw-Hill (2010). Activity 2.11: Assessing your general self-efficacy [Online learning center page]. Retrieved from http://highered.mcgraw-hill.com/sites/0073381233/student_view0/chapter2/self-assessment_2_11.html

APPENDIX B

INTERNAL-EXTERNAL SCALE

INTERNAL-EXTERNAL 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.

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 don'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 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 the people are responsible for bad government on a national as well as on a local level.

SCORING: The score is the number of underlined options selected. Items without any underlined options are filler items.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied, 80,* 1-28. doi:10.1037/h0092976

APPENDIX C

[DUMMY] VOCABULARY TEST

[DUMMY] VOCABULARY TEST

This 16-item test is used to determine your vocabulary level. Please select the option that best defines the given word. Try not to guess, but do not take long for each word as your response time is part of your score. Once you begin the test do not stop until it is complete.

1. conflagration a. mound b. fire* c. gathering	2. crave a. hunger* b. repulse c. calm	3. quagmire a. swamp* b. ingenuous c. simple	4. chart a. gather b. proceed c. graph*
5. ostensible a. possible b. indirect c. apparent*	6. agreeable a. friendly* b. boring c. intelligent	7. propinquity a. nearness* b. distance c. enlargement	8. decline a. observe b. reduce* c. include
9. staid a. solid b. grave* c. frivolous	10. visible a. clear* b. hidden c. worsen	11. sentient a. heedless b. careful c. cognizant*	12. anger a. patience b. wrath* c. pleasure
13. jocund a. sprightly* b. morose c. lethargic	14. canine a. cat b. dog* c. mouse	15. incorrigible a. defiant* b. auspicious c. pliable	16. complete a. occupy b. total* c. advance

Note. *Indicates the correct answer.

Developed by Patricia Padilla.

APPENDIX D

WORD SEARCH

WORD SEARCH

A R T X E A E L B O N T P P H
G I Z M O W R I S T Q T E Y E
S F Y S D K C I R B C D O D Y
I L K G M E V I L O A S D N G
S K Y E Q U I P T L G T U A I
A R N O H U V X I T E M S H A
O T S E L L O U O F R O S T L
Z A K D A I L T X J O Z Y E A
Z B I I D T T R E Y S B C D O
D L E V R S Y E K C L C K I K
Z E S A Z O S L R C Z A J S Y
B Q P E U N Z B A O I X N A D
P D B T A N G L E U U L S C S
R R H E H A B N B D S T C Q K
A P J E J Y M I X E S U E R S

HANDY	WRIST	VIDEO	TABLE	ITEMS
KOALA	EQUIP	FROST	JEANS	ANGLE
SKIES	BRICK	USUAL	OASIS	OLIVE
YOUTH	MIXES	ASIDE	LITER	PEDAL
CLICK	ROUTE	QUOTE	DEPTH	ULTRA
GIZMO	EXTRA	ZEBRA	NOBLE	XYLAN

Developed by Patricia Padilla.

APPENDIX E

LOW SELF-EFFICACY MANIPULATION CHECK

Performance Factors Questionnaire

1. I feel bad that my vocabulary test score is *below average* compared to other college students.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

2. I believe my *vocabulary test score is below average* compared to other college students.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

3. Before I began the word search, I was *motivated* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

4. Before I began the word search, I *believed* I would perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

5. Before I began the word search, I believed *my ability was important* to my performance on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

6. Before I began the word search, I believed *I had the ability* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

7. Before I began the word search, I believed that *time was important* to my performance on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

8. Before I began the word search, I believed I had *enough time* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

9. Being timed made me uncomfortable.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

Developed by Patricia Padilla.

APPENDIX F

HIGH SELF-EFFICACY MANIPULATION CHECK

Performance Factors Questionnaire

1. I feel good that my vocabulary test score is *advanced* compared to other college students.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

2. I believe my *vocabulary test score is advanced* compared to other college students.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

3. Before I began the word search, I was *motivated* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

4. Before I began the word search, I *believed* I would perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

5. Before I began the word search, I believed *my ability was important* to my performance on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

6. Before I began the word search, I believed *I had the ability* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

7. Before I began the word search, I believed that *time was important* to my performance on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

8. Before I began the word search, I believed I had *enough time* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

9. Being timed made me uncomfortable.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

Developed by Patricia Padilla.

APPENDIX G

LOW MEANS-EFFICACY MANIPULATION CHECK

Performance Factors Questionnaire

1. Before I began the word search, I was *motivated* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

2. Before I began the word search, I *believed* I would perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

3. Before I began the word search, I believed *my ability* was important to my performance on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

4. Before I began the word search, I believed *I had the ability* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

5. Before I began the word search, I believed that *time was important* to my performance on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

6. *When I had 15 minutes*, I believed I had *enough time* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

7. *When I had my time changed to 5 minutes*, I believed I had *enough time* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

8. *When I had my time changed to 5 minutes*, I felt *less motivated* to perform on the word search than when I had 15 minutes.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

9. Being timed made me uncomfortable.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

Developed by Patricia Padilla.

APPENDIX H

HIGH MEANS-EFFICACY MANIPULATION CHECK

Performance Factors Questionnaire

1. Before I began the word search, I was motivated to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

2. Before I began the word search, I *believed* I would perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

3. Before I began the word search, I believed *my ability* was important to my performance on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

4. Before I began the word search, I believed *I had the ability* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

5. Before I began the word search, I believed that *time was important* to my performance on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

6. *When I had 1 minute*, I believed I had *enough time* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

7. *When I had my time changed to 5 minutes*, I believed I had *enough time* to perform well on the word search.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

8. *When I had my time changed to 5 minutes*, I felt *more motivated* to perform on the word search than when I had 1 minute.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

9. Being timed made me uncomfortable.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
O	O	O	O	O

Developed by Patricia Padilla.

APPENDIX I

LOW SELF-EFFICACY [DUMMY] RESULT SHEET

Reports

National Percentage Data with Individual Respondent Information

Vocabulary

Result Type	National	Individual Respondent
Students Tested	412,819	Patricia Padilla
Mean Score	459	
% Advanced	13%	
% Above Average	26%	
% Average	24%	
% Below Average	28%	309
% Far Below Average	9%	

Note: Range is from 0-600 points.

Comparing Vocabulary Test Results

Scoring: Scores are calculated using the number of synonyms correctly identified given the expected response time for the college level, current as of December 2011. Please see *Appendix II: Statistical Information for Standardization*, under the vocabulary section for details.

How do I compare?

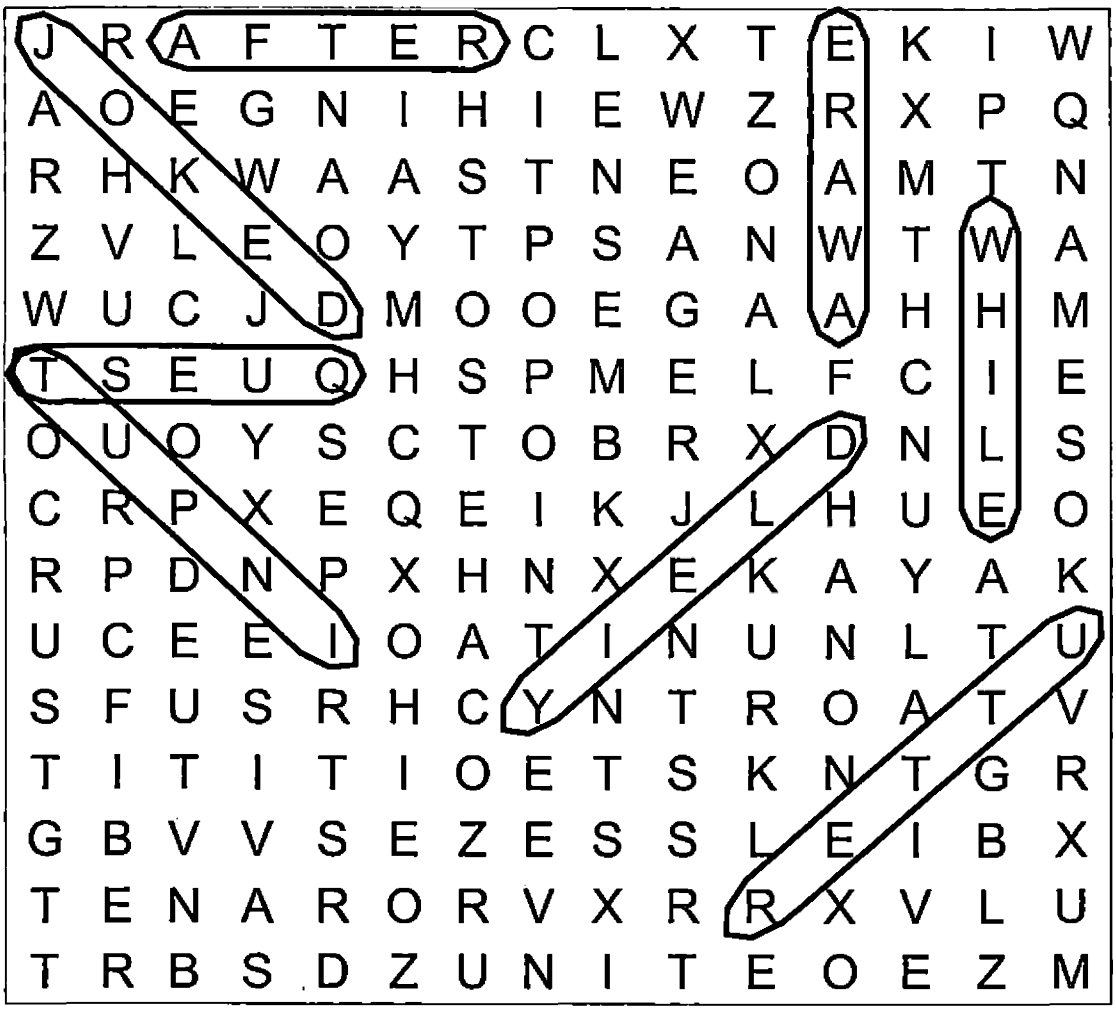
Patricia Padilla scored at the **37th percentile** for the national level. This vocabulary score is considered **below average** for a college level student.

Developed by Patricia Padilla.

APPENDIX J

EXAMPLE WORD SEARCH

WORD SEARCH



RIVET	THANK	POINT	CRUST	NAMES
YIELD	BASIC	HINGE	ORDER	UNITE
~~AFTER~~	XENON	~~UTTER~~	DOZEN	EAGER
LENSE	MOWER	WHILE	~~JOKED~~	VITAL
FIBER	ZONAL	KAYAK	EXIST	~~AWARE~~
~~INPUT~~	~~QUEST~~	SCENE	GREAT	OPTIC

Developed by Patricia Padilla.

APPENDIX K

HIGH SELF-EFFICACY [DUMMY] RESULT SHEET

Reports

National Percentage Data with Individual Respondent Information

Vocabulary

Result Type	National	Individual Respondent
Students Tested	412,819	Mark D. Agars
Mean Score	329	
% Perfect	4%	
% Advanced	22%	435
% Average	47%	
% Below Average	19%	
% Far Below Average	8%	

Note: Range is from 0-600 points.

Comparing Vocabulary Test Results

Scoring: Scores are calculated using the number of synonyms correctly identified given the expected response time for the college level, current as of December 2011. Please see *Appendix II: Statistical Information for Standardization*, under the vocabulary section for details.

How do I compare?

Mark D. Agars scored at the **89th percentile** for the national level. This vocabulary score is considered **advanced** for a college level student.

Developed by Patricia Padilla.

APPENDIX L

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

Human Subjects Review Board
Department of Psychology
California State University,
San Bernardino

PI: Padilla, Patricia and Agars, Mark

From: John P. Clapper, Michael Lewin

Project Title: Performance Factors Study

Project ID: H-12SU-06

Date: 10/15/12

Disposition: Expedited Review

Your IRB proposal is approved. This approval is valid until 10/15/2013.

Good luck with your research!

John P. Clapper, Co-Chair
Psychology IRB Sub-Committee

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