DRIVEN TO DISHONESTY: THE EFFECTS OF COMMUTING ON SELF-REGULATORY DEPLETION AND UNETHICAL BEHAVIOR

by

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ABSTRACT

Most people must commute to and from work each day, yet little research has examined this critical time between home and work and the potential spillover effects of commuting on employees' subsequent workplace behavior. Drawing on self-regulation theory and the commuting stress literature, I propose that stressful driving conditions on the way to work (e.g., bad weather, traffic congestion, long routes) can cause employees to subsequently behave unethically at work. Specifically, I suggest this occurs through a depletion of self-regulation as resources are consumed while driving under stress and thus unavailable for deterring tempting, unethical behavior. I test this mediation model in two studies using an experimental-causal-chain design. In Study 1, using a sample of 204 participants recruited at a university, I manipulated commuting conditions in a driving simulator and measured self-regulatory depletion and dishonesty using behavioral tasks in the laboratory. In Study 2, using an online panel of 117 participants, I manipulated self-regulatory depletion and measured dishonesty using modified versions of the same behavioral tasks. Overall I find some support that driving—regardless of driving-induced stress level—depletes self-regulatory resources and that reduced self-regulation leads to a higher likelihood to engage in unethical behavior.

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CHAPTER ONE: INTRODUCTION

Hundreds of millions of people commute to and from work in the United States and across the globe every day. These commutes—consisting of billions of hours every year—have important implications for individuals and the organizations that employ them. Despite the significant amount of time workers spend in transit to work each day (averaging about 25 minutes one way in the United States; McKenzie & Rapino, 2011), organizational researchers have largely neglected consideration of the impact this has on individuals and their behavior in the workplace.

Just as commuting is central to most people's morning ritual, maintaining the bottom line is central to most companies' ability to compete. Every year, various forms of dishonest and unethical behavior on the part of employees result in a loss of approximately five percent of revenue to U.S. businesses (Association of Certified Fraud Examiners, 2010). Although well-publicized ethical breaches that have caused substantial damage to our social and economic systems (e.g., Bernie Madoff, Enron, Worldcom) have been thoroughly examined, the reasons why average people engage in forms of smaller and more subtle acts of unethical workplace behavior are still not thoroughly understood.

In this dissertation, I aim to bridge the individual and workplace effects of commuting. First, I suggest that commuting-related stress causes people to engage in more unethical behavior. Second, I suggest that it is important to consider not only the direct effects of commuting but also the process through which it influences individuals. I build upon the existing research and theory by not only examining the direct relationship of commuting on unethical behavior, but also the underlying psychological process. In this regard, I rely and build upon self-regulation theory along with the behavioral ethics literature to examine the link between commuting stress and unethical behavior through a process of self-regulatory depletion. Third, this paper serves as a springboard for a new stream of spillover research that considers the impact of commuting and other daily hassles on the workplace behavior of employees.

This research complements several other literature streams, such as environmental and clinical psychology that study commuting, social psychology that studies self-regulation, and behavioral ethics that studies workplace dishonesty. For example, research has long documented the network of relationships between commuting, the built environment and individual differences (e.g., Novaco, Kliewer, & Broquet, 1991; Novaco, Stokols, & Milanesi, 1990). Although the field has become more specialized as it has advanced, this research forms much of the basis of the existing commuting stress literature. Within social psychology, self-regulation research has grown to become one of the largest areas of study in the field (Hagger, Wood, Stiff, & Chatzisarantis, 2010). Despite this prominence, little work has examined self-regulation on ethics—especially ethical behavior in organizations (Gailliot, Mead, & Baumeister, 2001; Mead, Baumeister, Gino, Schweitzer, & Ariely, 2009). Finally, the behavioral ethics literature has been rapidly advancing in recent years, showing many factors that affect dishonest and unethical behavior in the workplace. Little of this research, however, has shown spillover effects from other aspects of a person's life to his or her workplace behavior. This dissertation will contribute to each of these research streams in important ways.

Although the literature suggests commuting plays an important role in our lives, there is a dearth of internally valid research that examines whether and how one's daily commute is related to workplace behavior—particularly unethical behavior. I begin to address this gap by using experimental methods to examine whether individuals who are exposed to highly stressful commuting conditions engage in more unethical behavior. I also provide a step toward determining whether this process is mediated by self-regulatory depletion.

By establishing robust relationships among commuting stress, self-regulatory depletion, and unethical behavior, this study will show that—in addition to considering individual, group, and firm-level influences on organizational behavior—future theoretical and empirical work may benefit from a more explicit consideration of factors related to employee commuting and other daily hassles employees face. Moreover, researchers might expand their purview to consider how physical and environmental factors influence unethical behavior.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL BACKGROUND

Stress and Ethical Decision-Making

Despite the growing literature on business ethics, the relationship between stress and ethics in organizations remains sparse (e.g., Tenbrunsel & Smith-Crowe, 2008; Treviño, den Nieuwenboer, & Kish-Gephart, 2014; Treviño, Weaver, & Reynolds, 2006). The lack of consideration of stress is notable for several reasons. First, the study of the effects of stress on cognition, perception, and problem-solving is a well-researched domain (e.g., Chajut & Algom, 2003; Cooper, Dewe, & O'Driscoll, 2001; Lazarus, 1993) that is certainly applicable to ethics, both ethical decision-making and behavior. Second, stress is likely to accompany ethical dilemmas in organizational life as dealing with ethical dilemmas are stressful for workers (Mohr & Wolfram, 2010). Stress is a sequence of events that begins with a demand on an individual, followed by the perception that the demand is significant, and resulting in a response—usually one that affects one's overall well-being (Kahn & Byosiere, 1992). Stress comes from many sources, both within and outside the workplace, and is typically an unpleasant emotional experience. Many sources of stress have been examined in the existing literature, as have interventions; however, most of these studies have focused on individual and team performance as the dependent variable of interest with few looking at the relationship between stress and ethics.

The empirical findings that do exist show that stress indeed influences ethical decision-making. For example, according to one survey of workers in the United States, nearly half (48%)

reported that they performed illegal or unethical activities in response to pressure from their jobs. Further, 58 percent of the participants said they had considered acting unethically or illegally on the job because of workplace pressures (McShulskis, 1997). In addition, Boyd (1997) found that occupational stress caused employees to cut corners on quality control, cover up incidents at work, abuse sick days, and deceive customers. In another study, researchers found stress had negatively influenced counselors' decisions in ethical conflict situations (Hinkeldey & Spokane, 1985). In a study with organizationals leaders, Selart and Johansen (2011) found that those who were put in stressful situations were no less likely than others to recognize an ethical dilemma but they were more likely to *act* unethically.

Understanding the effects of stress on ethical decision-making and behavior is important in order to improve ethics in organizations. The research on stress and ethics to date has primarily focused on the first two stages of Rest's (1986) four-stage model of ethical decision-making—recognition of ethical dilemmas and making moral judgments. There has been little research on actual ethical behavior (the final stage of Rest's model). In this dissertation, I focus on this final stage—behavior (versus recognition, judgment, or intent). In addition, I will focus on one source of stress for workers that has been largely ignored in organizational behavior and business ethics, namely, commuting stress.

Commuting Stress and Unethical Behavior

Previous research has uncovered a number of individual and organizational factors related to unethical behavior in organizations (for recent reviews see Tenbrunsel & Smith-Crowe, 2008; Treviño et al., 2014; Treviño et al., 2006). However, the effects of spillover—when workplace attitudes and behaviors are affected by factors outside of work, which has gained recent attention by management researchers—has not been well-researched by behavioral ethicists (e.g., Nohe, Meier, Sonntag, & Michel, 2015). The idea of spillover is that the daily hassles and strain a person experiences at home (or anywhere outside work) can be depleting such that employees do not have adequate regulatory resources[1] to effectively handle the pressures and subsequent hassles at work or vice versa (e.g., Leiter & Durup, 1996).

Although there is significant research on the effects of home-to-work spillover on job behavior, there is little research on the effects of the time spent in between (i.e., daily commuting). Commuting is common to most workers (over 96% of American workers work outside their home) and elicits increased stress and arousal levels—especially in conditions that cause frustration (Hennessy, 2008, Hennessy & Wiesenthal, 1999; Hennessy, Wiesenthal, & Kohn, 2000; Novaco et al., 1990; Rasmussen, Knapp, & Garner, 2000; Wiesenthal, Hennessy, & Totten, 2000). There are many stimuli that daily commuters may encounter that may cause stress (e.g., bad weather, road construction, time pressures, and traffic congestion). According to the commuting impedance model, commuting stress occurs when goals are blocked (such as arriving on time to work or driving at a certain speed; Koslowsky, Kluger, & Reich, 1995). Most people report encountering many frustrating or irritating factors that lead to commuting stress on a daily basis (Novaco et al., 1990).

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[1] The notion of self-regulatory resources relies on an energy model of self-regulation. This model suggests that individuals must exert effort and energy to avoid giving into temptation. Johnson, Muraven, Donaldson, and Lin (in press) suggest these resources are required for any act of agency.

Considering that 86 percent of working adults in America commute via car or personal vehicle (76% drive alone), with an average commute time of over 25 minutes each way (McKenzie & Rapino, 2011), examining the effects of commuting—particularly driving—on organizational behavior is a pressing issue. Although the organizational consequences of commuting stress have not been thoroughly examined, several negative outcomes have been found in previous studies.

Most of the early commuting studies considered the relationship between commuting and attendance. While lacking sophistication, one such study (Knox, 1961) reported that distance from work was a strong predictor of absenteeism. Several other studies confirmed these findings (Martin, 1971; Taylor & Pocock, 1972). Novaco et al. (1990) also corroborated the early studies by showing that participants with high commute impedance scores (measured as a combination of distance and time), were more likely to use sick days and be absent. Leigh and Lust (1988) found commute distance predicted lateness. Nicholson and Goodge (1976), however, found a negative relationship between commute distance and being late. They attributed this counterintuitive finding to the fact that people who lived closer to the manufacturing plant where their study was conducted were more likely to use public transportation on which the workers did not maintain control over the schedule.

In addition to absenteeism and lateness, turnover has been found to be related to commute distance (Knox, 1961). Novaco et al. (1990) conducted longitudinal research and found that for people who changed jobs during the study, commuter satisfaction was significantly higher at the end of the study than at the beginning, whereas for the people who remained in their current job, commuter satisfaction did not change. In a study of teacher turnover, salary was found to mediate the relationship between commuting and turnover (Seyfarth & Bost, 1986).

The relationship between job performance and commuting has also been examined. Schaffer, Street, Singer, and Baum (1988) had participants complete a proofreading task immediately after their actual commute to work followed by ratings of their commuting speed and impedance. The authors found that a difficult or demanding commute reduced performance. In a departure from earlier correlational studies, White and Rotton (1998) conducted an experiment to manipulate whether participants drove their vehicle, or rode a bus between two points, or neither. They found that those who commuted (either driving or riding) did not persist as long and became more frustrated than the control group when completing unsolvable puzzles. Van Rooy (2006) found that participants who drove longer distances and in more traffic congestion were evaluated more negatively in employee performance appraisals. Finally, Hennessy (2008) conducted a field study of driver stress on workplace aggression and found that as driver stress increased, so too did their overt aggression, but only among males. By and large, therefore, the existing research suggests that commuting does indeed spill over to affect workplace behavior.

The Mediating Effect of Self-Regulatory Depletion on Unethical Behavior

The relationship between commuting stress and ethics has not been studied, but, as with other sources of stress, commuting stress is likely to influence individuals' ethical behavior. One explanatory mechanism proposed between stress and unethical behavior is the "fight-or-flight" response (Mohr & Wolfram, 2010; Taylor, Klein, Lewis, Gruenewald, Gurung, & Updegraff, 2000). This response is a natural, physiological response to stressors. Although typically considered in terms of fighting (if a chance to win exists) or fleeing from an enemy (if no chance to win), the physiological response can occur at many levels to respond to a variety of stressors other than an enemy (Cooper et al., 2001). This response could reduce peoples' inclination to engage in ethical behavior when they view the situation as competitive (Mohr & Wolfram, 2010). However, the fight or flight response does not adequately explain the process by which commuting stress leads to unethical behavior at work when the ethical dilemma is not competitive in nature.

The second explanatory mechanism begins with the premise that refraining from unethical behaviors demands resources—namely, self-regulation (the capacity to adjust one's thoughts, emotions, and behaviors; DeWall, Baumeister, Gailliot, & Maner, 2008; Gino, Schweitzer, Mead, & Ariely, 2011; Mead et al., 2009). Many studies suggest that an individual's self-regulation capacity is a finite resource and that use of such self-regulation resources over a prolonged time depletes the pool (Gailliot et al., 2001; Muraven & Baumeister, 2000). Because different activities use the same resource pool, prolonged self-regulation that taxes a person's self-regulatory capacity (such as driving; Zhou et al., in press), therefore, is likely to reduce resources available for subsequent tasks (Muraven & Baumeister, 2000). Refraining from tempting, dishonest behavior requires some level of self-regulation due to the incentive structure of the behavior (Gino et al., 2011). A few studies support the relationship between self-regulation and (un)ethical behavior. Muraven, Pogarsky, and Shmueli (2006), for example, found that self-regulatory depletion was related to cheating, as was trait self-control. Mead et al. (2009) found that participants were more dishonest in reporting their performance on a task when they were depleted. Similarly, Gino et al. (2011) found that ethical behavior required *and* depleted self-regulatory resources.

Commuting has been shown to increase stress and fatigue drivers (Benton, 1990). Other research has shown that mental and physical fatigue reduces self-regulation (Gailliot et al., 2007). Driving demands self-regulatory resources (Zhou et al., in press) and hence, will also reduce both an individuals' ability and motivation to engage in the effort necessary to behave ethically (Masicampo, Martin, & Anderson, 2014). Note that although the fight or flight process, which suggests an antagonistic response to stress whereby a person responds to the stress by adopting a competitive mindset, could explain some potential effects of commuting stress of unethical behavior, I adopt the second mechanism—self-regulation—for this dissertation. Unlike the first process, a self-regulatory perspective does not suggest a hostile response to stressors, but rather, suggests that avoiding unethical behavior requires some degree of self-control. It also suggests that commuting stress will reduce a person's capacity for self-regulation, thus reducing a person's likelihood of expending the self-regulation required to resist unethical behavior.

Hypotheses

Hypothesis 1: Commuting stress is positively related to self-regulatory depletion.

Hypothesis 2: Self-regulatory depletion is positively related to unethical behavior.

Hypothesis 3: Self-regulatory depletion mediates the relationship between commuting stress and unethical behavior.

CHAPTER THREE: RESEARCH STUDIES

Overview of the Studies

As described below, I used two experiments to test my predicted mediation model. Using an the experimental-casual-chain will allow me to draw the strongest causal inferences possible (Spencer, Zanna, & Fong, 2005; Stone-Romero & Rosopa, 2008; Stone-Romero & Rosopa, 2010). In Study 1 I manipulated the independent variable (X) and measured the mediating (M) and dependent variables (Y). In Study 2 I manipulated M and measured Y. Taken together, the results of these experiments allowed me to determine the degree of mediation and examine the evidence for my proposed $X \rightarrow M \rightarrow Y$ model.

In addition to testing my proposed hypotheses, one further goal of this dissertation was to test the relative strength of various tasks for assessing dishonesty. Over the past decade, many laboratory-oriented behavioral ethics (LOBE) paradigms have been developed by researchers to assess (un)ethical behavior in experimental studies. To date, however, there is no consensus about which task(s) or paradigm(s) are most likely to yield the expected effects. I used a counterbalanced dependent variable measurement procedure to assess the differences in effects between two of the most popular LOBE paradigms. The use of multiple dependent measures also provided an opportunity to assess one aspect of generalizability, which speaks to the value of testing for unethical behavior in two different ways. Moreover, since no empirical comparative work exists, it would have been difficult to know in advance whether one such measure might furnish more power than the other to detect experimentally induced effects (i.e., provide a more sensitive way to assess that impact), so it seemed prudent not to rely on either measurement approach alone.

Study 1

Method

Participants and Design

The first step in establishing the causal chain is to establish the $X \rightarrow M$ relationship. To do this I manipulated X (commuting stress) and measured M (self-regulatory depletion) along with measuring Y (unethical behavior). Participants in this laboratory experiment were solicited from the Central Florida region, including students from the University of Central Florida. The eligibility criteria included: (1) have a valid U.S. driver's license; (2) not be prone to motion sickness; (3) be able to recognize colors on a computer screen; (4) be able to do simple arithmetic; (5) be proficient in the English language; and (6) have previous experience of commuting to a job. Participants volunteered to participate for the opportunity to earn money based on performance during the study. Each participant was randomly assigned to one of three study conditions: stressful-driving commute, easy-driving commute, and control (no commute/baseline). The study included several tasks to be described in more detail in later sections: driving simulation (used to manipulate commuting stress), Stroop task (used to assess self-regulatory depletion), and two problem-solving tasks (used to assess dishonesty), along with several manipulation checks and other measures.

Sample Size

Simmons, Nelson, and Simonsohn (2011) recommended specified rules be established—before data collection begins—for terminating data collection efforts. To identify the required number of participants, I conducted a power analysis using the G*Power software package (Faul, Erdfelder, Lang, & Buchner, 2007). I used a small-to-medium size effect (d = .40) as this is similar to the effect size found in related research (e.g., Gino et al., 2011). Using Cohen's (1988) recommended power of .80, the a priori power analysis computed a required sample size of 53 participants per condition.

Following Meade and Craig's (2012) recommendations, I excluded participants who answered "no" to the question: "In your honest opinion, should we use your data in our analyses in this study?" I also excluded participants who provided insufficient effort on the Stroop task (as evidenced by accuracy performance two standard deviations below the mean), and participants who reported not having previous experience commuting to work. The final sample size was 204—note that this is larger than the a priori power analysis required due to an error in the random assignment program that was overweighting the difficult commute condition early in the study. Participants were an average of 23 years old (*SD* = 8.60) and 39 percent were male.

<u>Commuting Manipulation</u>

To manipulate the independent variable—commuting stress—I used two scenarios representing the various levels of commuting stress on a virtual reality driving simulator. Modern driving simulators can provide participants with a realistic experience with high driving fidelity, feedback to driver input, and immense virtual driving environments (Yan, Radwan, Abdel-Aty, Wang, Harb, & Santos, 2008). The driving simulator consisted of the interior of a vehicle cabin (including a driver's seat with complete dashboard/controls), three-side wrap-around screen with images generated by five channels (a forward view; two side and two rear view mirrors), an audio system, a vibration system, researcher/operator control center, database with a variety of maps, and a scenario development tool to place an assortment of features (cars, buildings, signs, obstacles, traffic control devices, and so forth) to create driving conditions similar to the real world. The system has the ability to output a number of data points from the steering wheel, accelerator, brake, speedometer, map coordinates, and time although those were not variables of interest in this study. As with much laboratory research, the advantages of using a driving simulator over on-road driving in this study include: having precise control of the experimental conditions, the increased efficiency and reduced expense of data collection, as well as the safety of the participants.

A review of the commuting stress literature informed my choices related to the design of the driving scenarios. Although long commutes are more stressful than short commutes (Koslowsky et al., 1995), this variable was held a constant 15 minutes across conditions. Participants were exposed to a 15 minute long driving scenario (this is the maximum recommended time an individual should spend in the simulator without a break due to possible motion sickness caused by the virtual reality environment). For the baseline condition, participants did not engage in simulated driving at all but were asked to write about their previous day's activities. This manipulation has been used as a control condition in a variety of self-control research (e.g., DeWall, Baumeister, Mead, & Vohs, 2011). This condition paralleled the 4.3 percent of American workers who report working from home on a daily basis (McKenzie & Rapino, 2011). These participants also spent 15 minutes on the writing task.

In the interest of creating a strong manipulation in this study, I varied levels of several stimuli that previous research has found to increase driving stress including bad weather (i.e. rain), slow-moving vehicles, traffic congestion, and traffic signals. The simulator—which has an expansive array of options for designing custom maps and scenarios—only allows non-technical operators (i.e., those who do not wish to program each individual element in the simulation using computer programming languages—in other words, this researcher) to choose from a limited set of levels for each option (e.g., low, medium, or high options). Thus, for each of the stressors, I included the "high" options in the stressful commute condition and the "low" options in in the easy commute condition.

Procedure

The experimenter ran each participant through the driving simulator individually. Upon arrival, participants were asked to provide informed consent and proof of a valid driver's license, followed by completing a brief questionnaire to measure possible covariates that may affect self-control such as the amount and quality of sleep they got the night before, how long ago they had last driven, when their last meal was (due to the possible effect of glucose as a self-control energy source; see Gailliot & Baumeister, 2007; Gailliot et al., 2007), and trait self-control (using Tangney, Baumeister, & Boone's, 2004, brief self-control scale).

Following the pre-experiment questionnaire, I used a random number generator to assign participants to one of the two commuting conditions—stressful or easy—or the no-commute control condition. Participants in the commuting conditions were then told a story about having to drive to work before performing some job tasks. Following these instructions, participants completed a two-minute practice trial on the driving simulator to ensure they understood the controls of the simulator and had a chance to get acclimated to driving in the simulator versus their own vehicle. Immediately following the practice trial, the participants completed their assigned driving scenario as described above. Once participants completed the driving simulation, they performed a Stroop task to measure self-regulatory depletion, followed by two dishonesty tasks to measure unethical behavior, and a final questionnaire. Participants in the no-driving condition were told to spend 15 minutes writing a about their activities on the previous day. Following this writing task, they proceeded with the same Stroop task, dishonesty tasks, and questionnaire as those in the driving conditions.

Self-Regulatory Depletion Measure

One difficulty in implementing an experimental-causal-chain design is that “to convincingly argue for a proposed psychological process with such a design, one must be able to argue that the proposed psychological process as it is measured and as it is manipulated are in fact the same variable” (Spencer et al., 2005, p. 846). To assuage this concern and strengthen my overall conclusions, I used the same task to both measure (in this Study) and manipulate (in Study 2) self-regulatory depletion—the mediating process variable of my model. The Stroop task has been successfully used as both a measure (e.g., Inzlicht & Gutsell, 2007) and manipulation (e.g., Galliot et al., 2007) of self-regulatory depletion. The task presents the name of a color (e.g., yellow, red, blue, green) in a font color that either matches the word (congruent; e.g., the word “blue” presented in blue font) or is incongruent (e.g., the word “green” presented in red font). I followed Crump, McDonnell, and Gureckis’s (2013) and Job, Dweck, and Walton’s (2010) procedures for adapting the Stroop task to be completed on a computer to allow more precise measurement of the variable. Each participant was randomly given 48 trials of congruent and 48 trials of incongruent words. Whereas this task traditionally requires participants to say the font color (not the word) out loud to the experimenter, adapting this study to the computer allowed more precise measurements of response latency times. In each trial, the participant was instructed to click on the correct response (as in Job et al., 2010). To incentivize sufficient effort on the task, participants were informed they would be paid $.02 for each correct response provided within 5 seconds of the initial appearance of the trial. Previous research has shown that incongruent trials require in self-regulatory resources but congruent trials do not (Inzlicht & Gutsell, 2007), thus I used response latency times of incongruent trials only as the outcome variables for this task.

Dishonesty Tasks

One by-product of this dissertation is that it provided an opportunity to evaluate the effectiveness of some commonly used tasks ethics researchers use for measuring unethical behavior behavior in the laboratory. Of the many available dishonesty tasks, I used the matrix task and the word-scramble task due to their popularity and immediate ability to be adapted for online use (which will be useful for Study 2). All participants completed both tasks, which were counterbalanced to account for potential order effects.

Matrix Task

The matrix task was developed by Mazar, Amir, and Ariely (2008) and presented as a problem-solving task. The participants were given 20 matrices containing 12 three-digit numbers (e.g., 1.29). Participants were instructed that to correctly solve a matrix they needed to find the two numbers that summed to 10 (see Figure 1 for an example). They were given 5 minutes to work on the task and informed that they would earn $0.15 for each matrix they solved correctly. After the task was completed, participants were instructed to dispose of their answer sheet in the nearby recycling bin, and only submit a collection form on which they self-reported their performance (total number of matrices solved) for payment from the experimenter. The participants were unaware that one of the matrices on their forms contained a unique identifier and that once the experiment was over, the experimenter retrieved the discarded answer sheets from the recycling bin to compare actual performance to reported performance. This allowed me to assess whether or not participants were honest in reporting their performance in two ways. One way uses the difference between matrices reported as solved and actually solved (a continuous variable measuring the magnitude of dishonesty) and the second way involves using a categorical variable of whether or not the participant was dishonest at all (this measures the likelihood to be dishonest).

Word-Scramble Task

The word-scramble task was adapted from Cameron and Miller (2009) and Wiltermuth (2011). This task consisted of nine scrambled words that the participants must solve in the order they appear (see Table 1). Participants were told they would be paid $0.15 per correctly solved word-scramble. Participants were also instructed that they would only be paid for the words they unscrambled up to the first one they report not unscrambling, even if they unscramble other words further down the list. Unbeknownst to the participant, the third scramble (unaagt → taguan) and ninth scramble (yomseevld→ semovedly) are nearly unsolvable (Wiltermuth reported that none of the participants in his pilot testing was able to solve them correctly).[2] The

[2] Taguan is a large flying squirrel and semovedly is a synonym for separately. Wiltermuth (2011) found that no participant was able to correctly solve these two scrambles in a pilot test or in the experiment. Further, in pilot testing, he found that no participant recognized the actual words, thus although these scrambles do have correct answers, it is highly unlikely the participants in my studies would have correctly solved them.

remaining word scrambles are very solvable. Participants were given five minutes for the task and then asked to report which words they unscrambled (e.g., "words one through five") but were not asked to write down or report their answers to the unscrambled words. The frequency with which participants reported solving the third word (thereby allowing them to get paid for subsequent scrambles) and ninth word served as the measures of dishonesty.

Other Measures

After participants completed the dishonesty tasks they then completed a post-experiment questionnaire. This questionnaire included a driver stress measure (as a manipulation check) originally developed by Gulian, Matthews, Glendon, Davies, and Debney (1989) to measure general driving stress and adapted by Hennessy and Wiesenthal (1997) to measure state driver stress using a 5-point Likert response format (1 = strongly disagree, 5 = strongly agree). The questionnaire also asked participants to rate the difficulty of the driving task using a 5-point response format (1 = Very easy, 5 = Very difficult) and the extent to which the driving task required willpower or self-control using a 5-point scale (1 = Not at all, 5 = To a great extent). These items (adapted from Gino et al., 2011) served as another measure of self-regulatory depletion.

Following these manipulation checks, participants completed Bargh, Chen, and Burrow's (1996) funnel debriefing procedure. This procedure involved four open-ended questions: (1) whether there was anything about the driving task that affected (positive or negative) their performance on subsequent tasks, (2) what they thought the purpose of the study was, (3) whether the driving task affected their performance on the color-matching (i.e., Stroop) task, and (4) whether they thought the driving task influenced them in any way. Finally, participants responded to demographic items regarding their age, race, education, employment status, number of miles driven annually, and work-related commuting behavior (distance, length of time, and mode of transportation).

Results and Discussion

Prior to performing further analyses, I examined the debriefing questions to gauge whether participants were aware of the study's purpose. Seventeen participants identified that the self-reporting of performance on the matrix and word-scramble tasks incentivized cheating or dishonesty although no one reported being aware of the purpose of the Stroop task or the link between the driving task and Stroop task. I conducted hypothesis tests with and without the individuals who correctly identified the ethical nature of the study; because the results were essentially identical in both cases, I report study findings including all participants to maximize statistical power.

Manipulation Checks

To ensure the manipulation worked as intended, I compared the two driving groups using the Hennessy and Wiesenthal (1997) measure of state driver stress. The participants in the stressful-driving condition reported significantly higher levels of driver stress ($M = 3.65$, $SD = .59$) than participants in the easy-driving condition ($M = 1.38$, $SD = .31$), $t = 27.19$, $df = 144$, $p < .001$.

Preliminary Analyses

Although this study was an experiment that relied on random assignment, it is still recommended to test for covariate balance (Murnane & Willett, 2011). To test for covariate balance, I conducted a series of ANOVAs (for continuous variables) and chi-square tests of independence (for categorical variables) on potential covariates. The results revealed no significant differences between the groups with regards to their trait self-control (p = .24), amount of sleep the previous night (p = .42), previous night's sleep quality (p = .42), time since last oral intake (p = .89), time since last driven an automobile (p = .68), average commute time (p = .43), average commute miles (p = .26), usual transportation method (p = .47), age (p = .97), and race (p = .61). However, there were significant differences among groups based on hours worked at a job (p < .01), annual miles driven (p = .02), and sex (p = .02). As such, I will adjust for these covariate imbalances in subsequent analyses.

Self-Regulatory Depletion

The purpose of this study was to establish the first link in the casual chain—that is, the relationship between driving stress and self-regulatory depletion. To test this relationship I conducted an ANCOVA—with the three significant covariates identified above—using the mean latent response times for the incongruent Stroop trials in milliseconds as the measure of the dependent variable. There was no significant differences on response times based on sex, $F(1,198) = 2.74$, $p = .10$, $\eta_p^2 = .01$. There were significant relationships in the number of miles driven annually and response times ($F(1,198) = 7.81$, $p < .01$, $\eta_p^2 = .04$) as well as number of hours worked weekly and response times ($F(1,198) = 7.68$, $p < .01$, $\eta_p^2 = .04$). As shown in Figure 3, after adjusting for these variables, there was a significant effect of driving condition on response times to the Stroop stimuli, $F(2,198) = 5.20$, $p < .01$, $\eta_p^2 = .05$. Planned pairwise comparisons (using a Bonferroni correction) revealed that participants in the stressful-driving condition (*adjusted M* = 1755.67, *SE* = 66.78) were significantly slower to respond to the stimuli (p < .01) than those in the no-driving condition (*adjusted M* = 1425.73, *SE* = 82.02), but not than those in the easy-driving condition (*adjusted M* = 1721.11, *SE* = 77.47, *p* = 1.00). Participants in the easy-driving condition likewise had significantly longer-to-respond times than those in the no-driving condition (*p* = .03).

Supplemental analyses on the two self-reported questions adapted from Gino et al. (2011) showed that participants in the stressful-driving condition did rate the driving task as significantly more difficult (*M* = 4.31, *SD* = 1.13) than did those in the easy-driving condition (*M* = 1.13, *SD* = .34, *t* = 21.45, *df* = 144, *p* < .001, *d* = 3.59). Finally, participants in the stressful condition found the driving task required significantly more self-control (*M* = 3.38, *SD* = .98) than did participants in the control condition (*M* = 1.71, *SD* = 1.12, *t* = 9.57, *df* = 144, *p* < .001, *d* = 1.60). These results indicate that there was no detectable effect of the level of driving stress on self-regulatory depletion using the Stroop task, but that the act of driving alone might be enough to reduce self-regulation. Additionally, although the Stroop task did not record a significant difference in self-regulation based on driver stress, the participants self-reported the stressful-driving condition as being more difficult and using more self-control.

Dishonesty

In addition to testing the $X \rightarrow M$ relationship, the design of this study allowed me to examine the direct effect of driving condition (*X*) on dishonesty (*Y*). Using the over-reporting of matrices solved as the dependent (dishonesty) variable, ANCOVA results revealed that there was no significant relationship between number of hours worked and dishonesty, $F(1,198) = .82$, $p = .37$, $\eta_p^2 < .01$. There was a significant difference in dishonesty based on sex, $F(1,198) = 4.32$, $p = .04$, $\eta_p^2 < .02$ (males were more dishonest than females). There was also a significant relationship between the number of miles driven annually and dishonesty ($F(1,198) = 7.02$, $p < .01$, $\eta_p^2 =$

.03). Finally, there was a significant effect of driving condition on dishonesty, $F(2,198) = 3.59$, $p = .03$, $\eta_p^2 = .04$, after adjusting for the above covariates. Planned pairwise comparisons (again sing a Bonferroni correction) revealed that, as with self-regulatory depletion, participants in the stressful-driving condition (*adjusted M* = 3.86, *SE* = .36) significantly over-reported their performance on the matrix task ($p = .03$) compared to those in the no-driving condition (*adjusted M* = 2.33, *SE* = .44), but not than those in the easy-driving condition (*adjusted M* = 3.17, *SE* = .41, $p = .61$). Participants in the easy-driving condition did not differ significantly on over-reported performance compared to those in the no-driving condition ($p = .51$).

Additional analyses using logistic regression revealed no significant differences of experimental condition on likelihood to cheat on the matrix task (over-reporting performance by at least one matrix; $\chi^2(2) = 2.52$, $p = .28$) or likelihood to cheat on the word-scramble (reporting solving the third word, "taguan," thus enabling them to get paid for words solved after that; $\chi^2(2) = .46$, $p = .80$). Together these results show that all participants were equally likely to cheat a little bit, but driving stress caused participants to cheat more.

Study 2

Method

Participants and Design

Following the establishment of the $X \rightarrow M$ relationship in Study 1, the second step in establishing the causal chain is to establish the $M \rightarrow Y$ relationship. To do this I manipulated M (self-regulatory depletion) and measured Y (unethical behavior). This relationship has previously been established in two studies (Gino et al., 2011; Mead et al., 2009), however this study served as what Lykken (1968) called a *constructive replication* as I used different methods for both manipulating the independent variable as well as measuring the dependent variable.

One major difference between this study and others is that I conducted this study online by recruiting participants on Amazon's Mechanical Turk (MTurk). I followed Peer, Vosgerau, and Acquisti's (2014) recommendations to ensure the quality of the data, namely, MTurk workers were required to be located in the United States and have a reputation score of greater than 95% (MTurk reputation is calculated as the percentage of HITs—Human Intelligence Task—that the requester approved). Participants were paid $0.10 for completing the HIT and told that they would be paid a "bonus" based on their performance on each task. This study was a randomly assigned 2 × 2 experiment with manipulations of depletion (the independent variable of interest) as well as ability to cheat (to rule out possible effects of depletion on actual performance).

<u>Sample Size</u>

As with Study 1, I conducted an a priori power analysis using G*Power (Faul et al., 2007) to identify the number of participants necessary to find a small-to-medium size effect (d = .40). Setting power equal to .80, the analysis computed a required sample size of 32 participants per condition (n = 128). The actual sample size used in the analyses was 117 after filtering out participants who answered "no" to the question: "In your honest opinion, should we use your data in our analyses in this study?" (Meade & Craig, 2012). Participants were an average of 37.84 years old (SD = 11.73) and 39 percent were male.

Procedure

Once an MTurk participant accepted the HIT, they were sent to a separate survey website where the experimental tasks were hosted. This study involved three tasks: a Stroop task (used to manipulate self-regulation depletion in this study), and the two dishonesty tasks from Study 1 (matrix task and word-scramble task) to assess unethical behavior. After giving informed consent, the participants were given a pre-experiment questionnaire to assess their trait self-control followed by instructions for completing the Stroop task. Galliot and colleagues (2007) found that presenting incongruent trials of the Stroop task requires expending self-regulation resources, whereas the congruent trials do not. Thus, in this study I manipulated whether the participants were given 48 incongruent trials (depletion condition) *or* 48 congruent trials (no-depletion condition). I used the same adaptations for completing the task on a computer as in Study 1.

Following the Stroop task, participants engaged in the same counterbalanced matrix and word-scramble tasks to measure dishonesty as used in Study 1, albeit with some slight variations for the online environment. Because this study was conducted online instead of in the laboratory, I was not able to retrieve the discarded answer sheet to verify honest behavior. Therefore, I followed Kouchaki and Wareham (2015) and Wiltermuth (2011), who adapted the matrix task for use on a computer by presenting several unsolvable problems. In this study, half the matrices ($n = 10$) were solvable (i.e., contain two cells that sum to 10), and, unbeknownst to the participants, half were unsolvable (i.e., do not contain two cells that sum to 10). The matrices were presented on the screen one at a time for 20 seconds each and participants were either required to identify the two cells that add to 10 by clicking on them (verification condition) or by simply checking a box below the matrix that indicates they solved the matrix without being asked to identify the matching pair (no verification condition; see Figure 2 for an example). Consistent with the prior research using this online paradigm (Kouchaki & Wareham, 2015; Wiltermuth, 2011), the measure of dishonesty was participants reporting of solving unsolvable matrices.

The word-scramble task from Study 1 was similarly adapted for use online. The same words were used as in Study 1. In the verification condition, participants were required to type the correct word before moving to the next word, whereas in the no verification condition, participants simply indicated that they successfully unscrambled the word before moving on.

After completing both dishonesty tasks, the participants were asked to complete a post-experiment questionnaire. As in Study 1, participants were asked to rate the difficulty of the color-matching task (i.e., Stroop) using a 5-point scale (1 = Very easy, 5 = Very difficult) and the extent to which the color-matching task required willpower or self-control using a 5-point response format (1 = Not at all, 5 = To a great extent). These items served as a manipulation check of self-regulatory depletion in this study. I also used latent response times—the time between the initial display of the Stroop stimulus and the first click of the font color name—and accuracy as additional manipulation checks (Crump et al., 2013). Participants completed Bargh et al.'s (1996) funnel debriefing procedure by responding to the four open-ended questions as in Study 1. Participants were also asked demographic items regarding their age, race, education, and employment status.

Results and Discussion

As in Study 1, I first examined the debriefing questions to gauge whether participants were suspect of the ethical aspect of the study. Fourteen participants identified correctly that the self-reporting of performance incentivized cheating or dishonesty although no one reported being aware of the link between the Stroop task and the subsequent problem-solving tasks. I conducted all subsequent tests both with and without these individuals and because the results did not vary, again I report the findings including all participants for statistical power.

Manipulation Checks

To ensure the Stroop task successfully induced self-regulatory depletion, I first compared the mean latent response times for the stimulus in milliseconds. As expected the participants in the depletion (incongruent) condition took significantly longer to respond to the stimulus (M = 1596, SD = 41) than participants in the control (congruent) condition (M = 1438, SD = 39, t = 2.11, df = 115, p = .04). Second, I coded the accuracy for each Stroop trial (correct = 1, incorrect = 0) and found that participants in the depletion condition performed significantly worse (M = 47.63, SD = 1.09) than participants in the control condition (M = 47.97, SD = .18, t = -2.42, df = 115, p = .02). Third, participants in the depletion condition rated the Stroop task as significantly more difficult (M = 1.57, SD = 1.02) than did those in the control condition (M = 1.10, SD = .35, t = 3.40, df = 115, p = .001). Finally, participants in the depletion condition found the Stroop task required significantly more self-control (M = 2.48, SD = 1.21) than did participants in the control condition (M = 1.82, SD = .94, t = 3.33, df = 115, p = .001).

Preliminary Analyses

Prior to testing my hypotheses, I conducted a series of ANOVAs (for continuous variables) and chi-square tests of independence (for categorical variables) on potential covariates (items shown in Appendix B) to examine covariate balance. As expected there were no significant differences between the groups with regards to their trait self-control ($p = .85$), amount of sleep the previous night ($p = .30$), previous night's sleep quality ($p = .27$), time since last oral intake ($p = .84$), time since last driven an automobile ($p = .88$), or sociodemographic variables (all *p*s > .23).

Dishonesty Tasks

Matrix Task

The purpose of Study 2 was to show the effect of self-regulatory depletion (*M*) on dishonesty (*Y*). This study included two measures of the dependent variable, each of which can be analyzed in various ways. First, a 2 (depletion vs. control) × 2 (verifiable vs. unverifiable) ANOVA showed that participants in the unverifiable condition reported solving more total matrices (both solvable and unsolvable) than participants in the verifiable condition, $F(3, 112) = 4.37$, $p < .01$, $\eta_p^2 = .11$ (see Figure 4). The interaction (depletion condition × verification condition) was not statistically significant ($F(1, 112) = .10$, $p = .75$, $\eta_p^2 < .01$), thus I conducted planned contrasts. A *t*-test showed that the magnitude of cheating in the unverifiable condition (by reporting that they solved an unsolvable matrix) between depleted participants ($M = 4.89$, $SD = 3.53$) and non-depleted participants ($M = 3.24$, $SD = 3.73$) was not different to a statistically significant degree, $t = 1.72$, $df = 55$, $p = .09$, $d = .45$. I will note that the effect size is nearing Cohen's (1988) definition of a moderate size effect indicating there may be a meaningful effect that my sample was too small to detect using an alpha of .05. Similarly, a *t*-test showed that actual performance on the matrix task was not affected by depletion (M = 7.37, SD = 4.34) vs. non-depletion conditions (M = 6.07, SD = 3.65, t = 1.02, df = 53, p = .24, d = .32).

Although the magnitude of cheating was not different to a statistically significant degree, another way to examine the results is to look at the likelihood of cheating. In fact, a chi-square test revealed there was a significant association between the depletion condition and whether or not the participants cheated $\chi^2(1) = 4.12$, p = .04. The odds ratio showed that the odds of cheating on the matrix task was 4.95 times higher if the participant was in the depletion condition (93% of participants in this condition cheated) than if they were in the non-depletion condition (72% cheated). In sum, the results for the matrix task show that depleted participants are more likely to cheat, but they only cheat to a small degree.

Word-Scramble Task

The other dependent variable included in this study was the frequency with which participants reported correctly solving the word "taguan"—the third word in the word-scramble task. As above, I was first interested in confirming there was no effect of depletion on actual performance in the verification condition (t = -.76, p = .45) prior to proceeding. Supporting my predictions, the chi-square examining the effect of depletion condition on rates of cheating was significant, $\chi^2(1) = 4.03$, $p < .05$. The odds of cheating on the word-scramble task was 2.99 times higher if the participant was in the depletion condition (65% of participants cheated) than if they were in the control condition (41% cheated).

Additionally, I analyzed whether depletion affected the likelihood of participants to report solving the last word of the task, "semovedly." Although the participants in the depletion condition were more likely to cheat (19%) than those in the control condition (10%), the chi-square revealed no significant effect of depletion condition on the rate of cheating on the last word, $\chi^2(1) = .97$, $p = .33$, $OR = 2.14$. As with the matrix task, the totality of results for the word-scramble task support the notion that depleted participants are more likely to cheat, but only a small amount.

CHAPTER FOUR: GENERAL DISCUSSION AND CONCLUSION

In this dissertation, I examined the effects of driving-induced stress on unethical behavior through a process of self-regulatory depletion. I relied on self-regulation theory and the existing commuting and stress literatures to make and test predictions about the effects. In contrast to the vast majority of the existing studies on commuting, I used experimental methods to examine the phenomenon to increase the internal validity of my research. Over two studies, I found that after driving, individuals have lower self-regulation and that self-regulation depletion causes people to behave more unethically.

Hypothesis 1 predicted an effect of driving stress on self-regulatory depletion. In Study 1, I found that although the manipulation of driver stress was strong, and participants reported that the stressfulness of the driving affected their self-control, there was no difference in depletion (as measured using the Stroop task) between the high-stress and low-stress driving conditions. However, I did find a difference between driving at all and the no-driving control condition. One limitation of this study—and thus a potentially interesting future study—is the role of driving on generalized stress. There is some work to suggest that all driving leads to increased stress levels (Koslowsky et al., 1995) but because I was primarily interested in the organizational implications of worker's different commute characteristics, I did not measure or predict effects of more generalized forms of stress of self-regulation. Therefore, although this study provides some support that driving to work may decrease self-regulation compared to those who don't drive, Hypothesis 1 was not supported.

Hypothesis 2 predicted an effect of self-regulation on unethical behavior. The results of Study 2 showed that depleted individuals were indeed more *likely* to cheat on the matrix task (about five times so) but they did not cheat to a significantly greater extent. This result implies that self-regulation resources are important for preventing the initial act of dishonesty, but once someone has engaged in unethical behavior, they do so to the same extent regardless of their self-regulation. However, as I noted previously, the lack of a statistically significant result on the magnitude of cheating on this task may have been due to insufficient statistical power. Future research should attempt to replicate this study with a larger sample to verify the results.

The results on the word-scramble task—the other measure of dishonesty in Study 2—told a similar story. Participants who were depleted were more likely to cheat (about three times more) on the third word of the task but not more likely to cheat on the ninth and final word of the task. This reinforces the matrix results in that although depleted people may be more likely to cheat to a small degree, they are no more likely to cheat to the greatest extent possible. The consistent results across both dependent variables measuring dishonesty in Study 2 provides robust support for Hypothesis 2.

Hypothesis 3 concerned the mediation effect of driving stress on unethical behavior through self-regulatory depletion. The logic of Kalish and Montague's (1964) Theorem 26 allows valid inferences to be drawn about mediation from the results of two randomized experiments (i.e., experimental-causal chain). Thus, taken together, the results of Study 1 and Study 2 provide partial support via the causal chain. Although Study 2 provided strong support for the second link in the chain—between self-regulatory depletion and unethical behavior—the results of Study 1 did not support the relationship between driving stress and self-regulatory depletion. However, the results do show that driving caused self-regulatory depletion, so although not formally hypothesized, the evidence from this paper does support the notion that any driving may affect unethical behavior through the process of self-regulatory depletion.

Study 1's design allowed me to test the direct effect of the driving condition in the experiment on unethical behavior. The results revealed that there were no differences among groups on an individual's likelihood to cheat but that individuals who were exposed to a stressful driving scenario cheated to a greater extent on the matrix task than those in the easy-driving or no-driving conditions. This effect did not hold on the word-scramble task. These results provide limited support for the direct effect of driving stress on unethical behavior. This limited support requires further research to fully examine a possible direct effect.

Although not a test of my hypotheses, I was also interested in the sensitivity of the two dishonesty tasks for measuring unethical behavior as there is currently no empirical research comparing any of the LOBE paradigms. The results of Study 2 showed consistent results across both tasks although the matrix task appears to have been more sensitive to detecting likelihood to cheat than the word-scramble task (odds ratio of approximately 5 vs. 3). Concerning the detection of cheating magnitude, although there was a difference between groups in the expected direction on both tasks, neither task provided statistically significant results. However, with more power, it is likely the matrix task would have registered a significant difference; it is unclear whether the word-scramble task would have done so. Thus, although both tasks were effective dependent variables in this study, it appears that of the two—as they were adapted for use online—the matrix task is more sensitive to measuring dishonesty.

With the recent “replication crisis” generating much discussion in the field, another purpose of Study 2 was to answer calls in psychology and management to conduct replication studies of both established and novel findings (e.g., Anderson & Maxwell, 2017; Byington & Felps, 2017; Shrout & Rodgers, in press). In addition to testing my hypotheses, Study 2 served as a constructive replication of Gino et al. (2011) and Mead et al. (2009). Using a different manipulation of self-regulatory depletion and different forms of measuring dishonesty, my results largely support the findings in the previous papers. First, as with both previous studies I found no effect of self-regulatory depletion on actual performance. Second, as with both previous studies I found the likelihood to cheat for depleted individuals significantly stronger than non-depleted individuals. Mead et al. (2009) did not provide adequate information for calculating an odds ratio, but I calculated the odds ratio for Gino et al.’s (2011) study (using the traditional matrix task) to be 2.48 which is smaller than the 2.99 (online word-scramble task) and 4.95 (online matrix task) values observed in my study. This difference in effect size could be due to either a stronger manipulation or more sensitive dishonesty measures. Finally, both Gino et al. (2011) and Mead et al. (2009) found an effect on cheating magnitude, which my results do not support—although this could have been due to small sample size in my study.

I have described several strengths and limitations of my studies above and despite the many strengths of Study 1, I would like to outline some additional limitations that may serve as both explanations for findings and serve as useful insights for designing future studies. First, there was a glitch in the random assignment that tended to overweight one condition early in the experiment until I caught and corrected the error. Although I have no reason to suspect it affected the results, it is possible that this was why there was some covariate imbalance across conditions. Although the ANCOVA controlled for this imbalance, there may have been imbalance in unmeasured variables that affected the results. Second, although the manipulation check confirmed the driving stress manipulation was effective, it may not have been strong enough. For example, whereas the average one-way commute for an American worker is about 25 minutes (McKenzie & Rapino, 2011), time in the simulator was limited to 15 minutes to protect the participants health. Also, considering there were effects compared to the control group, one possibility is that due to unfamiliarity with driving in the simulated environment, the simulator itself induced more stress that was not captured by using Hennessy and Wiesenthal's (1997) measure—which was developed for use in the field. It is also possible that the mundane realism of the simulator did not accurately reflect the stressors of real-world driving. Third, considering the differences recorded in self-reported self-control after the driving task, the Stroop task may not have been a sensitive enough measure to detect the self-regulatory depletion differences between the two driving conditions. Future studies should use additional measures of depletion, such as the handgrip stamina task (Tice, Baumeister, Shmueli, & Muraven, 2007).

Additional future research should focus on extending this dissertation by considering (a) other methods of commuting, (b) additional outcomes, and (c) boundary conditions. Although driving is the most widely used form of commuting, and therefore the focus of this study, the finding that both driving conditions differed from the no-driving condition raises the interesting question about how other methods of commuting (e.g., bus, subway, taxi, walking) might affect employees. Each of these commute forms have their own stressors that may differentially affect employees (Koslowsky et al., 1995). It would also be interesting to consider whether some methods of commuting actually serve to reduce stress between home and work. Another direction for future research would be to examine the effects of the actions of commuters that may affect their level of stress. One recent study, for example, found that listening to music reduced driving stress for new drivers (Lee & Winston, 2016).

The self-regulation theoretical framework suggests that there may also be effects of commuting on other workplace behaviors such as engagement (Lanaj, Johnson, & Barnes, 2014), helping behaviors (Lin & Johnson, 2015), cooperation (Christian, Eisenkraft, & Kapadia, 2014), undermining (Lee, Kim, Bhave, & Duffy, 2016), and aggression (Christian & Ellis, 2011) among others. In addition to considering other workplace outcomes, examining moderators and boundary conditions is a promising path of research as there are many potential personality and situational variables that can be measured or manipulated to provide a more nuanced understanding of the effects of commuting on workplace behavior.

Conclusion

This dissertation, which is the first to bridge the commuting and behavioral ethics research domains, revealed that driving depletes one's self-regulation resources and that this reduced self-regulation caused people to be more unethical. Although the results did not support my contention that the amount of stress associated with driving was impactful, I did confirm that self-regulatory depletion is an important consideration for organizations trying to curb unethical behavior. I hope this paper encourages more researchers to explore the important organizational implications of daily hassles, such as commuting, and other forms of spillover on employee's workplace behavior. I also hope to encourage the examination of ways to replenish self-regulation resources, thus curbing unethical behavior at work. Ultimately, a comprehensive understanding of the spillover effects of commuting will require a concerted effort from researchers to fully examine the realm of outcomes and moderators.

APPENDIX A: TABLES AND FIGURES

Table 1

Word Scrambles

	Scramble	Correct Word
1.	unhted	hunted
2.	eoshu	house
3.	unaagt	taguan
4.	ythoird	thyroid
5.	olarc	coral/carol
6.	jnipmug	jumping
7.	hgitwe	weight
8.	claslou	callous
9.	yomseevld	semovedly

5.16	0.62	7.77
6.50	4.84	5.59
7.84	6.06	2.62
9.38	4.69	1.62

Figure 1: An example of a matrix with correct answers highlighted.

5.64	2.85	9.48
1.68	9.52	2.15
6.71	4.55	1.67
8.10	5.48	8.91

Found it ☐

Figure 2: An example of an unsolvable matrix formatted for online environment.

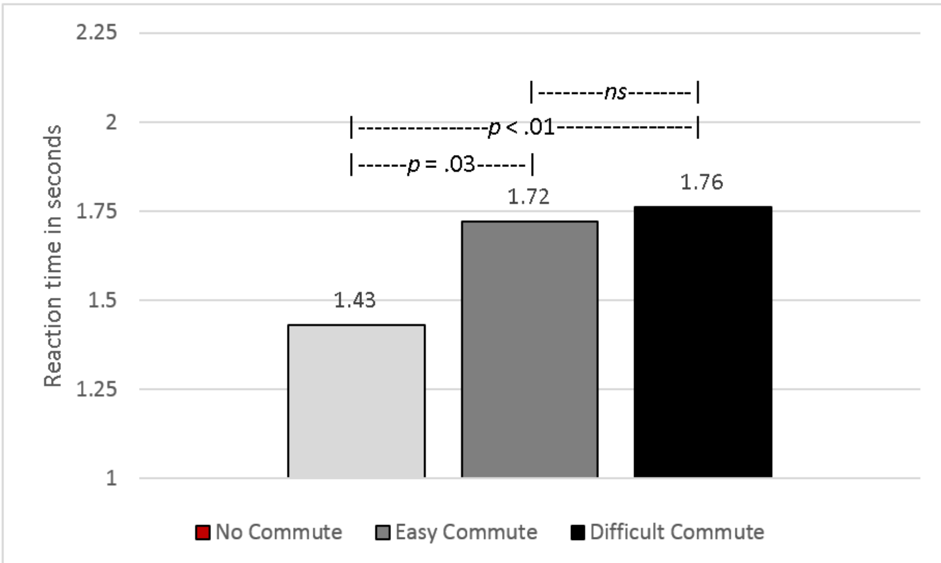

Figure 3: Latent response time on Stroop task in Study 1.

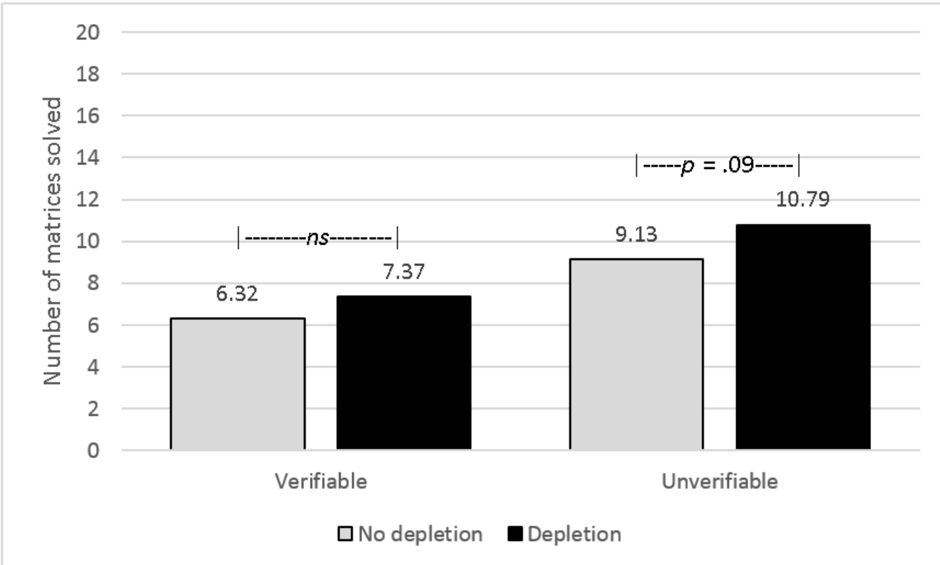

Figure 4: Number of matrices participants reported they solved correctly in Study 2.

APPENDIX B: SURVEY ITEMS

<u>Pre-Experiment Questionnaire Items</u>

Trait Self-Control (Tangney et al., 2004)

I am good at resisting temptation.
I have a hard time breaking bad habits. (R)
I am lazy. (R)
I say inappropriate things. (R)
I do certain things that are bad for me, if they are fun. (R)
I refuse things that are bad for me.
I wish I had more self-discipline. (R)
People would say that I have iron self-discipline.
Pleasure and fun sometimes keep me from getting work done. (R)
I have trouble concentrating. (R)
I am able to work effectively toward long-term goals.
Sometimes I can’t stop myself from doing something, even if I know it is wrong. (R)
I often act without thinking through all the alternatives. (R)

Additional Items

As accurately as you can, please indicate the total number of hours you slept last night.
Compared to an average night, my sleep was: (1=worse, 2=same as, 3=better)
Have you driven today? If so, how many hours ago did you last drive?
When was the last time you consumed any food or drink that contained more than zero calories?

<u>Post-Experiment Questionnaire Items</u>

State Driver Stress (Hennessy & Wiesenthal, 1997)

I was in a hurry.
I felt I had control of the driving situation. (R)
Traffic conditions were congested.
I was annoyed by driving behind other vehicles.
Trying but failing to overtake bothered me.
Trying but failing to overtake frustrated me.
I was not patient during the drive.
Because I was irritated I was driving aggressively.
I do mind being overtaken.
I felt aggressive.
I felt frustrated.
I was losing my temper when other drivers were doing silly things.
I felt tense when overtaking other vehicles.
I felt satisfied when overtaking other vehicles.

I felt tense.
I felt uneasy.
I felt nervous.
I felt bothered.
I felt distressed.
I felt peaceful. (R)
I felt relaxed. (R)
I felt contented. (R)
I felt comfortable. (R)
I felt calm. (R)

Additional Items (adapted from Gino et al., 2011)

How difficult was the driving task?
To what extent did the driving task require self-control or willpower?

Debriefing Items (to gauge suspicion; adapted from Bargh et al., 1996)

Was there anything about the driving task that affected (positive or negative) your performance on subsequent tasks? If so, what?
Did the driving task affect your performance on the color-matching task? If so, how?
Did the driving task affect your performance on the matrix task? If so, how?
Did the driving task affect your performance on the word-scramble task? If so, how?
Do you think any task influenced you in any way? If so, how?
What do you think the purpose of the study was?

Commuting and Demographic Items

Do you currently, or have you had in the past, a job that requires commuting?
How many house do you usually work each week?
How many minutes does it usually take you to get from home to work?
Approximately how many miles do you travel one way from home to work?
How do you usually get to work?
Approximately how many miles have you driven during the past 12 months?
What is your age?
What is your sex?
What is your ethnic or racial background?
What is the highest degree or level of school you have completed?

APPENDIX C: IRB LETTER

University of Central Florida

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Matthew Griffith**

Date: **March 17, 2016**

Dear Researcher:

On 03/17/2016, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination
Project Title:	Ethical leadership in organizations
Investigator:	Matthew Griffith
IRB Number:	SBE-16-12135
Funding Agency:	
Grant Title:	
Research ID:	n/a

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 03/17/2016 02:01:42 PM EDT

IRB Manager

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