ESSAYS ON ETHICS IN SUPPLY CHAIN MANAGEMENT

A Dissertation

by

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ABSTRACT

Ethical concerns in business practice have received considerable attention in recent years. However, limited research has examined the role of ethical decision-making in supply chain management. My first essay examines the ethical decision-making process where the magnitude of unethical behavior in a specific supply management decision is determined. Diverging from the prior research that focuses on identifying factors that influence ethical behaviors, my study proposes a theoretical framework that incorporates a multitude of mechanisms that affect the actual magnitude of unethical behavior. Utilizing this framework and an experimental study which rests on data from the US, China, and Italy, I provide a more granular examination of how individuals behave differentially when an unethical decision in the context of supply management would lead to disparate consequences. I then examine how firms can effectively reduce the magnitude of employee's unethical behavior in supply management by adopting appropriate incentive structures.

In my second essay, I extend my investigation of ethical decision-making and examine the dynamics between consecutive decisions that invoke ethical considerations in supply chain management. Instead of taking a static perspective and focusing on individual instances of ethical decision-making, I investigate an individual's ethical decision-making behaviors in the long term via a stochastic process methodology. Three aspects of the ethical decision-making process are examined in this study via a longitudinal experimental design over a 10 week period: the overall tendency of an individual engaging in ethical/unethical behaviors, the consistency and inconsistency in his/her behavioral patterns, and his/her vulnerability against ethical failures. My results suggest that ethics education achieved through frequent communication of ethical standards can effectively induce not only an ethical but also a consistent behavioral pattern in a supply chain manager's decision-making process.

Finally, I provide an overall discussion of the important findings in my essays as well as their theoretical and practical implications. I then discuss a common theme that emerges from my studies where individuals tend to adopt different mentalities in ethical decision-making process.

Based on this finding, I outline an approach that potentially identifies managerial levers that can effectively promote ethical practice in supply chain management.

DEDICATION

To my family.

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1. INTRODUCTION AND LITERATURE REVIEW

1.1 Introduction

Ethical concerns in business practice have received considerable attention in recent years. Unethical conduct can be largely attributed to individual behaviors within organizations, amongst other causes. For example, the infamous Ponzi scheme of Bernard Madoff led to one of the largest financial fraud cases in U.S. history, amounting to $64.8 billion (Reuters, 2009). However, organizations may also become the victim of systematic unethical behaviors when organizational members collude to undertake fraudulent practices. For instance, WorldCom, once the second-largest telecomunications company in the U.S., collapsed due to a massive accounting scandal directed by its former CEO Bernie Ebbers together with multiple senior managers within the firm (SEC, 2003).

Corporate fraud often results in destructive aftershocks to the affected organizations. According to the ACFE (2016), a typical organization loses 5% of revenues in a given year because of fraud, resulting in a projected annual total fraud loss of up to $3.7 trillion worldwide. Ethical failures seriously threaten a firm's financial stability as the financial losses caused by each case of fraudulent practice often exceed $1 million. Larger scandals, however, may lead to even more catastrophic consequences to the firms. Once-massive firms including Enron and Worldcom eventually collapsed after corporate scandals because of the severe punishment imposed by regulators, investors, and consumers.

Moreover, the impact of unethical conduct sometimes reaches far beyond the firms themselves. Shareholders are often directly affected by corporate scandals due to a massive drop in a firm's valuation. In a recent incident, the stock price of Uber, one of the major ride-hailing companies in the world, was expected to drop significantly after its former CEO resigned due to serious allegations regarding its workplace culture and claims of sexual harassment (Bloomberg, 2017). Business partners in the supply chain may suffer from the spillover effect of unethical behavior

because consumers may not differentiate between members in the supply chain (Hartmann and Moeller, 2014); for instance, suppliers of an offending firm may suffer catastrophic consequences if a major customer folds under pressure from regulators and other constituents. In some cases, unethical conduct can impact the society at large. For instance, reporters at the News of the World hacked into the phones of individuals including celebrities and crime victims, resulting in a severe leak of personal information (BBC News, 2012). Many government officials were involved in the widespread bribery orchestrated by the top executives at Wal-Mart de Mexico when the company attempted to obtain construction permits in order to build new stores and expand their business (The New York Times, 2012).

Therefore, it is imperative for firms to recognize the importance of ethics in their daily operations and supply chains. Ethical considerations are especially important in the context of supply chain management. In general, firms have conforming definitions of ethical/unethical behaviors in supply chain practices (Carter, 2000). This conformity suggests that ethical considerations are usually well-recognized when firms interact with supply chain partners. Dobler and Burt (2002) show that the individuals' behaviors in the purchasing department of a firm are important because it influences how the firm is viewed by suppliers and other organizations. Unethical behaviors taking place among individuals in a supply chain relationship can lead to distrust between supply chain partners (Hill et al., 2009). Given the fact that purchasing is typically the major cost center or the entity that spends most of the cost of goods sold within an organization, the amount of financial interest involved can often induce unethical conducts (Fearon and Leenders, 1993).

1.2 Ethics in Supply Chain Management

There is scant literature in the domain of supply chain management that specifically examines ethical issues from a behavioral perspective. The existing research on ethics in supply chain management typically focuses on identifying commonly seen ethical issues (Cooper et al., 2000) and the consequences of unethical behaviors (Carter, 2000; Hill et al., 2009). To the best of my knowledge, little research has taken a behavioral approach to examine ethical decision-making in supply chain management. From an academic research perspective, ethics in supply chain management

requires deliberate examination in that it inherently invokes various concerns at both the individual and organizational level. In addition, a supply chain related ethical/unethical decision will often result in consequences for both the decision maker's own organization and its supply chain partners. Deeply related to moral psychology, ethical decision-making is generally considered an individual-level process. Thus, many studies in the psychology literature focus on the role of individual differences such as individual characteristics, moral identity, cognitive moral development, moral philosophies, empathy, and moral affect (see Moore et al., 2012).

Although important, these individual-level factors cannot fully explain an individual's ethical decision-making in an organizational context. Another stream of literature illustrates that individual ethical decision-making is largely impacted by the organizational setting one is in. The interaction between individual and organizational factors forms a complex mechanism that partially drives the overall outcome of ethical decisions. Many contextual factors have been found to influence organizational members' ethical decision-making. For example, ethical leadership (Brown and Trevino, 2006), ethical climate (Pierce and Snyder, 2008; Mayer et al., 2009), codes of conduct (Weaver and Trevino, 1999), and ethical infrastructure (Rottig et al., 2011) within an organization affect an employee's ethical behavior. Other situational drivers including the intensity of unethical behavior (Singhapakdi et al., 1996), organizational goal orientations (Schweitzer et al., 2004), and problem framing (Bateman et al., 2001) also play significant roles in driving ethical behaviors.

The extant research on ethical decision-making in organizational contexts largely focuses on the situations where only personal benefits are involved (see Kish-Gephart et al., 2010). Indeed, individuals may often behave unethically in exchange for personal gains. For example, the U.S. Chamber of Commerce reports that the costs associated with employee theft are estimated to be $40 billion every year (CBS News, 2011). As an extreme example, the former chief executive and the former chief financial officer of Tyco reaped more than $150 million from the company for their personal benefit. Overall, the general assumption in the extant literature is that individuals are motivated to behave unethically within an organization only because doing so will lead to personal

benefits. As a result, limited research has examined the situations where an individual is motivated to engage in unethical behaviors for the benefit of the organization he/she works for (Kocher et al., 2016; Thau et al., 2015).

Many unethical behaviors exhibited by organizational members may in fact benefit the organization as well. For example, a New York Police Department detective was reported to frame innocent people to help fellow officers from his department to achieve higher rates of drug-related arrests, therefore improving the entire department's performance and competing for additional funding (The Huffington Post, 2011). The recent incident of Volkswagen also revealed that multiple individuals within the organization colluded to engage in fraudulent behaviors. To improve results of the emission test for its diesel engines, Volkswagen allegedly installed software to adjust NO_x output during testing. In these situations, individuals may behave differently in terms of ethical decision-making because their unethical behaviors may lead to benefiting their organizations as a whole rather than solely reaping personal rewards (Thau et al., 2015). Limited research has focused on the differences in ethical behavioral patterns when individual and organizational benefits are both present (c.f., Gino and Pierce, 2009; Umphress et al., 2010; Wiltermuth, 2011). In addition, little is known about how supply chain managers behave when certain unethical behaviors may benefit both the organization and themselves as individuals.

It is natural to consider ethical decision-making in supply chain management as a situation where both individual and organizational benefits may be involved. Supply chain related unethical behaviors by individuals are sometimes driven by the goal of obtaining benefits for the organization. For example, the tragic accident of a building collapse in Bangladesh in 2013 was connected to some of the major fashion retailers in the U.S. (Jacobs and Singhal, 2017). These firms were accused of being socially irresponsible as they failed to consider the safety conditions of the employees at their supplier companies. Instead, they adopted aggressive pricing strategies and short production deadlines for their suppliers in order to reduce procurement costs. In another example, an internal inspection by the U.S. Securities and Exchange Commission (SEC) showed that an Apple salesman convinced SEC personnel to procure a data storage solution from a specific

supplier, without looking into alternative options. During the process, SEC employees who were in charge of procurement operations also improperly shared budget information with the supplier (Hilzenrath, 2011). In these situations, it is likely that both individual and organizational benefits are invoked. On the one hand, the organization can take advantage of such behaviors, which may lead to cost reduction and other benefits at least in the short term. The individuals who exhibit such behaviors, on the other hand, may also benefit due to the incentive alignment mechanisms that are typically adopted in organizations. In this case, employees have an incentive to pursue benefits for their organization, knowing that such behaviors will likely be rewarded by the organization in the future via positive reciprocity in various forms. Compared to the well-investigated context where only individual benefits are involved in ethical decision-making, it remains unclear how individuals will behave when engaging in certain unethical behavior that may result in both individual and organizational benefits.

Overall, limited research has investigated ethical decision-making specifically in the context of supply chain management where business considerations are evoked. The extant studies are largely found in the psychology literature where behavioral experiments are typically employed. Such experiments, however, do not consider contextual factors involved in business decision-making. As mentioned above, ethical decision-making can be different in the context of supply chain management because both individual and organizational motives (i.e., personal benefits vis-à-vis organizational performance) are considered. Little is known about how individuals behave under ethical considerations when potential unethical behaviors may lead to both individual and organizational benefits in a business environment. My dissertation research seeks to partially bridge this gap in the extant literature by closely examining ethical decision-making in the context of supply chain management. My studies account for the fact that many ethics-related decisions in supply chain management engender both individual and organizational benefits simultaneously.

1.3 Overview of Dissertation Research

Overall, my dissertation research seeks to provide a comprehensive characterization of how individuals behave when facing supply chain decisions that invoke ethical considerations. In addition

to focusing on testing the effect of specific dispositional/situational factors on an ethical decision-making process, I seek to contribute to the extant literature mainly by developing two theoretical lenses that examine the ethical decision-making process. More specifically, my dissertation research formally conceptualizes and explores two dimensions involved in ethical decision-making processes, namely the magnitude dimension and the time/longitudinal dimension. Together, my research seeks to answer two overarching questions in the study of ethics in supply chain management: (1) How do individuals determine the magnitude of their unethical supply chain behaviors? and (2) How do individuals engage in unethical supply chain behaviors over time? In this way, the magnitude dimension and the time dimension of the ethical decision-making process may serve as new theoretical lenses that potentially assist future research in further examining how supply chain managers behave when ethical considerations are invoked.

In the first essay (Chapter 2), I formally examine the magnitude dimension of the ethical decision-making process. I seek to answer the general question of how an individual determines the magnitude of his/her unethical behavior in supply chain management decisions. I propose a framework where the magnitude of unethical behavior is conceptualized as a spectrum. The magnitude of unethical behavior is simultaneously affected by two opposing forces, namely maintaining an ethical self-concept and attaining more benefits. Individuals are motivated to behave ethically in order to maintain an ethical self-concept. However, they are also induced to engage in unethical behaviors when doing so will result in certain benefits. When both forces are salient in the decision-making process, an individual may reach an equilibrium between the two forces such that he/she will behave unethically (and therefore attain benefits) to a moderate degree, without negatively updating his/her self-concept as an ethical person. I further argue that a reevaluation of that person's self-concept may occur after the magnitude of unethical behavior reaches beyond a threshold. In this situation, an individual may exhibit different behavioral patterns in ethical decision-making before/after such a reevaluation.

Resting on this framework, I conduct an experimental study that simulates a real-life situation where purchasing managers face decisions between adhering to ethical standards and obtaining

economic benefits for both their organization and themselves as individuals. The results suggest that the magnitude of unethical behavior is indeed affected by the two opposing forces (i.e., maintaining an ethical self-concept and attaining benefits). In addition, individuals exhibit different behavioral patterns when the increase in the magnitude of unethical behavior appears to trigger a reevaluation of their self-concept as an ethical person. My empirical analyses suggest that individuals tend to behave unethically to a lesser extent when their decision would result in adverse consequences to others. However, they may escalate the magnitude of unethical behavior when other organizational members would benefit from the unethical decision. These effects may vary, however, before/after an individual has reevaluated his/her self-concept as ethical persons.

The second essay (Chapter 3) of my dissertation focuses on the time dimension of the ethical decision-making process. I expand my investigation on ethical decision-making in supply chain management and examine the dynamics between consecutive decisions that involve ethical considerations. Instead of taking a static perspective of examining ethical decision-making in supply chain management, this study seeks to take into account the inter-temporal dimension when modeling the ethical decision-making process via a longitudinal study of behaviors. Drawing on the prior literature, I propose that an individual's current decision is influenced by prior decisions in two opposing ways. On the one hand, the theory of moral consistency suggests that individuals have a tendency to behave ethically/unethically in a consistent manner. In this case, when an individual engages in ethical/unethical behaviors in the past, he/she will be more likely to exhibit similar behaviors in a subsequent decision. On the other hand, moral balancing suggests that individuals are sometimes driven toward the opposite of their previous actions. When the previous action is ethical, an individual may feel entitled to engage subsequently in unethical behavior (moral licensing). If the previous behavior is unethical, an individual may behave ethically when the next opportunity arises because he/she will feel obligated to maintain an ethical self (moral cleansing).

To empirically examine these dynamic behavioral patterns in ethical decision-making, I conduct a longitudinal study that spans a total of 12 weeks. In doing so, I observe consecutive decision outcomes of an individual's ethical decision-making process. My empirical analyses suggest that

ethics dynamics can be examined from three distinct yet interrelated perspectives, namely (1) the overall tendency of engaging in ethical/unethical behaviors, (2) the consistency/inconsistency in the behavioral pattern, and (3) the likelihood of an individual switching to an unethical behavior after behaving ethically in the past. Finally, this study suggests that firms can rely on ethics education as an effective managerial lever in promoting not only ethical conduct but also consistency in individual's ethical decision-making behaviors in supply chain management.

In Chapter 4, I provide an overall discussion about my dissertation research as well as discuss a common theme that emerged from my empirical findings. More specifically, I demonstrate that two general mentalities may exist in an individual's ethical decision-making in supply chain management. Individuals who adopt an *ethical mentality* tend to focus mainly on upholding ethical standards and therefore behave more ethically and consistently. When adopting a *situational mentality*, however, individuals tend to approach decision-making based more on the potential benefits that can emerge from engaging in unethical behaviors. In this situation, they may be more likely to engage in unethical behaviors. Resting on this finding, I describe an approach that potentially promotes ethical practice in supply chain management. I posit that the efficacy of three commonly adopted managerial levers that promote ethical practice (i.e., ethical surveillance, ethical sanctions, and formal communication) may vary, depending on the dominant mentality an individual adopts in making supply chain related decisions. Thus, firms should focus resources on the appropriate managerial lever(s) that is most apposite and thus effective to their employees in order to promote ethical conduct in supply chain management.

In summary, I focus my dissertation research on closely examining ethical decision-making in the context of supply chain management. I develop specialized statistical models to investigate important ethical behavioral patterns (in terms of the magnitude of unethical behavior and the dynamics in ethical decision-making process) as well as the role of individual differences and managerial levers in such decision-making processes. I then move beyond descriptive approaches and present a prescriptive approach that assists firms in promoting ethical practice in supply chain management.

2. BOUNDEDNESS AND COMPLEXITY IN ETHICAL PURCHASING DECISIONS

2.1 Introduction

Ethical concerns in business practice have received considerable attention in recent years. According to the Association of Certified Fraud Examiners, a typical organization loses 5% of revenues in a given year because of fraud, resulting in a projected annual total fraud loss of up to $3.7 trillion worldwide. Ethical failures seriously threaten a firm's financial stability as the financial losses caused by each case of fraudulent practice often exceeds $1 million (ACFE, 2016). Larger scandals, however, may lead to even more catastrophic consequences to the firms. Once-massive firms such as Enron and Worldcom eventually collapsed after corporate scandals because of the severe pressure imposed by regulators, investors, and the public.

Ethical considerations are especially salient in the context of supply chain management. In fact, it is estimated that about 30% of unethical conduct within a firm are related to supply chain operations (ACFE, 2016). Firms generally have similar views of ethical/unethical behaviors in supply chain practices (Carter, 2000). Maintaining an ethical image has become imperative for firms today when interacting with supply chain partners as firms connected in the supply chain may suffer from the spillover effect associated with unethical behavior. The entire supply chain could sustain severe losses because consumers may not differentiate between members in the supply chain who acted ethically or unethically or may have difficulty in apportioning blame (Hartmann and Moeller, 2014).

This study focuses on ethical decision-making in supply management, a critical activity in supply chain management. According to Dobler and Burt (2002), the behavior of individuals in the purchasing department of a firm is important because it plays a boundary-spanning role and represents how the firm interacts with suppliers and other organizations. Given the fact that purchasing is typically a major cost center, and often the entity that spends most of the cost of goods sold within an organization, the amount of financial interest involved can often induce unethical

conduct (Fearon and Leenders, 1993). Accordingly, the economic, social, and legal consequences of unethical behaviors in purchasing management can be substantial (Carter, 2000). As unethical conduct can be largely attributed to individual behaviors within organizations (Treviño, 1986), this study focuses on individual decision-makers as the unit of analysis and investigates ethical decision-making in supply management from a behavioral perspective.

As more and more firms strive to encourage organizational members to maintain a high ethical standard in supply management, it becomes imperative to understand the underlying mechanisms behind ethical/unethical behaviors. The extant literature focuses on responding to the question of when and why an individual behaves ethically or unethically. A diverse number of factors have been shown to affect such decisions in organizational contexts. For example, situational factors such as the intensity of unethical behavior (Singhapakdi et al., 1996), ethical climate in the organization (Pierce and Snyder, 2008), and organizational goal orientation (Schweitzer et al., 2004), among many other factors, have been demonstrated to influence individual ethical behaviors. Some managerial levers such as promoting formal ethical infrastructure (Rottig et al., 2011), ethical leadership, and organizational citizenship behavior (OCB) were found to yield significant impact on ethical decision-making as well (Rottig et al., 2011; Brown and Trevino, 2006; Turnipseed, 2002).

An equally important, yet often overlooked, question regarding ethical decision-making is why and how an individual chooses to behave unethically but only to a certain level. In other words, what explains how far someone would go once he/she decides to act unethically? The existing studies often focus on explaining under what circumstance(s) an individual will behave ethically/unethically and treat the response variable as binary. A common implicit simplification in the extant studies is that unethical decisions are of the same magnitude or consequence. Whether an individual acting unethically, for instance, profits $100 or $100,000 is considered an unethical action and no attempt is typically made to distinguish what variables may explicate the magnitude or level of unethical behavior. Little attention has been paid to theoretically examine the factors that affect the magnitude of an unethical decision. However, research by Mazar et al. (2008) argues that, when behaving unethically, individuals do not necessarily pursue the most extreme unethical

decision in exchange for the maximum benefit that can be reaped by an unethical decision. Instead, individuals often behave unethically only to a certain extent in order to maintain their positive self-concept because they perceive themselves as ethical persons. The work of Mazar et al. suggests that there exists heterogeneity in the magnitude of unethical behavior, which has not been theoretically or empirically examined in the extant literature.

From a practical standpoint, the heterogeneity in the magnitude of unethical behavior plays an important role in various business settings including supply management. For instance, the OECD (2014) reports that, between 1999 and 2014, more than half of foreign bribery cases reported by 17 countries occurred in public procurement contracts. The monetary value of bribery, however, ranged from a trivial amount of $13 to an astonishing amount of $1.4 billion. The amount of bribery was typically smaller than 5% of the transaction value involved in the incidents. Nevertheless, the bribery amount exceeded 25% of the transaction value in about 15% of the reported cases. In supply management, an increase in the magnitude of unethical behavior can lead to substantially more severe consequences due to the large quantities of goods that are purchased and the fairly substantive monetary value involved in purchasing transactions (Carter, 2000). In this sense, an individual-level unethical behavior could lead to consequences of a much larger scale as the individual engages in such a behavior on behalf of the firm. It is therefore of both theoretical and practical interest to understand how the magnitude of unethical behavior an individual pursues is determined, and how the decision-making process is affected by various factors found in business settings.

While the construct of moral intensity, a very well established variable in the domain of ethics, can potentially serve as an explanatory variable for explaining variation in the level or magnitude of unethical behavior, there are several conceptual challenges that may limit its efficacy. Moral intensity can be interpreted as the degree of benefit (or harm) associated with an unethical action (Jones, 1991). I argue in Section 2.2.2 that a framework that relies on the concept of moral intensity potentially suffers from several limitations. The section presents a critical review of the concept of moral intensity and discounts its utility when explaining the magnitude of unethical behavior.

First, moral intensity in the extant literature is treated as a characteristic of a *given* action (i.e., a situational factor). Thus, it may be problematic to rely on moral intensity in explaining the magnitude of unethical behavior because moral intensity can no longer be treated as a situational factor outside of the decision-making process. Second, moral intensity is construed as a unidirectional construct that describes the potential consequence/implication of an unethical behavior. As a result, a framework that relies on moral intensity cannot explain the situations where an individual chooses to behave unethically only to a moderate degree and does thus not maximize/minimize the corresponding level of moral intensity. Third, a framework based on moral intensity cannot account for the situations where an individual exhibits multiple behavioral patterns, depending on the substantive meaning of the decision implied by the magnitude of unethical behavior under consideration.

To address these limitations, a different framework regarding the magnitude of unethical behavior is proposed in Section 2.2.3. The framework postulates that the magnitude of unethical behavior is simultaneously driven by two opposing forces, namely maintaining an ethical self-concept and maximizing economic benefit. The framework also affords multiple behavioral patterns in the decision-making process, each corresponding to certain decisions with similar substantive meanings. More specifically, individuals may follow the same behavioral pattern only when the change in the magnitude of unethical behavior does not trigger a reevaluation of his/her self-concept as an ethical person. Three propositions can be generated from the framework. First, multiple behavioral patterns may be observed in the decision-making process that determines the magnitude of unethical behavior. Second, the entire spectrum of the magnitude of unethical behavior can be usefully observed in the decision-making process. For instance, individuals may choose to behave unethically only to a moderate degree such that the magnitude of unethical behavior is neither absolutely maximized nor minimized. Third, the magnitude of unethical behavior can be driven simultaneously by two forces, namely maintaining an ethical self-concept and maximizing (economic) benefit. These propositions can later be examined empirically in Section 2.4.3 to probe the efficacy of the proposed framework in explaining how the magnitude of unethical behavior is

determined in one's decision-making process.

Following the construction of the framework, I demonstrate in Section 2.2.4 that the proposed framework can serve as a useful medium in examining how the magnitude of unethical behavior is affected by different dispositional or situational factors during the ethical decision-making process. More specifically, the effect of a certain factor on the magnitude of unethical behavior can be conceptualized as either a driving force of maintaining an ethical self-concept or a driving force of maximizing benefit. In addition, the efficacy of a given factor may vary, depending on the substantive meaning of the decision. To demonstrate the utility of the framework, I examine the effect of two factors, namely the expected severity of (negative) consequence of an unethical behavior and the incentive scheme about who benefits from an unethical behavior (individual or group). I hypothesize that an individual tends to decrease the magnitude of unethical behavior when the consequence of an unethical behavior is higher but increase the magnitude when the benefit of unethical behavior is shared within the organization. However, as will be discussed in Section 2.4.4, it remains to be empirically examined how these hypothesized effects would vary in the decision-making process, depending on the substantive meaning of the decision under consideration.

To empirically examine the conceptual framework, I conduct a behavioral experiment study where participants are asked to make a supply management (i.e., sourcing) decision where ethical considerations are invoked. This scenario-based experimental design simulates a real-life situation so that it allows me to investigate an individual's behavioral patterns in a business setting. The experiment is specifically designed such that a spectrum of the magnitude of unethical behavior can be observed. To facilitate empirical analyses, a specialized statistical model is formulated to structurally capture the unique characteristics specified in the conceptual framework.

The empirical analyses in this study demonstrate that individuals indeed exhibit large heterogeneity in their behavioral patterns. As predicted by the extant literature, I observe both types of decisions (ethical and unethical decisions) given the decision-making scenario. More importantly, the reported magnitude of unethical behavior itself is largely heterogeneous as well. The results demonstrate large variance in the reported magnitude of unethical behavior and the respective eco-

nomic consequences. The results also suggest that individuals exhibit varying behavioral patterns as the magnitude of unethical behavior indicates a reevaluation of an individual's self-concept as an ethical person. I found that individual characteristics and situational factors may have a significant impact on ethical decision-making but only for certain types of decisions. For instance, certain factors, such as gender, may merely affect an individual's decision when considering to behave ethically or unethically. However, those same factors may not influence or explain his/her decision to opt for a specific magnitude of unethical behavior. Such results provide important implications to supply management practitioners. More specifically, preventing/averting unethical conduct altogether and reducing the magnitude of unethical behavior can sometimes call for very different managerial approaches and demand perhaps different coping mechanisms. Finally, I examine the effect of two important situational factors on the magnitude of unethical behavior. The results demonstrate that individuals tend to engage in an unethical behavior with a lesser magnitude when their decision will result in adverse consequences to others. Nevertheless, the magnitude of unethical behavior tends to increase if an individual's unethical decision benefits not only himself/herself but also other organizational members.

The rest of this chapter is organized as follows. The next section presents the framework describing the magnitude of unethical behavior and its theoretical background. Section 2.3 describes the setting of the experimental study. I then present the empirical analyses in Section 2.4. Additional studies are discussed in Section 2.5. The major insights of this research are discussed in detail in Section 2.6.

2.2 Theorizing on the Magnitude of Unethical Behavior

2.2.1 Moral Intensity and the Magnitude of Unethical Behavior

The overarching goal of this research is to examine an individual's decision-making behavior in terms of the magnitude of unethical behavior. The existing research on ethical decision-making mostly focuses on identifying mechanisms where a decision is made and how individual and environmental factors impress such a process (Loe et al., 2000). Much of this body of literature can

be summarized according to the model proposed by Rest (1986). In this influential framework, an individual's decision-making process when ethical considerations are invoked can be conceptualized as a four-stage process. This framework asserts that an individual first needs to recognize that the decision invokes ethical considerations (Moral Awareness). He/she will then make a judgment about the present issue (Moral Judgment) and subsequently will form the intent regarding undertaking a particular decision (Moral Intention). Finally, the individual will take action resting, to some degree, on the intent formed in the previous stage (Moral Behavior).

Subsequent research often explicitly or implicitly builds upon this four-stage framework (Craft, 2013; Lehnert et al., 2015). Although Rest's framework is rather old (i.e., dates to 1986), the extant literature has been preoccupied with identifying factors that affect each of the four stages. According to Lehnert et al. (2015), researchers have studied various individual and organizational factors in different stages of decision-making. For example, ethical sensitivity, cognitive moral development, gender, and education may explain an individual's ability to recognize a moral action in a situation. Age, cognitive moral development, gender, peers, and personal values may play important explanatory roles for moral judgment. Cultural values, emotions, and personality are perhaps strong factors when forming an ethical intent. When engaging in actual behaviors, individuals may be influenced by factors including age, cultural values, gender, personality, and rewards. Many of the factors identified in the literature may exert an impact across multiple stages of the decision-making process.

Despite the substantial effort in understanding ethical decision-making, there is scarcity in research that examines the factors that explain the magnitude of unethical behavior during one's decision-making process. In other words, what factors affect how far an individual will go when engaging in unethical behaviors? A relevant stream of research suggests that the concept of moral intensity is important in modeling an individual's decision-making process. In his seminal work, Jones (1991) argues that researchers should take into account the characteristics of the ethical issue itself when examining ethical decision-making. A model that does not consider the characteristics of the present issue as an independent variable will naturally imply that the decision-making

process of individuals will be identical for all issues invoking morality or ethicality. Thus, an issue-contingent model of ethical decision-making is necessary where individuals are assumed to behave differently, depending on the characteristics of the issues under consideration.

To incorporate the issue-specific contingencies in an individual's decision-making process, Jones (1991) proposed the concept of moral intensity, which captures "the extent of issue-related moral imperative in a situation" (Jones, 1991, p.372). Moral intensity characterizes an ethics-related issue with six dimensions, namely the magnitude of consequences, social consensus, probability of effect, temporal immediacy, proximity, and concentration of effect. Essentially, moral intensity measures the impact of a particular behavior based on time, proximity, and level of repercussion (either positive or negative) (Lehnert et al., 2015). Among these dimensions, the magnitude of consequences is defined as "the sum of the harms (or benefits) done to victims (or beneficiaries) of the moral act in question" (Jones, 1991, p.374). Social consensus is defined as the degree of social agreement about whether a particular act is evil/good. The probability of effect of an action consists of the probability of it actually taking place and the probability of it causing harm/benefit. The temporal immediacy dimension measures the length of time until the consequences of a particular action are felt. The feeling of nearness (social, cultural, psychological, or physical) between the individual and the victims/beneficiaries of the action is captured by the proximity dimension. Lastly, the concentration of effect of an action reflects the number of people affected by the prospective consequence.

Together, these six dimensions describe the nature of a particular issue an individual faces in terms of ethical considerations. Many studies have shown that moral intensity has a strong impact on an individual's decision-making. The findings in the literature consistently show that there is a negative relationship between moral intensity and the likelihood of engaging in unethical behavior (Kish-Gephart et al., 2010). In fact, moral intensity has been found to serve as a strong predictor in all four stages in Rest's model (see, for example, Frey, 2000).

It seems on first glance that the magnitude of unethical behavior is but the magnitude of the consequence dimension of moral intensity but under a different label. By definition, the magnitude

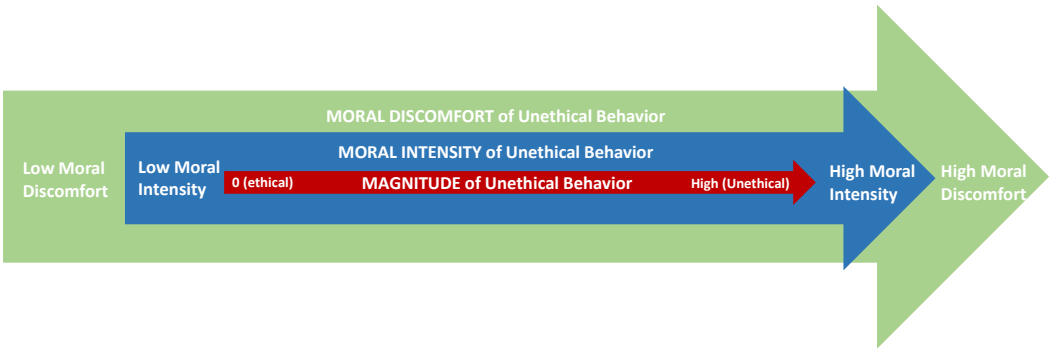
of consequence measures how much harm (or benefit) does a particular action cause to the victim (or beneficiary). In most cases, the magnitude of the consequence increases with the magnitude of one's unethical behavior because it normally causes more harm to the victim and/or more benefit to the individual who conducted such behavior. Therefore, an intuitive way to conceptually represent the magnitude of unethical behavior is to focus on moral intensity (specifically, the magnitude of consequence dimension).

The heterogeneity in the magnitude of unethical behavior exhibited by different individuals can be attributed to the disparate levels of "moral discomfort" engendered by the moral intensity of the situation. According to the definition in Jones (1991), moral intensity refers to a characteristic of the issue itself rather than how an individual perceives it. The same level of moral intensity may result in disparate responses across individuals. Moreover, individuals may react differently to moral intensity levels at different times under different circumstances (Singhapakdi et al., 1999). Conceptually, moral discomfort describes the level of the actual impact of a decision on the decision-maker. Thus, the moral intensity implied in a decision engenders moral discomfort imposed on the decision maker in the given situation. Moral intensity generally increases with the magnitude of unethical behavior. Accordingly, individuals generally experience a higher level of moral discomfort when the moral intensity involved in a particular decision is higher (Frey, 2000).

The conceptual model demonstrated in Figure 2.1 suggests that the magnitude of unethical behavior varies in parallel with the level of moral intensity of the matter and the corresponding moral discomfort an individual experiences during the decision-making process. According to this theorization, the moral discomfort an individual experiences is very low (or even zero) when he/she chooses to behave ethically since the moral intensity is extremely low in this situation. The moral intensity increases by a small degree when the individual chooses to be only slightly unethical. The moral discomfort he/she experiences in this situation is relatively low as well. However, moral intensity continues to increase with the magnitude of unethical behavior such that the individual will experience a high level of moral discomfort when he/she behaves very unethically. In this way, the model implies that individuals are less likely to behave very unethically

(as opposed to slightly unethically) when the moral discomfort resulting from moral intensity is higher. This theoretical prediction aligns with many existing studies, which suggest that moral intensity is negatively correlated with unethical behaviors (Frey, 2000; Leitsch, 2004; Karacaer et al., 2009; Valentine and Bateman, 2011).

Figure 2.1: The Magnitude of Unethical Behavior as a Reflection of Moral Intensity



The model presented above can be seen as a parsimonious framework for conceptualizing an individual's ethical decision-making process, and specifically, in determining the magnitude of his/her unethical behavior. The framework reflects the fact that the magnitude of unethical behavior generally corresponds to the moral intensity implied in the decision and hence the moral discomfort experienced by the decision maker. Grounded on the theoretical work in moral intensity (Jones, 1991), the model predicts that an individual is less likely to engage in very unethical behaviors in order to avoid experiencing high levels of moral discomfort. From this perspective, it seems that moral intensity is a suitable theoretical foundation to examine the magnitude aspect in ethical decision-making. Nevertheless, a closer examination of this framework reveals that the existing research on moral intensity has several limitations, which need to be further addressed.

2.2.2 Limitations of the Extant Framework

A framework such as Figure 2.1 that builds on moral intensity as a theoretical foundation mainly suffers from three limitations in explaining the decision-making process that determines

the magnitude of unethical behavior. First, the framework follows a strong assumption that the moral intensity involved in an individual's decision is given *a priori* and does not vary when different magnitudes of unethical behavior are considered. Second, the framework focuses only on moral intensity and does not consider other forces (such as the prospective economic reward) that can potentially affect the magnitude of unethical behavior. Third, such a framework implicitly assumes that an individual follows the same behavioral pattern as the magnitude of his/her unethical behavior changes. In other words, the framework assumes that individuals will evaluate their decisions in the same manner regardless of how trivial/significant their unethical decisions are. Overlooking these limitations could lead to substantial flaws in theorizing about drivers and consequences of the magnitude of unethical behavior.

2.2.2.1 Moral Intensity and the Magnitude of Unethical Behavior

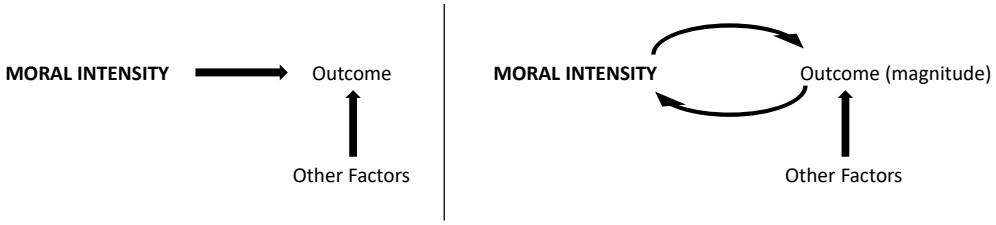
The first major drawback of relying on moral intensity is that the extant theory cannot explain why an individual chooses to engage in an unethical behavior of a particular magnitude (and hence experiences a certain level of moral discomfort). As discussed previously, the main goal of this study is to develop a framework that theoretically and empirically represents the ethical decision-making process, which determines the magnitude of unethical behavior an individual engages in. To respond to this research question, one has to conceptually treat the magnitude of unethical behavior as the outcome of such a mental process. Moral intensity, however, is conceptualized as a situational factor that essentially explains the extent of moral imperative related to a particular behavior. In this way, it represents the characteristics of a *given* action where ethical considerations are invoked (Jones, 1991; Kish-Gephart et al., 2010).

Although subtle, this difference in conceptualization may severely limit the efficacy of moral intensity theories in explaining how the magnitude of unethical behavior is determined. The central notion of moral intensity is that the nature of a given action will affect an individual's ethical decision-making process. In the respective empirical studies, research subjects are typically given an ethical decision-making situation where the level of moral intensity is manipulated by the study design. The moral intensity of a decision is therefore treated as an "independent variable" in the

models and analyses (e.g., Cole, 2009; Miyazaki, 2009; Church et al., 2005; Curtis, 2006). The common theme in the literature is to examine the effect of moral intensity on a focal construct. For example, Lysonski and Durvasula (2008) study the relationship between moral intensity and fear of consequences. Steenhaut and Kenhove (2006) show that moral intensity is associated with guilt. Moreover, moral intensity has been shown to relate to the perceived risks of engaging in certain behaviors (de Matos et al., 2007).

This use of moral intensity, as a characteristic of an action and hence a situational factor in the model, implies that the nature of a particular action is given *prior to* when the decision is made. When studying how the magnitude of unethical behavior is determined, however, one needs to conceptualize the magnitude as the outcome of the decision-making process. Thus, the moral intensity emanating from the decision context cannot be treated as given because it varies according to the magnitude of the decision. In other words, moral intensity can be *endogenously* determined when an individual chooses a certain magnitude of unethical behavior. Consider for instance a decision making situation that involves constructing a manufacturing plant where there are two choices: (1) build a plant that is expensive but environmentally friendly, and (2) build a plant that is not expensive but can cause cancer to nearby inhabitants in the long term. The moral intensity of the decision can be established on the aftermath of making a specific choice. The moral intensity associated with choice 1 would be fairly low while the moral intensity attached to choice 2 would be rather high.

Figure 2.2: Moral Intensity and the Magnitude of Unethical Behavior



As depicted on the left panel of Figure 2.2, moral intensity is usually considered as a characteristic of a given situation. Together with other factors, it may affect the outcome of ethical decision-making. The right panel of the figure depicts the situation where the magnitude of unethical behavior is considered. As in the previous case, the moral intensity of a decision again affects the decision-making process. However, as one evaluates the magnitude of the unethical behavior, the corresponding moral intensity (and hence the moral discomfort) involved in decision-making will be likely to change as well. For example, an employee at a grocery store may consider stealing money from the cash register. The moral intensity involved in this decision reflects how he/she views the matter from an ethical standpoint and thus affects his/her decision. As he/she considers how much money to steal, however, the moral intensity implied in stealing $5 vs. $200 will be very different. It is natural to assume that the level of moral intensity involved in stealing $5 is lower than that in stealing $200.

As a result, it may be problematic to rely on moral intensity in conceptualizing the magnitude of unethical behavior. If assuming that the magnitude of unethical behavior does not affect the corresponding moral intensity, the model presented in Figure 2.1 would be sufficient - the magnitude of unethical behavior will be driven by the level of moral intensity (specifically, the magnitude of consequence) of the situation. An individual will choose to behave in a particular manner in terms of magnitude based on the level of moral intensity he/she chooses to evoke and the corresponding level of moral discomfort he/she will experience. Nevertheless, this theoretical framework will become convoluted when taking into account the interaction between the magnitude of unethical behavior and the corresponding moral intensity it implies. Moral intensity is not given in one's decision-making process, nor does it determine the magnitude of the behavior. Instead, individuals may constantly evaluate the moral intensity he/she would provoke as the magnitude of unethical behavior is considered.

2.2.2.2 Two Driving Forces of the Magnitude of Unethical Behavior

The second limitation of research focusing only on moral intensity is that it does not explicitly account for the consequences of unethical behaviors from both sides of the matter (i.e., both the

benefit and harm resulting from an unethical behavior). As a result, moral intensity cannot describe the entire spectrum of individuals' decision-making in terms of the magnitude of unethical behavior. In his definition, Jones (1991) does allow the magnitude of consequence to be interpreted as either the harm or benefits to the victims or beneficiaries. However, the existing theoretical frameworks do not make a clear distinction between the upside (benefit to the decision maker) and the downside (harm to the victim) when engaging in an unethical behavior. When studying the magnitude of unethical behavior, such a simplifying approach will again cause convolutions in theoretical reasoning. Consider a situation where an individual determines the magnitude of unethical behavior. When interpreting moral intensity more as the harm that would be imposed on the victim, the model would predict that the decision maker should choose to engage in less unethical behavior. When moral intensity is interpreted more as the benefit the decision maker could harness, the existing theories would predict that he/she will engage in unethical behavior of a greater magnitude.

Without differentiating between the upside and the downside involved in a decision, a model that focuses on only moral intensity as the driving factor will always create *unidirectional* predictions about the magnitude of unethical behavior. In other words, such a model will predict that an individual will choose only between a decision with the smallest possible magnitude of "unethicality" (i.e., minimum harm to the victim) and another decision with the largest possible magnitude (i.e., maximum benefit to the decision maker). In reality, however, individuals do not always opt for a magnitude of unethical behavior that maximizes or minimizes the implied moral intensity. They often choose to behave unethically but only to a moderate degree (Mazar et al., 2008). Therefore, rather than focusing on moral intensity as a sole driving force of the magnitude of unethical behavior, a more refined research model should consider two separate driving forces that jointly determine the magnitude of unethical behavior. These two driving forces may affect the magnitude of unethical behavior but in an opposite manner. The first driving force induces an individual to behave more unethically to achieve greater benefit. The second driving force, however, induces the individual to behave less unethically to reduce the harm caused by his/her action.

Both the upside and the downside involved in an unethical decision should be taken into account simultaneously when predicting the magnitude of unethical behavior.

2.2.2.3 Discontinuity in the Magnitude of Unethical Behavior

The third limitation of the extant framework is that it often leads to an oversimplified empirical treatment of the magnitude of unethical behavior. Such oversimplification occurs because the framework does not incorporate the fact that the substantive meaning of one's unethical decision can change dramatically when he/she chooses to act unethically to a different magnitude. As a result, the extant framework cannot properly examine situations where individuals may exhibit different behavioral patterns, depending on the magnitude of their unethical behavior.

The extant research typically operationalizes the outcome of unethical decisions in two ways. Many studies conceptualize and operationalize the outcome as a binary variable (e.g., Wang and Murnighan, 2017; Gino and Pierce, 2010; Mann et al., 2014). In other words, an individual behaves either ethically or unethically. Other studies treat the outcomes as an ordinary continuous variable (e.g., Gino et al., 2013; Effron et al., 2015; Welsh and Ordóñez, 2015). For example, a typical approach to measure ethicality in experimental research is to ask subjects to self-report the frequency of a certain number of tasks they performed correctly. Subjects have an incentive to overstate the number of tasks performed correctly compared to what they actually achieved since the promised reward is proportional to the score.

A major drawback of such approaches is that they make strong assumptions when comparing the impact of different outcomes. On the one hand, researchers can only distinguish between acting ethically and unethically when considering outcomes as binary variables. There is no productive way to take into account the extent to which a person chooses to behave ethically or unethically. On the other hand, treating the outcome as a continuous variable assumes that each incremental unit of unethical behavior corresponds to the same level of impact. This treatment, however, may be oversimplifying in some circumstances. Consider a hypothetical scenario where a person reaps financial benefits from 0 to 100 if acting unethically. In this case, an outcome of 0 will imply that the person chooses to behave completely ethically. A score of 100 would mean that the person

chooses to act unethically as much as possible. Although intuitive and easy to implement, such a continuous measure assigns equal psychological weights to any number within the spectrum. However, one may argue that the psychological implications of switching from ethical to unethical behavior are different from those when individuals choose to extend their unethical behavior to a greater magnitude. In other words, switching from a score of 0 to 1 can yield fundamentally different implications than switching from a score of 10 to 11. In the former case, switching from a score of 0 to 1 has much more substantial meaning as it suggests that the decision maker switched from being entirely ethical to now being slightly unethical. Opting to act ethically may imply that the force that drives the decision to the ethical side of the spectrum is so compelling that it overshadows the forces that pull the decision to the unethical side. In this situation, a marginal increase in the potential rewards that can be attained will not suffice to drive the individual to change his/her behavior from acting ethically to acting unethically. Opting to behave a little unethically, however, implies that an individual is already comfortable of sustaining some psychological costs for the sake of obtaining some benefits. Pursuing some more rewards (e.g., switching from a score of 10 to 11) can still be acceptable as long as an individual does not have to reevaluate his/her moral self. In this sense, the potential stimulation/benefit of unethical behavior needs to be much higher to drive an individual's decision from 0 to 1 than from 10 to 11.

Taken together, the underlying mechanism that induces the change from ethical behavior to unethical behavior (i.e., the magnitude of unethical behavior changes from 0 to 1) can be different from the one that determines the magnitude of unethical behavior at other levels. Many of the extant studies indeed examine these two issues separately. For example, the (ethical) self-regulation failure literature typically focuses on the switching point between ethical behaviors and unethical behaviors (Baumeister and Heatherton, 1996). According to this literature, individuals maintain a consistent behavioral pattern through self-regulation. The process of self-regulation, however, requires mental resources and therefore is subject to failure, making some unethical behaviors and subsequent benefits more tolerable. The magnitude of unethical behavior, as noted above, can be conceptualized as the product of two opposing forces interacting with each other. The change

in the mechanisms behind decisions of different substantive meanings would result in a discrete "step" in the magnitude of unethical behavior. In other words, an unethical behavior of magnitude 1 may not be treated simply as an escalation from a decision of magnitude 0 because they are substantively different. The differences between a decision score of 3 and 4 or 10 and 11, however, can be immaterial because there is no step in between - the two decisions are substantively indifferent. In the latter cases, the magnitude of unethical behavior can be seen as continuous when comparing two substantively indifferent decision outcomes.

From a practical perspective, a more appropriate measure for the magnitude of unethical behavior should be neither a binary variable nor a purely continuous variable. Instead, the magnitude of unethical behavior should be conceptualized as a mixture of discrete and continuous parts. The continuous components reflect the gradual, substantively indifferent changes in the magnitude of unethical behavior. The discrete parts, however, are also necessary in order to represent the situations when a change in the magnitude of unethical behavior results in a new type of decision with substantively different meanings.

It is also important to note that multiple decision "steps" may be present in certain situations because the nature of these decisions become different as the magnitude of unethical behavior continues to increase. Consider a related example. A person who stole from his/her workplace could be charged with either misdemeanor theft or felony theft, depending on the value of the property involved in the crime. Three types of decisions with distinctive substantive meanings are implied in this example. When the individual chooses not to steal money (magnitude of behavior $= 0$), the substantive meaning of his/her action is "ethical". When he/she chooses to steal a small amount of money below a certain threshold (e.g., $500), his/her action is defined as unethical and it constitutes a misdemeanor theft. When the magnitude of the behavior is above the threshold, the substantive meaning of the decision is again changed and now implies that his/her behavior is unethical and can be denoted as felony theft.

In summary, a model that considers the magnitude of unethical behavior being driven by moral intensity will result in too many "moving parts" that cannot be captured explicitly. When theo-

retically predicting the magnitude of an individual's unethical behavior, researchers may simply argue that the chosen magnitude will be driven by the underlying moral intensity he/she decides to engender. However, how/why such a level of moral intensity is determined still remains muddled because the decision-making process involves both the upside (benefit) and the downside (harm). In fact, moral intensity itself may not be determined prior to choosing the magnitude because it is inherently established once a specific magnitude is selected. Finally, individuals may go through completely different decision-making processes when the magnitude of unethical behavior implies decisions with different substantive meanings. The extant framework does not incorporate such a fundamental change in an individual's behavioral pattern.

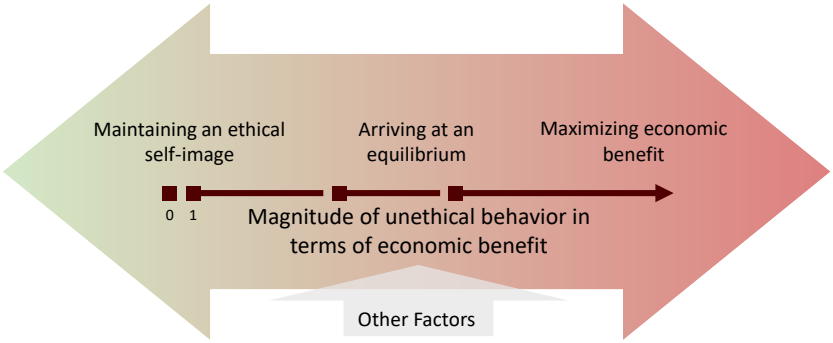
2.2.3 A Bounded and Complex Framework of the Magnitude of Unethical Behavior

As discussed above, moral intensity could be an appealing theoretical foundation because this well-studied construct is closely related to the magnitude aspect of unethical behaviors. However, it might not be theoretically ideal for the present research to rely on moral intensity in explaining how the magnitude of unethical behavior is determined in an ethical decision-making process.

A more refined framework is needed to explain the large heterogeneity in the magnitude of unethical behaviors observed in real life situations. Rather than focusing on moral intensity as an unidirectional construct that can be interpreted as either harm or benefit, the framework depicted in Figure 2.3 suggests that the magnitude of one's unethical behavior is driven by two opposing forces, namely maintaining an ethical self-image and maximizing personal benefit. These two forces together affect the specific magnitude of the unethical behavior an individual chooses to engage in. The level of moral intensity related to a particular magnitude is therefore determined within the decision-making process (i.e., endogenously) rather than exogenously given.

As demonstrated in Figure 2.3, the horizontal axis represents the magnitude of unethical behavior, which is equal to 0 when the behavior is ethical. On the other extreme, the magnitude of an unethical behavior can be maximized on the right-hand side of the spectrum where the benefit is also maximized. The model assumes that, when deciding the magnitude of unethical behavior, individuals tend to start from the position of being ethical and progressively explore decisions that

Figure 2.3: A Model of the Magnitude of Unethical Behavior



invoke higher magnitudes of the unethical behavior. Such an assumption is in line with literature that suggests people tend to conform to ethical norms and behave ethically (Campbell, 1964; Henrich et al., 2001; Hilbig and Zettler, 2009).

The magnitude of unethical behavior mapped on the x-axis in Figure 2.3 should reflect the abrupt changes in the substantive meaning of unethical behaviors in such a way discussed in Section 2.2.2.3. We note that this axis that reflects the magnitude of unethical behavior can be segmented by certain "breakpoints". In this way, the framework takes into account that individuals may exhibit multiple behavioral patterns, depending on the magnitude of their unethical behavior. The observed magnitudes of unethical behavior are therefore bounded within their corresponding behavioral pattern.

In Figure 2.3, the decisions in a particular segment share the same behavioral pattern because they do not differ substantively. Therefore, they can be treated as the outcomes of the same decision-making process. The escalation of the magnitude of unethical behavior around the breakpoints, however, should not be treated as a gradual process. In this situation, the substantive meaning of an unethical decision changes when the magnitude increases beyond a certain threshold (represented by the breakpoints). Accordingly, the observed magnitudes of unethical behavior on the opposite sides of these breakpoints should not be treated as outcomes of the same behavioral pattern. Thus, this framework proposes that the observed magnitudes of unethical behavioral

can be the outcomes of multiple behavioral patterns when they represent decisions with different substantive meanings. In other words, the observed magnitudes of unethical behavior should be grouped and treated separately if they imply different substantive meanings.

Proposition 2.1. *There may exist multiple types of decisions in terms of the magnitude of unethical behavior, each corresponding to a distinctive behavioral pattern.*

As previously discussed in Sections 2.2.2.1 and 2.2.2.2, relying solely on moral intensity may not properly describe the mechanism that determines the magnitude of unethical behavior. The framework depicted in Figure 2.3, however, conceptualizes the observed magnitude of unethical behavior as a product of the interaction between the two opposing forces. The moral intensity is allowed to be endogenously determined during the decision-making process. This model can be advantageous because it is able to explain situations beyond the ones where the magnitude of unethical behavior is only minimized (for the minimum harm to the victim) or maximized (for the maximum benefit to the decision maker). That is, the model also explains situations where the magnitude of unethical behavior is neither 0 nor the maximum. In this fashion, the model in Figure 2.3 incorporates the entire spectrum of ethical/unethical behavior considered in ethical decision-making.

Different schools of thought can be found in the literature that explain the magnitude of unethical behavior. On the one hand, the more traditional perspective in the literature posits that individuals perform an economic analysis when assessing behaviors that evoke ethical considerations. In doing so, they balance the trade-off between expected external benefits and the external costs of acting unethically (Allingham and Sandmo, 1972). The decision is made such that it maximizes the overall utility. For example, when considering whether to rob a gas station store, a person compares the expected amount of gain from undertaking the robbery against the probability of being caught and the magnitude of punishment (Mazar et al., 2008). Overall, the potential benefit resulting from an unethical behavior will drive the magnitude of unethical behavior to the right-hand side of the spectrum in Figure 2.3. On the other hand, the pure economic cost-benefit model will not suffice in explaining every ethical decision. As noted earlier, higher levels of moral inten-

sity are negatively associated with unethical behaviors. In addition to economic considerations, an internal value system regulates individual behavior by inducing psychological rewards for ethical behaviors and moral discomfort or guilt for ethical violations (Mazar et al., 2008). According to Mazar et al. (2008), individuals strive to maintain a positive self-image about how ethical they are. This consideration serves as an opposing or counterbalancing force that drags the magnitude of unethical behavior to the ethical side because unethical behaviors will induce psychological costs that are detrimental to the positive self-concept. As an individual behaves more unethically, such costs will accumulate and eventually reach a threshold where he/she will have to negatively update his/her self-concept. To avoid such situations, individuals may find a compromise between obtaining economic benefits and maintaining self-concept by only behaving unethically at a moderate level. In this fashion, the individuals may reap certain rewards without having to reevaluate their moral selves.

Both approaches described above are relevant in theorizing the magnitude of unethical behavior. One would argue that the pure economic model of ethical behavior seems over-simplistic as it focuses only on external gains/losses and ignores the moral/psychological implications of acting ethically/unethically. However, this model can still be powerful in explaining situations where internal cost/reward considerations are not invoked. The extant literature indeed suggests that individuals do not always invoke ethical considerations. Rather, a moral disengagement mechanism distances individuals from the consequences of their ethical behaviors. In this case, individuals do not incur psychological penalties as moral disengagement suppresses self-regulatory mechanisms, which otherwise prevents individuals from violating ethical values (Shu et al., 2011).

In such situations where an internal reward system is assumed to be inactive, individuals may tend to evaluate ethical decisions based solely on economic consequences. In this case, a standard economic cost-benefit analysis model will suffice in explaining the ethical decisions. In terms of deciding the magnitude of their unethical behaviors, individuals may always have an incentive to pursue the highest magnitude in order to attain maximum benefits, assuming that the risk of being caught and the severity of punishment does not increase with the respective magnitude (c.f.,

Gino and Margolis, 2011). In this case, individuals may opt for the highest possible magnitude of unethical behavior as it usually corresponds to the maximum available benefit.

The psychological process that determines the magnitude of unethical behavior may be different, however, when taking into account the psychological reward/penalty associated with the decision. As noted above, psychological cost serves as an additional force that curtails an individual from acting unethically. The psychological cost of undertaking unethical behavior may increase with the magnitude of unethical behavior. As a result, individuals may choose to act unethically only to a certain degree so that their positive self-image remains unaffected. In doing so, individuals reach an equilibrium between obtaining benefits and maintaining their positive self-concept in terms of being honest (Mazar et al., 2008). Opting for a moderate magnitude of unethical behavior allows individuals to reap some benefits without having to experience severe psychological losses. However, the benefit cannot be excessively heightened to a point where individuals would have to negatively update their view of themselves as being an ethical person.

Proposition 2.2. *The entire spectrum of the magnitude of unethical behavior can be observed in ethical decision-making process. In other words, individuals do not always choose the extreme decisions where they maximize or minimize the magnitude of unethical behavior.*

The model presented in Figure 2.3 can be seen as inherently contingent based upon how the two opposing forces (maintaining an ethical self-image vs. obtaining benefit) play out during the decision-making process. An individual will engage in an ethical behavior when maintaining an ethical self-image is predominant in the decision-making process. In this situation, his/her stand will not be compromised by any amount of a potentially available benefit. In contrast, ethical considerations may not be invoked at all as the individual solely focuses on maximizing the benefit he/she would obtain from an unethical behavior. In the third situation, both forces are salient in the decision-making process, causing the individual to choose an ethical middle-ground that results in a moderate magnitude of unethical behavior (and hence a moderate amount of benefit).

Proposition 2.3. *The observed magnitude of unethical behavior is affected by two driving forces, namely maintaining an ethical self-image and obtaining benefit.*

To summarize, the magnitude of unethical behavior can be conceptualized as the outcome of the interaction between two opposing forces, namely the tendency to maintain an ethical self-image versus the tendency to maximize the acquired benefit. The tendency of maintaining an ethical self-image can sometimes prevail such that the individual will not engage in any unethical behavior. In another situation, ethical considerations may not be triggered and thus the individual will focus solely on maximizing the potential benefit. In other cases, however, individuals can seek to reach an equilibrium between the two forces and engage in unethical behaviors that are of moderate magnitudes. Individuals are assumed to probably start from the ethical side of the action (i.e., to the left of the spectrum) and evaluate their decisions in terms of the magnitude of unethical behavior. It is possible that the substantive nature of the decision changes as the magnitude of unethical behavior escalates, making the spectrum in the model discontinuous at certain critical points.

2.2.4 Factors Influencing the Magnitude of Unethical Behavior

Relying on the framework depicted in Figure 2.3, factors previously identified in the ethical decision-making literature can be conveniently categorized along the two driving forces (i.e., maintaining an ethical self-image and maximizing economic benefit). When examining the effect of various dispositional or situational factors on the ethical decision-making process, the extant literature typically treats them as being positively/negatively associated with unethical behavior. Such general statements, however, may not be sufficient for determining how the magnitude of unethical behavior is affected by these factors. As discussed above, the specific decisions an individual makes can be substantively different when considering the magnitude of unethical behavior. The impact of specific factors on the decision-making process can therefore vary as well, depending on the substantive meaning or implication of the decision. For instance, a factor may have a positive effect on the likelihood of an individual engaging in unethical behavior (as opposed to engaging in ethical behavior). This factor, however, may not necessarily increase the magnitude of unethical behavior once the individual decides to behave unethically. In such situations, it might be inaccurate to state that the factor is positively associated with the magnitude of unethical behav-

ior because its impact varies across decisions of different substantive meanings - it increases the likelihood of switching from an ethical behavior to an unethical one but does not induce the individual to behave more aggressively when choosing the magnitude of an already-unethical behavior. Therefore, in this framework, the effect of certain factors can be more precisely conceptualized as driving the magnitude of unethical behavior to the ethical/unethical side. The effect of these factors determines which direction the decision is driven to and may be salient only on decisions of certain substantive meanings.

To demonstrate how different factors can be theoretically/empirically incorporated in the framework, this study considers two situational factors that are of particular relevance in supply management, namely the consequence of unethical behavior and the beneficiary of the unethical behavior. Prior studies have furnished some evidence that these factors are associated with unethical behavior. Therefore, testable hypotheses can be generated regarding the magnitude of unethical behavior.

2.2.4.1 The Effect of Severity of Consequence on the Magnitude of Unethical Behavior

Previous empirical evidence suggests that the expected severity of consequence tends to be directly related to the likelihood that a person recognizes an ethical problem (Singhapakdi et al., 1996; Thong et al., 1998). In other words, an individual is more likely to become aware of the ethical concerns associated with a potential decision. According to Rest (1986), moral awareness is the first step of ethical decision-making where an individual must recognize that the present issue involves ethical considerations. In this sense, moral awareness serves as an important barrier against unethical behaviors (Haines et al., 2008). A higher level of severity of consequence is more likely to trigger an individual's ethical consideration and discourage him/her from engaging in an unethical behavior.

In addition, individuals are less likely to engage in unethical behavior when the action will result in more severe consequences because it triggers a higher level of guilt. Guilt has been long recognized as a self-regulation mechanism (Amodio et al., 2007). In essence, guilt may create a discrepancy between how an individual views himself/herself and his/her actual behaviors (Higgins and Klein, 1985). Individuals are therefore induced to correct their actions to resolve such

a discrepancy. In the context of ethical decision-making, guilt can serve as a form of psychological punishment because it induces negative emotional reactions (Nelissen and Zeelenberg, 2009).

On the opposite side, guilt promotes positive (and, in a certain sense, ethical) behaviors as it leads to reinforcement learning, inhibition of transgressive behavior (Devine et al., 1991), and promotion of prosocial behaviors (Baumeister et al., 1994). Overall, the sense of guilt associated with more severe consequential unethical behavior may serve as a psychological force that prevents one from pursuing too much of economic rewards and therefore drives the magnitude of unethical behavior to the ethical side of the spectrum.

To summarize, previous studies have suggested that individuals tend to behave less aggressively in terms of engaging in unethical behavior when their actions would produce significant adverse consequences. In my proposed framework, the prospective severity of consequence emanating from unethical behavior may prompt the individual to consider his/her ethical self-image, therefore inducing an individual to behave unethically to a smaller magnitude.

Hypothesis 2.1. *A more severe consequence of a decision is associated with a generally lower magnitude of unethical behavior.*

2.2.4.2 The Effect of Incentive Scheme on the Magnitude of Unethical Behavior

The incentive scheme can affect ethical decision-making as well. The beneficiary of unethical behavior has been identified as a factor that affects ethical decision-making. When the benefit of unethical behavior is shared among organizational members, individuals may find it easier to justify their unethical behaviors because they mentally distance their action from ethical considerations and therefore feel less guilty (Umphress and Bingham, 2011; Gino et al., 2013). According to Umphress and Bingham (2011), individuals sometimes engage in unethical behaviors that potentially benefit their organizations or its members. The underlying rationale of such behaviors is that individuals may engage in unethical behaviors on behalf of their organization with the hope that their behaviors will be recognized and reciprocated by their organization in the future. The expectation of reciprocal reward in the long run may induce an individual to behave unethically (Umphress et al., 2010).

In addition, individuals may be willing to engage in unethical behaviors that benefit their organization when they identify themselves strongly with their organization. An individual may consider his/her membership within an organization as a part of his/her self-concept. In other words, an individual may possess a strong perception of belonging and membership to his/her organization (Tafjel and Turner, 1986). In such situations, individuals are more motivated to engage in behaviors that benefit their organization because they internalize the organization's success and failures as their own (Mael and Ashforth, 1995). Therefore, Umphress and Bingham (2011) argue that an individual who strongly identifies with his/her organization may be more likely to engage in unethical behaviors that potentially benefit the organization.

Overall, the driving force of maintaining an ethical self-image can be weakened when the benefit of unethical behavior is shared within the organization. In other words, it is possible that the magnitude of unethical behavior will be driven to the unethical side of the spectrum when the unethical behavior benefits not only the individuals themselves but also other organizational members (c.f., Conrads et al., 2013; Danilov et al., 2013) An individual is more likely to engage in an unethical behavior of a higher magnitude when the benefit associated with such a behavior will be shared among the organizational members.

Hypothesis 2.2. *An incentive scheme where the benefit of unethical behavior is shared is associated with a generally higher magnitude of unethical behavior.*

The remaining part of this study seeks to apply the proposed framework in an empirical setting. The main purpose is to demonstrate that the framework can be directly incorporated in empirical analyses through specialized statistical models. Important factors impacting the decision-making process such as the consequence of unethical behavior and the incentive scheme for the benefit of unethical behavior will be directly examined in such models as well.

2.3 Experimental Design

My study employs a scenario-based experimental exercise that simulates a setting where an individual is asked to make purchasing decisions under ethical considerations. This experimental

design creates an isolated decision-making problem in which participants can focus on assessing the potential outcomes of their ethical decisions.

This inquiry is conducted in two parts. Participants are expected to finish the two parts with a span of several days in between. On Day 1, I first collect demographic information from each subject including age, gender, and household income. The participants are then asked to read a statement regarding ethical conduct standards in supply management (from the Principles and Standards of Ethical Supply Management Conduct) produced by the Institute for Supply Management (ISM).

The statement (reproduced in Appendix A.1.1) proclaims three guiding principles of ethical conduct for supply management practitioners, including (1) Integrity in Decisions and Actions, (2) Value for Employer, and (3) Loyalty to Profession. The statement then provides ten ethical standards derived from these principles that cover a range of behaviors that are considered ethical/unethical. Among these standards, disclosing confidential and proprietary information (such as sealed bids) in supply management practices is clearly considered as unethical. I specifically emphasize that these principles/standards are endorsed by the company described in the experimental setting. However, the principles/standards are not enforced in our exercise. The participants then have to correctly answer several questions in a quiz with regard to the principles/standards before they can proceed to the rest of the experiment material (see Appendix A.1.2). This data collection process ensures that the participants have a clear understanding of the ethical principles/standards in supply management and thus have sufficient knowledge to make informed decisions during the experiment.

2.3.1 Decision Scenario

The next stage of the experiment introduces the scenario of the main experimental exercise. The participants are told to assume the role of the Director of Supply Management at an organization that specializes in manufacturing transmissions for automobile manufacturers. The organization recently received a contract to supply 100,000 transmissions for each of the next three years. The organization, however, needs to outsource the production of transmission cases to an external sup-

plier. The participants are told that the selection of a supplier is based on a sealed-bid process and the major decision criterion is unit purchasing price. They are also told that, based on engineering and accounting estimates, the organization can expect bidding prices around $880 per unit, but that this is an estimated price, and some suppliers may be willing to submit a slightly lower bid in order to secure the contract.

The organization solicited bids from several qualified suppliers and the participants are presented with three eligible bids. The bid prices per unit are $1,126, $1,000, and $1,080, respectively. The scenario stresses that it is important for the organization to minimize expenses as it is facing financial difficulties. Reducing purchasing cost can lead to significant cost reduction and profitability improvement due to the large quantity involved in the contract. Therefore, without additional information, the lowest bid ($1,000) would be the optimal decision. See Appendix A.2.1 for the reading material presented to the experiment subjects.

To introduce ethical considerations in the setting, I present an email to each experimental participant supposedly sent from the supplier who submitted the second lowest bid ($1,080 per unit). In the email, the supplier states that they are willing to lower their price further as they are eager to win the outsourcing contract (see Appendix A.2.2). If the participant, acting as Director of Supply Management, chooses to disclose the current lowest bid he/she received, the supplier will provide a further 4% discount based on the lowest bid that is communicated to them. The subjects are then informed that they have the option to choose between (1) disclosing the lowest bid to the supplier and (2) not disclosing the bid and awarding the contract to the original lowest bidder ($1,000 per unit). I specifically state that, just as in real life, this supplier will have no way of knowing exactly what the other competing suppliers are bidding for the contract. Therefore, should the subject choose to disclose the lowest bid, he/she can report any reasonable price (i.e., a price below the actual lowest bid $1,000) to the supplier as the lowest bid they received. Subjects are not asked to make a decision in the Day 1 part of the experiment.

2.3.2 Treatment Manipulations

The participants return for the Day 2 part of the experiment several days later (typically one week). The time lapse ensures that the participants have sufficient time to deliberate in their mind regarding the issue at hand and to make a decision after careful deliberation and reflection. At the beginning of Day 2, the subjects are reminded of the decision scenario they encountered on Day 1. Next, two additional statements (treatment manipulations) are introduced via random assignment before they make the decision. The first manipulation is concerned with potential safety considerations involved with their decision (safety treatment). This treatment serves as a manipulation of the consequence of unethical behavior, which is expected to affect the magnitude of the unethical behavior. The baseline condition states that sourcing from the supplier who offered the additional discount will not affect product safety. The second condition, however, suggests that the failure rate of the products will be doubled (from 1 in 10,000 to 2 in 10,000).

The second treatment describes the incentive scheme for attaining the cost reduction (beneficiary treatment). The participants are told that the organization instituted an incentive scheme to encourage employees to reduce spend. As a result, the subjects can obtain an annual bonus if the final purchasing price is below the target price, which is set by the Vice President of Supply Management at $980 per unit. The experimental subjects can also earn a reward in real cash but the amount is capped at $10 and will be proportional to the difference between the target price and the final price. Subjects are randomly assigned one of the two possible conditions: (1) the bonus will be calculated and paid to the subject alone acting as the Director of Supply Management; (2) the bonus will be calculated and paid to the entire organization where all the members (50 employees) will share the bonus equally. The two conditions are designed such that, if the final price is the same between two conditions, the amount of reward a participant will obtain personally will be the same as well. In other words, the total bonus calculated in condition (2) is 50 times that in condition (1). But, the personal bonus in condition (2) is calculated by dividing the total bonus by 50, which will then be equal to the amount of personal bonus in condition (1) where the bonus is not shared. Such a design isolates the effect of the incentive scheme itself from the effect of the

magnitude of potential rewards.

2.3.3 Decision Outcomes and Incentive Compatibility

To provide commensurate incentives to the participant, the amount of annual bonus was translated into an actual cash reward in a proportional manner. The participants may obtain up to $10 of cash reward at the end of the experiment regardless of which of the two conditions they are in. After consulting with three academics and three local students, the maximum reward in Italy and China was set at €5 and ¥50, respectively, so that they reflect approximately an equivalent value. Table A.1 summarizes the formulas used for calculating the annual bonus and the cash reward given to the subjects. The formulas that calculate the rewards for Italy and China populations are simply the original formula but scaled proportionally. Detailed description of this incentive scheme is demonstrated in Appendix A.2.4.

The subjects can choose whether or not to accept the supplier's offer. A subject can choose to award the contract to the lowest bidder based on the initial bid and thus act ethically since confidential information regarding bid prices will not be shared. In contrast, he/she can choose to disclose the lowest bid or even a lower price than the lowest bid to the supplier and then obtain the extra 4% discount on top. Because the supplier has no way of knowing their competitors' bids, the participant can choose to report any reasonable price as if it were the real lowest bid they received. The lowest bid price allowed by the experimental design has a lower bound of $780 to reflect the fact that the unit purchasing price cannot be set unrealistically low.

After making the decision, the subjects were required to explain their decision choice in their own words (see Appendix A.5). Moreover, they were also asked to evaluate whether certain factors (such as benefiting the organization or obtaining personal benefits) served as motives behind their decisions. Finally, subjects were asked to rate the level of realism regarding the experimental scenario (see Appendix A.6). The overall average score of realism is scored at $5.6568/7$, indicating that the experimental design reflects a good degree of realism.

2.4 Empirical Analysis

2.4.1 Sampling

The experiment was carried out at major universities across multiple countries (U.S., Italy, and China) to ensure that the results are generalizable across different cultural backgrounds. The participants were recruited from business schools on a voluntary basis and compensated based on the incentive scheme discussed in the experimental design section. The participants were first asked to read an introductory document that describes the procedure of the study and then to provide their consent for participation. They were then asked to complete the Day 1 part of the study after providing their email address and a previously assigned identification number. The Day 2 part of the study was conducted at least 4 days after the participants had completed the previous part and no later than 7 days. Detailed procedures regarding the experiment were outlined in Section 2.3.

A total of 1133 valid observations were collected. About 35.1% of the observations were obtained from the U.S., 36.2% from Italy, and 28.5% from China. The majority of the participants were 30 years old or younger, with 60.7% between the age of 20 and 22. Approximately 41.1% of the participants were males, while about 58.8% were females. In the sample, 984 participants were pursuing a bachelor's degree, 98 were pursuing a master's degree, and 51 were pursuing a doctoral degree. Student subjects were used in this study because of several considerations. First, professionals may hesitate to disclose true behaviors in the study due to the concern that their unethical behaviors will be revealed to their employers. Second, the behavioral patterns of student subjects observed in this study should not be different from those of working professionals. As all the contextual information is furnished to the subjects in the experiment, their decisions will be made based solely on an individual's behavioral patterns regarding ethical decision-making. Third, the incentive schemes in the study are more effective in incentivizing student participants than working professionals as the small amount of monetary reward ($10 at maximum) will provide larger stimulation to students who have lower incomes. Table 2.1 summarizes important sample demographic information.

Table 2.1: Sample Demographics

Variable	Categories	Frequency	Percent
Country	U.S.	398	35.1%
	Italy	411	36.2%
	China	324	28.5%
Gender	Male	466	41.1%
	Female	667	58.9%
Age	<20	173	15.2%
	20-22	688	60.7%
	22-30	257	22.6%
	>30	15	1.2%
Degree	Bachelors degree	984	86.8%
	Masters degree	98	8.6%
	Doctoral degree	51	4.5%
Importance of religion	Not important at all	125	11.0%
	Unimportant	129	11.3%
	Somewhat unimportant	72	6.3%
	Neither Important nor Unimportant	292	25.7%
	Somewhat important	198	17.4%
	Important	189	16.6%
	Highly Important	128	11.2%

2.4.2 Variables of Interest

The main purpose of this study is to examine the complex nature of the magnitude of a decision maker's unethical behavior and how the decision-making process can be affected by diverse factors. Thus, the empirical analysis in this study should be focused on applying the conceptual framework (depicted in Figure 2.3) rather than testing for the effect of particular theoretical constructs. The two treatments as well as other covariates included in this study are chosen because previous studies have suggested that they are relevant in ethical decision-making. Therefore, it is more likely that they will be impactful in deciding the magnitude of unethical behavior.

However, there is little theoretical work that specifically predicts in which stage a particular treatment or covariate affects an individual's ethical decision-making process or how such an effect varies across decisions of different substantive meanings. The conceptual framework proposed in this study simply warrants a statistical model that specifically captures the complexity in the

magnitude of unethical behavior and its underlying decision-making process. Likewise, the two treatments examined in this study are only expected to have an impact on the decision-making process in general. How and when exactly do these treatments become salient within the decision-making process is not addressed from a theoretical perspective. In this sense, the study is also partially exploratory in that there is no detailed hypothesis *a priori* about how different factors affect the decision-making process when the magnitude of unethical behavior is considered.

Therefore, the proposed model is formulated such that the model reflects the conceptual framework (Figure 2.3) proposed in this study. The empirical analysis of this study, however, is exploratory in nature and begins with the assumption that all the treatments and relevant covariates potentially affect the decision-making process in all of the framework stages. The actual effects are determined in a purely empirical manner. Thus, the same set of variables are entered in each of the statistical model components so that the results will not be biased by prior judgment in terms of variable selection across different stages.

Three types of variables are entered in the model - individual respondent characteristics, situational factors, and treatments from the experimental design. Together, these three types of variables are expected to provide a more inclusive characterization of how individuals respond to various factors. The individual characteristics considered in the model include age, household income, gender, and personal values.

Personal values serve to reflect how individuals value different aspects of their lives. The orientation of personal values varies significantly among individuals and is typically considered dispositional for a particular person, regardless of the decision circumstances. Following the seminal work by Schwartz et al. (2012), 19 personal values are measured at the beginning of the experimental study on Day 1 (before the scenario is introduced), namely whether/how much the respondent values the following: Pleasure, An Exciting Life, A Varied Life, An Enjoying Life, Self-indulgent, Social Recognition, Independent, Ambitious, Daring, Choosing Own Goals, Capable, Successful, Influential, Equality, Social Justice, Loyal, Honest, Helpful, and Responsible. These personal values were deemed relevant in ethical decision-making after careful deliberation of their definitions

by the author. Measurements of personal values are obtained by asking subjects to rate the importance of each of these values (from 1-"Not at all important" to 7-"Extremely important") to them.

To avoid introducing high-dimensionality and subsequent numerical instability into the estimation process, a two-step process is followed to select a small number of variables that will be entered later in the main analysis. First, the 19 question items were then collapsed into five higher order categories of personal values (i.e., Benevolence, Hedonism, Universalism, Stimulation, and Achievement) using Principal Axis Factoring with Oblimin Rotation (see Table A.2 for detailed results). Five question items (i.e., Social Recognition, Independent, Ambitious, Choosing Own Goals, Capable) were dropped after an iterative process due to low construct loadings (< 0.5). I then selected the most influential personal value categories from several simplifying models and then include them in the main model. In this way, a large number of different personal values can be captured parsimoniously by few variables. Second, the following three models are estimated for variable selection: (1) an OLS regression model which takes *de-facto* price (i.e., the actual unit cost the subject's company pays to the selected supplier) as the dependent variable; (2) a logistic regression model which takes a binary variable (ethical - do not disclose information vs. unethical - disclose information) as the dependent variable; (3) a multinomial logistic regression model which takes a categorical dependent variable (ethical - do not disclose information, unethical but honest - disclose the true lowest bid, or unethical and deceptive - disclose a phony lowest bid). Detailed results are included in Appendix A.4.

Estimating the above models reveals that only two personal value categories (Benevolence and Hedonism) appear to affect an individual's decision in this study. Benevolence can be roughly defined as "preserving and enhancing the welfare of those with whom one is in frequent personal contact (Schwartz et al., 2012, p.5-7)." Hedonism is defined as "pleasure or sensuous gratification for oneself(Schwartz et al., 2012, p.5-7)". Together with age, household income, and gender, these variables serve to capture the individual-level heterogeneity among the participants (Cagle and Baucus, 2006; Elango et al., 2010; Lam and Hung, 2005).

In addition, although gender is generally considered as an individual-level characteristic, prior literature has demonstrated that gender has both main and moderating effects on ethical decision-making (e.g. Elango et al., 2010; Beekun et al., 2010; Cagle and Baucus, 2006). Therefore, both the main effect and interaction effect of gender are estimated in the model.

The situational factors considered in the analysis reflect the perceived potential punishment associated with unethical behavior, the ethical climate within the organization, and the countries where the study was conducted. Prior literature suggests that the consequence of an individual engaging in unethical behavior is a strong predictor of an individual's behavior (Mencl and May, 2009). It is generally shown that an individual is less likely to behave unethically when the potential punishment is more severe. To rule out this confounding factor in estimating the treatment effects, the perceived severity of punishment emanating from the decision is measured and included as a control variable ("Acting as the Director of Supply Management, you decided to take the specific action regarding Ben because the severity of punishment if get caught being dishonest is negligible"; rate from 1-"Strongly Disagree" to 7-"Strongly Agree"). In organizational settings, prior research demonstrates that an employee's decision-making is affected by the ethical climate at a workplace. A questionnaire item ("My organization has a strong ethical climate"; rated from 1-"Strongly Disagree" to 7-"Strongly Agree") was utilized to account for such heterogeneity. Finally, similar to the role of gender, the country variables are also posited to interact with treatment variables to capture the cross-cultural differences, as prior research has suggested that cultural values/nationality may have moderating effects on ethical decision-making (Spicer et al., 2004; Beekun et al., 2010).

The two treatments (Beneficiary and Safety) are the main variables of interest in the analysis. Variable *Treatment:Beneficiary* is set to 0 when there is no sharing of benefit and 1 when the entire organization is said to equally share the benefit. A manipulation check for this treatment was conducted by asking the participants to respond to a questionnaire item ("I get to keep all the potential bonus to myself", 7 likert-scale from "Strongly Disagree" to "Strongly Agree"). A t-test reveals that the reported responses differ significantly between the control group and the

treatment group ($t = 14.793, p < 0.0001$). Subjects in the control group (those who do not need to share the benefit) reported a higher group average score (4.663) than those in the treatment group (3.113). Variable *Treatment:Safety* is equal to 1 when behaving unethically will result in inferior product safety. There is no consequence with regard to product safety when the variable is equal to 0. The manipulation check was conducted through questionnaire item ("The failure rate of the transmission will be impacted depending on which supplier I select", 7 likert-scale from "Strongly Disagree" to "Strongly Agree"). The collected responses differ significantly between the control group and the treatment group ($t = -22.211, p < 0.0001$). The group average score of this item is 3.375 for the control group but higher (5.584) in the treatment group. As discussed in Section 2.2, the magnitude of unethical behavior is expected to be driven towards the unethical side when the personal benefit is shared among the organization. When behaving unethically will have a severe consequence (compromising product safety), the magnitude of unethical behavior is expected to be driven to the ethical side.

2.4.3 Empirical Analyses

2.4.3.1 Empirical Evidence of the Proposed Framework

The conceptual framework in Figure 2.3 warranted three propositions regarding the underlying mechanism that determines the magnitude of an individual's unethical behavior (see Section 2.2.3). These propositions suggest that (1) the observed magnitude of unethical behavior should be potentially grouped and examined by types because their substantive meanings can be very different, (2) the entire spectrum of the magnitude of unethical behavior should be accounted for because individuals do not always maximize/minimize the magnitude of their unethical decisions, and (3) the magnitude of unethical behavior is influenced by two opposing forces simultaneously.

The collected data indeed reflects such characteristics as described in the framework (Figure 2.3). First, it seems that subjects treated their decisions differently, according to the type of their decisions. Three major types of decisions are naturally derived from the experimental design. An individual may choose to behave ethically and not disclose the bid information (i.e., an ethical

decision). He/she may also choose to disclose the information but report the true lowest bid that was received ($1000), therefore making an unethical but honest decision. Finally, the individual may choose not only to disclose the information but also to report a deceptive lowest bid price set under $1000 so that he/she will receive extra benefits. In this situation, the decision is both unethical and deceptive. These three types of decisions apparently reflect different substantive meanings to the subjects during the experiment because they imposed different magnitudes of psychological impact. To measure the potential psychological impact of an individual's decision, I measure the perceived ethicality at the beginning of the experiment in Day 1 (before presenting the scenario) using two questionnaire items (I consider myself to be an honest person; My perception of myself being a moral person today in contrast to yesterday is [Much Worse - Much Better]). After making the decision on Day 2 of the experiment, the subjects were asked to answer these same questions again. The difference between an individual's responses before/after the decision therefore serves as two measures for how the decision affected his/her self-view in terms of ethicality (i.e., the psychological impact of the decision). The data suggests that the impact of the decision on individuals varied greatly across the three types of decisions. More specifically, ANOVA analyses show that the two measures of psychological impact differed significantly, depending on the type of the decision ($p < 0.001$ across both questions and respective tests). This result speaks to the first proposition that the observed magnitude of unethical behavior may in fact be the outcome of multiple behavioral patterns.

Second, the subjects exhibited large heterogeneity in terms of the magnitude of unethical behavior. About 494 out of 1133 participants chose not to disclose the bid information and therefore remained ethical (43.60%). These responses therefore represent those behaviors with an "unethical magnitude" of 0. Among those individuals who chose to behave unethically and disclose the competitor bidding information (639 out of 1133, or 56.39%), the lowest bid reported ranged from $780 to $1000, which covers the entire range of the allowed responses. Together, the observed decisions covered the entire spectrum of possible magnitude of unethical behavior (from a magnitude of 0 to the maximum allowed magnitude, which corresponds to reporting a lowest bid of $780).

This finding provides strong support to the second proposition.

Before we examine the third proposition, one needs to account for the first two propositions because they suggest that a proper empirical model should incorporate not only the magnitude of unethical behavior but also the discontinuity resulting from different substantive meanings (i.e., types) of the decisions. Therefore, a specialized empirical strategy is necessary to take into account all the three propositions at the same time.

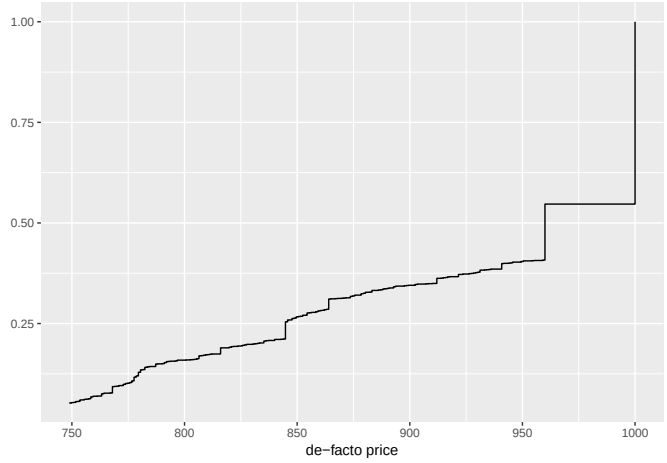
2.4.3.2 Limitations of Commonly-Used Statistical Models

The framework (Figure 2.3) described above assumes that the observed outcomes of decision-making are products of a complex underlying mechanism. Multiple approaches can be taken to empirically analyze the framework. A simplistic strategy of empirical analysis will be to assume that all of the observed decisions are realizations of a single probability distribution. In this case, it is natural to utilize a linear model framework such as ANOVA or regression to establish the statistical relationship between the outcomes and the explanatory variables. For example, a regression model can be formulated as $d_i = \boldsymbol{x}_i'\boldsymbol{\beta} + e_i$. However, such an approach potentially suffers from two limitations.

First, this simplifying approach may not fully capture the unique data structure warranted by the framework as well as the experimental design of this study. As demonstrated in the empirical distribution function (Figure 2.4), there are two sharp jumps in the plot, which indicate substantive point masses that amount to about 59% of the entire sample. These two point masses represent the "ethical" group ($d_i = 1000$) and the "unethical but honest" group ($d_i = 1000 \times (1 - 0.04) = 960$) of decision makers. The rest of the observations from the "unethical and deceptive" group ($d_i < 960$) form a smoothly increasing curve in the plot, which suggests a continuous underlying distribution. The assumption of all the observations being generated by the same data-generating process implies that the probability density of such distribution has two sharp peaks at 960 and 1000, but is continuous below 960. Such a continuous distribution is clearly improbable. Analyses based on a single data-generating distribution (as is assumed in regression or ANOVA models) may therefore lead to biased or misleading results. Instead, it is sensible to assume that the data-generating

process is partly discrete and partly continuous. This idea is incorporated by the statistical model presented above as it essentially models a mixed distribution to capture the discrete and continuous components separately.

Figure 2.4: Empirical Distribution of Observed *de-facto* price



It is possible to simplify the analysis by treating all the observations as realizations of a discrete distribution. To make this approach feasible, one can collect the "unethical and deceptive" outcomes into one group. In this way, the outcome of the decision-making process only takes three nominal values, namely "ethical", "unethical but honest", and "unethical and deceptive". A multinomial logistic regression model can be used to examine the effect of treatments and other factors on the likelihood of an individual choosing one of the three decisions. Although statistically sound, this approach is again not ideal, as it is unable to capture the exact magnitude of deceptive behaviors. As a result, this simplifying approach cannot answer the question of what factors affect an individual's decision given that he/she behaves unethically and decides to disclose a deceptive lowest bid. The information contained in the unethical and deceptive group would then be lost.

The second limitation of treating the entire sample as outcomes of a single distribution is that it imposes strong assumptions on the relationship between ethical decision-making and the explanatory variables. Such an approach would only allow treatments and covariates to have non-

varying effects on the decision-making process across the entire spectrum of the decision. In other words, the effect of $\boldsymbol{x}$ on the decision-making process is assumed to be the same when explaining $d_i = 1000$, $d_i = 960$, or $d_i \in (748.8, 960)$. This is because all d_i's are governed by one distribution, which in this case is modeled as a function of $\boldsymbol{x}$. This model cannot account for the possibility that a particular variable has significant impact only in certain situations or that a variable has a varying effect on decisions of different types.

As discussed above in Section 2.2.3, behaving ethically, behaving unethically but honestly, and behaving unethically and deceptively are substantively different decisions. Therefore, factors affecting the decision between being ethical and unethical may not have the same effect in deciding whether to disclose the true bid information, or choosing what lowest bid to report once the subjects decide to act with deception. In the next section, I propose another statistical model where each of these questions is modeled separately with a dedicated set of explanatory variables and their corresponding model coefficients. Thus, the new model will allow a more granular examination of the decision-making process and how it is affected by the treatments and covariates.

2.4.3.3 Modeling the Magnitude of Unethical Behavior

In this section, I describe an empirical strategy specifically tailored to analyze the complex structure of the decision-making process outlined in the conceptual framework (Figure 2.3). The overarching idea is that, in the proposed model, the outcomes of the decision-making process are modeled separately by a set of conditional probabilities. In this way, decisions of different substantive meanings (types) are captured by the corresponding model components.

Overall, the model is formulated such that it captures the following (conditional) probabilities (i.e., model components): (1) the probability of an individual behaving ethically/unethically (i.e., $p(\text{ethical})$ and $p(\text{unethical})$), (2) the probability of an individual behaving honestly (i.e., reporting the true lowest bid \$1,000) or deceptively (i.e., reporting a phony lowest bid that is below \$1,000), given that he/she behaves unethically (i.e., $p(\text{honest}|\text{unethical})$ and $p(\text{deceptive}|\text{unethical})$), and (3) the probability of an individual behaving unethically and deceptively and further reporting a specific *de-facto* price of d_i (i.e., $p(d_i|\text{unethical}, \text{deceptive})$). Thus, each of the distributions is

conditioned on the previous one. The magnitude of unethical behaviors described in distribution (3) is greater than the ones in distribution (2), which in turn is higher than the ones in distribution (1).

The model will be formulated in terms of the *de-facto* price each subject reports, which is calculated as the lowest bid price reported by the subjects, minus the 4% discount, if applicable. Specifically, let $\boldsymbol{d}$ be a vector that contains the outcomes of the subjects' decision-making in terms of the calculated *de-facto* price. According to the experimental design, subjects who chose not to disclose any bidding information (and thus behaved ethically) will report a *de-facto* price of \$1,000. Those who disclosed the true lowest bid (i.e., unethical but honest) will report a *de-facto* price of \$960 ($1000 \times (1 - 4\%)$). Unethical and dishonest participants (i.e., disclosing a deceptive lowest bid) will report a de-facto price that is below \$960. For instance, if a subject reported a price of \$900, then the *de-facto* price would be \$864 ($900 \times (1 - 4\%)$). The lowest possible de-facto price in the data is constrained at \$748.8 as the participants could only disclose a reasonable bid price that is equal to or above \$780.

Combining the above three model components results in a mixed probability density function that describes the data-generating process behind the observed outcomes (i.e., subjects' decisions in the experiment). Assuming that the decisions observed across subjects are independent of each other, the likelihood of observing the obtained data can be written as follows:

$$
\begin{aligned}
L = \prod_i \big[& p(\text{ethical}) \\
& + p(\text{honest}|\text{unethical}) \times p(\text{unethical}) \\
& + p(d_i|\text{deceptive}, \text{unethical}) \times p(\text{deceptive}|\text{unethical}) \times p(\text{unethical}) \big]
\end{aligned}
$$

The first line of the right-hand-side of the equation represents the probability of individual i behaving ethically (i.e., not disclosing the lowest bid information). The second line denotes the probability of individual i reporting the true lowest bid, given that he/she chooses to behave un-

ethically and discloses the lowest bid information. The third line then describes the probability of individual i reporting a lowest bid of d_i, given that he/she chooses to behave unethically and at the same time to report a bid price lower than the true lowest bid received from the bidding suppliers (i.e., \$1,000). To facilitate a more refined analysis that examines how the treatments and other covariates affect different (conditional) probabilities, the above formulation can be extended to a regression-type model where a logit-link function is used for each (conditional) probability. For example, $p(\text{ethical})$ can be written as $log\big(\frac{exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}{1+exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}\big)$, which is a function of observed data $\boldsymbol{x}_i$ and $\boldsymbol{\beta_1}$. In this way, the probability of individual i behaving ethically in the experiment is determined by his/her covariates $\boldsymbol{x}_i$. The corresponding model parameters $\boldsymbol{\beta_1}$ represent the effect of these covariates on the probability of engaging in ethical behavior. The rest of the model components work in a similar manner. The log-likelihood function can be written as:

$$
\begin{aligned}
&logL(\boldsymbol{\Theta}|\boldsymbol{d},\boldsymbol{x},\boldsymbol{y},\boldsymbol{z}) = \\
&\quad \sum_i log\big(\frac{exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}{1+exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}\big)\mathbb{1}_{(d_i=1000)}(d_i) \\
&\quad + \sum_i \big[log\big(\frac{1}{1+exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}\big) + log\big(\frac{exp(\boldsymbol{y}_i'\boldsymbol{\beta}_2)}{1+exp(\boldsymbol{y}_i'\boldsymbol{\beta}_2)}\big)\big]\mathbb{1}_{(d_i=960)}(d_i) \\
&\quad + \Big\{ \sum_i \big[log\big(\frac{1}{1+exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}\big) + log\big(\frac{1}{1+exp(\boldsymbol{y}_i'\boldsymbol{\beta}_2)}\big)\big] \\
&\quad + \sum_i \big[log\Phi\big(\frac{748.8-\boldsymbol{z}_i'\boldsymbol{\beta}_3}{\sigma}\big)\mathbb{1}_{(d_i=748.8)}(d_i) + log\Phi\big(\frac{\boldsymbol{z}_i'\boldsymbol{\beta}_3-960}{\sigma}\big)\mathbb{1}_{(d_i=960)}(d_i) \\
&\quad + log\phi_{tr}(d_i-\boldsymbol{z}_i'\boldsymbol{\beta}_3,\sigma^2)\mathbb{1}_{(748.8<d_i<960)}(d_i)\big]\Big\}\mathbb{1}_{(d_i<960)}(d_i) \qquad (2.1)
\end{aligned}
$$

In this equation, Θ collects all the model parameters to be estimated from the observed data matrices $\boldsymbol{d},\boldsymbol{x},\boldsymbol{y}$, and $\boldsymbol{z}$. $\boldsymbol{d}$ again represents the observed *de-facto* price. $\mathbb{1}_D(d_i)$ is defined as $\mathbb{1}_D(d_i) = \begin{cases} 1 & : d_i \in D \\ 0 & : d_i \notin D \end{cases}$ The first line of the right-hand side of the equation governs the probability of an individual behaving ethically/unethically. By specification, the probability for individual i is affected by a set of covariates in column vector $\boldsymbol{x}_i$. The effect of each covariate is captured

by the corresponding element in the coefficient vector $\boldsymbol{\beta}_1$. The second line of the equation governs the probability of an individual being honest and disclosing the true lowest bid information, given that he/she behaves unethically. Such conditional probability for individual i is captured by covariate vector $\boldsymbol{y}_i$ and the corresponding coefficents $\boldsymbol{\beta}_2$.

The remaining part of the equation captures the rest of the observed outcomes where individuals behave not only unethically but also deceptively. In other words, these individuals disclose a deceptive lowest bid in order to secure more benefits, resulting in *de-facto* prices that are lower than \$960. Given that an individual behaves unethically and reports a deceptive lowest bid, the resulting *de-facto* price can potentially take any reasonable value. Therefore, this group of outcomes follows a continuous probability distribution. A linear regression framework is utilized here to reflect the fact that covariates $\boldsymbol{z}_i$ potentially affect individual i's decision of reporting a particular *de-facto* price d_i. $\boldsymbol{\beta}_3$ captures the corresponding effect of each covariate.

Additional refinement of the model is required as the *de-facto* prices reported by the deceptive group can only take values between \$748.8 and \$960. The conditional distribution will therefore have a limiting support $S_{d_i|\text{deceptive}} \subseteq [748.8, 960)$. Note that this interval is closed on the left but open on the right. In this conditional distribution, d_i cannot take the value 960 or above as $d_i = 960$ would suggest that the participant reports the true lowest bid information (i.e., \$1000) and behaves honestly, which is a decision of a different nature. However, it is possible to observe $d_i = 748.8$ when individual i discloses a *de-facto* price of \$748.8 (i.e., reports a bid price of \$780). Materially, such an outcome suggests that an individual reports the lowest bid price allowed by the experimental design in order to obtain maximum benefit. He/she would report a *de-facto* price even below \$748.8 had the experimental design allowed so. Therefore, the "true" *de-facto* prices that are below \$748.8 will be stacked at \$748.8.

Taken together, the data obtained from the deceptive group is left-censored at \$748.8 but right-truncated at \$960. The last three lines of the equation capture such a data structure. Let $\Phi(\cdot)$ be the cumulative distribution function of the standard normal distribution. $\phi(\mu, \sigma^2)$ denotes the normal density function with mean μ and standard deviation σ. This component can be interpreted

as a latent variable model. Let d_i^* be the true outcome of individual i's decision-making process and d_i represents the observed outcome. Then d_i^* is modeled as a function of covariates x_i and corresponding $\boldsymbol{\beta}_3$. $d_i = d_i^*$ when $d_i^* \in (748.8, 960)$ and $d_i = 748.8$ when $d^* \leq 748.8$.

In summary, the proposed model described in Equation 2.1 utilizes multiple components to capture the unique structure of the obtained data. Each type of decision is governed by a conditional distribution. These conditional distributions are then modeled as functions of corresponding explanatory variables. This special design is necessary because the observed outcomes reflect decisions of different types with their own theoretical underpinnings. In addition, this model implicitly represents the decision-making process as a sequential process, which corresponds to the conceptual framework discussed in the previous sections. The model essentially processes the data in multiple steps. In the first step, the model responds to the question of how an individual decides whether or not to disclose the lowest bid information at all (i.e., being ethical vs. unethical). In the second step, the model assumes that an individual already behaves unethically and examines how he/she decides whether or not to disclose the true lowest bid. In the last step, the model examines how an individual decides to report a particular deceptive lowest bid for a certain amount of economic benefit once the subject decides to act both unethically and deceptively.

Note, however, that the notion of a sequential process is only reflected in a conceptual and mathematical way rather than an inter-temporal one. The observed data does not contain any inter-temporal information regarding how an individual first decides between being ethical and unethical, and then decides between being honest and deceptive, and finally decides what lowest bid to report. Rather, the data only reflects the final outcome of an individual's decision-making process. The model is sequential in a sense that the decision-making process is conceptualized as an individual facing decisions of different types as he/she behaves unethically with an increasing magnitude.

The mathematical formulation in the model behaves in the same manner when interpreted in the following way: (1) the model first examines when and how an individual deviates from ethical behavior and opts to behave unethically; (2) it then examines when and how he/she deviates from

being truthful and discloses a deceptive lowest bid; (3) it finally examines when and how he/she chooses to report a lower deceptive bid price in order to obtain an even higher level of economic benefit. The magnitude of unethical behavior increases as an individual cascades through the three steps above. Each of the steps in turn corresponds to a barrier the individual faces when behaving more unethically. Accordingly, the three model components examine when an increase in the magnitude of unethical behavior occurs and how it is affected by explanatory variables.

2.4.4 Results

The empirical analysis of the proposed model (Equation 2.1) was performed using maximum likelihood estimation. The model parameters were estimated by numerically maximizing the log-likelihood function $logL(\boldsymbol{\Theta}|\boldsymbol{d}, \boldsymbol{x}, \boldsymbol{y}, \boldsymbol{z})$ over $\boldsymbol{\Theta}$. The estimation procedure was conducted in R (version 3.4.3).

2.4.4.1 Decision Between Behaving Ethically and Unethically

The first stage of the modeled process examines the probability of an individual behaving ethically (i.e., awarding the contract to the original lowest bidder) or unethically (i.e., disclosing the lowest bid information to the soliciting supplier, or $p(\text{unethical})$). The estimated parameters reflect the probability of making the ethical decision ($p(\text{ethical})$). Naturally, the probability of making the unethical decision is represented indirectly in an opposite way because $p(\text{unethical}) = 1 - p(\text{ethical})$.

The second column of Table 2.2 reports the estimation results of model parameters $\boldsymbol{\beta_1}$, which represent the effect of covariates on an individual's probability of engaging in an ethical behavior. Several control variables have significant impact on the probability of behaving ethically. As expected, the lower the perceived severity of punishment, the lower the probability that an individual would behave ethically and not disclosing the bid information ($\beta = -0.4129$, $p < 0.0001$). In other words, the perceived severity of punishment related with unethical behavior significantly promotes ethical behavior. Individuals who value hedonism are less likely to behave ethically ($\beta = -0.0899$, $p = 0.0034$) and awarded the contract to the supplier who submitted the lowest bid.

The sample from Italy reports a lower probability of ethical behavior ($\beta = -0.7169$, $p = 0.0187$). Interestingly, the probability of engaging in ethical behavior is lower in China when doing so will result in inferior product safety ($\beta = -0.8362$, $p = 0.0107$). In addition, the interaction between gender and the treatment regarding product safety is marginally significant ($\beta = 0.4921$, $p = 0.0680$), suggesting that females may be more likely to uphold the ethical standard in awarding the contract if disclosing the bid information will result in inferior product safety.

2.4.4.2 Deciding to Behave Honestly or Deceptively

The second stage of the model (the third column of Table 2.2) examines the effect of the variables on the probability of an individual reporting the true lowest bid to the soliciting supplier, given that he/she behaves unethically and discloses the lowest bid information (i.e., $\boldsymbol{\beta_1}$). The The coefficient corresponding to hedonism ($\beta = -0.1313$, $p = 0.0122$) suggests that there is a negative covariation between hedonism and the probability of being unethical but honest. In other words, a person who values hedonism will tend to behave deceptively and report a lowest bid below \$1000. The perceived degree of punishment curtails individuals from behaving unethically and deceptively ($\beta = -0.2054$, $p = 0.0058$). Moreover, the ethical climate within the organization has a positive effect on ethical conduct in that strong ethical climate is associated with a higher probability of behaving unethically but being honest ($\beta = 0.2438$, $p = 0.0220$). The coefficient of the interaction term between gender and the beneficiary treatment is 0.9923 and statistically significant ($p = 0.0375$). When the benefit resulting from unethical behavior is shared among the organization members, females are more likely to be honest about the lowest bid they received when disclosing the information. Finally, there is moderate statistical evidence that the probability of behaving unethically but honestly is higher when individuals value benevolence more ($\beta = 0.0838$, $p = 0.0700$).

2.4.4.3 Deciding to Act Unethically and Deceptively

The final component of the model estimates the effect of the variables on the *de-facto* price reported by those individuals who behave unethically and deceptively. The coefficient of age is

negative ($\beta = -7.8831$) and marginally significant ($p = 0.0553$). This suggests that individuals of an older age tend to report a lower bid in exchange for more economic benefit. Higher values of hedonism are associated with reporting a lower *de-facto* price ($\beta = -4.6051, p = 0.0005$). Participants from China are more conservative in terms of reporting a deceptive lowest bid as the coefficient is positive ($\beta = 46.5651$) and statistically significant ($p = 0.0004$). In other words, they are more likely to report a deceptive lowest bid (as reported in the second model component) but at the same time are reluctant to report an extremely low *de-facto* price.

The treatment effects in this stage are manifested through multiple avenues. There is some statistical evidence suggesting that females tend to report a higher *de-facto* price when the benefit is shared in the organization ($\beta = 20.2082, p = 0.0734$). However, sharing the benefit seems to induce a lower *de-facto* price in Italy ($\beta = -23.7376, p = 0.0914$) and China ($\beta = -33.3627, p = 0.0230$). The consequence treatment in terms of safety seems to have an unexpected effect in the sample from China where participants reported even lower *de-facto* prices when doing so will result in lower product safety ($\beta = -26.0938, p = 0.0755$).

2.4.4.4 Hypothesis Testing

Two hypotheses were established in Section 2.2.4. In my empirical analyses, these hypotheses can be tested by examining the estimated parameters of the corresponding experimental manipulations, namely the treatment variable (1) *Consequence* and (2) *Beneficiary*. The empirical results indeed provide some degree of support to the hypotheses. However, the effect of the treatment variables varies across decisions of different substantive meanings.

Hypothesis 1 posits that a more severe consequence of a decision is associated with a generally lower magnitude of unethical behavior. As discussed in Section 2.4.4.1, the consequence of unethical behavior is indeed negatively associated with the probability of a female engaging in an unethical behavior. Surprisingly, however, subjects from China seem to be more likely to engage in an unethical behavior when the consequence is more severe. Moreover, the consequence of unethical behavior does not have any impact on the decision-making process once the decision maker has decided to behave unethically (see Section 2.4.4.2, 2.4.4.3).

Hypothesis 2 suggests that an incentive scheme where the benefit of unethical behavior is shared may be associated with a generally higher magnitude of unethical behavior. Nevertheless, the hypothesis is supported only in the Chinese and Italian samples when the subjects decide to report a certain *de-facto* price, given that the study participant has decided to behave not only unethically but also deceptively (see Section 2.4.4.3). It seems, however, that females are less likely to behave deceptively when the benefit is shared among the organization - a result that contradicts Hypothesis 2 (see Section 2.4.4.2, 2.4.4.3).

Overall, the empirical results partially support the Hypotheses stated in Section 2.2.4. Nevertheless, the results demonstrate that the hypothesized effects do not always exist across decisions with different substantive meanings. The consequence of unethical behavior (as examined in Hypothesis 1) only affects the decision-making process when an individual decides whether to disclose the lowest bid information at all. It does not, however, have any impact on the decision-making process when the study participant decides what lowest bid to report to the supplier. In addition, the effects may vary between genders and across cultural background. Overall, the empirical analyses clearly show that there exists large heterogeneity in the magnitude of unethical behavior and in the effects of treatments and covariates on ethical decision-making. To better interpret these findings, several additional analyses are demonstrated in the next section. Section 2.6 then provides a detailed discussion about all the empirical findings as well as their theoretical and practical implications.

Table 2.2: Model Estimation Results

Variables	$p(\text{ethical})$	$p(\text{honest}\|\text{unethical})$	$p(d_i\|\text{deceptive}, \text{unethical})$
(Intercept)	$1.4546^{\dagger}$	-1.3004	840.1495^{***}
	(0.8516)	(1.4881)	(37.7352)
Age	0.1075	-0.1441	$-7.8831^{\dagger}$
	(0.1015)	(0.1821)	(4.1129)

Continued on next page

Table 2.2 – *Continued from previous page*

Variables	$p(\text{ethical})$	$p(\text{honest}\|\text{unethical})$	$p(d_i\|\text{deceptive}, \text{unethical})$
Income	-0.0258	0.0255	2.5847
	(0.0403)	(0.0717)	(1.7645)
Benevolence	0.0368	$0.0838^{\dagger}$	1.6365
	(0.0250)	(0.0462)	(0.9959)
Hedonism	-0.0899^{**}	-0.1313^{*}	-4.6051^{***}
	(0.0306)	(0.0523)	(1.3319)
Severity (reverse-coded)	-0.4129^{***}	-0.2054^{**}	-23127
	(0.0431)	(0.0744)	(1.8615)
Ethical Infrastructure	0.0332	0.2438^{*}	2.9391
	(0.0563)	(0.1064)	(2.2942)
Gender	0.1361	0.0307	10.1461
	(0.2391)	(0.4072)	(9.7705)
Beneficiary: Organization	-0.0108	-0.3697	12.3259
	(0.2703)	(0.4512)	(12.5570)
Consequence: Low Safety	0.3229	0.0635	17.8827
	(0.2699)	(0.4486)	(12.5466)
Country: Italy	-0.7169^{*}	-0.8076	-10.3344
	(0.3048)	(0.4947)	(13.2807)
Country: China	-0.2452	-0.6277	46.5651^{***}
	(0.3030)	(0.5432)	(13.2310)
Gender	-0.0269	0.9923^{*}	$20.2082^{\dagger}$
$\times$Beneficiary: Organization	(0.2690)	(0.4769)	(11.2875)
Gender	$0.4921^{\dagger}$	0.0421	-4.7650
$\times$Consequence: Low Safety	(0.2696)	(0.4710)	(11.2086)

Continued on next page

Table 2.2 – *Continued from previous page*

Variables	$p(\text{ethical})$	$p(\text{honest}\|\text{unethical})$	$p(d_i\|\text{deceptive}, \text{unethical})$
Country: Italy	-0.1539	0.2131	$-23.7376^{\dagger}$
$\times$Beneficiary: Organization	(0.3094)	(0.4999)	(14.0638)
Country: China	-0.0004	-0.9711	-33.3627^{*}
$\times$Beneficiary: Organization	(0.3261)	(0.6535)	(14.6779)
Country: Italy	-0.1292	0.0648	-6.9424
$\times$Consequence: Low Safety	(0.3081)	(0.4947)	(14.0157)
Country: China	-0.8362^{*}	-0.7351	$-26.0938^{\dagger}$
$\times$Consequence: Low Safety	(0.3277)	(0.6585)	(14.6828)

$^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

2.5 Additional Analysis

2.5.1 The Driving Force of Maximizing Benefit

The two treatments (manipulations) considered in the main study (Beneficiary and Safety) mainly pertain to an individual's tendency to maintain an ethical self-image. As will be discussed below, the opposing force (i.e., maximizing benefit resulting from an unethical behavior) in the proposed framework was not directly examined. We conducted an additional study to probe this opposing force in determining the magnitude of unethical behavior.

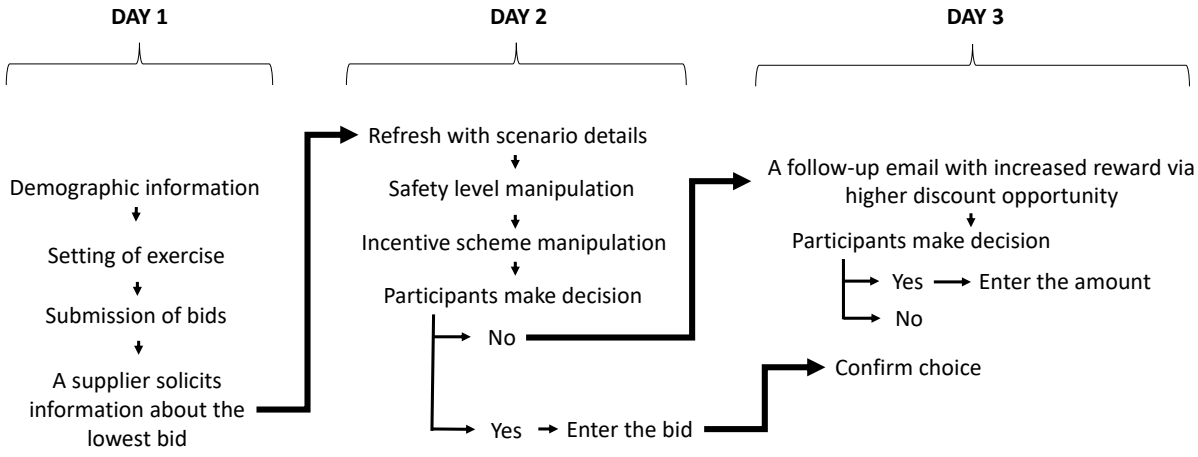
The original study was designed such that it allowed participants to decide the magnitude of their unethical behavior. In such a design, it is difficult to directly manipulate how strongly an individual feels regarding maximizing the potential benefit because it is determined by their own decision regarding the magnitude of unethical behavior. One way to examine the role of maximizing benefit in the proposed framework is to include an additional treatment where the amount of benefit differs across individuals. For example, participants in the treatment group will receive double the monetary reward compared to those in the control group, given that they report the same magnitude of unethical behavior. Such between-subject design, however, does not provide a

clear reference point for a given participant to experience how strongly he/she feels to maximize the benefit. Therefore, it is difficult to uncover the treatment effect of increased tendency of maximizing economic benefit because individuals may value the same amount of monetary reward very differently.

The additional study employs an alternative design, which examines the within-subject effect of changes in the tendency of maximizing benefit. The study is conducted in a three day setting where the first two days are identical to the main experimental, design. The Day 3 part of the experiment proceeds differently, depending on a participant's decision on Day 2. For participants who chose to disclose "a" lowest bid to the supplier (the real bid price or a deceptive one), an email is shown simply confirming the choice they made. For participants who refused to disclose the lowest bid, the Day 3 part of the experiment first reminds them of their decision and the safety and beneficiary conditions as presented in Day 2. The study then presents a follow-up email from the supplier who solicited the lowest bid and offers a further discount. In the email, the supplier states that they are willing to supply their transmission cases at an even lower price by providing a discount rate specified by the participant (see Appendix A.7). The participants are asked to reevaluate the situation and their decision about whether or not to disclose the lowest bid they received on Day 1. The maximum discount rate for the organization is now set realistically as 25%, should a participant choose to report the lowest bid and to specify the desired discount rate. Instead of a maximum cash reward of $10 on Day 2, the corresponding reward to the participant is now capped at $20 on Day 3. Figure 2.5 depicts the complete flow of the experiment.

The purpose of this study is to uncover potential evidence that the magnitude of an unethical behavior is partially driven by the tendency of maximizing benefit. The third day of the experiment essentially offers the motivation as well as the opportunity of maximizing economic benefit, while holding other conditions constant. It is expected that such change will drive the magnitude of unethical behavior to the right-hand side (i.e., the unethical side) of the spectrum. Since only the participants who chose to remain ethical on Day 2 will experience such change, I expect that the change in the magnitude of unethical behavior will be manifested as individuals switching

Figure 2.5: Additional Study



from the ethical decision (i.e., magnitude of unethical behavior $= 0$) to an unethical one (i.e., magnitude > 0).

We conducted the study at a U.S. university with an additional 373 undergraduate student participants. On Day 2, 193 participants chose to disclose the lowest bid information while 180 participants chose to remain ethical. These 180 participants were presented with a second chance to make a decision again on Day 3 with a higher maximum available economic reward. In total, 51 out of 180 participants (28.3%) indeed switched to an unethical decision and disclosed a lower bid price. Only 17 participants reported the true lowest bid ($1000). There were 34 individuals who not only disclosed the bid information but also reported a deceptive price (lower than $1,000). Furthermore, the average *de-facto* price reported on Day 2 by those who chose to disclose the information was $886.39. On Day 3, the average *de-facto* price resulting from the unethical decisions was significantly lower at $836.38 ($p = 0.0003$). Such a difference can be seen as evidence that an increase in the potential of maximizing benefit triggers unethical behavior and at the same time increases the magnitude of unethical behavior. Table 2.3 summarizes the decision outcomes in both the main and the additional study. On Day 3 of the additional study, a significant portion of subjects (out of those that displayed ethical behavior on Day 2) chose not to disclose any information (71.67%). However, the average *de-facto* price was lower because most of the individuals

who chose to disclose the bid information opted for a higher discount rate (9.96% on average) as opposed to the original 4% in order to attain more cost reduction.

Table 2.3: Decision Outcomes of Main and Additional Study

	Main Study		Additional Study			
	Day 2 Decision		Day 2 Decision		Day 3 Decision	
Ethical	494	43.60%	180	48.26%	129	71.67%
Unethical & Honest	114	10.06%	72	19.30%	17	9.44%
Unethical & Deceptive	525	46.34%	121	32.44%	34	18.89%
Total	1133		373		180	

2.5.2 Model Extension

The statistical model presented in this study (as described in Equation 2.1) can be conveniently modified to accommodate different empirical settings. In the conceptual framework, the magnitude of unethical behavior can be discontinuous at one or multiple critical points where the nature of a decision can become substantively different. For example, reporting \$1000 vs \$999 in values in the experiment do not differ substantially in an economic sense. However, these two decisions should be treated differently because the latter decision involves deception. In the statistical model, these two types of decisions are captured by separate model components. The same idea can be applied in other settings where multiple types of decisions are involved.

In the main study, it was possible to treat the *de-facto* price \$748.8 as a separate type of decision because it was the lowest possible price allowed by the experimental design ($780 \times (1 - 4\%)$). This decision could be seen as an unique type of decision where an individual focuses solely on maximizing the cost savings for his/her company and the corresponding personal reward. In the main model, these observations are captured by a censored-data structure. An alternative modeling approach would be to include an additional model component as shown in the following equation:

$$
\begin{aligned}
&logL(\boldsymbol{\Theta}|\boldsymbol{d},\boldsymbol{x},\boldsymbol{y},\boldsymbol{z},\boldsymbol{w}) = \\
&\quad \sum_i log\big(\frac{exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}{1+exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}\big)\mathbb{1}_{(d_i=1000)}(d_i) \\
&\quad + \sum_i \big[log\big(\frac{1}{1+exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}\big) + log\big(\frac{exp(\boldsymbol{y}_i'\boldsymbol{\beta}_2)}{1+exp(\boldsymbol{y}_i'\boldsymbol{\beta}_2)}\big)\big]\mathbb{1}_{(d_i=960)}(d_i) \\
&\quad + \Big\{ \sum_i \big[log\big(\frac{1}{1+exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}\big) + log\big(\frac{1}{1+exp(\boldsymbol{y}_i'\boldsymbol{\beta}_2)}\big) + log\big(\frac{exp(\boldsymbol{w}_i'\boldsymbol{\beta}_3)}{1+exp(\boldsymbol{w}_i'\boldsymbol{\beta}_3)}\big)\big] \\
&\quad + \sum_i log\phi_{tr}(d_i - \boldsymbol{z}_i'\boldsymbol{\delta}, \sigma^2)\Big\}\mathbb{1}_{(748.8<d_i<960)}(d_i) \\
&\quad + \sum_i \big[log\big(\frac{1}{1+exp(\boldsymbol{x}_i'\boldsymbol{\beta}_1)}\big) + log\big(\frac{1}{1+exp(\boldsymbol{y}_i'\boldsymbol{\beta}_2)}\big) + log\big(\frac{1}{1+exp(\boldsymbol{w}_i'\boldsymbol{\beta}_3)}\big)\big]\mathbb{1}_{(d_i=748.8)}(d_i)
\end{aligned}
\tag{2.2}
$$

The last line of the above equation represents an additional model component that captures those observations where $d_i = 748.8$. The probability of an individual i making such a decision is governed by vector $\boldsymbol{w}_i$ and the corresponding coefficients in $\boldsymbol{\beta}_3$. Note that these coefficients reflect how different factors affect the probability of an individual choosing to obtain the maximum available economic benefit given that he/she behaves unethically and deceptively. An increase in this probability will result in a decrease in the probability of an individual achieving only a moderate amount of economic reward, given that he/she chooses to behave unethically and deceptively. Comparing to the model in the main study (Equation 2.1), the extended model (Equation 2.2) is principally different from the one in the main study in that it differentiates between the conditional probability of an individual engaging in a moderate degree of unethical behavior ($d_i \in (748.8, 960)$) and the conditional probability of being as unethical as possible for the maximum amount of reward available ($d_i = 748.8$).

The results from model estimation (reproduced in Appendix A.8) show that hedonism is positively associated with the probability of choosing the highest magnitude of unethical behavior ($\beta = 0.1612, p = 0.0157$) and hence the maximum economic reward. This association is con-

sistent with the finding in the main study that hedonism tends to drive an individual's decision more to the unethical side. Participants from China are generally less likely to make the extreme decision where the magnitude of unethical behavior is maximized ($\beta = -2.0863$, $p = 0.0193$). Additionally, there seems to be a positive relationship between age and the tendency of opting for the maximum possible economic reward ($\beta = 0.3344$, $p = 0.0862$). These findings are consistent with the main study in terms of how these factors impact the outcome of decision-making.

2.6 Discussion

How individuals behave in ethical decision-making has been a long-lasting research tradition in the literature but not necessarily within the supply chain management literature. This research question is particularly relevant to business management researchers because individual-level ethical/unethical behaviors often result in consequences to the entire organization. Previous studies have established a comprehensive theoretical framework, which incorporates various factors and processes that predict whether an individual will behave ethically or unethically in a given situation. Researchers have also discussed some of the important intricacies in ethical decision-making specifically in the context of supply management (Kim et al., 2016).

Despite the large body of research in the ethical decision-making literature, there is still limited effort examining the magnitude of unethical behavior. From a research standpoint, it is often reasonable and practical to treat the outcome of ethical decision-making as either ethical or unethical during theorization or empirical analysis for the sake of simplicity. This approach can be powerful in facilitating researchers' efforts in identifying and isolating the impacts of a particular factor on the decision outcomes. However, such simplification often implies that a decision-maker can only choose between being completely ethical and being completely unethical in any situation and that there is no "middle ground" between the two extremes. In addition, when applying this simplification, there are only two potential consequences of ethical decision-making because individuals can engage in only two possible behaviors.

A worthwhile attempt to further our theoretical understanding of ethical decision-making would be to specifically look at the outcome of such decision-making processes as a continuum. In this

study, I focused on developing a conceptual framework that captures the entire spectrum of the magnitude of unethical decisions. I further argued that the unique characteristics of the framework warrants a specialized statistical model for empirical testing. The experimental studies suggested that there indeed exist large heterogeneities in the magnitude of unethical behavior in the context of supply management. In this section, I summarize the theoretical and empirical contributions in my study and discuss how they potentially provide guidelines for practitioners in promoting ethical conducts in supply management.

2.6.1 A Framework for the Magnitude of Unethical Behavior

The central argument of this research is that the heterogeneity in the magnitude of unethical behavior has important practical and theoretical implications for understanding ethical decision-making in supply management. It might not be sufficient to only look at how/when an individual behaves ethically/unethically. From a practical perspective, the magnitude of unethical behavior within an organization is usually directly correlated with the severity of economic, social, or legal consequences. Thus, those unethical behaviors with higher magnitudes would naturally result in substantially more severe impact to both individual decision makers and their firms.

This study proposed a conceptual framework which explains how the magnitude of unethical behavior is determined in supply chain managers' decision-making process. The framework is centered on several characteristics. First, the magnitude of unethical behavior can be as low as "0" or "none", which represents an ethical decision. Second, the magnitude of unethical behavior may not be continuous and linear as the unethical behavior increases. The substantive implications of a decision may become different once the magnitude of unethical behavior increases beyond certain critical points. Supply management decisions that are of different substantive meanings may require separate examinations. Third, because of such discontinuity, factors of research interest may have varying effects on decisions of different substantive meanings. Therefore, it may not suffice to follow a conventional theorizing process which simply predicts that certain factors are positively/negatively associated with the magnitude of unethical supply management behavior in general. The framework in this study instead posits that factors may have an influential effect

on the magnitude of unethical behavior towards either the ethical side or the unethical side of the decision. In this way, the effect of a factor may be not only changing the magnitude of a given decision but also driving the decision to another type with different substantive meanings.

The empirical portion of this study proposed a specialized statistical model to accommodate these unique characteristics from a modeling perspective. The data-generating process behind the magnitude of unethical behavior is modeled as a mixed distribution so that it can incorporate different decision types using separate model components. A series of conditional probabilities is used to model the progressiveness of the magnitude of unethical behavior as it escalates. Each conditional distribution can be modeled as a function of covariates so that factors of research interest can have varying impact on decisions of different types (i.e., decisions of different substantive meanings).

2.6.2 Heterogeneity in Ethical Decision-Making

The conceptual framework and the corresponding statistical model in this study provide guidelines for empirically examining the heterogeneity in the magnitude of unethical behavior. The experimental study indeed showed that there exists substantial amount of variance in the reported outcomes of ethical decision-making in the context of supply management. More importantly, the results suggested that the decision-making process can be heterogeneous in many ways, each revealing important theoretical and practical implications for supply chain researchers.

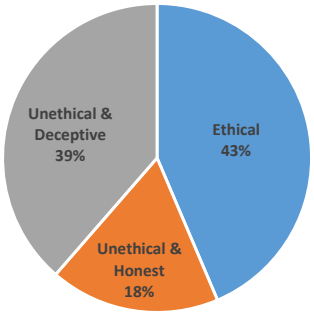
2.6.2.1 Heterogeneity in the Reported Magnitude of Unethical Behavior

The experimental design in this study allowed one to observe the entire spectrum of ethical decision-making in a supply management context. The collected data showed that there is large variance in the magnitude of unethical behavior.

In the study, the decision made by a participant results in two corresponding outcomes, namely the cost savings achieved for the firm and the monetary reward given to the participant. As depicted in Figure 2.6, it turned out that 494 out of 1133 participants (about 43.6%) in Study 1 chose not to disclose the lowest bid information and behaved ethically. By study design, these participants did

not achieve any cost savings for the firm and hence received no reward. About 56.4% (639 out of 1133) of the participants did choose to disclose the lowest bid information in exchange for benefits to both the firm and themselves. What was more important, however, is that the results indicated a large variance even in the "unethical" group alone. A large number of the participants from the "unethical" group (114 out of 494, or 17.8%) chose to report the true lowest bid information ($1,000). This observation further suggests that reporting the true lowest bid information should be treated as a different type of decision compared to reporting a deceptive lowest bid. There is also large heterogeneity in the "unethical and deceptive" group where individuals not only disclosed the information but also reported a deceptive bid price in order to obtain more benefit. The resulting *de-facto* price ranged from $748.8 to $959.04, which covered the entire spectrum of possible decisions allowed by the experimental design.

Figure 2.6: Decision Outcomes



Overall, the empirical study in this research clearly suggested that the heterogeneity in the magnitude of unethical behavior should not be overlooked when examining individual's ethical decision-making process in the context of supply management. In the main experimental study, around 56% of the participants chose to engage in unethical behaviors to achieve cost savings for their firms which resulted in personal bonus. However, such a statement is not sufficient at all in contextualizing their behavior - the cost savings achieved by the participants ranged from as low as $4 million to as high as around $25 million (one fourth of the transactional value of the entire pur-

chasing contract, assuming that the unit purchasing price is $1,000), with a large standard deviation of around $7.56 million. The economic consequences to the firm varied substantially, depending on the magnitude of individuals' unethical behaviors. Correspondingly, individuals may obtain a personal monetary bonus of as low as $20,000 or as high as about $231,000. The cash reward the subjects received during the experimental study ranged from $1 to $10. Such heterogeneity in the personal gains could lead to serious complications or concerns from a managerial perspective as well. For example, an employee who disclosed confidential information to the supplier and attained a bonus of $20,000 may not be treated the same as another employee who attained $200,000. Although these results were obtained from a hypothetical setting in an experimental environment, they clearly suggested that the magnitude of an employee's unethical behavior can have a huge and varying impact on the economic, social, or even legal consequences to the firm.

2.6.2.2 Heterogeneity in the Effect of Treatments and Covariates

Another major finding of this study was that the factors considered in the empirical analyses exhibited heterogeneous effects on ethical decision-making. The conceptual framework and the statistical model made it possible to examine the effect of treatments and covariates in different aspects pertaining to the determination of the magnitude of unethical behavior. It turned out that many variables rarely demonstrate consistent effect during the decision-making process. Instead, they may play important roles only in certain stages of the decision-making process.

The experimental study mainly considered the potential effect of two treatment variables, namely the consequence of unethical behavior and beneficiary of unethical behavior. Previous studies have produced some evidence that these two factors may have significant effects on individual's ethical decision-making (see Gino et al., 2013; Valentine and Bateman, 2011). However, the empirical analyses in this research demonstrated that such effects are not aways salient during the decision-making process where the actual magnitude of unethical behavior is determined. The consequence of unethical behavior in terms of product safety only affected an individual's decision between behaving ethically or unethically in general. Product safety considerations did not bear any impact on what lowest bid information to disclose given that the subject decided to behave

unethically. In contrast, who will receive the benefit resulting from unethical behaviors (i.e., the beneficiary treatment) did not affect the probability of an individual behaving ethically/unethically at all. The effect of this treatment became salient only after an individual chose to engage in an unethical behavior.

The same insight could be applied to other covariates in the analysis as well. For example, the perceived severity of potential punishment on unethical behavior tended to make individuals behave ethically or at least honestly when disclosing the lowest bid information. However, the perception of punishment did not seem to reduce the magnitude of unethical behavior once an individual chose to be deceptive and report a deceptive lowest bid.

In addition, the factors of research interest may have heterogeneous effects in the sense that the treatment effects were moderated by other covariates. The empirical results suggested that males and females reacted differently to both of the two treatments. Females tend to be more ethical when the benefit of unethical behavior is shared with the organization or when the unethical behavior will result in a severe consequence. The treatments also have varying effects on participants from different countries. Subjects from Italy and China tend to behave more unethically when the benefit is shared with the organization.

Finally, the empirical study showed that it is still possible that some factors have consistent effects on ethical decision-making, even if the magnitude of unethical behavior is taken into consideration. One personal value (hedonism) showed consistent effects in every aspect of decision-making. More specifically, individuals who value hedonism were more likely to behave unethically (as opposed to behaving unethically), to report a deceptive lowest bid (as opposed to being honest), and to report a lower bid price in exchange for more economic benefit. In other words, hedonism consistently drove an individual's decision to the unethical side of the spectrum.

The results suggested that our current understanding of how diverse factors affect ethical decision-making may be further extended by taking into account the magnitude of unethical behavior. Many previous studies have reported that certain factors were not found to be relevant in ethical decision-making (Pierce and Sweeney, 2010; Marques and Azevedo-Pereira, 2009; Fernando and

Chowdhury, 2010; Karacaer et al., 2009). It is possible that their impact on the decision-making process is salient only in certain situations. For instance, a factor may not affect an individual's tendency to behave ethically/unethically in general. However, that factor may have a strong impact on determining how unethical an individual would choose to behave under specific circumstances. In fact, the empirical results in this study showed that age is a significant predictor of ethical decision-making *only* when an individual decides to behave unethically and deceptively. This result may provide a potential explanation for why age was not found to be associated with ethical decision-making in previous studies (e.g., Forte, 2004; Cagle and Baucus, 2006)

2.6.3 Managerial Implications

The extant literature has identified various factors that are either positively or negatively associated with unethical behavior. The traditional wisdom in the literature is that firms should adopt certain policies or managerial practices that reduce unethical conduct in general (Giacalone and Thompson, 2006). This study, however, argues that the magnitude of unethical behavior demands special attention in managerial practices. What if unethical conduct is sometimes inevitable? Reducing the magnitude of unethical behavior can be as important to managers as eliminating unethical behavior altogether because the potential consequence of an unethical behavior is directly correlated with its magnitude. It might be very difficult to completely eliminate unethical conduct in an organization because doing so can be costly (Sims, 1992; Zajac and Westphal, 1994). The diminishing returns to investing in related practices or policies that reduce unethical behaviors further suggests that firms may never be completely safe from unethical conduct (Zajac and Westphal, 1994). In this sense, managerial levers that reduce the magnitude of unethical behavior can be particularly valuable for firms as they can serve as "damage-control" so that the consequence of already-incurred ethical failures can at least be contained.

This study suggests that it might be beneficial for supply chain managers to adopt a different mindset in promoting ethical behavior. Instead of looking for managerial levers that potentially diminish unethical behaviors altogether, managers could consider various managerial levers as driving forces that direct individual decisions towards the ethical side of the spectrum. From this point

of view, certain policies/practices which did not seem effective against unethical supply chain conduct may actually prove useful in reducing employees' tendency to engage in extremely unethical behaviors. As shown in the empirical analyses, certain factors may not be effective in preventing unethical behavior altogether but proved powerful in reducing the magnitude of already-unethical behaviors. What reduces the magnitude of unethical behavior, however, did not necessarily lower the probability of engaging in unethical behavior in general. Other factors can behave in the opposite manner - they may be effective in reducing the probability of unethical behavior but ineffective in reducing the magnitude of unethical behavior.

Taken together, supply chain managers may need to utilize multiple managerial levers so that the decisions made within a supply chain organization are all driven towards the ethical side. The ultimate goal is to have a joint force of managerial levers that is strong enough to drive all the decisions to become ethical. Many managerial levers might not be traditionally considered as a "cure" that prevents employees from engaging in all unethical behaviors. However, some of these levers may still be relevant as they can be considered as a "remedy" for unethical behaviors as they can be instrumental in reducing the magnitude of unethical behavior.

In addition, this research demonstrated that certain dispositional factors may have a consistent effect on ethical decision-making in supply management, after taking into account the magnitude of unethical behavior. For example, individual characteristics such as age and gender are generally associated with an individual's tendency toward ethical decision-making. More importantly, certain personal values such as hedonism may systematically drive an individual's decision towards the ethical/unethical side. From a practical perspective, firms may utilize existing measurement tools such as the one in Schwartz et al. (2012) during their hiring process to construct a profile of new employee's personal values. This profile may reflect the employee's behavioral tendencies in terms of ethical decision-making. For example, firms may be more cautious about a supply manager's integrity if he/she highly values immediate gains and gratification. Overall, personal characteristics such as age and gender and traits such as personal values are all easily obtained information which could be used to assist supply chain managers in making purchasing-related

decisions and promoting ethical conduct more effectively.

Our findings also suggest that an incentive scheme may be an effective managerial lever to promote ethical conduct in supply management because it plays an important role in affecting ethical decision-making. When designing payment schemes to incentivize supply managers, firms should consider not only encouraging employees to achieve economic benefit for the firm but also inducing them to behave in a more ethical manner. Individual characteristics such as nationality and gender may also determine how an individual will react to such payment schemes. Our findings suggest that supply managers generally tend to behave more ethically when the economic reward of good performance will be shared among team members. Therefore, it may be beneficial to establish a decision-making practice where supply management-related decisions are made collectively by organizational members. For example, the selection of potential suppliers might be determined by a joint committee consisting of multiple supply managers. A payment scheme that is more transparent to organizational members may also help to prevent unethical conduct in supply management-related activities.

2.6.4 Future Research

This study is one of the first attempts to theoretically and empirically capture the mechanism that determines the magnitude of unethical behavior, specifically in the context of supply management. Future research can take on multiple directions either to enrich the theoretical framework or to provide more empirical validation in other settings. First, this study focuses on proposing the conceptual framework and hence considers only several factors in the empirical analyses. Future research can move on from the exploratory approach taken in this research and focus on theoretically identifying other factors that should be incorporated in the framework. Second, the conceptual framework can be tested in different empirically settings where a variety of factors can be examined accordingly.

Finally, it might be particularly important to identify factors that exhibit conflicting effects in the framework. For instance, it is possible that what makes an individual more likely to engage in an unethical behavior may actually drive him/her to behave unethically only to a smaller degree.

In this study, participants from China seem to be more likely to engage in unethical behavior in general, compared to participants from other countries. However, they tended to behave less aggressively when reporting a deceptive lowest bid. It is thus possible that the cultural background of China imposes less restrictions against unethical behaviors but at the same time discourages excessive misconduct. Identifying such factors could lead to important practical implications as well as theoretical insights.

2.7 Conclusions

In this study, I proposed a conceptual framework that seeks to examine the magnitude of unethical behavior in the context of supply management decisions. I formulated specialized statistical models to capture the unique characteristics posited in the framework. I then took on an exploratory approach and analyzed the magnitude of unethical behavior in a supply management setting. The experimental studies revealed important practical and theoretical implications.

3. DYNAMICS IN ETHICAL DECISION-MAKING IN SUPPLY CHAIN MANAGEMENT - A LONGITUDINAL STUDY

3.1 Introduction

Ethical failures have become an important concern in business practice. The Association of Certified Fraud Examiners (2018) reported that U.S. organizations lose around 7% of their revenue to fraud, which annually represents roughly $994 billion in losses. Operations and supply chain related activities are especially susceptible to ethical failures, since about 30% of recorded cases of fraudulent practices were related to OM/SCM functions within the firm (ACFE, 2016). In fact, a recent survey of practitioners by Deloitte suggests that supply chain related fraud has become a more serious threat to many firms in the past few years, even after those firms implemented advanced analytics-based preventive measures (Chartered Institute of Procurement & Supply, 2017).

Ethical failures can have a devastating impact on firms because they often consist of a series of repeated acts/misconducts over a long period of time. According to ACFE (2018), corporate fraud schemes usually endure for months or even years, with the median duration being 16 months. Longer durations of fraud schemes in turn result in dramatically higher economic losses. For instance, Enron was found to overstate its earnings repeatedly during a four-year period. Satyam Computer Services, India's fourth largest IT company, was found to have engaged in various fraudulent practices for many years, such as forging transactions, inflating expenses, and manipulating inventory values. Between 2001 and 2007, multiple divisions in Siemens were involved in a series of internal corruption schemes, which resulted in a total of $1.4 billion of illegal payments (Kroll, 2011). BAE Systems, a British multinational defense, security, and aerospace company, was accused of paying £30 million to a prince of Saudi Arabia every quarter for 10 years in exchange for favorable treatment in a defense contract (The Guardian, 2007). These examples of corporate ethical misconduct all suggest that ethical failures may rarely play out as individual instances. Instead, ethical failures may often consist of a series of unethical behaviors over time that together result in

severe consequences.

This study focuses on investigating an individual's ethical decision-making process from a longitudinal perspective. Most of the extant research typically examines single instances of ethical decision-making or considers multiple decisions independent of each other. In reality, however, most of the major corporate ethical failures are not the result of a single action. Instead, such failures often turn out to comprise a series of repeated unethical behaviors where individuals often start with a minor unethical infraction but later engage in unethical behaviors that result in much larger consequences (The Association of Certified Fraud Examiners, 2018). Thus, instead of considering an individual's decisions as isolated instances, this study first seeks to evaluate the overall tendency of ethical/unethical behaviors from a longitudinal, collective perspective.

Although beneficial, it may not suffice for firms to focus solely on their employees' overall tendency to behave ethically/unethically: an individual who tends to behave ethically overall does not necessarily uphold the ethical standards over every specific decision. As reported by The Association of Certified Fraud Examiners (2018), many perpetrators of fraudulent practices did not have a recorded history of a prior ethics offense. It is likely that individuals do not necessarily behave in a consistent way. In other words, behaving ethically/unethically in the past does not always suggest decisions of the same nature in the future - there might be inconsistencies in an individual's behavioral pattern. Thus, this study also addresses the question of whether/how individuals behave consistently or inconsistently when making a series of decisions and discusses how to promote consistency in ethical decision-making.

Furthermore, The Association of Certified Fraud Examiners (2018) reports that individuals who had been employed with their organization longer tend to engage in fraudulent practices with bigger magnitudes compared to those with shorter tenures. This result can be particularly alarming to practitioners - few employees are completely safe from engaging in unethical behaviors. It is possible that individuals will gradually fail to uphold their ethical standards and eventually become a perpetrator of unethical conduct. It is also possible for an individual to need time to fully understand organization parameters in which an unethical decision might be carried out. Thus, the third

goal of my study is to investigate such a possibility by examining how vulnerable an individual is to engaging in unethical behavior after behaving ethically in the past.

Recently, the literature has started to examine the inter-temporal association between consecutive decisions that an individual makes over time (Barque-Duran et al., 2016). As suggested by this extant literature, individuals have non-stationary behavioral patterns in ethical decision-making. In supply chain management, such dynamic behavioral patterns could suggest that the current decision made by an individual may be affected by his/her prior decisions; the individual's history of ethical behaviors should matter. More specifically, individuals exhibit two types of dynamic ethical behavioral patterns, namely moral balancing and moral consistency (Mullen and Monin, 2016). On the one hand, moral consistency refers to a situation where individuals tend to behave consistently in ethical decision-making. An ethical behavior will likely lead to or be followed by another ethical behavior subsequently, or *vice versa*. Moral balancing, on the other hand, suggests that engaging in ethical or unethical behavior will increase the likelihood of engaging in an opposite type of behavior when the opportunity arises (Cornelissen et al., 2013a). In the literature, moral balancing often consists of moral licensing and moral cleansing (Brañas-Garza et al., 2013). A stream of literature focuses on the situation where an individual switches from acting ethically to acting unethically, a situation often termed moral licensing. Other studies focus on the opposite behavior, namely moral cleansing where an individual stops acting unethically and subsequently demonstrates ethical behavior(s) (see Mullen and Monin, 2016, for a comprehensive review of the related literature). Depending on which pattern an individual follows, he/she will tend to act consistently with or contradictory to his/her previous decisions.

Although somewhat studied in the psychology literature, limited research has emerged in supply chain management literature that attempts to validate and capture these two distinct behavioral patterns. This research study potentially fills this gap in the supply chain management literature by demonstrating the importance of incorporating longitudinal ethical dynamics when modeling supply chain decision-making. In supply management practice, managers repeatedly face decisions that affect their firm, their supply chain partners, and often themselves as individuals. Many

decisions invoke ethical considerations and therefore are subject to behavioral changes driven by moral balancing or moral consistency. It is thus important for firms to strive to maintain high and consistent ethical standards. In many cases, a single instance of ethical failure may result in catastrophic consequences to the firm in terms of both reputation and financial performance.

Therefore, this study also investigates whether procedurally inducing ethical awareness can affect the dynamics of ethical decision-making. Prior studies have shown that ethical awareness serves as an important barrier to acting unethically (Rest, 1986). However, it remains unclear whether ethical awareness has long-lasting effects on ethical decision-making. According to Gino and Bazerman (2009), individuals may gradually become less sensitive to unethical behaviors due to "ethical erosion". Therefore, overlooking an individual's present unethical behaviors can have severe long-term consequences. This study examines whether increasing ethical awareness through ethics education leads not only to ethical but also to consistent individual behaviors. If ethical awareness does have strong and lingering effects on ethicality, firms can potentially leverage related practices to encourage ethical practices in their supply management operations.

To empirically examine how individuals behave over time across multiple decisions, I conducted a behavioral experiment study where participants were asked to make a series of ten supply chain related decisions over a span of ten weeks. This scenario-based experimental design seeks to simulate a real-life situation in which supply chain managers are repeatedly faced with decisions that involve ethical considerations.

The empirical analyses seek to characterize the dynamic behavioral pattern exhibited by the experimental subjects. Three aspects of ethical dynamics are examined in this study. First, my study shows that most of the individuals indeed behaved unethically at some point during the study. The overall probability of engaging in unethical behavior, however, varied across individuals. Second and more importantly, the results suggest that there was a high level of inconsistency in individuals' behavioral patterns - the individuals often switched between ethical and unethical behaviors, regardless of their overall tendency of behaving ethically/unethically in the long term. Third, it seems that the risk of an individual deviating from an ethical behavioral pattern may decrease dra-

matically after he/she has behaved ethically for a long period of time in the past. This study also finds that ethics education affects all the examined aspects of ethical dynamics. More specifically, ethics education can increase an individual's overall tendency to behave ethically, decrease the inconsistency in his/her behavioral pattern, and fortify his/her position to behave ethically in the future. Using a generalized model, I also demonstrate that such effects may all be attributed to a complete shift in an individual's underlying mentality that determines his/her behavioral pattern.

The rest of this chapter is organized as follows. Section 3.2 presents the theoretical background of ethical dynamics and the efficacy of ethics education. Sections 3.3 and 3.4 describe the setting of the experimental study. A set of empirical analyses are discussed in Section 3.5 to establish a complete characterization of ethical dynamics. Important research findings and implications are discussed in Section 3.6.

3.2 Theoretical Background and Hypotheses

3.2.1 Ethical Dynamics and Related Literature

Ethics has been a central topic in many fields of scientific inquiry for a long time. Traditionally, researchers take a static approach to examine single instances of ethical decisions. In other words, the outcomes of ethical decision-making processes are often assumed to be independent of each other. A variety of factors have been shown to affect ethical decision-making, including personality, cultural and value orientation, competition (Hegarty and Sims, 1978), affect (Vincent et al., 2013), presence of wealth (Gino and Pierce, 2009), goal setting (Schweitzer et al., 2004), and mentality (Greenbaum et al., 2012), among other factors.

Multiple mechanisms have been proposed to explain ethical decision-making. For example, moral disengagement theory argues that individuals sometimes make unethical conduct personally acceptable by persuading themselves that the behavior is actually morally permissible (Shu et al., 2011). Essentially, individuals experience cognitive dissonance when acting unethically because of the gap between their moral standards and their real actions. Moral disengagement works as a self-serving mechanism that helps individuals to justify their unethical behaviors and therefore

to alleviate the cognitive dissonance (Bandura, 1990; Detert et al., 2008). Self-regulation failure is another mechanism proposed in the literature that attempts to explain unethical behaviors. According to this body of work, individuals are tempted to act unethically because of short-term benefits. However, ethical behaviors can result in long-term losses in terms of a damaged moral self-image. Individuals resolve such conflict by exerting self-control (Gino et al., 2011). In this way, self-control is the psychological capacity that enables an individual to behave consistently with his/her long-term interests. Such capacity, however, is often a diminished resource as individuals constantly exert self-control to resist short-term temptations (Baumeister and Heatherton, 1996). Self-regulation failure theory suggests that individuals are more likely to engage in unethical behaviors when their self-control is depleted (Gino et al., 2011).

A growing stream of behavioral sciences literature has moved beyond single instances of ethical decisions and instead focuses on the dynamic nature of ethical decision-making (e.g., Chugh and Kern, 2016). According to this body of work, an individual's prior ethical decisions have a strong impact on subsequent ethical decisions. Previous studies have identified two contrasting behavior patterns. On the one hand, individuals may exhibit moral consistency where engaging in ethical or unethical behavior increases the likelihood of engaging in the same type of behavior later on. On the other hand, moral balancing may exist where behaving ethically or unethically decreases the likelihood of engaging in the same type of behavior again later on (Cornelissen et al., 2013a).

Previous research generally maintains that individuals have a strong proclivity towards consistency (Beaman et al., 1983; Burger, 1999; Gawronski and Strack, 2012). This tendency also holds in ethics-related scenarios (Foss and Dempsey, 1979; Thomas and Batson, 1981). After engaging in an ethical/unethical behavior, an individual is more likely to behave in the same fashion later on (Cornelissen et al., 2013a; Gino et al., 2010), resulting in consistent behaviors. Multiple explanations for moral consistency are provided in the psychology literature. For example, individuals may exhibit moral consistency because of the need to maintain one's self-concept or self-perception. In other circumstances, moral consistency may be seen as a decision heuristic that helps preserve cognitive resources during an ethical decision-making process (Albarracín and

Wyer, 2000; Cornelissen et al., 2013a).

In contrast to moral consistency, moral balancing behaviors are directed towards the opposite of the previous actions. When the previous action is ethical, individuals may feel "licensed" to engage in some unethical behaviors in exchange for personal benefits. Past ethical behaviors may serve as "moral credentials" for individuals to relax their moral strivings and therefore engage in unethical behaviors (Jordan et al., 2011). When previous behaviors are considered unethical, an individual may feel obligated to engage in ethical behavior to compensate for the negative psychological impact that often accompanies unethical behaviors. Such a phenomenon has been termed as "moral cleansing" or "moral compensation" (e.g., Tetlock et al., 2000). According to this line of work, moral cleansing occurs because unethical behaviors result in emotional distress as one evaluates his/her moral self-image. In this situation, individuals are motivated to alleviate such distress by taking actions to improve their moral self-image, such as behaving ethically when the opportunities arise (Sachdeva et al., 2009).

Nevertheless, the extant literature suffers from several limitations in terms of explaining the dynamic behavioral patterns in ethical decision-making an individual may exhibit in the context of supply chain management. First, it is important to note that all these concepts developed in the literature are inherently dynamic in nature. The central argument of this line of research is that one should not overlook an individual's prior behaviors related to ethics when examining his/her present ones. Hence, investigating moral consistency and moral balancing naturally requires researchers to observe multiple decisions that invoke ethical considerations, which implicitly requires researchers to constrain such decisions and considerations to a recurring decision context. Unfortunately, the extant empirical studies use rather trivial and hypothetical tasks to measure ethicality when investigating ethical dynamics. For example, Cornelissen et al. (2013a) employ a hypothetical dictator game to induce unethical behavior. In this game setting, subjects are assigned as pairs and informed that, as a dictator, one of the two subjects will decide how to allocate a sum of money the pair will receive between the dictator and the other subject. Both of the two subjects are in fact told that they are assigned as the dictator. As a result, how subjects allocate the reward

becomes a measure of ethicality - allocating more money to the decision maker himself/herself would indicate a more unethical behavior. In other studies such as Jordan et al. (2011), subjects are asked to perform some simple tasks such as performing arithmetic calculations. Researchers measure ethicality either by allowing subjects to have the chance to cheat or by asking them to self-report task outcomes. Subjects may exaggerate their performance in order to receive more rewards. Other studies do not measure ethicality based on the subject's observed actions but instead measure it perceptually using psychometric scales (e.g., Barque-Duran et al., 2016).

Although such measurement approaches are accepted in pure psychology research, we argue that more contextual factors should be taken into account when examining ethical behaviors in business situations. Ethical decision-making in business is often more complex because both personal and organizational factors need to be accounted for. The major difference of ethical decisions in business settings is that an individual's decision affects not only him/herself but also the organization and its constituents. In addition to individual characteristics, factors such as organizational culture, incentive schemes, and managerial practices may impact the decision. When making business decisions, individuals need to evaluate themselves both as a person and as a professional. From a practical perspective, decisions that invoke ethics in organizational settings are often much more consequential than those trivial tasks often performed by subjects in psychological experiments. Finally, research has shown that making business decisions will likely impose an outcome-oriented mindset to individuals. For example, Greenbaum et al. (2012) propose the concept of bottom-line mentality. When dictated by bottom-line mentality, individuals are likely to engage in unethical behaviors resulting from one-dimensional thinking that prioritizes economic outcomes and ignores other considerations.

Second, the extant studies generally examine ethical dynamics by recording only two consecutive decisions made by a certain individual (c.f., Barque-Duran et al., 2016). The effect of moral consistency and moral balancing is examined by observing the potential behavioral change between only the two decisions. However, it remains unclear whether the effect of moral consistency/moral balancing that originated from the current decision persists beyond the immediate next

decision. In addition, from an empirical perspective, the effect of moral consistency/balancing may be better identified when more decisions are observed from the same decision-maker so that both within-subject and between-subject variations can be utilized in statistical analyses.

Compared to the extant experimental studies, which look at only one or a few consecutive ethical decisions, my experimental design allows me to observe multiple rounds of decisions made by each participant with relatively substantial time in between each decision. Taking advantage of such a longitudinal design, my analysis can infer not only group level differences but also individual-level heterogeneity. In addition, such an experimental design allows estimating statistical models where the aforementioned theoretical concepts and arguments can be effectively translated into a mathematical structure. Empirically fitting such models can yield important insights about the unobserved parameters and how they are affected by external factors. Ultimately, I seek to identify factors that might be exploited as managerial levers to promote consistent ethical behaviors in supply chain practices.

3.2.2 Three Aspects of Ethical Dynamics

In this essay, I aim to partially fill the gap in the literature by specifically investigating the potential role of moral consistency and moral balancing in ethical decision-making in the context of supply chain management. I take into account the inherent dynamic nature of these two behavioral patterns and, building on existing studies, test related theoretical predictions in a supply chain setting. My study seeks to examine three aspects of ethical dynamics that are relevant to supply management practice. First, I investigate an individual's overall tendency to engage in ethical/unethical behaviors when facing multiple instances of ethical decision-making. Second, I examine how individuals behave consistently/inconsistently (i.e., switching/not switching between ethical and unethical behaviors) when making consecutive decisions. Third, I characterize the vulnerability of an individual exhibiting an ethical failure after making multiple ethical decisions in the past (i.e., how long before an individual deviates from an ethical decision-making pattern and behaves unethically).

I argue that these three aspects should be examined individually because they have differ-

ent theoretical/practical implications in explaining the dynamic behavioral pattern in an ethical decision-making process. The first aspect is mainly concerned with the overall tendency an individual exhibits in terms of behaving ethically/unethically. Such a tendency can be seen as an aggregate measure of an individual's ethicality.

The second aspect, however, focuses on examining how an individual behaves between consecutive decisions. In this way, the second aspect of ethical dynamics is concerned with the consistency/inconsistency in one's behavioral pattern, which bears different meanings than his/her overall tendency in ethical decision-making. In other words, two individuals may have the same level of tendency of engaging in unethical behaviors but different levels of consistency in ethical decision-making. In the long run, the two individuals will exhibit the same level of overall ethicality. However, their behavioral patterns can be dramatically different because the person with a high level of consistency will be less likely to switch between an ethical behavior to an unethical one across consecutive decisions.

Third, it is also of interest to determine how long before an individual fails to uphold the ethical standards and switches to an unethical behavior. From a practical perspective, managers may be particularly interested in determining how "vulnerable" an employee is against the temptation of obtaining some benefit through unethical conduct. Behaving ethically and consistently in the past does not necessarily mean that the individual will continue to do so in future decisions. Therefore, the third aspect examined in this study focuses on an individual's risk of exhibiting "ethical failure" after behaving ethically in the past.

3.2.3 The Effect(s) of Ethics Education

A central objective of this study is to investigate the effect of ethics education (i.e., firms frequently communicating ethical standards in supply chain practice to their employees to promote ethical conduct)[1] on an individual's ethical decision-making process in the long term. As discussed in the previous section, ethical dynamics can be decoupled into three distinctive aspects, namely

[1]For convenience, frequent communication of ethical standards and ethics education will be used interchangeably hereafter in this paper.

(1) the overall tendency of behaving ethically/unethically, (2) the consistency/inconsistency in the behavioral pattern, and (3) the vulnerability to exhibiting ethical failure after behaving ethically in the past. Accordingly, it is possible that ethics education affects ethical dynamics in multiple ways as well. Therefore, this study seeks to examine the effect of ethics education on each of the aspects of ethical dynamics.

Employee education can serve as an important managerial lever in improving organizational performance. For instance, Barrett and O'Connell (2001) find that in-company training generally improves employee productivity. Employees tend to perform better and become more committed to the organization when the firm invests more in employee development (Tsui et al., 1997). Krause et al. (1999) conclude from a meta-analysis that behavioral-based employee education programs significantly improved firms' safety performance.

Most firms implement formal managerial levers to address ethical issues, including ethical standards (codes of conduct) (Treviño et al., 1999). However, merely having ethical standards/codes of conduct may not suffice to promote ethical conduct. Instead, ethical standards/codes of conduct may be effective only when accompanied by managerial practices that promote the implementation of such standards (Cooper et al., 2000; Laczniak and Inderrieden, 1987). Frequent communication of ethical standards, or more generally, ethics education, may serve as an important means of helping organizational members to internalize ethical standards and truly behave accordingly when making decisions. In fact, the extant literature has indeed identified ethics education as an effective way of promoting ethical conduct/codes of conduct (Melé, 2005; Armstrong et al., 2003). Therefore, I expect that ethics education will generally lead to a lower tendency of individuals to engage in unethical behavior within an organization.

Hypothesis 3.1. *Individuals who received ethics education have a lower tendency of engaging in unethical behavior.*

Nevertheless, while the extant literature has demonstrated some evidence about the general efficacy of ethics education in promoting ethical conduct, it remains unclear whether/how ethics education affects the consistency/inconsistency in an individual's ethical decision-making process.

There is little extant research regarding how ethics education affects ethical decision-making in the long term.

According to related studies, systematic ethics education may help to establish an ethical culture/climate within the organization (Ardichvili et al., 2009). Ethical climate (organizational members' shared perceptions of procedures, policies, and practices with regard to ethics) is in turn associated with lower likelihood of unethical conduct (Zhang et al., 2009; Martin and Cullen, 2006). In addition, some studies suggest that employees tend to be more vigilant against unethical conduct when receiving ethics education. Rest (1986) proposes that moral awareness is the first stage in an ethical decision-making process where an individual determines whether the issue at hand invokes ethical concerns. Frequent communication of ethical standards may have a positive impact on an individual's sensitivity of ethical awareness because it increases the likelihood that an ethically questionable act will be detected (Rottig et al., 2011). Ethical awareness may in turn serve as an lasting barrier against unethical behaviors every time an individual is engaged in decision-making where ethical considerations are potentially invoked (Haines et al., 2008; Tenbrunsel and Smith-Crowe, 2008).

In addition, systematic and recurrent ethics education increases an employee's exposure to ethical standards. Through repeated exposures, individuals may be more likely to truly internalize these standards because repetition is often positively associated with learning and retention (Zajonc, 1968; Zajonc et al., 1974). It is possible that frequent communication of ethical standards can result in a reinforcing effect on an individual's ethical behavioral pattern. In this way, the individual is more likely to behave ethically in a consistent way for a longer duration without exhibiting an ethical failure (i.e., switching to an unethical behavior after behaving ethically in past decisions).

Taken together, I expect that ethics education (manifested via frequent communication of ethical standards in supply chain management) will play an important role in promoting consistency in ethical decision-making. Ethics education may also induce individuals to remain in an ethical behavioral pattern through better learning and retention of ethical standards. Therefore, ethics education should not only promote ethical conduct in general but also should induce individuals to

behave in a consistent way. Over time, individuals may truly internalize ethical standards through ethics education and adopt a consistent behavior pattern in decision-making when ethical considerations are invoked. In this case, an individual will become even less vulnerable to ethical failures because he/she has formed an ethical decision-making pattern from his/her previous ethical decisions.

Hypothesis 3.2. *Individuals who received ethics education are more likely to behave ethically in a consistent manner.*

Hypothesis 3.3. *Individuals who received ethics education are less vulnerable to exhibiting ethical failure after behaving ethically in the past.*

3.3 Overview of Experimental Design

Multiple approaches have been used to collect information for research regarding individual ethical behaviors. An examination of the dynamic nature of ethical decision-making naturally requires observing a large number of consecutive behaviors exhibited by individuals in a supply chain management context. In practice, however, it is often difficult to repeatedly observe and document a series of individual behaviors throughout a period of time. As a result, there is scant related research that uses secondary data sources, with Pierce and Snyder (2008) being an exception. In that study, the authors use a unique database that contains the behaviors of vehicle emission inspectors working for different organizations. Because some of the inspectors switched to a different employer during the period when the data was collected, the authors were able to examine how these inspectors exhibited changes in their ethical behavior (in terms of the rate at which they pass vehicles) after moving to a new organization with a different ethical climate. Divergent from an approach based on secondary data, an experimental approach does not rely on existing data sources but instead creates a simulated environment where individual behaviors can be treated via stimuli, isolated, and recorded.

In addition, as in other research using observational data, one limitation of using secondary data sources is that researchers have a limited ability to influence the data-generating process in

order to investigate how interventions affect the outcomes. Thus, secondary data is rarely collected at the level of the individual decision maker for longitudinal phenomena. Controlled experiments, however, provide researchers with more direct control over a set of designated factors whose impact on outcomes can be directly examined and compared with each other. Researchers are therefore able to examine the relationship between factors and outcomes in a more direct manner and, more importantly from a practical perspective, identify effective managerial levers that can be applied in practice.

The relative ease of data-collection and variable manipulation make controlled experiments the most adopted data-collection method used in ethics research (e.g., Gino and Pierce, 2009; Schweitzer et al., 2004; Mazar et al., 2008; Kouchaki et al., 2013). However, there are potential limitations to this approach that need to be carefully addressed. To observe consecutive outcomes of an ethical decision-making process, researchers need to track a series of decisions made by the same individuals. Doing so requires an experimental design different from the dominant approach used in the existing ethical dynamics research, which only records two rounds of decisions from each subject (Barque-Duran et al., 2016). When adding more rounds, some learning effect will be triggered and subjects will start to anticipate the researcher's intention. This potential issue could be more problematic if social desirability becomes salient as subjects make more and more decisions. The existing studies typically utilize "filler tasks" to address such potential bias in data collection. For example, a two-stage design requires subjects to answer two rounds of focal questions (and/or complete two rounds of focal tasks). In such a case, subjects will be asked to complete the filler tasks between the two rounds. These tasks are designed to be completely unrelated to the focal variables (ethics-related, in this case) so that they serve as "distractors".

Although widely acceptable in the literature, I argue that such an approach may not be ideal in the setting of this study. First, the effectiveness of using filler tasks has not been thoroughly evaluated and there are no general guideline for designing filler tasks. The use of filler tasks is often necessary in the extant studies due to the short duration between the decisions. Relying on filler tasks between multiple rounds, however, may significantly diminish their effectiveness in hiding the true

purpose of the study. To the best of my knowledge, Barque-Duran et al. (2016) is the only study that examines more than two consecutive behavioral rounds regarding ethical decision-making. The authors collected five rounds of information about ethical behavior, after a setup round (Stage 0). This design results in a total of four rounds of filler tasks. The validity of using more filler tasks may be questionable when even more rounds of behaviors are recorded because participants may uncover the true purpose of the experiment (i.e., observing ethical decision-making) as they begin to see the repetitive pattern in the experimental design. Second, the traditional approach of controlled experiments may not generate enough degree of realism, since subjects are asked to complete multiple tasks within a short period of time practically allowed in a single experimental session. For example, the experiments in Barque-Duran et al. (2016) allocated subjects at most 40 minutes to complete the entire session. In business practice, however, individuals may never need to repeat intensive ethical considerations with negligible time in-between. In this sense, it remains unclear in the literature whether the dynamic effects between ethical decisions persist after a longer period of time (a week, for instance) in-between business decision-making instances.

3.3.1 Experimental Design

To address the potential challenges discussed above, I propose a novel experimental design, which does not mainly rely on filler tasks in between ethical decisions. Instead, I rely on longer in-between-decision times to create a better separation of ethical decisions and consequently a more realistic simulation of supply chain management practice. The experiment is conducted throughout the regular semester in classes of undergraduate business students. A class environment allows a longer engagement with student participants in order to keep track of their consecutive behaviors. To ensure diligent participation, the experiment is broken down into multiple rounds with little amount of required effort during each round. Course credit (and potentially monetary reward) were given for participation and alternative assignments was also be available in case a student chose not to participate. Students were informed that the experiment would be conducted by a group of researchers and their instructor was not among them. As a result, the instructor would not have access to a student's anonymous responses in any way or form. The course credits would

be assigned directly by the researchers based on student participation. However, what specific decisions they made in the experiment would not affect the credits they receive.

The monetary reward a participant may receive is directly proportional to the number of "unethical decisions" an individual makes during the study. Each unethical decision will result in a reward of \$2. An "ethical decision" will not generate any monetary reward. For example, an individual who chooses to engage in 3 unethical decisions and 7 ethical decisions in the experiment will receive a total monetary reward of $\$2 \times 3 = \$6$. The experimental respondents were also told that they must finish all of the rounds throughout the entire semester in order to qualify for the credits/reward. It was noted to respondents that each round would take no longer than three to five minutes of their time each week. Respondents also were told that they could report their responses easily on their personal computers or mobile devices via Qualtrics.

3.3.1.1 Decision Tasks

The experiment consists of a series of *rounds* of decision tasks. In each round, participants were shown a supply management *decision scenario* where, as a decision maker, they would need to make a business decision; the participants could act unethically and obtain personal rewards as well as benefits for the company or act ethically and forfeit the opportunity for personal rewards or company benefits. I composed a total of 12 scenarios and conducted a pretest to select the best 10 scenarios for the main study (see Appendix B.2). The scenarios were selected based on whether they induced a similar level of psychological impact and perceived ethicality to the participants. Such a criterion helps rule out the alternative explanation that the dynamic behavioral patterns potentially observed in the data were induced by the significant change in the nature of the scenarios themselves, rather than by the effect of ethical dynamics. A total of 61 responses were collected for conducting this pretest.

3.3.1.2 Measures

Three-questionnaire measurement items were used to evaluate each of the scenarios: (1) How likely are you to [engage in the unethical behavior] (7 likert-scale from "Extremely Likely" to "Ex-

tremely Unlikely")? (2) Based on your perception, how ethical do you think it is to [engage in the unethical behavior] (7 likert-scale from "Extremely Unethical" to "Extremely Ethical")? (3) How do you describe your feelings while reading the material and evaluating your decision (scale from 0 - "Very Disturbed/Annoyed" to 100 - "Very Comfortable/Happy")? During pretest, we visually inspected the overall scores reported by the pretest respondents for each of the question items and dropped Scenarios 3 and 9 as their scores were largely different from the rest of the scenarios. ANOVA analyses were then performed on the selected 10 scenarios. The results suggested that the scenarios did not induce statistically different levels of psychological impact or perceived ethicality (the p-values corresponding to the F-statistics are 0.7410, 0.2681, and 0.1897, respectively).

To ensure that participants fully understand the scenarios and make informed, well-thought out decisions, a simple question regarding some basic information contained in the scenario's text was posed to the participants (*marker question*). After responding to the marker question correctly, participants were asked to decide whether or not to engage in the seemingly unethical behavior mentioned in the respective text. In each decision round, the participants were reminded that the actual decision they make will remain anonymous and will not affect the course credits they receive. However, they must answer the marker questions correctly in order to proceed. Multiple attempts to choose the correct answer to the marker questions would result in the deduction of credits because such a behavior suggests that the respective participant was not diligent and attentive to the experimental material. Participants were also reminded that they will have to finish each and every round of the experiment in order to qualify for credits, which would not be awarded until the end of the semester.

Demographic and other basic information was collected before the first round of the experiment (see Appendix B.1). Ten rounds of experiments were then conducted throughout the semester, with approximately one round per week. I arbitrarily distributed the scenarios according to a following sequence (as numbered in Appendix B.2): 5, 8, 6, 2, 7, 10, 1, 12, 4, 11. The purpose of the experiment was disguised in order to avoid anticipation. The experiment was framed as "an exercise to make intelligent supply chain management decisions". To further conceal the true

research question, several questions that measure the subject's stress level were given as distractors. For incentive compatibility purposes, each time a participant chose to engage in the behavior, which leads to personal and company rewards, he/she was informed that a small amount of money would be given at the end of the semester ($2 per decision). Each participant was assigned a unique ID, which was used later to construct a repeated measures dataset. The experiment was concluded by a final survey (Appendix B.3) where participants were asked to report the major motives behind their decisions and justify their behavior in their own words.

3.3.1.3 Treatment Manipulation

The experimental design includes a treatment that manipulated the level of ethics education, and subsequently awareness, received by the individuals. More specifically, the subjects were divided into a control group and a treatment group. Subjects in the treatment group were exposed to frequent communication of ethical standards in supply chain management in the realm of the course where the experimental study was conducted. The ethical standards in supply chain practice were repeatedly communicated through different means during the duration of the 10-week experiment. First, a course module was dedicated to discussing ethical supply chain practices, which lasted about three class sessions. Second, apart from the dedicated course module, students watched a 1.5-hour video on counterfeit operations and the use of child labor. They were then asked to write a reflection paper and turn it in after a week. Third, some of the exam questions (true/false questions and essay questions) were related to ethics. Fourth, each student was asked to respond to a series of essay questions that pertained to a case study that involved ethically questionable supply management practices. Students were also required to write an essay on how to establish an ethical infrastructure within an organization. Fifth, every week during the course of the study, the course instructor discussed real-life business cases regarding ethics. The important implications, especially the ethical dilemmas involved in each story, were discussed. The case material was posted on the course website after the discussion. The overall goal of this treatment was to simulate a real-life situation where firms frequently provide various forms of ethics education to their employees. Subjects in the control group did not receive any such treatment.

3.4 Empirical Setting

3.4.1 Sampling

The experiment was carried out at a major university in the U.S. The participants were recruited from a population of undergraduate business students who were enrolled in one of the two courses (Operations Management or Sourcing and Procurement).

A student population was used for sampling mainly because of practical considerations. First, the nature of our experimental design requires subjects to respond to a total of 12 scenarios (one pre-experiment questionnaire, ten decision scenarios, and one post-experiment questionnaire), which span across 12 weeks. Deploying a non-student population (e.g., an online panel of respondents) would likely result in a very high attrition (drop-out) rate as the study would progress. A reasonably low attrition rate is more attainable using student subjects because they can be constantly reminded of completing the surveys through group emails and/or in-class announcements. Second, student subjects are easier to incentivize in terms of both lowering the drop-out rate and providing enough economic stimuli for making decisions resting on their "true" behavioral patterns. Practitioner subjects, however, may be concerned about the potential consequence if their unethical behaviors during the experiment were observed by the organization they are currently working for. In a classroom environment, course credits are available as a means of motivating subjects to participate and continue with the study. The student subjects in our study were told that they would receive a certain amount of course credits if and only if they finish the entire study (i.e., all assignments over the 12 weeks). They were also told that the amount of course credits they receive will not be determined by the actual decisions they made during the study. They would receive credits based on participation when all 12 assignments are completed. In addition, students were told that they may receive a cash bonus at the end of the study where the monetary reward is determined by the types of decisions they made in each of the 10 decision-making scenarios (see Section 3.3 for details). Third and most importantly, using a student population provides a natural opportunity for frequent communication of ethical standards in supply chain management.

As described in Section 3.3, ethical standards were communicated in multiple ways to the students in the treatment group throughout the course. Such a multi-faceted approach of communication can be seen as a simulation of ethics education in an organizational environment, which can prove very difficult to implement when conducting the study using other populations.

Table 3.1: Number of Observations and Attrition in Repeated Sampling

	Control Group	**Attrition (%)**	**Treatment Group**	**Attrition (%)**
Frontend	37	-	81	-
Decision 1	36	2.70%	81	0.00%
Decision 2	36	0.00%	79	2.47%
Decision 3	36	0.00%	78	1.27%
Decision 4	36	0.00%	77	1.28%
Decision 5	36	0.00%	77	0.00%
Decision 6	36	0.00%	76	1.30%
Decision 7	36	0.00%	74	2.63%
Decision 8	36	0.00%	73	1.35%
Decision 9	36	0.00%	73	0.00%
Decision 10	35	2.78%	72	1.37%
Backend	35	0.00%	72	0.00%
Overall		**5.41%**		**11.11%**

The study was conducted between September, 2017 and December, 2017. A total of 118 students (37 in the control group and 81 in the treatment group) participated in the "Frontend" of the study where they were asked to provide demographic information and read about the experimental setting. Among these students, 107 students (35 in the control group and 72 in the treatment group) eventually completed the entire study. The overall attrition rate was 10.28% (5.41% in the control group and 11.11% in the treatment group). Detailed records of sample attrition are reproduced in Table 3.1. As a result, the final data used for empirical analyses comprises 107 individuals. Each subject reports time series data of length $t = 10$.

Table 3.2 summarizes important demographic information regarding the sample. The majority of the subjects were between the ages of 20 and 22. In the sample, 44 out of 107 (41.1%) subjects

were males and 63 subjects (58.8%) were females.

Table 3.2: Sample Demographics

Variable	Categories	Percent	
Gender	Male	44	41.10%
	Female	63	58.80%
Age	<20	2	1.87%
	20-22	96	89.72%
	22-30	9	8.41%
Race	Asian American	8	7.48%
	African American	4	3.74%
	Foreign National	4	3.74%
	Hispanic or Latino	15	14.02%
	Hawaiians/Other Pacific Islander	1	0.93%
	White American	75	70.09%
Political Orientation	Democrat	22	20.56%
	Republican	45	42.06%
	Others	13	12.14%
	None	27	25.23%
Household Income	Less than $24,999	8	7.48%
	$25,000 to $49,999	8	7.48%
	$50,000 to $74,999	8	7.48%

Continued on next page

Table 3.2 – *Continued from previous page*

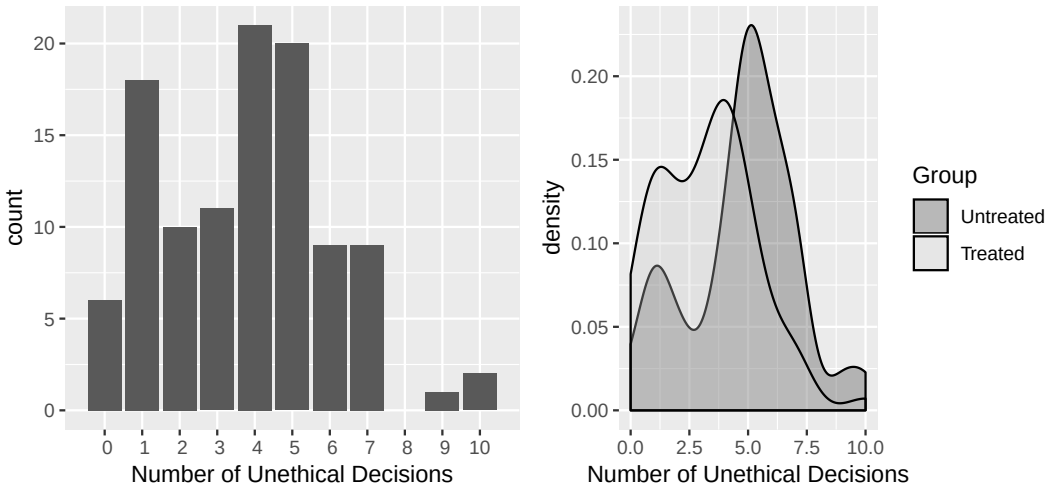
Variable	Categories	Percent	
	$75,000 to $99,999	15	14.02%
	$100,000 to $149,999	19	17.76%
	$150,000 to $199,999	16	14.95%
	$200,000 or more	33	30.84%
Importance of Religion	Not important at all	13	12.15%
	Unimportant	4	3.74%
	Somewhat Unimportant	3	2.80%
	Neither Important nor Unimportant	10	9.35%
	Somewhat Important	16	14.95%
	Important	35	32.71%
	Highly Important	26	24.30%

On average, the subjects engaged in 3.74 unethical decisions across ten decision scenarios. Accordingly, the average monetary award a subject received was $7.49. Nevertheless, the standard deviation of the number of unethical decisions was 2.25, indicating fairly large heterogeneity in the decisions made by the participants. The left panel of Figure 3.1 depicts the overall distribution of the total number of unethical decisions reported by the subjects throughout the study. The right panel of Figure 3.1 plots the density of the distribution by treated vs. untreated group. Subjects in the treated group (i.e., those who received ethics education) seemed to have engaged in fewer unethical behaviors as the group density is concentrated towards the lower end of the spectrum (compared to the density of the untreated group).

3.4.2 Research Objectives and Variables of Interests

The main objective of this study is to examine the dynamic characteristics of ethical decision-making in supply chain management. I propose that three aspects are essential to examine an

Figure 3.1: Distribution of the Number of Observed Unethical Decisions



individual's behavioral pattern, namely (1) the overall tendency of exhibiting unethical behaviors, (2) the probability of behaving consistently or inconsistently, and (3) the vulnerability to deviating from ethical decisions, given a past history of ethical behaviors (i.e., how likely an individual would exhibit an ethical failure after a streak of ethical decisions). Multiple sets of analyses are conducted to examine each of these distinctive yet related aspects.

A series of specialized statistical models are required to directly analyze the corresponding dynamic characteristics of ethical decision-making. The main goal of these analyses is to structurally capture how individuals exhibit dynamic behavioral patterns in a series of supply chain management-related decisions. In essence, the models of this study are centered around modeling (1) the overall probability of an individual engaging in unethical behavior, (2) the probability of an individual behaving consistently/inconsistently between consecutive decisions, and (3) the duration of an individual behaving ethically before violating ethical standards.

Nevertheless, it is also important to acknowledge that these probabilities are potentially heterogeneous across individuals. Ethics education, as a central variable of interest in this study, is also expected to have a significant effect on the estimated probabilities. A sensible approach to account for such heterogeneity is to extend the statistical models such that they estimate the conditional probabilities, given certain covariates. To avoid any inconsistency in the empirical analyses, the

same set of variables will be entered in each of the proposed models.

Multiple covariates are included in the model fitting process to account for the heterogeneity among the experimental subjects and between the control and treatment groups. In my empirical setting, according to the extant research, several individual characteristics (gender, age, religiosity, race, and income) may be relevant for generating the observed outcomes (e.g. Elango et al., 2010; Beekun et al., 2010; Cagle and Baucus, 2006). Although the extant research has not specifically examined whether/how these individual characteristics affect ethical dynamics, they are likely to play an important role as previous studies have found that they may be associated with ethical decision-making in general (see, for example, Cagle and Baucus, 2006; Nguyen et al., 2008; Marques and Azevedo-Pereira, 2009; Vitell et al., 2009; McCullough and Faught, 2005; Vitell et al., 1992). In the empirical analyses, the race of the experimental subjects is grouped by white/non-white to avoid numerical instability. Religiosity is measured by the question "I would describe myself as religious" (rated from 1-"Strongly disagree" to 7-"Strongly agree").

Among the variables examined in the analyses, ethics education (frequent communication of ethical standards) is a factor of particular importance. More specifically, ethics education in practice can potentially become an effective managerial lever for promoting ethical decision-making within firms. In the experimental study, frequent communication of ethical standards is designed as a pre-assigned manipulation where only individuals in the treatment group (as opposed to the control group) receive such communication during the course of the study. In doing so, the experiment simulates a real-life situation where employees are often involved in various discussions/deliberation about ethical conduct in supply chain management. An indicator variable is constructed and entered in the statistical models where $Treatment = 0$ for subjects in the control group and $Treatment = 1$ for subjects in the treatment group. Accordingly, the corresponding model coefficients for this variable represents the treatment effect.

3.5 Empirical Analyses

In this section, I discuss three empirical analyses that correspond to the three aspects in dynamic ethical decision-making in the realm of supply management. A specialized statistical model was

formulated for each of the analyses to directly reflect the unique mathematical structure. I discuss each empirical model in each section that follows. All the statistical analyses were performed in R (Version 3.4.3). The insights from the empirical results will be discussed in Section 3.6.

3.5.1 The Overall Tendency of Engaging in Unethical Behavior

A first step of this study is to examine the overall likelihood of an individual engaging in unethical behavior(s). As noted in the previous sections, the extant research typically focuses on single instances of ethical decision-making. In this study, however, multiple decisions of a given individual are observed and can therefore be considered as a repeated measure of his/her ethicality. In doing so, the goal of this analysis is to examine an individual's tendency to engage in unethical behavior when facing multiple decisions over a long period of time, rather than how an individual tends to behave when evaluating a single decision.

As discussed above, an individual's previous supply chain management decisions can potentially affect future decisions. Consider two research designs that both focus on examining a supply chain manager's tendency to engage in unethical behavior. The first design only observes a single decision made by the manager in the study. The second design, however, records multiple decisions made by the same individual. At first glance, these two designs seek to answer the same question (i.e., examining the likelihood of an individual behaving ethically/unethically). However, the second design may provide a more accurate estimation due to repeated decisions. The first design cannot account for the dynamic relationships (i.e., moral consistency and moral balancing) between consecutive decisions because such longitudinal information is not observed. In this regard, the second research design provides a slightly different estimation of the individual's likelihood of unethical behavior, namely the overall likelihood of engaging in unethical behavior(s) *after* accounting for the fact that each of the supply chain management decisions may have been affected by a previous supply chain management decision.

3.5.1.1 Empirical Strategy

The first analysis of this research seeks to examine the overall tendency of engaging in unethical supply chain management behavior using a series of ethical/unethical decisions made by the experimental subjects. Let $D_{i,t}$ denote an individual i's decision in decision round t. $D_{i,t} = 1$ if he/she behaved unethically and $D_{i,t} = 0$ if he/she behaved ethically. A probit model is used because the dependent variable is categorical. To further account for individual-specific variations (so that the consecutive decisions made by an individual are not restricted to be independent of each other), a probit model with an individual random effect is also estimated [2]

$$D^*_{i,t} = \mathbb{1}\{\boldsymbol{x}'_{i,t}\boldsymbol{\beta} + \alpha_i + \varepsilon_{i,t} \geq 0\} \tag{3.1}$$

where $\mathbb{1}\{s_{i,t} \in S\} = \begin{cases} 1 & : s_{i,t} \in S \\ 0 & : s_{i,t} \notin S \end{cases}$. $\boldsymbol{x}_{i,t}$ is a vector of covariates for individual i in decision round t. α_i represents the random effect which varies across individuals.

3.5.1.2 Empirical Results and Hypothesis Testing

Table 3.3 summarizes the results from estimating the two probit regression models. A model without individual-level random effect (pooled model) suggests that females are more likely to engage in unethical behaviors during the course of the experiment ($\beta = 0.1790, p = 0.0302$). However, the gender difference disappears after including a random effect in the model ($\beta = 0.1912, p = 0.1227$). In both models, religiosity is negatively associated with the probability of behaving unethically ($\beta_{pooled} = -0.0543$, $p = 0.0066$; $\beta_{re} = -0.0601$, $p = 0.0459$). An individual is less likely to engage in unethical behavior during the study when he/she considers religious beliefs as being important in his/her life.

Hypothesis 1 suggests that individuals who received ethics education will have a lower tendency to engage in unethical behaviors in supply chain management decisions. Strong evidence of treatment effect of ethics education is found in both estimated models. For subjects in the treat-

[2]Note that a fixed effect model in not feasible in our empirical setting because the covariates entered during the estimation process are time-invariant.

Table 3.3: Probit Regression Results

	pooled	random-effect
(Intercept)	-0.1532 (0.3605)	-0.1573 (0.5385)
Treatment: Ethics Education	-0.3921 $(0.0853)^{***}$	-0.4234 $(0.1290)^{**}$
Age	0.0589 (0.1309)	0.0647 (0.1952)
Gender (female)	0.1790 $(0.0826)^{*}$	0.1912 (0.1239)
Religiosity	-0.0543 $(0.0200)^{**}$	-0.0601 $(0.0301)^{*}$
Race (non-white)	-0.1428 (0.0984)	-0.1504 (0.1468)
Income	0.0009 (0.0226)	-0.0004 (0.0338)
Sigma		0.6217 $(0.0927)^{***}$
Log-Likelihood	-689.3311	-674.2392
Num. obs.	1070	1070

$^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

ment group who received ethics education during the course of the study, the overall probability of engaging in unethical behavior was significantly lower ($\beta_{pooled} = -0.3921, p < 0.001; \beta_{re} = -0.4234, p = 0.0010$). In other words, individuals are less likely to violate ethical standards when they are frequently exposed to ethics education.

3.5.1.3 Model Extension and Robustness of Results

An important extension of the approach above is to take into account the inter-temporal correlation that potentially resides between consecutive decisions. Because a supply chain manager's current decision can be affected by a previous one, ignoring this possible dynamic relationship could potentially lead to model misspecification. A natural way of incorporating the dynamic relationship in the random effect probit model presented above is to add a lagged dependent variable ($D_{i,t-1}$) on the right-hand side of the equation. However, estimating such a model can be statistically and computationally difficult due to the "initial conditions problem" (Wooldridge, 2005). The dynamic nature of the model imposes a recursive structure in the likelihood function which is conditioned on the initial observations ($D_{i,1}$). As a result, the initial observations need to be modeled specifically even though they are also dependent on the individual random effect α_i. The

model is formulated as two parts as proposed by Heckman (1981):

$$D^*_{i,t} = \mathbb{1}\{\gamma D_{i,t-1} + \boldsymbol{x}'_{i,t}\boldsymbol{\beta} + \alpha_i + \varepsilon_{i,t} \geq 0\}, t > 1 \tag{3.2}$$

$$D^*_{i,1} = \mathbb{1}\{\boldsymbol{z}'_{i,1}\boldsymbol{\pi} + \theta\alpha_i + \varepsilon_{i,1} \geq 0\} \tag{3.3}$$

where $\boldsymbol{z}_{i,1}$ is a vector of covariates for individual i in the first decision round. $\boldsymbol{\pi}$ represents the corresponding model coefficients that affect the probability of an individual choosing to behave ethically/unethically in the first round of the decision. α_i again captures the individual random effect, which is allowed to have a different impact on the initial decision (as opposed to the decisions later on) through a scaling parameter θ. The model can be estimated by maximizing the likelihood function

$$L(\Psi) = \prod_i \int_{\mathbb{R}} \Phi[(\boldsymbol{z}'_{i,1}\boldsymbol{\pi} + \theta\alpha_i)(2D_{i,1} - 1)] \prod_{t=2}^{10} \Phi[(\gamma D_{i,t-1} + \boldsymbol{x}'_{i,t}\boldsymbol{\beta} + \alpha_i)(2D_{i,1} - 1)] d\Phi(\frac{\alpha_i}{\sigma_\alpha}) \tag{3.4}$$

In the equation above, $\Phi(\cdot)$ represents the CDF for the standard normal distribution. σ_α is the standard deviation of the random effect α_i. Ψ contains all the free parameters to be estimated in the model. A further extension of the model is to allow an inter-temporal correlation between error terms $\varepsilon_{i,t}$. In this fashion, the model can account for the possibility that the unobserved variation (after controling for individual-level random effect) also covaries with the unobserved effect in the previous round. Following Hyslop (1999), let $\rho \in [-1, 1]$ denote the inter-temporal correlation between the error terms $\varepsilon_{i,t}$. The inter-temporal correlation between error terms can then be captured by $\varepsilon_{i,t} = \rho\varepsilon_{i,t-1} + \eta_{i,t}$ for $t \geq 2$ where $\eta_{i,t} \sim N(0, 1 - \rho^2)$.

Table 3.4 summarizes the results from estimating the two dynamic models. In the first model, without dynamic error terms, the previous decision made by an individual is positively associated with his/her present decision ($\gamma_{w/o} = 0.1686$, $p = 0.0287$). This suggests that an individual is more likely to engage in unethical behavior again if he/she behaved unethically in the previous decision

round. However, I did not find such an association in the second model where the unobserved variation was allowed to have dynamic correlation ($\gamma_w = 0.1036$, $p = 0.6034$).

As in the previous models, where the dynamic relationship between consecutive decisions is not included, ethics education has a significant impact on the probability of engaging in unethical behavior in both of the models ($\beta_{w/o} = -0.4111$, $p = 0.0015$; $\beta_w = -0.4199$, $p = 0.0029$). When ethical standards are frequently communicated, an individual is less likely to behave unethically in his/her decisions. I did not find a significant treatment effect of ethics education in the first round of the decision ($\pi_{w/o} = -0.2709$, $p = 0.4351$; $\pi_w = -0.2610$, $p = 0.4834$). However, such a result is expected because the treatment may not have been fully established at the beginning of the experiment. In addition, religiosity is negatively associated with the likelihood of observing unethical behavior ($\beta_{w/o} = -0.0581$, $p = 0.0487$; $\beta_w = -0.0594$, $p = 0.0686$). In the first round of the decision, older participants seemed to be less likely to engage in unethical supply chain management behavior ($\pi_{w/o} = -0.9761$, $p = 0.0666$; $\pi_w = -1.0049$, $p = 0.0858$).

Overall, this analysis focuses on the overall tendency of engaging in unethical behavior in the experiment. I found largely consistent results across different model specifications. In particular, the treatment of ethics education strongly affected an individual's ethical decision-making in every model. The empirical findings provide evidence that supports Hypothesis 1 - subjects in the treatment group exposed to ethics education are less likely to engage in unethical behaviors in general. Moreover, religiosity also seems to consistently lower the probability of engaging in unethical behavior. Other demographic information, however, does not seem to explain the decision outcomes.

3.5.2 Moral Consistency and Moral Balancing

A limitation of the previous analysis in terms of characterizing ethical dynamics in supply chain management stems from the fact that the models only consider the probability of engaging in unethical behavior at the aggregate level. How exactly did an individual behave in a particular decision round is not considered. As a result, these models mainly utilize the information regarding the frequency an individual choose to behave ethically/unethically throughout the study. However,

Table 3.4: Dynamic Probit Regression Results

	w/o dynamic errors	w/ dynamic errors
Decision (t-1)	$0.1686\ (0.0771)^{*}$	$0.1036\ (0.1995)$
Factors affecting $\boldsymbol{\beta}$:		
(Intercept)	$-0.3181\ (0.4083)$	$-0.3045\ (0.4154)$
Treatment: Ethics Education	$-0.4111\ (0.1296)^{**}$	$-0.4199\ (0.1409)^{**}$
Age	$0.1386\ (0.1321)$	$0.1412\ (0.1358)$
Gender (female)	$0.1619\ (0.1131)$	$0.1685\ (0.1179)$
Religiosity	$-0.0581\ (0.0295)^{*}$	$-0.0594\ (0.0326)^{\dagger}$
Race (non-white)	$-0.1935\ (0.1183)$	$-0.1975\ (0.1206)$
Income	$0.0009\ (0.0294)$	$-0.0007\ (0.0301)$
Factors affecting $\boldsymbol{\pi}$:		
(Intercept)	$1.0507\ (1.4487)$	$-0.0735\ (1.4976)$
Treatment: Ethics Education	$-0.2709\ (0.3471)$	$-0.2610\ (0.3724)$
Age	$-0.9761\ (0.5322)^{\dagger}$	$-1.0049\ (0.5849)^{\dagger}$
Gender (female)	$0.4517\ (0.3388)$	$0.4468\ (0.3757)$
Religiosity	$-0.0440\ (0.0807)$	$-0.0437\ (0.0824)$
Race (non-white)	$0.3788\ (0.3749)$	$-0.4018\ (0.3902)$
Income	$0.0093\ (0.0946)$	$-0.0109\ (0.0966)$
Theta	$2.2264\ (1.2360)^{\dagger}$	$2.3843\ (3.0741)$
Sigma	$0.3568\ (0.0858)^{***}$	$0.3543\ (0.1533)^{*}$
Rho		$0.0528\ (0.0539)$
Log-Likelihood	-668.389	-668.715
AIC	1370.778	1371.430
BIC	1455.360	1456.012

$^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

they do not directly capture how often did individuals behave consistently/inconsistently, which is of both theoretical and practical importance as well. Consider two sequences of decisions: (1) ethical, ethical, unethical, unethical; (2) ethical, unethical, ethical, unethical. The overall probability of engaging in unethical behavior in both of the sequences is $2/4 = 0.5$. However, the second sequence of behaviors is less consistent because the decision-maker constantly switched his/her behavior between an ethical one and an unethical one. The dynamic probit models partially incorporate the effect of previous decisions on the present one but do not model the switching behavior exhibited by the subjects.

This analysis examines the consistency aspect of ethical dynamics in decision-making. The main objective is to investigate whether/when individuals behave consistently (moral consistency) or inconsistently (moral balancing) between consecutive decisions. To closely examine how moral consistency and moral balancing are manifested, I formulate a probability model, which describes the observed decisions as a stochastic process where an individual switches between two decisions (states), namely an ethical decision and an unethical decision.

3.5.2.1 Empirical Strategy

Consider a series of decisions where the decision maker switches between acting ethically ($D_{i,t} = 0$) and unethically ($D_{i,t} = 1$) according to a transition probability matrix

$$Q_{t-1,t} = \begin{array}{c} \\ D_{i,t-1}=0 \\ D_{i,t-1}=1 \end{array} \begin{array}{c} \begin{array}{cc} D_{i,t}=0 & D_{i,t}=1 \end{array} \\ \begin{pmatrix} \varphi_{00} & \varphi_{01} \\ \varphi_{10} & \varphi_{11} \end{pmatrix} \end{array}$$

Each element of the transition matrix represents the probability of switching/not switching from one state to another. For example $\varphi_{00} = Pr(D_{(i,t)} = 0|D_{(i,t-1)} = 0)$ represents the probability of an individual i acting ethically given he/she acted ethically in the previous round. Similarly, $\varphi_{01} = Pr(D_{(i,t)} = 1|D_{(i,t-1)} = 0)$ denotes the probability of an individual switching from behaving ethically to behaving unethically. φ_{10} and φ_{11} can be interpreted in a similar fashion. In this formulation, φ_{01} and φ_{10} represent the probability of exhibiting moral licensing (i.e., switching from an ethical behavior to an unethical one) and moral cleansing (i.e., switching from an unethical behavior to an ethical one), respectively.

Given sequences of observed ethical decisions, one can estimate the aggregate-level transition probability matrix through maximum likelihood estimation. The estimator is simply $\hat{\varphi}_{qr}^{MLE} = \frac{n_{qr}}{\sum_{u=1}^{2} n_{qu}}$ where $q, r = \{0, 1\}$ and n_{qr} calculates the number of observations in the data where $D_{(i,t)} = q$ and $D_{(i,t+1)} = r$. The standard errors for these estimates are obtained by $se_{qr} = \frac{\hat{p}_{qr}^{MLE}}{\sqrt{n_{qr}}}$ or through bootstrapping (Efron and Tibshirani, 1986) so that confidence intervals of the estimates can be established.

The model presented above serves as a baseline that estimates the probabilities of observing moral consistency and moral balancing (including moral licensing and moral cleansing) without accounting for individual differences and the experimental manipulation. From a theoretical standpoint, it is important to disentangle the multiple forces that shape the transition probabilities. To achieve this goal, consider an extended Markov Chain model where the probabilities of moral consistency and moral balancing are expressed as functions of explanatory variables $\boldsymbol{x_{it}}$:

$$\varphi_{00}(\boldsymbol{x'_{it}\beta}) = \frac{exp(\boldsymbol{x'_{it}\beta})}{1 + exp(\boldsymbol{x'_{it}\beta})} \tag{3.5}$$

$$\varphi_{11}(\boldsymbol{x'_{it}\gamma}) = \frac{exp(\boldsymbol{x'_{it}\gamma})}{1 + exp(\boldsymbol{x'_{it}\gamma})} \tag{3.6}$$

where a logistic transformation is used to ensure that the transition probabilities φ_{00} and φ_{11} are within 0 and 1. Note that $\varphi_{01} = 1 - \varphi_{00}$ and $\varphi_{10} = 1 - \varphi_{11}$. $\boldsymbol{x_{it}}$ contains explanatory variables for subject i in decision round t. $\boldsymbol{\beta}$ and $\boldsymbol{\gamma}$ are vectors of parameters to be estimated. For convenience, denote function $s(t) = [a, b]$ if $D_{i,t-1} = a$ and $D_{i,t} = b$. Similar to Muenz and Rubinstein (1985), the model can be estimated by maximizing the log-likelihood function

$$\begin{aligned} log(L) \propto \sum_i \sum_{t>1} \Bigg\{ & \Big[log \frac{exp(\boldsymbol{x'_{it}\beta})}{1 + exp(\boldsymbol{x'_{it}\beta})} \Big] \mathbb{1}\{s(t) = [0,0]\} + \\ & \Big[1 - log \frac{exp(\boldsymbol{x'_{it}\beta})}{1 + exp(\boldsymbol{x'_{it}\beta})} \Big] \mathbb{1}\{s(t) = [0,1]\} + \\ & \Big[1 - log \frac{exp(\boldsymbol{x'_{it}\gamma})}{1 + exp(\boldsymbol{x'_{it}\gamma})} \Big] \mathbb{1}\{s(t) = [1,0]\} + \\ & \Big[log \frac{exp(\boldsymbol{x'_{it}\gamma})}{1 + exp(\boldsymbol{x'_{it}\gamma})} \Big] \mathbb{1}\{s(t) = [1,1]\} \Bigg\} \end{aligned} \tag{3.7}$$

over parameters $\boldsymbol{\beta}$ and $\boldsymbol{\gamma}$. In this formulation, the same covariate vector $\boldsymbol{x_{it}}$ is assumed to simultaneously affect both φ_{00} and φ_{11}. $\boldsymbol{\beta}$ and $\boldsymbol{x}$ directly affect the probability of remaining ethical for two consecutive rounds (i.e., φ_{00}). However, they also affect the probability of switching from

ethical behavior to unethical behavior (φ_{01}) indirectly because $\varphi_{01} = 1 - \varphi_{00}$. $\boldsymbol{\gamma}$ also operates in a similar manner. Therefore, the estimated coefficients can be interpreted as the effects of one variable on two competing transition probabilities. For example, assume β, the coefficient for an explanatory variable x, is positive. The interpretation of this coefficient is that, when x increases, an individual is more likely to remain ethical, provided that he/she acted ethically in the previous round (bigger φ_{00}). In the meantime, it is natural to see that this individual will be less likely to switch from ethical behavior to an unethical behavior (smaller φ_{01}).

3.5.2.2 Empirical Results and Hypothesis Testing

Table 3.5: Estimated Transition Matrix

	Probability	Confidence Interval
$\hat{\varphi}_{00}$	0.6856	$(0.6466, 0.7225)$
$\hat{\varphi}_{01}$	0.3143	$(0.2775, 0.3534)$
$\hat{\varphi}_{10}$	0.5178	$(0.4657, 0.5698)$
$\hat{\varphi}_{11}$	0.4821	$(0.4302, 0.5343)$
Log-Likelihood	-214.6795	
AIC	433.3591	
BIC	440.8642	

Table 3.5 summarizes the point estimates of transition probabilities obtained through estimating $\hat{\varphi}_{qr}^{MLE} = \frac{n_{qr}}{\sum_{u=1}^{2} n_{qu}}$. The bias-corrected accelerated (BCa) 95% bootstrap intervals with 2000 replicates are included in the parentheses. If an individual behaved ethically in the previous decision, the probability of being ethical again in the next decision round is much higher, at around 68.56%. Correspondingly, there is only a 31.43% chance that he/she will switch from an ethical decision to an unethical decision. From the collected data, it was evident that subjects were more likely to remain ethical if they have acted ethically in the previous decision ($p_{H_0:\varphi_{00} \leq 0.5} < 0.001$) instead of engaging in an unethical behavior. This result suggests that individuals tend to conform

to ethical standards and maintain an ethical behavioral pattern. Nevertheless, I do not find evidence that individuals will be driven towards either ethical or unethical decisions, given that they have behaved unethically in the previous round ($p_{H_0:\varphi_{10},\varphi_{11}=0.5} = 0.4963$). At the aggregate level, it seems equally probable that an individual who engaged in an unethical behavior will either remain unethical or switch to an ethical decision.

Table 3.6: Factors Affecting Transition Probabilities

	φ_{00}	φ_{11}
(Intercept)	0.2780 (0.8292)	-0.6897 (0.9530)
Treatment: Ethics Education	0.5894^{**} (0.2007)	-0.6101^{**} (0.2234)
Age	-0.1874 (0.2904)	0.3342 (0.3595)
Gender (female)	-0.2959 (0.1868)	0.1200 (0.2283)
Religiosity	0.0916^{*} (0.0465)	-0.0767 (0.0530)
Race (non-white)	0.2909 (0.2230)	-0.2566 (0.2730)
Income	0.0766 (0.0522)	$0.1039^{\dagger}$ (0.0613)
Log-Likelihood	-608.305	
AIC	1244.610	
BIC	1312.791	

$^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

Hypothesis 2 posits that individuals who received ethics education are more likely to behave ethically in a consistent manner. The results from fitting the model are produced in Table 3.6. The model coefficients for the treatment variable (*Treatment: Ethics Education*) provide strong evidence of a treatment effect. More specifically, there is a positive association between the treatment and the estimated φ_{00} ($\beta = 0.5894$, $p = 0.0033$). In other words, individuals in the treatment group are more likely to remain ethical in a consistent manner, compared to switching from an ethical behavior to an unethical one. This result shows strong support to Hypothesis 2. There is also a negative association between estimated φ_{11} and the treatment ($\gamma = -0.6101$, $p = 0.0063$). When ethical standards are frequently communicated during the course of the study, individuals are less

likely to remain in the unethical state over two consecutive decisions. In contrast, they are more likely to switch to behaving ethically even if they have behaved unethically in the previous decision round. Interestingly, it seems that the treatment had an impact on both φ_{00} and φ_{11} with similar magnitudes ($\beta = 0.5894$ and $\gamma = -0.6101$). This finding may suggest that the treatment has an equal effect on an individual's decision-making process in terms of both promoting consistent ethical behaviors and discouraging consistent unethical behaviors.

Demographic variables do not seem to affect the transition probabilities to any meaningful extent. An individual who values religious belief is more likely to remain ethical between two consecutive decisions, instead of switching to an unethical one. However, religiosity does not significantly affect his/her present decision when the previous decision was unethical. In addition, it seems that individuals with higher income tend to be more likely to be consistently unethical ($\beta = 0.1039$). However, this result is only statistically marginal ($p = 0.0900$).

3.5.3 Vulnerability to Unethical Decisions Over Time

As discussed previously, the theory of moral licensing suggests that individuals may feel "entitled" to engage in certain unethical behavior after behaving ethically in the past (see, for example, Monin and Miller, 2001). It is possible that such a "licensing effect" would accumulate over time before inducing an individual to eventually behave unethically in a supply chain management decision. The same idea could be applied to moral cleansing as well. The previous analysis provides insights about how likely a supply chain manager is to remain consistent in his/her decisions or switch to a decision of different nature *at a given point*. It does not directly examine how long an individual stays in one particular state (ethical/unethical) before switching to the opposite state. From a practical perspective, it is of particular interest to investigate how vulnerable an individual is to unethical decisions, especially after behaving ethically in a consistent manner across multiple past decisions.

3.5.3.1 Empirical Strategy

Survival models are specifically designed to respond to such a question using repeated measures of the state of an event over time. In the context of this study, the event of interest occurs when an individual opts for an unethical decision. The model is formulated based on the survivor function $S(t) = Pr(T \geq t)$, which denotes the probability that an unethical behavior has not yet been observed before decision round t. Here T represents the decision round where an unethical decision is observed. An equally important model component is the hazard function $\lambda(t) = \lim_{\Delta t \to 0} \frac{Pr(t \leq T < t+\Delta t | T \geq t)}{\Delta t}$, which represents the rate of occurrence of the event (i.e., the risk of observing an unethical behavior).

The empirical setting of this study presents several complications in using a conventional survival model. First, conventional survival models often treat the underlying data-generating process as continuous over time. In my experiment, however, the events (i.e., an individual's decisions) are made and observed exactly at the predetermined discrete time points during the study. As a result, the instantaneous hazard function $\lambda(t)$ is not available as $\Delta t \to 0$ does not have a realistic meaning. Second, survival analyses typically focus on terminal events such as the failure of a mechanical system that denote the end of the entire process. In this study, however, the events (i.e., engaging in unethical behaviors) are repeatable because individuals can behave unethically multiple times during the course of the experiment. In this situation, the durations of "episodes" (i.e., how many decisions before an individual behaves unethically) from the same individual cannot be treated as independent observations. Individual differences such as a subject's overall tendency to engage in unethical behaviors will affect all of the episodes observed from the same individual. Failing to account for such a within-subject correlation will lead to a violation of the assumption that all observed durations are independently distributed.

A discrete-time hazard model is used for this analysis to address these complications. Let p_{it} denote the probability that individual i behaves unethically in decision round t, given that he/she has not engaged in unethical behavior in $t-1$. Then $p_{it} = Pr(D_{i,t} = 1 | D_{i,t'} = 0 : t' < t) = Pr(T = t | T \geq t)$ is a discrete-time approximation to the continuous-time hazard function $\lambda_i(t)$.

Following Allison (1982), the log-likelihood function of the survival model is written as:

$$log(L) = \sum_{i} \sum_{j=1}^{t_i} \left[D_{i,t} log \frac{p_{ij}}{(1-p_{ij})} + log(1-p_{ij}) \right] \tag{3.8}$$

where $logit(p_{it}) = \boldsymbol{x'_{it}}\boldsymbol{\beta} + \boldsymbol{y'_{it}}\boldsymbol{\gamma}$. Let $\boldsymbol{y_{it}}$ be a vector of indicators for each of the possible durations (i.e., the number of rounds before an unethical decision occurs). $\boldsymbol{x_{it}}$ contains individual i's covariates observed at t that potentially affect the risk of observing an unethical behavior. To model the recurrent events, the hazard function can be modified as

$$logit(p_{itk}) = \alpha_i + \boldsymbol{x'_{itk}}\boldsymbol{\beta} + \boldsymbol{y'_{itk}}\boldsymbol{\gamma} \tag{3.9}$$

where α_i is an individual-level random effect which follows distribution $N(0, \sigma_\alpha^2)$. In this way, multiple episodes observed from a given individual are effectively grouped together in the analysis. The durations of these episodes are only conditionally independent given the individual-level heterogeneity (Barber et al., 2000; Steele, 2011).

3.5.3.2 Empirical Results and Hypothesis Testing

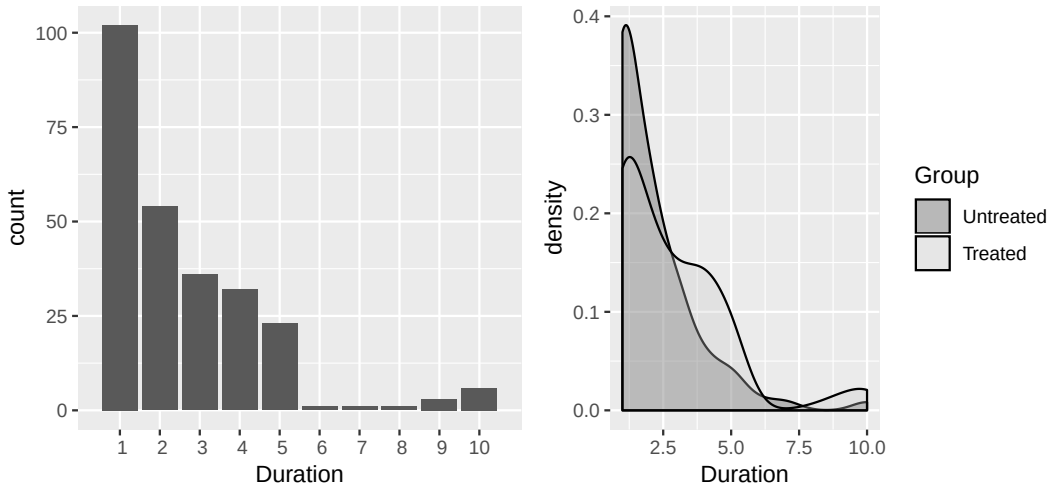
Figure 3.2 demonstrates the overall distribution of how long before an individual exhibits ethical failure after a certain number of ethical decisions. The median duration before an event (i.e., observing ethical failure) in the data is two rounds. As depicted on the left panel of Figure 3.2, most individuals remained ethical for one or two rounds before they switched to an unethical one. The right panel of Figure 3.2 plots the density of observed durations by treated/untreated group. Individuals who did not receive the treatment (i.e., ethics education) tend to have a shorter duration of ethical supply chain management decisions before exhibiting ethical failure. To facilitate the proposed survival analyses, a total of six "Duration" indicators are constructed to reflect the possible durations before observing the switching behavior. In particular, "Duration (6)" includes all the observations with duration of six or above to avoid numerical instability in the estimation process due to a small numbers of observations for respondents making six or more consecutive ethical decisions.

Table 3.7: Survival Models Results

	Model 1	Model 2	Model 3
(Intercept)	-0.5492 (0.8212)	-0.4123 (0.8391)	0.3603 (1.4212)
Duration(2)	-0.0739 (0.2249)	–	–
Duration(3)	0.1336 (0.2550)	–	–
Duration(4)	0.3548 (0.2953)	–	–
Duration(5)	-1.9093 $(0.7432)^{*}$	–	–
Duration(6)	-1.6846 $(0.6175)^{**}$	–	–
Treatment: Ethics Education	-0.5165 $(0.1993)^{**}$	–	–
Duration(2)$\times$ Control	–	-0.0569 (0.3817)	0.4226 (0.4767)
Duration(3)$\times$ Control	–	0.3168 (0.4708)	1.1895 $(0.6474)^{\dagger}$
Duration(4)$\times$ Control	–	-1.2675 (0.8100)	-0.2250 (0.9787)
Duration(5)$\times$ Control	–	-1.3310 (1.1078)	-0.3537 (1.2640)
Duration(6)$\times$ Control	–	-1.2864 (1.0998)	-0.2670 (1.3621)
Duration(1)$\times$ Treatment	–	-0.5952 $(0.2844)^{*}$	-1.0272 $(0.4454)^{*}$
Duration(2)$\times$ Treatment	–	-0.6690 $(0.3151)^{*}$	-0.8823 $(0.4437)^{*}$
Duration(3)$\times$ Treatment	–	-0.5107 (0.3405)	-0.5165 (0.4615)
Duration(4)$\times$ Treatment	–	0.1045 (0.3625)	0.3730 (0.5014)
Duration(5)$\times$ Treatment	–	-2.8433 $(1.0441)^{**}$	-2.5700 $(1.1127)^{*}$
Duration(6)$\times$ Treatment	–	-2.3952 $(0.7631)^{**}$	-2.0923 $(0.9152)^{*}$
Age	0.1867 (0.2865)	0.1795 (0.2871)	0.2540 (0.4940)
Gender (female)	0.2842 (0.1856)	0.2962 (0.1874)	0.5664 $(0.3306)^{\dagger}$
Religiosity	-0.0658 (0.0462)	-0.0728 (0.0465)	-0.1457 $(0.0819)^{\dagger}$
Race (non-white)	-0.3182 (0.2196)	-0.3681 $(0.2224)^{\dagger}$	-0.5688 (0.3787)
Income	-0.0652 (0.0519)	-0.0747 (0.0524)	-0.1132 (0.0879)
Prior Offense	–	–	-0.3995 $(0.1340)^{**}$
sigma	-0.0000 (0.8077)	-0.0000 (0.5524)	-1.6205 $(0.4925)^{**}$
Log-Likelihood	-374.5965	-370.6753	-364.9639
AIC	775.1930	777.3506	767.9270
BIC	833.7682	858.4547	853.5370

$^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

Figure 3.2: Number of Rounds before Ethical Failure (Duration)



Hypothesis 3 suggests that individuals who received ethics education are less vulnerable to ethical failures. In other words, they will be less likely to engage in unethical behavior after behaving ethically in the past. To ensure the robustness of empirical results, three models are estimated with different sets of covariates to account for different model specifications. The results are demonstrated in Table 3.7. The results from Model 1 suggest that, after remaining ethical for multiple rounds (5, 6 rounds, or more), an individual is less likely to switch to an unethical decision ($\beta_{duration=5} = -1.9093, p = 0.0102$; $\beta_{duration=6} = -1.6846, p = 0.0063$). The treatment in the experiment (Treatment: Ethics Education) has an overall negative effect on the risk of switching to unethical behaviors ($\beta = -0.5165, p = 0.0095$). Subjects who were exposed to ethics education were generally less likely to exhibit ethical failures (i.e., engaging in an ethical behavior).

In Models 2 and 3, an interaction term between the treatment variable and the duration indicators are entered in the model so that the impact of durations of ethical decisions on the risk of switching is examined separately between the control group and the treatment group. The results from Model 2 demonstrate that an individual's vulnerability to switching to an unethical decision only changes over time in the treatment group. More specifically, individuals in the treatment group are less likely to switch to an unethical behavior when they have chosen ethical decisions for only one or two times ($\beta_{duration=1} = -0.5952, p = 0.0363$; $\beta_{duration=2} = -0.6690, p = 0.0337$).

Moreover, the subjects are even less likely to switch behaviors after behaving ethically for a long period of time ($\beta_{duration=5} = -2.8433$, $p = 0.0064$; $\beta_{duration=6} = -2.3952$, $p = 0.0017$). Similar results can be found in Model 3.

An additional variable was entered into Model 3 to examine the possibility that an individual's risk of switching to an unethical behavior would change depending on his/her past ethical failures. Variable "Prior Offense" counts the total number of unethical decisions an individual has made in the past prior to the present decision. The result suggests a negative association between the number of prior unethical decisions and the risk of switching to an unethical behavior ($\beta = -1.6205$, $p = 0.0028$). The more unethical decisions an individual has made in the past, the less likely he/she would deviate from making an ethical decision (i.e., experiencing an ethical failure). There is also some evidence that an individual in the control group is more likely to switch to unethical behaviors after remaining ethical for three rounds ($\beta = 1.1895$, $p = 0.0661$).

Demographic information rarely plays a significant role in predicting the hazard function. The model coefficients for gender, religiosity, and race are sometimes marginally significant in Model 2 or 3. However, such results are inconsistent across models and unconvincing due to very high p-values (with the smallest p-value being 0.0752).

Overall, three main conclusions can be drawn from the survival analyses. First, the results consistently suggest that the treatment of frequent communication of ethical standards in supply chain management decreases the risk (hazard) of individuals switching from ethical behaviors to unethical ones. Second, it seems that individuals in the treatment group tend to remain consistent in the first few ethical decisions. Third, individuals in the treatment group are even less prone to switching to unethical behaviors after behaving ethically for a long period of time. Therefore, there is strong empirical evidence that supports Hypothesis 3.

3.6 Discussion

3.6.1 Overall Discussion of the Empirical Findings

This study seeks to provide an overall characterization of longitudinal ethical dynamics exhibited by individuals when making multiple decisions in the context of supply chain management. Compared to situations where individual decisions are examined separately, ethical decision-making in supply chain management can prove more complex when taking into account the inter-temporal relationships between past and present decisions.

3.6.1.1 Overall Tendency of Engaging in Unethical Behavior

Three aspects in ethical dynamics were examined using empirical methods. The first aspect focused on an individual's overall tendency in engaging in unethical behaviors. Although extensively studied in the literature, little research has been done where such tendency is investigated after accounting for the inter-temporal correlations between consecutive decisions. As a starting point to characterize ethical dynamics, my first analysis employed multiple model specifications to estimate the probability of an individual behaving unethically at any point during the experiment, including models that specifically account for the dynamic relationship between consecutive decisions. I found largely consistent results across different models with regard to the effect of covariates considered in the analyses. Ethics education in supply chain management, as a major focal variable in this research, showed a strong and consistent effect on an individual's tendency to behave ethically across all the models. Thus, there is strong evidence that ethics education in supply chain management will discourage employees from engaging in unethical behaviors. This result speaks to the extant research that discusses the efficacy of ethics education in promoting ethical behaviors in organizations (e.g., Melé, 2005; Luthar et al., 1997; Luthar and Karri, 2005).

3.6.1.2 Consistency/Inconsistency in Ethical Decision-Making Process

An important implication of ethical dynamics is that individuals may be induced to switch between ethical behaviors and unethical behaviors when facing multiple decisions over time. As a result, it may not suffice to focus solely on an individual's overall tendency of engaging in un-

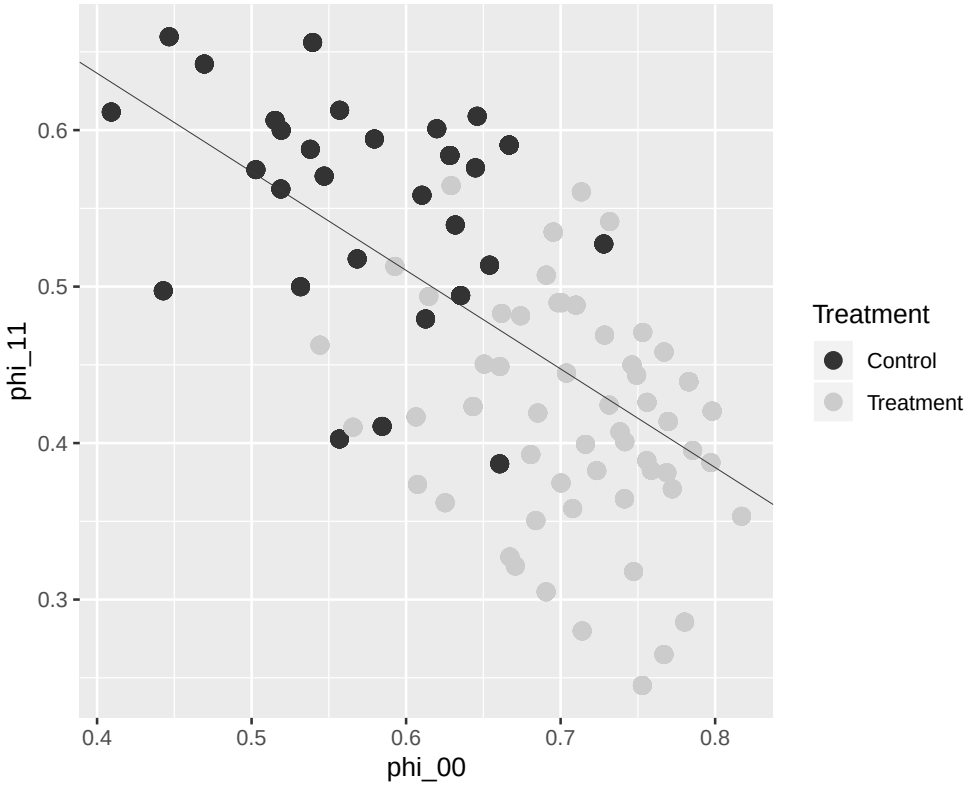
ethical behaviors - he/she may generally lean towards behaving ethically but at the same time tend to behave inconsistently across multiple decisions. To closely examine the consistency aspect of ethical dynamics, a specialized statistical model was formulated which describes the consistency/inconsistency in an individual's behavioral pattern using transition probabilities.

The empirical results illustrated that individuals could exhibit both consistent and inconsistent supply chain management behaviors. The predicted transition matrix for each individual can be calculated by supplying the covariates to the fitted model. Figure 3.3 depicts the predicted φ_{00} (the probability of being consistently ethical) against φ_{11} (the probability of being consistently unethical). The figure demonstrates a strong linear relationship between the two probabilities ($correlation = -0.6322, p < 0.001$) - individuals who have a higher φ_{00} tend to have a lower φ_{11}. This suggests an overall behavioral pattern exhibited by the study participants - an individual who tends to behave ethically more consistently is also less likely to be consistently unethical. In addition, Figure 3.3 demonstrates a fairly clear distinction between observations from the control group and the treatment group. Subjects in the control group generally have a lower φ_{00} but a higher φ_{11}. Individuals in the treatment group, however, tend to have a higher φ_{00} but a lower φ_{11}.

In addition, it is possible to derive the stationary distribution (π) of the estimated Markov Chain using the transition probabilities. The stationary distribution satisfies the condition $\pi Q = \pi$ and has closed form solutions in this model ($\pi_0 = \frac{1-\varphi_{11}}{1-\varphi_{00}+(1-\varphi_{11})}$, $\pi_1 = 1 - \pi_0$). The estimated stationary distribution turns out to be ($\pi_0 = 0.6218, \pi_1 = 0.3781$). In the long term, around 62.18% of the decisions made by the subjects would be ethical, while about 37.81% would be unethical. Overall, individuals tend to be more likely to behave ethically rather than unethically. However, the results suggest that the individuals in the control group seem equally likely to behave ethically/unethically as the group-specific stationary distribution is ($\pi_0 = 0.5159, \pi_1 = 0.4840$). The stationary distribution estimated from the treatment group, on the other hand, largely favors ethical decisions rather than unethical decisions ($\pi_0 = 0.6729, \pi_1 = 0.3270$).

Intuitively, the treatment of ethics education (achieved through frequent communication of ethical standards) significantly increases φ_{00} and decreases φ_{11}. As a result, individuals who received

Figure 3.3: Correlation Between Predicted Transition Probabilities



the treatment were much more likely to behave ethically in a more consistent way. Even if they engaged occasionally in an unethical decision in a given decision round, it was much more likely that they would immediately switch back to an ethical behavior in the following round. Such behavioral pattern results in the overall observation that individuals in the treatment group are more likely to engage in ethical behavior. In this sense, the consistency aspect of ethical dynamics provides a rationale behind how frequent communication of ethical standards in supply chain management decreases the overall tendency of engaging in unethical behavior.

3.6.1.3 Vulnerability to Ethical Failure

The third aspect of ethical dynamics focuses on how vulnerable an individual is to behaving unethically after engaging in ethical behaviors in the past. If individuals are indeed susceptible to behaving inconsistently in ethical decision-making, it would be important to examine whether

they will remain in an ethical behavioral pattern for a long period of time. A specialized survival model was utilized to account for the discrete and recurrent nature of the collected data. The result showed that the risk of deviating from an ethical behavioral pattern differs between the control and treatment group. When exposed to frequent communication of ethical standards, individuals were significantly less likely to switch to unethical behaviors after behaving ethically for a long time. In other words, ethics education seemed to fortify an individual's ethical behavioral pattern and make him/her less susceptible to the effect of moral licensing.

Another interesting finding from this analysis is that individuals did not seem to become more vulnerable to engaging in unethical supply chain behaviors over time. The extant research on moral licensing generally argues that past ethical behaviors may serve as "moral credentials" for individuals to behave unethically later on (Blanken et al., 2015). An interesting yet often overlooked question, however, is whether such credentials require repeated ethical decisions to accumulate to a certain point which triggers the moral licensing effect. The results from this analysis did not yield evidence in favor of this hypothesis - the probability of an individual exhibiting moral licensing behavior does not increase with how long he/she has behaved ethically. In contrast, the negative model coefficients for the durations of ethical behaviors on the risk of engaging in unethical behavior suggested that moral licensing becomes less probable as an individual exhibits consistent ethical behaviors over time. A longer streak of ethical behaviors is in fact associated with a lower probability of switching to an unethical behavior later on.

3.6.2 Towards a General Model of Ethical Dynamics

The empirical findings of this study showed that demographic information (e.g., age, race, and gender) generally offered little explanatory power in modeling ethical dynamics. The treatment of frequent communication of ethical standards in supply chain management, however, seemed to induce a shift in the dynamic behavioral pattern in supply chain management decision-making as it demonstrated significant effects across all the analyses. If it is true that ethics education could result in a fundamental change in the overall behavioral pattern in ethical dynamics for supply chain management decisions, a general model should capture the overall shift in the behavioral

pattern altogether rather than examine the different manifestations of such change separately.

3.6.2.1 Modeling Behavioral Patterns

A natural way of modeling two behavioral patterns in the data-generating process is to utilize latent variables in the statistical models. In this section, a Latent Markov model is proposed to examine whether ethical dynamics can be explained by an individual's general behavioral patterns. The (unobserved) behavioral patterns are modeled and estimated using both between-subject and inter-temporal variations contained in the observed data.

Latent Markov models assume that the observed data is generated by an unobserved stochastic process. In this analysis, individuals are assumed to switch between two different behavioral patterns, which are not directly observed. An individual's ethical decision-making has four possible outcomes, namely (1) behaving consistently ethical ($D_{i,t-1} = D_{i,t} = 0$), (2) switching to an unethical behavior ($D_{i,t-1} = 0, D_{i,t} = 1$), (3) switching to an ethical behavior ($D_{i,t-1} = 1, D_{i,t} = 0$), and (4) behaving consistently unethical ($D_{i,t-1} = D_{i,t} = 1$). For convenience, let Y_{it} denote a categorical variable that contains these four possible outcomes for individual i in decision round t.

For an individual i, denote $\tilde{\boldsymbol{Y}}$ as a vector of $Y^{(t)}$'s, which are the realizations of Y's in round $t = 1$ through $t = T$. Here $T = 9$ as a total of 9 pairs of consecutive decisions were observed. Let $\boldsymbol{X}^{(t)}$ be a vector of explanatory variables observed in round t. Stacking these vectors across t's gives another vector $\tilde{\boldsymbol{X}}$.

Following Kulkarni (2016), the latent Markov process is denoted by $\boldsymbol{S} = \{S^1, ..., S^9\}$ where $S^{(t)}$ represents an individual's behavioral pattern in round t. Therefore, this latent Markov process has a two-dimensional state space $S^{(t)} \in \{1, 2\}$. Assuming that observations ($Y^{(t)}$) are conditionally independent given the latent process $\boldsymbol{S}$, the probability of observing an instance $Y^{(t)} = y$ in round t given the underlying state $S^{(t)} = s$ and explanatory variables $\boldsymbol{X}^{(t)}$ can be written as:

$$\psi^{(t)}_{y|s,\boldsymbol{x}} = Pr(Y^{(t)} = y | S^{(t)} = s, \boldsymbol{X}^{(t)} = \boldsymbol{x}) \tag{3.10}$$

where $y = \{0, 1, 2, 3\}$, $t = \{1, ..., 9\}$, and $s = \{1, 2\}$. To capture the stochasticity in state

transition, let:

$$\pi^{(t)}_{s|s',\boldsymbol{x}} = Pr(S^{(t)} = s|S^{(t-1)} = s', \boldsymbol{x}^{(t)} = \boldsymbol{x}) \tag{3.11}$$

which is the transition probability from round $t-1$ to round t and from state s' to s. Here $t = \{2, ..., 9\}$, and $s, s' = \{1, 2\}$. Note that these probabilities are formulated such that they are conditional on explanatory variables $\boldsymbol{x}^{(t)}$. In this way, the explanatory variables are assumed to affect the transition between behavioral patterns. Using a logit parameterization proposed by Bartolucci and Farcomeni (2009), the transition probability is modeled as

$$log\frac{Pr(S^{(t)} = s|S^{(t-1)} = s', \boldsymbol{X}^{(t)} = \boldsymbol{x})}{Pr(S^{(t)} = s'|S^{(t-1)} = s', \boldsymbol{X}^{(t)} = \boldsymbol{x})} = log\frac{\pi^{(t)}_{s|s',\boldsymbol{x}}}{\pi_{s'|s',\boldsymbol{x}}} = \boldsymbol{x}'\boldsymbol{\gamma}_{s's}, \quad t \geq 2 \tag{3.12}$$

Here, let $s \neq s'$ for model identifiability. This constraint results in only two cases in my particular model for each t, namely $\{s = 0, s' = 1\}$ and $\{s = 1, s' = 0\}$. For ease of notations, assume $\boldsymbol{x}$ has 1 as the first element. Thus, $\boldsymbol{\gamma}_{s's}$ will be the parameters estimated from the model.

The equation above takes a recursive form and therefore requires a starting state when $t = 1$. Since S only takes two possible values, the initial probabilities can be represented in a similar way with a single logit equation:

$$log\frac{Pr(S^{(1)} = 2|\boldsymbol{X} = \boldsymbol{x})}{Pr(S^{(1)} = 1|\boldsymbol{X} = \boldsymbol{x})} = log\frac{\pi^{(1)}_{2|\boldsymbol{x}}}{\pi^{(1)}_{1|\boldsymbol{x}}} = \boldsymbol{x}'\boldsymbol{\beta}_{s's} \tag{3.13}$$

Taking into account all state transitions, the joint distribution of all states visited ($\boldsymbol{S} = (s^{(1)}, ..., s^{(T)})$) given all explanatory variables across rounds ($\tilde{\boldsymbol{X}} = (\boldsymbol{x}^{(1)}, ..., \boldsymbol{x}^{(T)})$) is written as:

$$Pr(\boldsymbol{S} = \boldsymbol{s}|\tilde{\boldsymbol{X}} = \tilde{\boldsymbol{x}}) = \pi_{s^{(1)}|\boldsymbol{x}^{(1)}} \prod_{t>1} \pi_{s^{(t)}|s^{(t-1)}\boldsymbol{x}^{(t)}} \tag{3.14}$$

The second layer of distribution that generates the observed data $\tilde{\boldsymbol{Y}}$ given the latent states $\boldsymbol{S}$ and explanatory variables $\tilde{\boldsymbol{X}}$ can be written as:

$$Pr(\tilde{\boldsymbol{Y}} = \tilde{\boldsymbol{y}}|\boldsymbol{S} = \boldsymbol{s}, \tilde{\boldsymbol{X}} = \tilde{\boldsymbol{x}}) = \prod_t \psi^{(t)}_{y|s,\boldsymbol{x}} \tag{3.15}$$

Note, however, that the above equation cannot be used directly for estimation because the state variables $\boldsymbol{S}$ are unobserved. Instead, only the marginalized function $p(\tilde{\boldsymbol{y}}|\tilde{\boldsymbol{x}})$ is available:

$$p(\tilde{\boldsymbol{y}}|\tilde{\boldsymbol{x}}) = \sum_{\boldsymbol{s}} \{\pi_{s^{(1)}|\boldsymbol{x}^{(1)}} \prod_{t>1} \pi_{s^{(t)}|s^{(t-1)}\boldsymbol{x}^{(t)}} \times \prod_{t} \psi^{(t)}_{y|s,\boldsymbol{x}}\} \tag{3.16}$$

The likelihood function can be obtained by aggregating the above function across the entire sample of N subjects. Therefore, the log-likelihood function is:

$$\ell(\boldsymbol{\theta}) = \sum_{i=1}^{N} log(p(\tilde{\boldsymbol{y}}_{\boldsymbol{i}}|\tilde{\boldsymbol{x}}_{\boldsymbol{i}})) \tag{3.17}$$

where subscript i indexes individual subjects in the data. $\boldsymbol{\theta}$ denotes all the parameters to be estimated. The two equations above clearly suggest that the likelihood function is likely impossible to evaluate directly because of the unobserved variables $\boldsymbol{s}$ and the product terms within the summations in Equation 3.16. An expectation-maximization (EM) algorithm is required for estimating the model (Dempster et al., 1977; Bartolucci and Farcomeni, 2009).

Two sets of estimated quantities are of main interest in this analysis. First, the estimated coefficients $\boldsymbol{\gamma}$ reflect the effect of covariates on how individuals switch between the two behavioral patterns during the course of the study. Second, $\psi_{y|s,\boldsymbol{x}}$ characterizes how individuals tend to behave when following one of the behavioral patterns.

3.6.2.2 Empirical Evidence of Two Behavioral Patterns

Table 3.8 summarizes the estimated $\psi_{y|s,\boldsymbol{x}}$ given s, which essentially provides a characterization of the two behavioral patterns. The results indeed suggest a very distinct separation between the two patterns. The first inferred pattern (Pattern 1) is characterized by a very high probability of being consistently ethical ($Pr(Y = 0) = 0.7812$). In other words, when following this behavioral pattern, an individual is very likely to remain ethical in consecutive decisions. He/she has a general tendency to focus on behaving ethically, regardless of the present situation or his/her past history of decisions. There is a very low probability of being inconsistent and switching between ethical and unethical behaviors in this pattern ($Pr(Y = 1) = 0.1083$, $Pr(Y = 2) = 0.1105$). Overall, an

individual has a 78.12% chance of being not only ethical but also consistent when behaving according to the first behavioral pattern. He/she would rarely behave inconsistently between consecutive decisions and would virtually never behave unethically twice in a row ($Pr(Y = 3) = 0$).

The second behavioral pattern (Pattern 2), however, could lead to much more unethical and inconsistent behaviors. As demonstrated in the table, there is a very low probability that individuals who follow the second behavioral pattern will behave ethically in a consistent manner $Pr(Y = 0) = 0.0637$. Instead, these individuals are equally likely to switch back and forth between ethical behaviors and unethical behaviors over time ($Pr(Y = 1) = 0.2837$, $Pr(Y = 2) = 0.2836$). Moreover, they are highly likely not only to behave unethically but also to remain unethical across multiple decisions ($Pr(Y = 2) = 0.3689$).

Table 3.8: Characterization of Unobserved Behavioral Patterns

	$s = 1$ (Pattern 1)	$s = 2$ (Pattern 2)
$Pr(Y = 0)$ (Consistently Ethical)	0.7812	0.0637
$Pr(Y = 1)$ (Switching to Unethical Behavior)	0.1083	0.2837
$Pr(Y = 2)$ (Switching to Ethical Behavior)	0.1105	0.2836
$Pr(Y = 3)$ (Consistently Unethical)	0.0000	0.3689

When compared side-by-side, the two behavioral patterns seem to imply two different mentalities individuals tend to assume, namely an "ethical mentality" and a "situational mentality". When adopting an ethical mentality, an individual is very ethical and consistent when making decisions. The probability of he/she behaving unethically is extremely low in any situation. In contrast, for individuals with a situational mentality, they can engage in both ethical and unethical behaviors and do not behave consistently in general. These individuals do not seem to follow a stringent principle of always leaning towards ethical or unethical decisions. In other words, individuals adopting a situational mentality are more susceptible to the effect of moral licensing and moral cleansing. It is also possible that they would even remain unethical over a certain period of time.

Following such a typology, one can provide a strong theoretical explanation for how ethics education simultaneously shifted all the three aspects of ethical dynamics. More specifically, the three aspects of ethical dynamics become highly integrated when considering them as three facets of the same underlying mentality. With an ethical mentality, individuals are mostly inclined to behaving ethically in every instance of decision-making, regardless of the situation. As a result, the overall probability of them making an ethical decision at any given point of time becomes higher. Because an ethical mentality induces consistent behaviors, the probability of remaining ethical across decisions becomes higher as well. Finally, the risk of an individual violating ethical standards becomes even lower over time as he/she fully adopts the ethical mentality, which indicates an extremely low probability of engaging in unethical behaviors.

When a situational mentality is adopted, however, individuals exhibited largely inconsistent behaviors when making decisions over time. The overall probability of these individuals engaging in unethical behaviors becomes higher because they are much more likely to switch from ethical decisions to an unethical one or even remain unethical across multiple decisions. Because individuals are subject to the effect of moral licensing and moral cleansing in this situation, the probabilities of switching between ethical and unethical decisions become higher. In addition, their risk of switching to unethical behaviors may not be related to their past decisions because of their inconsistent behavioral pattern - it is unlikely for these individuals to remain ethical for long enough before an ethical behavioral pattern is fortified by past ethical decisions.

3.6.2.3 The Effect of Ethics Education

Table 3.9 summarizes the effect of covariates on how individuals switch between the two behavioral patterns (mentalities)[3]. Note that the coefficients in each of the columns are associated with the probability of switching out of the original mentality. It turns out that the treatment of frequent communication of ethical standards via supply chain management education only has significant impact on $\pi_{s=1|s=2,\boldsymbol{x}}$. The treatment imposed a significantly positive impact on the probability of switching from the second behavioral pattern to the first one ($\gamma = 0.9590, p = 0.0267$). In other

[3]Full Model (summarized in Table 3.8 and 3.9) Log-Likelihood=-1145.376, AIC=2344.752, BIC=2416.918

words, individuals in the treatment group are more likely to switch from a situational mentality to an ethical mentality. The treatment is not significantly associated with the probability of switching from an ethical mentality to a situational mentality. This result may suggest that individuals are more likely to remain in the ethical mentality as it inherently promotes consistent behaviors.

Table 3.9: Factors Affecting the Switching Between Mentalities

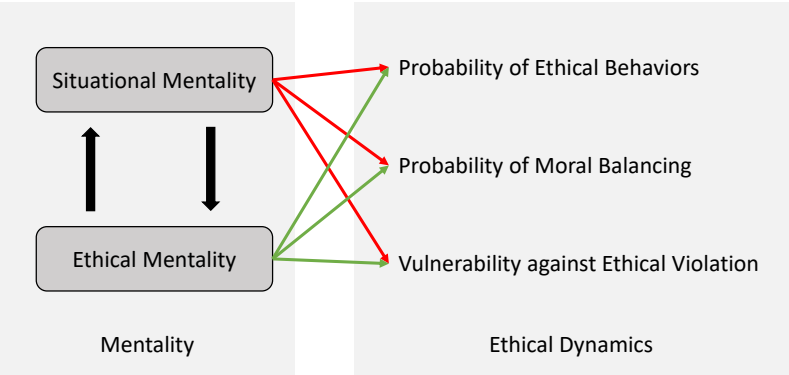
	$\pi_{s=2\|s=1,\boldsymbol{x}}$	$\pi_{s=1\|s=2,\boldsymbol{x}}$
(Intercept)	$-0.4354\ (1.8778)$	$-2.4822\ (1.7275)$
Treatment	$-0.6128\ (0.5567)$	$0.9590\ (0.4327)^{*}$
Age	$-0.4313\ (0.6648)$	$-0.0350\ (0.4956)$
Gender (female)	$0.3433\ (0.4631)$	$0.2240\ (0.3523)$
Religiosity	$0.0307\ (0.1561)$	$0.1937\ (0.1119)^{\dagger}$
Race (non-white)	$0.3482\ (0.5978)$	$0.1303\ (0.4768)$
Income	$-0.1680\ (0.1195)$	$-0.1746\ (0.0930)^{\dagger}$

$^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

The main analyses in this study suggest that the treatment has three types of effect on the ethical decision-making process, namely (1) increasing the overall likelihood of engaging in ethical behavior, (2) increasing the likelihood of remaining ethical, and (3) fortifying the consistency pattern of ethical behavior. The analysis in this section, however, suggests that these three types of effect may not be isolated. Rather, these effects together may actually reflect a much more fundamental shift in the mentality an individual adopts during the ethical decision-making process: ethics education may induce an ethical mentality which overall promotes not only ethical but also consistent decisions.

In summary, individuals may adopt one of the two mentalities (ethical mentality vs. situational mentality) in the decision-making process when ethical considerations are invoked. An individual adopting an ethical mentality is more likely to exhibit consistently ethical behaviors and rarely engage in unethical behaviors in general. When adopting a situational mentality, however, an indi-

Figure 3.4: Conceptualization of Ethical Dynamics



vidual is significantly less consistent in decision-making and constantly switches between ethical decisions and unethical decisions. When exposed to ethics education, individuals are more likely to adopt an ethical mentality as opposed to a situational mentality. An individual's behavior pattern in ethical decision-making process changes systematically (in terms of the probability of behaving ethically/unethically, the probability of behaving consistently/inconsistently, and the probability of exhibiting ethical failure after a streak of ethical behaviors) when he/she switches between an ethical mentality and a situational mentality. Such a conceptualization is depicted in Figure 3.4.

3.6.3 Managerial Implications

In supply chain management practice, in addition to making sure that employees behave ethically in individual decisions, firms should also focus on promoting consistency in employees' decision-making process. Few studies have examined how to promote ethical conduct in the long term. This study partially bridged this gap in the literature and examined three different aspects of ethical dynamics.

The study yielded several important implications to practitioners in terms of promoting ethical conduct in supply chain management. The results suggest that firms indeed need to evaluate employee's ethical behaviors from a long-term perspective. In the collected data, almost all the subjects (101 out of 107) eventually engaged in unethical behavior(s) at some point during the

experiment. From a practical standpoint, it may not suffice to determine an individual's overall tendency of engaging in ethical/unethical behaviors based on one or several decisions in the past. Instead, such tendency should be evaluated based on a series of observed behaviors over a much longer period of time.

Even if a supply chain practitioner has been deemed ethical in his/her decision-making based on long term observations, he/she may still behave unethically in future situations. This study estimated that the general probability of an individual switching from ethical decisions to an unethical one during supply chain management decisions is about 30% on average. Although such estimate can vary significantly depending on individual or situational factors, it is evident that the probability of deviating from ethical behaviors will always exist in almost any situation. Therefore, firms should constantly seek to prevent unethical conduct from occurring, even if their employees have maintained high ethical standards in the past. Promoting ethical conduct in supply chain management should always be an on-going process.

Even though most of the individuals are susceptible to engaging in unethical behaviors at some point, this study did not find evidence that such risk of ethical failures will accumulate as one continues to behave ethically (c.f., Chugh and Kern, 2016). In contrast, with the help of proper ethics education, it seems that consistent ethical behaviors may fortify one's behavioral pattern so that he/she will be even less likely to behave unethically in the future. This result suggests that promoting consistency in ethical decision-making may have long-lasting benefits. Firms should establish an organizational culture via ethics education which rewards consistency in ethical behaviors so that all the employees will eventually adopt such a behavioral pattern and actively uphold ethical values and standards in supply chain management.

Finally, the results also showed that ethics education (more specifically, frequent communication of ethical standards in supply chain management) can be very effective in promoting ethical conduct in general, especially when ethical dynamics are taken into consideration. Although ethical dynamics suggest that all individuals are subject to potential unethical conduct and may switch between ethical and unethical behaviors, ethics education can significantly increase an individual's

overall tendency of not only behaving ethically but also behaving in a consistent manner.

Similar to the findings in other related research (e.g., Armstrong et al., 2003; Luthar and Karri, 2005), the benefits of ethics education were manifested in multiple ways in this study. However, it is likely that these manifestations all originated from the fundamental change in one's behavioral pattern, or mentality. I found that individuals exhibited two distinct types of ethical dynamics, depending on their underlying mentality. Ethics education effectively induced individuals to adopt an ethical mentality (as opposed to a situational mentality) which is characterized by a significantly higher tendency of behaving not only ethically but also consistently. The risk of experiencing inconsistency in ethical decision-making process becomes extremely low. These results may suggest that, in the long run, firms should focus their resources on promoting an ethical mentality among their supply chain managers instead of monitoring and eliminating individual instances of unethical conduct (Deshpande, 1996).

3.6.4 Future Research

This study is one of the first attempts to systematically examine the dynamic characteristics of ethical decision-making process. Future research can potentially build upon this work and examine ethical dynamics in other contexts. Only a small number of variables were examined in this study. Future research can investigate the effect of other important dispositional or situational factors on how individuals behave in ethical decision-making process in the long term. For instance, a future study can examine important factors including the moral intensity implied in the decisions (Singhapakdi et al., 1996; Thong et al., 1998), ethical climate in the organization (Pierce and Snyder, 2008), and organizational citizenship behavior exhibited by the decision-maker (Brown and Trevino, 2006).

It may be of both theoretical and practical interest to examine the two mentalities proposed in this study (ethical mentality and situational mentality) in more detail. A particularly interesting research question would be to investigate under what circumstances individuals are more likely to adopt one mentality as opposed to the other. In addition, the two mentalities were inductively inferred in this study using a data-driven approach. The next step in this line of work would

be to formally conceptualize these mentalities in a theoretically-grounded manner and develop corresponding measurements for future empirical research.

Lastly, it would be interesting to examine the long-term efficacy of the managerial levers identified in the extant literature. For example, Tenbrunsel et al. (2003) suggest that firms can promote ethical conduct through ethical infrastructure, which contains formal communication, surveillance, and sanctioning systems. Future research can examine whether these managerial levers have only a short term effect or can decrease employee's tendency of unethical behavior in the long run.

3.7 Conclusions

In this study, I examined the dynamic characteristics of ethical decision-making process in supply chain management. I found that individuals exhibit dynamic patterns in making decisions when ethical considerations are invoked. The efficacy of ethics education in promoting consistency in ethical decision-making was also investigated. Specialized statistical models were formulated to reflect different aspects of ethical dynamics. Using an experimental approach, I derived important insights that are of both theoretical and practical importance.

4. OVERALL DISCUSSION AND CONCLUSIONS - TOWARDS AN APPROACH OF PROMOTING ETHICAL PRACTICE IN SUPPLY CHAIN MANAGEMENT

4.1 Introduction

In this chapter, I provide an overall discussion about my dissertation inquiry. I start with summarizing the important theoretical and empirical findings from the first two chapters. In essence, two dimensions of the ethical decision-making process were examined in my research, namely the magnitude dimension and the time dimension. I demonstrated that individuals exhibit complex behavioral patterns when determining the magnitude of an unethical behavior. In addition, an individual's present decision may be affected by his/her past decisions.

Next, I discuss a common theme in the findings that yields important implications about ethical decision-making in supply chain management. Through a set of exploratory analyses, I demonstrate that two general mentalities may exist in an individual's decision-making process in supply chain management. More specifically, individuals who adopt an ethical mentality tend to focus mainly on upholding ethical standards and therefore consistently engage in ethical behaviors. When adopting a situational mentality, individuals are more likely to heavily consider the potential benefits that may accrue from an unethical decision. In this case, they are more likely to engage in unethical supply chain decisions.

Finally, I describe an approach that potentially utilizes this common theme to promote ethical practice in supply chain management. I posit that the efficacy of three commonly used managerial levers that potentially promote ethical practice (i.e., ethical surveillance, ethical sanctions, and formal communication) may vary, depending on the dominant mentality an individual adopts in making supply chain related decisions. I then propose another experimental study where managerial levels will be matched with the presumed mentality of an individual; I expect that unethical behaviors will subside because an apposite managerial lever may act as an antidote.

4.2 Two Dimensions of Ethical Decision-Making Process

In my dissertation research, I mainly focus on two dimensions in ethical decision-making process, namely the magnitude dimension and the time or longitudinal dimension. In doing so, I seek to contribute to the extant literature by providing a comprehensive characterization of how individuals approach ethical decision-making in supply chain management. My studies demonstrate that both the magnitude and the time dimension are salient in explaining study participants' decisions where ethical considerations are invoked in a supply chain management decision.

4.2.1 The Magnitude Dimension in Ethical Decision-Making

The first chapter of my dissertation focused on the magnitude dimension of ethical decision-making process. In this study, I sought to answer the general question of how an individual determines the magnitude of his/her unethical behavior in supply chain management decisions. To conceptualize this decision-making process, I proposed a framework where the magnitude of unethical behavior is treated as a spectrum (see Figure 3 in Chapter 1). The magnitude of unethical behavior can register as low as "zero", where the decision is considered totally ethical. The magnitude of unethical behavior increases, however, as a decision moves towards the right-hand-side of the spectrum.

Three major implications have emerged from the framework in terms of conceptualizing the magnitude of unethical behavior. First, instead of making the simplification that the outcome of the ethical decision-making process is either an ethical decision or an unethical one, the framework acknowledges and posits that unethical behaviors may have different magnitudes. In other words, the framework specifically incorporates decisions that are neither completely ethical nor completely unethical. Second, the magnitude of unethical behavior is linked with the substantive meaning of the corresponding decision. In other words, the magnitude of unethical behavior may reach beyond a certain threshold such that an individual has to reevaluate his/her self-concept as an ethical person. Thus, an individual's behavioral pattern in ethical decision-making may change before/after such a reevaluation of self-concept. For instance, a factor may affect an individual's

behavioral pattern of deciding between an unethical behavior and an unethical one. However, that same factor may not have the same impact on his/her decision when determining the actual magnitude of unethical behavior, since the individual may have reevaluated his/her self-concept after deciding to behave unethically. Third, the magnitude of unethical behavior is affected simultaneously by two opposing forces. On the one hand, individuals have a proclivity to maintain their ethical self-concept. Via this mechanism, the magnitude of unethical behavior is pulled towards the ethical side of the spectrum. On the other hand, individuals are also motivated to behave unethically in order to maximize benefits, either personal or organizational. In this sense, the magnitude of unethical behavior may surge as an individual seeks to attain maximum benefits resulting from his/her unethical behavior.

Relying on this framework, I conducted an experimental study to examine how the magnitude of unethical behavior is determined in the realm of supply management. A scenario-based experiment was conducted where subjects were asked to make a supplier selection decision that invoked ethical considerations. More specifically, during a closed bid process, the subjects were given the option to disclose the lowest bid information to a soliciting supplier in exchange for economic benefit (cost reduction to the organization and a personal bonus). The subjects had the option to select between an ethical decision (i.e., do not disclose the information) and an unethical decision (i.e., disclose the information and attain economic benefit). In addition, the subjects could opt to report a bid price that was lower than the true lowest bid they received, acting not only unethically but also deceitfully. In this case, they would attain even more economic benefit resulting from a higher cost reduction.

The experimental design afforded me with the opportunity to observe the entire spectrum of the magnitude of unethical behavior, namely (1) an ethical decision where a subject does not disclose the lowest bid information, (2) an unethical but honest decision where a subject discloses the true lowest bid to achieve economic benefit, and (3) an unethical and deceptive decision where a subject reports a bid price that is below the true lowest bid so that he/she will attain even more economic benefit.

The empirical results indeed provided support to the proposed conceptual framework. First, I observed the entire spectrum of the magnitude of unethical behavior (ethical decisions, unethical but honest decisions, and unethical and deceptive decisions). Second, these three types of decisions imposed different levels of psychological impact on the decision makers, suggesting reevaluations of individual's self-concept as an ethical person when he/she behaved unethically to a higher degree. Finally, the magnitude of reported unethical behaviors was affected when the two driving forces (maintaining an ethical self-concept and maximizing benefits) changed. These results demonstrated that the proposed framework can provide guidance to the empirical examination regarding the magnitude of unethical behavior.

Relying on this framework as a paradigm, I examined the effect of two salient factors on the magnitude of unethical behavior. The first factor was concerned with the consequences of unethical behavior. The results suggested that an individual tends to behave unethically to a lesser magnitude when his/her decision would result in adverse consequences to others. The second factor was concerned with an incentive scheme that manipulated the beneficiary of benefits emanating from an unethical behavior. In general, an individual tends to escalate the magnitude of his/her unethical behavior when other organizational members (in addition to the decision maker himself/herself) would benefit from the unethical decision.

4.2.2 The Time Dimension in Ethical Decision-Making

The second chapter of the dissertation examined the time dimension in ethical decision-making in the context of supply chain management. More specifically, I investigated ethical dynamics, the inter-temporal relationships between consecutive decisions that invoke ethical considerations in supply chain management. The overall objective was to examine how individuals approach ethical decision-making in supply chain management over time. Moreover, I investigated whether the provision of ethical education assumes a positive impact on ethical dynamics in supply chain management.

Three related yet distinct aspects of ethical dynamics were examined in this study. First, I probed an individual's overall tendency of engaging in unethical behavior when facing consecutive

decisions in supply chain management that invoke ethical considerations. Second, I addressed the consistency and inconsistency in the ethical decision-making process. As an individual makes multiple decisions in supply chain management that potentially invoke ethical considerations, he/she may behave ethically or unethically in a consistent fashion or swap behaviors between an ethical or an unethical one. Ultimately, four dynamic patterns were explored, namely (1) behaving ethically consecutively, (2) switching from an ethical behavior to an unethical one, (3) switching from an unethical behavior to an ethical one, and (4) behaving unethically consecutively. Third, I assayed the vulnerability of an individual against ethical failure. More specifically, I focused on how likely an individual is to act unethically in a given episode given that the individual behaved ethically in the previous episodes.

To empirically examine these aspects of ethical dynamics, I conducted a longitudinal study that spanned a total of 12 weeks. The experimental study involved 10 decision-making scenarios in the context of supply chain management that invoke ethical considerations. In each decision-making scenario, subjects were asked to opt between behaving ethically and unethically. One of the two groups was treated with education regarding ethics on a regular basis and for the entire 12 week period. This type of experimental design furnished me with the ability to observe consecutive decision outcomes of an individual's ethical decision-making process and appraise the effect of ethics education on ethical dynamics.

A set of empirical analyses were conducted to examine the three aspects of ethical dynamics. First, the results suggested that the estimated average tendency of engaging in unethical behavior was about 48.40%. However, ethics education significantly reduced such tendency to around 32.70%. Second, individuals exhibited all four dynamic patterns, demonstrating that they indeed behaved both consistently and inconsistently throughout the study. For individuals who received ethics education, the consistency in their ethical behaviors increased. They were also less likely to behave unethically in a consistent fashion. Finally, individuals who received ethics education were unlikely to exhibit ethical failure after behaving consistently ethically in the past.

Overall, the results suggest that the effect of ethics education has three facets, each correspond-

ing to a particular aspect of ethical dynamics. Ethics education increases the general tendency of an individual to engage in ethical behaviors (as opposed to unethical behaviors). It also induces individuals to behave more consistently across multiple decisions. Furthermore, ethics education has a reinforcing effect on an individual's behavioral pattern such that he/she will continue to behave ethically, given a history of ethical behaviors.

4.2.3 Complexity in Ethical Decision-Making Process

The results in my studies all suggested that individuals exhibit complex behavioral patterns in ethical decision-making process. When making a decision that invokes ethical considerations in supply chain management, an individual not only needs to decide between behaving ethically and unethically but also needs to decide on the magnitude of his/her unethical behavior, predicated that the individual decided to act unethically. The ethical decision-making process becomes even more complex when taking into account the inter-temporal relationships between consecutive decisions. An individual's past decisions will affect the current decision. Such an effect varies and drives the current decision either towards or afar from the past decisions, further increasing the complexity in his/her ethical decision-making process.

In summary, the results from my research demonstrate the complexity in an individual's ethical decision-making process in supply chain management. The extant literature has consistently suggested that ethical decision-making is a complex issue as it can be affected by a wide range of factors (see, for example, O'Fallon and Butterfield, 2005; Craft, 2013; Loe et al., 2000). My studies further demonstrate that the complexity may also originate from the fact that the ethical decision-making process is multidimensional in nature.

4.3 Mentalities in Ethical Decision-Making Process

Despite the complexity in ethical decision-making process, a common theme appeared consistently in my studies and potentially provided a general characterization of how individuals approach ethical decision-making in supply chain management. In the second chapter, I examined three aspects of ethical dynamics and demonstrated that the effect of ethics education had three

facets (i.e., increasing the overall tendency of engaging in ethical behavior, improving the consistency in engaging in ethical behavior, and reinforcing an ethical behavioral pattern in the long term). In Section 6.2 (Chapter 2), I showed that individuals might exhibit two underlying mentalities in ethical dynamics, namely an ethical mentality and a situational mentality. The observed three aspects of ethical dynamics may in fact be reflections of the underlying mentality an individual adopts. Rather than affecting the three aspects of ethical dynamics separately, ethics education may induce a complete shift in an individual's behavioral pattern where an individual switches from a situational mentality to an ethical mentality.

4.3.1 Ethical Mentality and Situational Mentality

As demonstrated in Table 8 (Chapter 2), an ethical mentality implies an ethical and consistent behavioral pattern where an individual is very likely to behave ethically across multiple decisions over time. The probability of switching between an ethical decision and an unethical one is very low. When adopting a situational mentality, an individual is more likely to switch between ethical and unethical behaviors. Furthermore, the overall probability of engaging in unethical behavior is much higher.

When comparing these two mentalities, an ethical mentality seems to imply a much stronger focus on behaving ethically itself. The idea of upholding ethical standards dominates the ethical decision-making process such that an individual would rarely behave unethically to attain economic benefits. This characterization is reflected by the fact that an individual who adopts an ethical mentality would rarely switch from an ethical decision to an unethical one. Even if an unethical decision was made, he/she will almost surely switch back to behaving ethically immediately when he/she is presented with another decision that invokes ethical considerations. In contrast, a situational mentality implies a decision-making process that is more "situated" in the present decision. When adopting a situational mentality, an individual is much more aware or attaches more valence on the potential economic benefits resulting from unethical behaviors. He/she is more likely to engage in an unethical behavior in certain situations. This rationale explains the high probability of observing switching behaviors when a situational mentality is adopted. In a situational mentality,

the potential benefits associated with unethical behaviors are more salient in the decision-making process, resulting in a higher overall tendency of engaging in unethical behavior.

4.3.2 Ethical Mentality and Situational Mentality in Other Settings

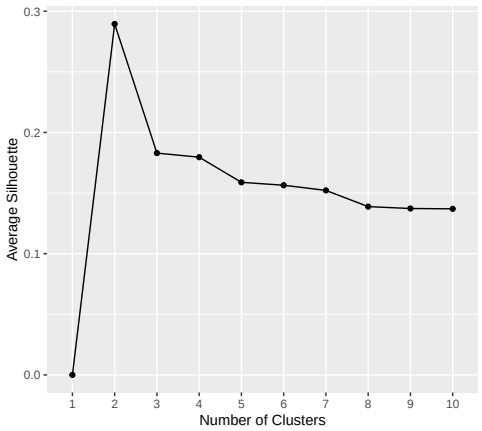
In my second chapter, the two mentalities were inductively derived from an empirical analysis. Differentiating between the two mentalities proved useful in explaining how individuals behaved in ethical decision-making from a longitudinal perspective. In turns out, however, that a similar differentiation of underlying mentalities can potentially be found in other settings of ethical decision-making as well. In this section, I demonstrate that ethical mentality and situational mentality can also be found in the decision-making process where the magnitude of unethical behavior is determined.

In the main experimental study described in the first chapter, subjects were asked to provide the rationale behind their decisions. More specifically, after making the decision (in terms of disclosing the lowest bid information to the soliciting supplier), the subjects were asked to verbally justify their decisions by responding to an open-ended question (I decided to take the specific action above because...). They were further asked to rate the extent to which they agreed with a set of statements (motives) describing the rationale behind their decisions. The statements are reproduced in Appendix C.1. In this way, I collected information about how the subjects approached ethical decision-making during the study.

To investigate whether ethical mentality and situational mentality exist in this study, I begin with a clustering analysis of the obtained data regarding the subjects' rationale/motives. The *k*-means method is used in this analysis where the number of clusters is specified as two in order to probe whether the two mentalities potentially exist during the decision-making process. Because the *k*-means method relies on a pre-supplied number of clusters, I repeat the *k*-means analysis with a different number of clusters to ensure that grouping the observations into two clusters indeed provides the best description of the observed data. Following Rousseeuw (1987), the average silhouette is calculated for each cluster analysis to evaluate the optimal number of clusters. As depicted in Figure 4.1, the average silhouette is highest when the number of clusters is set to two,

suggesting that there indeed exists two groups within the collected data.

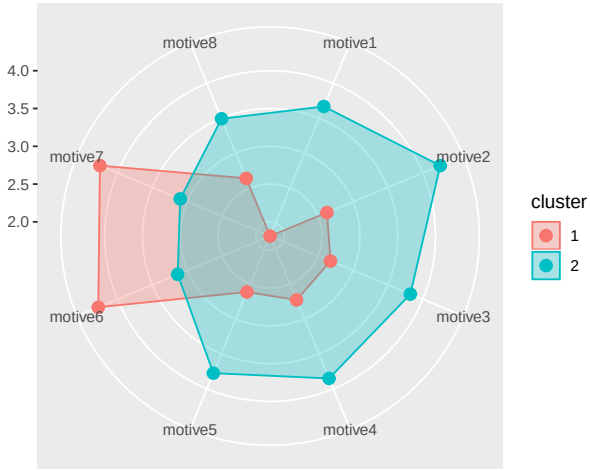
Figure 4.1: Optimal Number of Clusters



To characterize these two clusters, I plot the average score on each of the eight motives reported by the subjects (see Figure 4.2). The figure suggests a clear separation between the two clusters. More specifically, individuals who were grouped into Cluster 1 reported significantly higher scores on Motive 6 and 7 ("... it is unethical to share such information" and "... sharing such information violates ethical standards"). Individuals in Cluster 2, however, reported higher scores on the rest of the motives (listed in Appendix C.1) that pertain to the potential benefits resulting from an unethical decision.

Thus, it appears that individuals in Cluster 1 tended to focus more on ethical standards when making decisions. Individuals in Cluster 2, instead, placed more emphasis on the potential benefits associated with the decisions. In this sense, the two clusters seem to be reflective of the ethical mentality and the situational mentality respectively, identified in the second chapter of my dissertation. To demonstrate that these two mentalities were indeed the driving forces behind the separation of the two clusters, I performed a factor analysis on the eight motives to reduce the data perhaps into two dimensions (see Appendix C.1). Consistent with the visual evidence presented in Figure 4.2, Motive 6 and Motive 7 deviate from the other motives and are loaded on a separate

Figure 4.2: Characterization of the Obtained Clusters

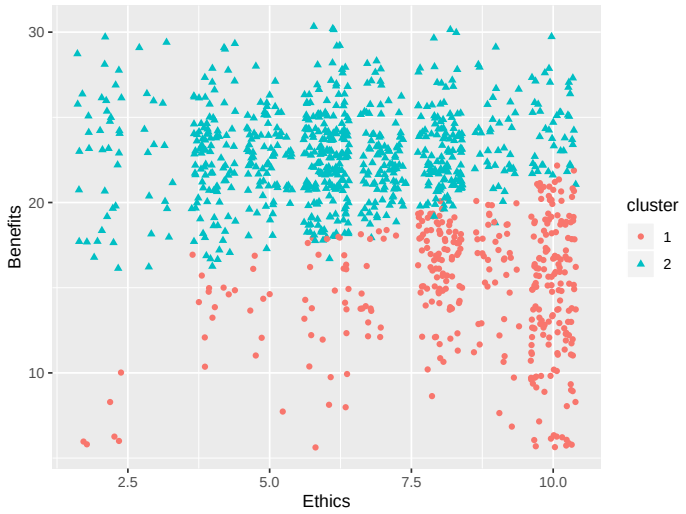


factor with substantial loadings. This result provides further evidence that two distinct mentalities were present during the study.

Furthermore, I computed two measures of mentality by taking the summation of the items corresponding to the ethical/situational mentality based on the factor analysis. The first measure, "Ethics", reflects the degree of emphasis placed on ethical standards by an individual during the decision-making process. "Benefits" is reflective of the saliency of the benefits that can be accrued from unethical behavior during the decision-making process. Figure 4.3 plots each subject's scores in terms of the two factors. The figure illustrates that the degree of emphasis placed on ethical standards/benefits resulting from an unethical decision was indeed the major criterion in the clustering analysis. Individuals in Cluster 1 (which corresponds to an ethical mentality) placed more importance on the ethics dimension. Individuals in Cluster 2 (which corresponds to a situational mentality), however, directed more saliency on the benefits dimension.

In summary, the analyses described in this section suggest that two underlying mentalities can be inferred from my research regarding the magnitude of unethical behavior in supply chain management. Akin to the mentalities identified in my research on ethical dynamics, the two mentalities essentially describe the level of importance an individual places on (1) upholding ethical standards

Figure 4.3: Obtained Clusters and Mentalities



and (2) attaining benefits. An individual who adopts an ethical mentality focuses on upholding ethical standards during the ethical decision-making process. An individual guided by situational mentality instead focuses on attaining benefits that result from engaging in unethical behaviors.

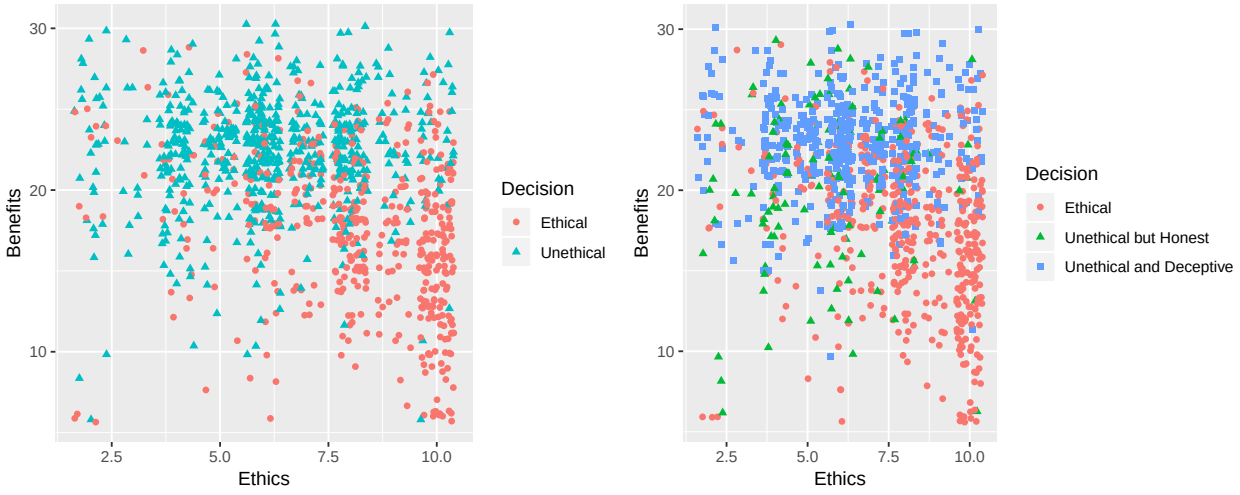
4.3.3 Further Evidence of Ethical Mentality and Situational Mentality

In the previous section, I demonstrated that two mentalities could be inferred from the experimental study in the first chapter of my dissertation. The characteristics of the two mentalities coincide with those of the ethical mentality and the situational mentality identified in the second chapter of my dissertation. In this section, I present more empirical evidence to corroborate such findings.

One may argue that, because the motives were measured after the decisions were made, they may not correctly reflect how individuals pondered or questioned their decisions during the study and not after the study. Instead, the motives may merely reflect how the subjects justified their decisions after the decision-making process. In essence, what this implies is that individuals who decided to behave ethically would naturally justify their decisions in terms of upholding ethical standards. By the same logic, individuals who behaved unethically would justify their decisions in terms of attaining potential benefits.

Nevertheless, the collected data suggest that the measured motives were not mere justifications made by the subjects after making the decision. As depicted in Figure 4.4, the decision made by an individual did not strictly correlate with the importance he/she placed on upholding ethical standards and attaining benefits. In other words, individuals who eventually behaved ethically may have considered not only upholding ethical standards but also attaining benefits. Similarly, an individual who made unethical decisions may not have fully ignored the importance of upholding ethical standards. Instead of merely capturing how the subjects justified their decision after the study, the measured motives may indeed reflect how they approached their ethical decision-making and how they evaluated their decision during the study.

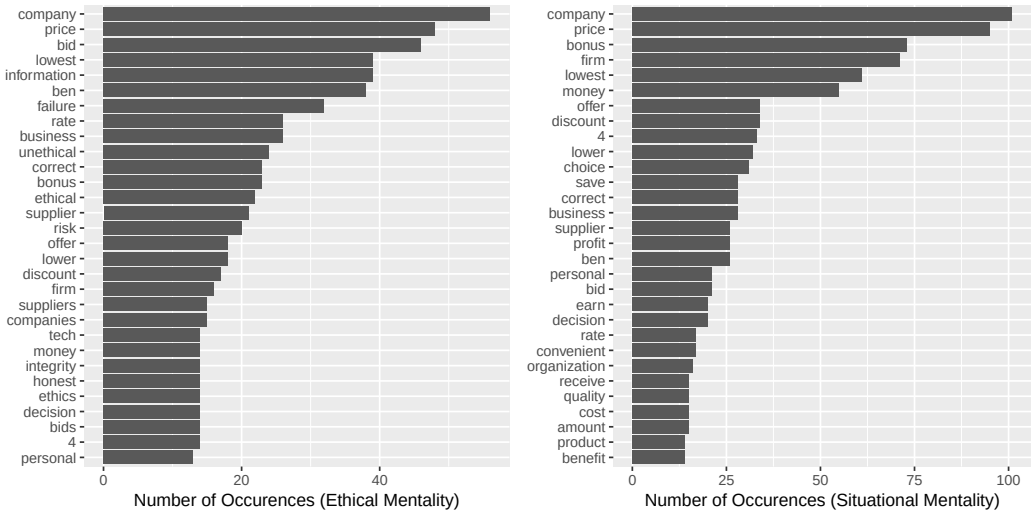
Figure 4.4: Mentalities and Decision Outcomes



Another potential concern about the inferred mentalities is that the subjects only responded to eight given motives. It is possible that there exist other underlying mentalities that could not be incorporated by the provided motives. To demonstrate that the inferred mentalities (ethical mentality and situational mentality) were sufficient in characterizing how individuals approached ethical decision-making, I conducted a textual analysis using the subjects' responses to the open-ended question, that preceded the set of the eight Likert type measures.

Upon making their decision, the subjects were asked to verbally explain how/why they decided to engage in an ethical/unethical behavior. Analyzing such textual data can potentially reveal other thinking or mental patterns in the ethical decision-making process. To prepare the data for the textual analysis, I removed stop words (e.g., "the", "of", and "to") that do not contain information about the ethical decision-making process (Joachims, 1998). After removing responses written in Chinese (recall that the study was also conducted in China), the textual analysis encompassed a total 809 written responses from the experimental subjects. See Appendix C.2 for examples of written texts included in the analysis.

Figure 4.5: Top 30 Keywords in Verbal Justifications by Inferred Mentality



As demonstrated in Figure 4.5, I plot the top 30 most common words that appeared in the text grouped by the inferred mentalities. A comparison between the two mentalities suggests that a number of keywords appeared consistently in the text, regardless of the mentality individuals adopted during the decision-making process. These common keywords, including "company", "price", "bid", "business", and "suppliers", seem to reflect the decision-making scenario itself instead of how the subjects approached ethical decision-making. In contrast, several keywords appeared in only one of the mentalities.

Table 4.1: Unique Keywords in Inferred Mentalities

Mentality	Keywords
Ethical Mentality	information, failure, unethical, ethical, risk, tech, integrity, honest, ethics
Situational Mentality	choice, save, profit, earn, convenient, organization, receive, qualify, cost, amount, product, benefit

Table 4.1 summarizes the unique keywords that appeared in the text written by individuals who were clustered into the ethical mentality and the situational mentality respectively. On the one hand, when adopting an ethical mentality, individuals were more likely to reference words that reflect the ethical considerations and consequences invoked in the decision (e.g., unethical, ethical, integrity, honest). On the other hand, individuals who adopted a situational mentality tended to focus on the potential benefits. These keywords are mostly related to the transactional aspect involved in the decision. In addition to the benefits, some of the keywords such as cost, amount, and product also seem to relate to the costs associated with the decision. These two sets of unique keywords again reflect the two mentalities inferred from the clustering analyses based on motives. Finally, the textual analysis does not seem to reveal another salient mentality that is different or divergent from the identified ethical mentality and situational mentality. Thus, ethical mentality and situational mentality together may be sufficient in providing a general characterization of individuals' ethical decision-making process.

4.4 Promoting Ethical Practice in Supply Chain Management

In this section, I discuss the practical implications of identifying the underlying mentalities examined in the previous sections. More specifically, I posit that firms may effectively promote ethical practice in supply chain operations by selecting the most appropriate managerial levers based on employee's mentality in ethical decision-making.

Various models have been developed to predict an individual's behavior when ethics-related issues are invoked. According to Rest (1986), ethical decision-making involves four components, namely moral awareness, moral judgment, moral intention, and moral action. Subsequent research

on ethics mostly focuses on identifying factors that potentially affect ethical decision-making through one or more components. For example, prior research demonstrates that individual factors such as gender, age, professional experience, and cultural background may have a significant impact on an individual's tendency to engage in unethical behavior (see Cohen et al., 2001; Christie et al., 2003; Cherry et al., 2003; Fleischman and Valentine, 2003, among many other studies). In organizational settings, an individual's ethical decision-making is also influenced by factors such as ethical climate (defined by Victor and Cullen (1988) as a shared perception among organizational members regarding the criteria and focus of ethical reasoning within an organization), social networks (Brass et al., 1998), ethical leadership (Trevino et al., 2003), and level of discussion about ethics within the organization (Bird, 1996).

Despite this growing body of work in business ethics, the extant models of ethical decision-making are largely exploratory and correlational in nature (Tenbrunsel et al., 2010). It remains unclear how to effectively predict the circumstances under which an individual chooses to act ethically/unethically (Kish-Gephart et al., 2010). More importantly, very few studies have focused on applying the existing theoretical findings in guiding business practitioners to promote ethical behaviors in real-life (Rottig et al., 2011). From a practical standpoint, most of the firms today implement certain formal managerial levers to address ethical issues within the organization (Treviño et al., 1999). The efficacy of such levers, however, is often inconclusive. For example, formal codes of conduct or ethics are commonly endorsed and implemented in firms as a managerial tactic. However, previous studies have shown that such tactics may not always be effective in promoting ethical conduct (c.f. McCabe et al., 1996; Badaracco and Webb, 1995). Therefore, it is important for firms to implement the most effective managerial levers to promote ethical practice since the cost of implementation can be high (Treviño et al., 1999) and the consequences (reputational and financial) associated with ethical failures can proved to be substantive. Such decision can be even more critical since implementing inappropriate levers may even lead to an increased rate of unethical behaviors (Tenbrunsel and Messick, 1999).

4.4.1 Managerial Levers of Promoting Ethical Practice

A potential approach in improving the efficacy of managerial levers in promoting ethical practice is through predicting an individual's behavioral pattern in ethical decision-making process. Building on such a model, it is possible to identify the conditions where a particular managerial lever is most effective in promoting ethical behavior.

The extant literature typically examines three types of managerial levers, namely ethical surveillance, ethical sanctions, and formal communication. In their influential study, Tenbrunsel et al. (2003) propose an umbrella concept coined as "ethical infrastructure", which represents a system of managerial levers that a firm uses to affect an individual's ethical decision-making. According to their categorization, formal communication (those levers that officially communicate ethical values and principles, such as codes of conduct or codes of ethics), surveillance (those levers that monitor and detect ethical or unethical behaviors), and sanctioning systems (those levers that reward or punish ethics-related behaviors) are the most commonly used levers.

It is possible that the efficacy of these levers to impact behavior differs across individuals with diverse mentalities. I posit that formal communication of ethical standards is most effective when an individual is largely guided by an ethical mentality and does not focus on the potential economic benefits resulting from unethical behaviors. In contrast, ethical surveillance and sanctioning in combination may be more effective for individuals guided by a situational mentality where ethical considerations may not be salient in their decision-making.

4.4.2 Dominant Mentalities in Ethical Decision-Making

As discussed in Section 4.3.2, individuals may adopt either an ethical mentality or a situational mentality in ethical decision-making. Ethical mentality focuses on the ethical considerations invoked in the decisions. Situational mentality is mainly concerned with the potential benefit (or cost) involved in the decision-making process.

It is possible that individuals have inherent tendencies to rely on one particular mentality when making a decision. In other words, an individual may be more inclined to rely on either an eth-

ical mentality or a situational mentality when facing a decision where ethical considerations are invoked. The extant literature provides some evidence that individuals may lean towards a certain behavioral pattern in decision-making. For instance, Cornelissen et al. (2013b) measure individuals' dominant mindset (consequential mindset vs. deontological mindset) using a scenario-based question. Individuals tend to have a dominant behavioral pattern in terms of following a consequential/deontological mindset in ethical decision-making. Following this logic, it is possible to identify an individual's general tendency towards adopting an ethical mentality or a situational mentality. Switching to another mentality can be difficult as the switch will necessarily result in a drastic change in an individual's overall behavioral pattern (see Chapter 2).

When adopting a situational mentality, economic considerations can be dominant in one's decision-making process. To focus on the potential benefits, an individual may perform a cost-benefit analysis of the potential outcome related to an unethical behavior. In this situation, an individual is more likely to engage in unethical behaviors given higher financial rewards, lower probability of being caught, and lower magnitude of punishment (Hechter, 1990; Mazar et al., 2008). By definition, ethical surveillance and ethical sanctioning closely correspond to the elements of the economic models. Ethical surveillance provides firms with capabilities to monitor organizational members' behavior and hence increases the probability of identifying one's unethical conduct. When an ethical sanctioning system is in place, it formalizes a punishment system against those individuals who behave unethically. Moreover, it may also serve as a reward system to individuals who retain their ethicality, thus increasing the desirability of the alternative option (i.e., not engaging in unethical behavior). Therefore, ethical surveillance and sanctioning directly affect the probability of being caught and the magnitude of punishment. These two levers combined should therefore be more effective for affecting supply chain managers' behavior when an individual assumes a situational mentality and mainly evaluates the costs and benefits associated with an unethical action.

Proposition 4.1. *Managerial levers pertaining to ethical surveillance and ethical sanctioning are more effective in promoting ethical practice in supply chain management for individuals who adopt*

a situational mentality.

Prior studies demonstrate that the effect of codes of ethical conduct (a common type of formal communication) on ethical decision-making is inconclusive (Kish-Gephart et al., 2010). In other words, such managerial levers may not be effective in promoting ethical practice. However, it is possible that codes of conduct are effective only for a certain type of individuals who tend to invoke ethical considerations in decision-making. Formal communication of ethical standards may serve as an important means of helping organizational members to internalize ethical standards and truly behave accordingly in ethical decision-making. In this context, individuals may be more likely to truly internalize these standards because repetition is often positively associated with learning and retention (Zajonc, 1968; Zajonc et al., 1974). Overall, formal communication of ethical standards may have a positive impact on an individual's sensitivity of ethical awareness because it increases the likelihood that an ethically questionable act will be detected (Rottig et al., 2011). Such an effect may be salient only when an individual tends to invoke ethical considerations during his/her decision-making process.

Proposition 4.2. *Managerial levers pertaining to formal communication are more effective in promoting ethical practice in supply chain management for individuals who adopt an ethical mentality.*

4.4.3 Future Research

As a future research direction, I outline an approach that empirically examines the propositions presented in the previous section. The central objective of this analysis is to evaluate the effect of different managerial levers (ethical surveillance, ethical sanctioning, and formal communication) on an individual's ethical decision-making process, given his/her dominant mentality. The mentalities (ethical mentality and situational mentality) were previously identified using a data-driven approach. In practice, in order to select the most effective managerial levers, one needs to measure an individual's dominant mentality prior to implementing managerial levers. Therefore, the first step of this proposed future study is to develop an instrument that predicts which mentality an individual tends to adopt during ethical decision-making.

Next, an experimental study can be conducted to evaluate the effectiveness of managerial levers. At the beginning of the experiment, subjects will be randomly assigned into either treatment or control group. Their dominant mentality in ethical decision-making will be measured by the developed instrument. Subjects will then be asked to make certain decisions where supply chain ethics are involved, potentially through a scenario-based study similar to the two studies conducted in my dissertation research.

For those participants in the treatment group, a particular type of managerial lever (formal communication, ethical surveillance, or ethical sanctioning) will be assigned to each individual such that the managerial lever will match his/her dominant mentality. For example, if an individual is most likely to adopt a situational mentality, he/she will be assigned to a managerial lever where an ethical sanctioning system is in place.

For participants in the control group, the managerial lever imposed will be randomly selected without matching with their predicted mentality. The effect of taking mentality into account when selecting managerial levers can therefore be estimated by comparing the ethical decision outcomes between the control group and the treatment group. It is expected that participants in the treatment group will be less likely to engage in unethical behavior because the imposed managerial lever was selected based on the mentality each individual is likely to have. In this case, a matched managerial lever would be more effective in promoting ethical practice because it will serve as an antidote against unethical tendencies.

4.5 Conclusions

In my dissertation research, I focused on understanding ethics of decision makers when involved in supply chain management decisions. My first study examined how the magnitude of unethical behavior is determined in an individual's ethical decision-making process. I demonstrated that the magnitude of unethical behavior can be driven by two opposing forces (i.e., maintaining an ethical self-concept and attaining economic benefits) through a complex mechanism. The second study investigated the dynamic behavioral patterns exhibited by individuals when making multiple decisions in the long term. I specifically focused on understanding how/when individuals behave

not only ethically but also consistently in making multiple decisions.

Overall, my dissertation contributes to the OM/SCM literature by providing a more granular examination of how individuals approach ethical decision-making when facing supply chain decisions. My studies have important implications for practitioners specifically in terms of how to effectively promote ethical practice in supply chain management. Based on my research findings, I discussed two mentalities that provided a general characterization of how individuals approach ethical decision-making in supply chain management. I then outlined an approach that potentially promotes ethical practice in supply chain management by selecting the most effective managerial levers based on employee's mentality.

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APPENDIX A

APPENDIX TO BOUNDEDNESS AND COMPLEXITY IN ETHICAL PURCHASING DECISIONS

A.1 Principles and Standards of Ethical Supply Management Conduct

A.1.1 Reading Material Presented to the Subjects

Ethical Considerations at TransWorld, Inc.

The Institute for Supply Management (ISM) has issued Principles and Standards of Ethical Supply Management Conduct and TransWorld, Inc. endorses these principles and standards and encourages organizational members to follow them.

PRINCIPLES

1. Integrity in Your Decisions and Actions
2. Value for Your Employer
3. Loyalty to Your Profession

From these principles are derived the ISMÂő standards of supply management conduct:

STANDARDS

1. IMPROPRIETY. Prevent the intent and appearance of unethical or compromising conduct in relationships, actions and communications.
2. CONFLICT OF INTEREST. Ensure that any personal, business and other activities do not conflict with the lawful interests of your employer.
3. INFLUENCE. Avoid behaviors or actions that may negatively influence, or appear to influence, supply management decisions.

4. RESPONSIBILITIES TO YOUR EMPLOYER. Uphold fiduciary and other responsibilities using reasonable care and granted authority to deliver value to your employer.

5. SUPPLIER AND CUSTOMER RELATIONSHIPS. Promote positive supplier and customer relationships.

6. SUSTAINABILITY AND SOCIAL RESPONSIBILITY. Champion social responsibility and sustainability practices in supply management.

7. CONFIDENTIAL AND PROPRIETARY INFORMATION. Protect confidential and proprietary information; such information, is not to be disclosed to other suppliers unless you have the explicit authorization from the company that furnished the information.
   Examples of information that may be considered confidential or proprietary include:

   (a) Price and other related elements

   (b) Contract terms and conditions

   (c) Sealed bids and requests for quotations (RFQs)

   (d) Product and other costs

8. RECIPROCITY. Avoid improper reciprocal agreements.

9. APPLICABLE LAWS, REGULATIONS AND TRADE AGREEMENTS. Know and obey the letter and spirit of laws, regulations and trade agreements applicable to supply management.

10. PROFESSIONAL COMPETENCE. Develop skills, expand knowledge and conduct business that demonstrates competence and promotes the supply management profession.

A.1.2 Quiz Questions regarding the Statement

Please respond to the following questions that pertain to the material you just read above (correct answers are marked in bold):

1. Social responsibility is not a concern for the purchasing profession (True/**False**)

2. Your personal interests can interfere with the legitimate interests of your employer (**True**/False)

3. Bids, quotations (RFQs), and price can be freely shared with external parties (such as other suppliers) once submitted to your company (True/**False**)

A.2 Experimental Scenario

A.2.1 Description of Experimental Scenario

[subject's first name], you are now assuming the role of the Director of Supply Management at TransWorld Inc.

TransWorld specializes in manufacturing car transmissions for big players in the auto industry. Your company was recently awarded a sizable contract by a major auto manufacturer. According to the contract, your company will be responsible for supplying transmission packages for an entire new line of cars. The manufacturer suggested that they would purchase approximately one hundred thousand units of transmission packages per year in the next three years from your company.

Needless to say, this contract is essential for TransWorld's success in the next several years. As the Director of Supply Management, you immediately issued a Request for Quotations (RFQs) to seven qualified companies that provide transmission cases, a necessary component for producing transmission packages.

You have done business with these suppliers in the past so you are confident that any of the seven suppliers can do a good job in meeting your design specifications as well as other requirements. As a result, price becomes a major criterion in deciding which supplier wins the contract. Your cost accountants and engineers estimate that the lowest price on these transmission cases should be around $780, though some suppliers starving for business may be willing to offer a lower price.

Two weeks ago, three very competent suppliers submitted their sealed bids. In a few days, you will need to award the contract to the selected supplier so that they can start the production process in time.

The three suppliers that submitted bids along with their specific price quote are:

Case Masters:	$1,126
Metal Works:	$1,000
Tech-Inc.:	$1,080

This is not a trivial decision - with the downturn of the industry, your company is facing financial challenges and the top leadership at your company has been looking for opportunities to save money in order to increase profitability. Some of your direct competitors had to downsize their labor force recently in order to stay in business. Reducing the cost of sourcing transmission cases can lead to significant total cost reduction and improved profitability.

A.2.2 Email Soliciting the Lowest Bid Information

Dear [subject's first name],

Our team here at Tech-Inc. submitted a quote/pricing proposal in reference to your request for quotations (RFQ) for transmission cases. Our quote was submitted within the prescribed time limit two weeks ago and we are eager to work with you to assure that you get the lowest price for the sizable number of transmission cases you are to acquire over the next three years.

We believe that we priced our product very competitively at $1,080 per unit but we are willing to lower the price if you received a lower quote for competing products of similar quality. We are positive we can work something out. Please let us know what the lowest price quote is per unit and we can even price our product at 4% lower than the lowest quote per unit. Given the volume of 100,000 units per year, this can amount to significant savings for your firm.

As you know, our reputation is stellar and we always deliver quality products reliably. Our history together is long and we are proud that you selected us as a valuable partner on several occasions.

We are aware that you will award the contract in the next few days so please relate to us as soon as possible the lowest price quote per unit and we will respond shortly with a revised proposal.

Sincerely,

Ben

Ben Anderson

VP Sales, Tech-Inc.

Peoria, IL

A.2.3 Formulas Used to Calculate Annual Bonus and Cash Reward

Table A.1: Formulas Used to Calculate Annual Bonus and Cash Reward

	Personal Bonus	Shared Bonus
Bonus for Cost Reduction	$S \times 100000 \times 1\%$	$S \times 100000 \times 50\%/50$
Cash Reward to Subjects	Bonus$/10000 \times 0.5$	

$S = 980 -$ (reported lowest bid) $\times (1 - 0.04)$

A.2.4 Incentive Scheme (Beneficiary Treatment)

A.2.4.1 Personal Bonus

Your company has instituted a bonus scheme for directors alike you in order to encourage cost reduction. The top management has stipulated that you can earn a 1% bonus for every dollar below a targeted price of $980 per unit. This can lead to a considerable amount of bonus compensation since your company is expected to purchase 100,000 units of transmission cases every year. In other words, you will get a annual bonus that is equal to (savings per unit from $980) * 100,000 units * 1%.

For example, if the final price is $979, the company will obtain a reduction of $1 per unit. Your share will be $0.01 ($1 * 1%). The total annual bonus for you will be $1,000 (100,000 units * $0.01).

If the price reduction is $10 per unit (that is, if the final price is $970), you will receive an annual bonus of $10,000 (100,000 units * $10 * 1%).

If the price reduction is $100 per unit (with a final price of $880), the total annual bonus will be $100,000 (100,000 units * $100 * 1%).

Cash Bonus to you as a participant:

The annual bonus (as calculated in the previous page) will be converted to cash at a rate of $10,000 bonus to $0.50 cash, for up to $10. You will personally receive a cash reward, if any, from the lab administrator when you complete the third part of the exercise.

For example, if the final price is $970, your annual bonus will be $10,000. In this case, you will receive $0.50 in cash from the lab administrator.

If the final price is $880, your annual bonus will be $100,000. In this case, you will receive $5 in cash from the lab administrator.

At a final price of $780 you will receive $10.

Finally, since the cash reward is capped at $10, for any final price you obtain that is below $780, you will still receive $10 when you complete the entire exercise.

Your cash reward will be issued at the end of the entire exercise. If there is reward, you will receive an email from the administrator with instructions to obtain it.

A.2.4.2 Shared Bonus

Your company has instituted a bonus scheme for employees in order to encourage cost reduction. The top management has stipulated that organization members (including you) can share a 50% bonus for every dollar below a targeted price of $980 per unit. This can lead to a considerable amount of bonus compensation since your company is expected to purchase 100,000 units of transmission cases every year. There are 50 members in your organization that will share equally the bonuses. Therefore, you will get an annual bonus that is equal to [(savings per unit from $980) * 100,000 units * 50%]/50.

For example, if the final price is $979, the company will obtain a reduction of $1 per unit. You will share a bonus of $0.50 ($1 * 50%) per unit with your colleagues. The total annual bonus for you will be $1,000 (100,000 units * $0.50/50).

If the price reduction is $10 per unit (that is, if the final price is $970), the organizational

members will receive a total annual bonus of $500,000 (100,000 units * $10 * 50%). Your portion will be $10,000 ($500,000 / 50).

If the price reduction is $100 per unit (with a final price of $880), the total annual bonus will be $5,000,000 (100,000 units * $100 * 50%). Your portion will be $100,000 ($5,000,000/50).

Cash Bonus to you as a participant:

The annual bonus (as calculated in the previous page) will be converted to cash at a rate of $10,000 bonus to $25 cash, which is to be equally shared by the 50 organizational members. Your portion would be $0.50 cash, for up to $10. You will personally receive a cash reward, if any, from the lab administrator when you complete the third part of the exercise.

For example, if the final price is $970, your annual bonus will be $10,000. In this case, you will receive $0.50 in cash from the lab administrator.

If the final price is $880, your annual bonus will be $100,000. In this case, you will receive $5 in cash from the lab administrator.

At a final price of $780 you will receive $10.

Finally, since the cash reward is capped at $10, for any final price you obtain that is below $780, you will still receive $10 when you complete the entire exercise.

Your cash reward will be issued at the end of the entire exercise. If there is reward, you will receive an email from the administrator with instructions to obtain it.

A.3 Measurements for Personal Values

Table A.2: Factor Analysis of Personal Values Measurements

Construct/Question Items	Factor Loading	CR
Please consider the following values and report your level of importance for...		
(from Strongly Disagree to Strongly Agree)		
Benevolence (Cronbach's alpha = 0.791)		0.7727
Honest (genuine, sincere)	0.836	
Loyal (faithful to my friends, group)	0.649	
Responsible (dependable, reliable)	0.646	
Helpful (working for the welfare of others)	0.567	
Hedonism (Cronbach's alpha = 0.670)		0.6643
Pleasure (gratification of desires)	0.775	
Self-indulgent (doing pleasant things)	0.588	
An enjoying life (enjoying food, sex, leisure, etc.)	0.517	
Stimulation (Cronbach's alpha = 0.717)		0.7112
A varied life (filled with challenge, novelty and change)	-0.684	
Daring (seeking adventure, risk)	-0.676	
An exciting life (stimulating experiences)	-0.654	
Universalism (Cronbach's alpha = 0.791)		0.738
Social justice (correcting injustice, care fore the weak)	-0.93	
Equality (equal opportunity for all)	-0.696	
Achievement (Cronbach's alpha = 0.592)		0.6055
Successful (achieving goals)	0.792	
Influential (having an impact on people and events)	0.513	

A.4 Variable Selection for Personal Values

Table A.3: Variable Selection using OLS and Logistic Regression

	Dependent variable:	
	de-facto price (OLS)	ethical/unethical (Logistic)
Intercept	919.557*** (32.935)	−0.572 (0.810)
Age	−1.269 (4.068)	−0.073 (0.098)
Gender(female)	28.370*** (5.434)	−0.379*** (0.132)
Income	4.577*** (1.502)	−0.055 (0.036)
Severity (reversed-coded)	−14.588*** (1.609)	0.368*** (0.041)
Ethical Infrastructure	10.045*** (1.999)	−0.140*** (0.049)
Benevolence	3.302*** (1.156)	−0.056** (0.029)
Hedonism	−5.336*** (1.251)	0.098*** (0.031)
Universalism	−0.560 (1.476)	0.020 (0.036)
Stimulation	−0.454 (0.982)	−0.015 (0.024)
Achievement	−1.494 (1.652)	0.060 (0.040)
Observations	1,133	1,133
R^2	0.153	
Adjusted R^2	0.146	
Log Likelihood		−711.439
AIC		1,444.879
Residual Std. Error	88.365 (df = 1122)	
F Statistic	20.302*** (df = 10; 1122)	
Note:		*p<0.1; **p<0.05; ***p<0.01

Table A.4: Variable Selection using Multinomial Logistic Regression

	Dependent variable:	
	Unethical & Honest	Unethical & Deceptive
Intercept	-3.902^{***} (1.393)	-0.535 (0.853)
Age	-0.234 (0.168)	-0.032 (0.104)
Gender(female)	0.054 (0.225)	-0.488^{***} (0.139)
Income	0.028 (0.058)	-0.083^{**} (0.039)
Severity (reverse-coded)	0.230^{***} (0.065)	0.406^{***} (0.044)
Ethical Infrastructure	0.109 (0.090)	-0.199^{***} (0.052)
Benevolence	0.013 (0.051)	-0.074^{**} (0.030)
Hedonism	-0.025 (0.049)	0.135^{***} (0.033)
Universalism	0.044 (0.061)	0.016 (0.038)
Stimulation	-0.009 (0.040)	-0.017 (0.026)
Achievement	0.106 (0.071)	0.046 (0.043)
AIC	1,968.561	1,968.561
Note:		*p<0.1; **p<0.05; ***p<0.01

A.5 Measurements for Motives

- I decided to take the specific action above MAINLY because... (please complete below in your own words)
- Acting as the Director of Supply Management, you decided to take the specific action regarding Ben because (rate from 1-"Strongly Disagree" to 7-"Strongly Agree"):
    1. of the money you would personally make
    2. of the money you could save your company
    3. sharing such information violates ethical standards
    4. you desire recognition for your efforts to help the company
    5. you expect that you will get more financial rewards in the future
    6. you expect that perhaps your boss will reciprocate and offer you recognition such as a promotion for your efforts

7. it is unethical to share such information
8. you can ensure that your company does not downsize its labor force
9. the company might reciprocate in ways to reward your action
10. of the degree of certainty/uncertainty of actually receiving the bonus
11. you feel that you are entitled to the bonus
12. you feel that the organization deserves to save money
13. you feel that the more distant the payment is from today, the less probable you will actually receive the bonus
14. it is natural for you to protect the short-term interests of your organization
15. everybody else in your organization would take the same action
16. everybody around your social circle would take the same action
17. it is natural for you to protect the long-term interests of your organization

A.6 Measurements for Perceived Realism

Perceived Realism (rate from 1-"Strongly Disagree" to 7-"Strongly Agree")
(Cronbach's alpha = 0.773, overall average score = 5.6568/7)

1. The situation described was realistic
2. I had no difficulty in imagining myself in the situation
3. I was truly engaged with this exercise
4. I found the exercise to be interesting

A.7 Experimental Design (Day 3)

Email message presented to the subjects who chose not to disclose the lowest bid information:

Earlier today, you received an email from Ben:

Dear [subject's first name],

Thank you for the reply and we regret to hear about your decision. We truly value the long-term relationship between our firms and therefore would love to work out a special arrangement regarding this particular contract.

We understand that this contract plays an important role in the next few years given its volume. With our experienced team and state-of-the-art facilities, we are perfectly capable of fulfilling your contract at a lower price without compromise in quality. We are sure that we can work together and achieve significant cost savings. Therefore, we would like to offer you a percentage discount that will sway your decision.

Again, we are eager to work with you on this contract. Please kindly reconsider our offer and let us know what percentage discount will be satisfactory to your team. We will do our best to match the lowest bid you received with the additional discount you specified.

Look forward to hearing back from you.

Sincerely,

Ben

Ben Anderson

VP Sales, Tech-Inc.

Peoria, IL

A.8 Results from the Extended Model

Table A.5: Estimation Results from the Extended Model

Variables	p(ethical)	p(honest|unethical)	$p(d_i$|deceptive, unethical)	p(maximum benefit|deceptive, unethical)
(Intercept)	$1.4547^{\dagger}$	-1.3004	835.7827^{***}	$-3.2806^{\dagger}$
	(0.8516)	(1.4881)	(32.5275)	(1.6915)
Age	0.1075	-0.1441	-4.3108	$0.3344^{\dagger}$
	(0.1015)	(0.1821)	(3.7210)	(0.1949)
Income	-0.0258	0.0255	1.8151	-0.1030
	(0.0403)	(0.0717)	(1.5696)	(0.0970)
Benevolence	0.0368	$0.0838^{\dagger}$	1.1774	-0.0494
	(0.0250)	(0.0462)	(0.9186)	(0.0456)
Hedonism	-0.0899^{**}	-0.1313^{*}	-2.8506^{*}	0.1612^{*}
	(0.0306)	(0.0523)	(1.2141)	(0.0667)
Severity (reverse-coded)	-0.4129^{***}	-0.2054^{**}	-1.3264	0.0885
	(0.0431)	(0.0744)	(1.7191)	(0.0894)
Ethical Infrastructure	0.0332	0.2438^{*}	2.4951	-0.0642
	(0.0563)	(0.1064)	(2.1142)	(0.1016)

Continued on next page

Table A.5 – *Continued from previous page*

Variables	p(ethical)	p(honest|unethical)	$p(d_i$|deceptive, unethical)	p(maximum benefit|deceptive, unethical)
Gender	0.1361	0.0307	6.8055	−0.2784
	(0.2391)	(0.4072)	(8.9847)	(0.4463)
Beneficiary: Organization	−0.0108	−0.3697	3.0089	−0.8498
	(0.2704)	(0.4512)	(11.3024)	(0.6791)
Consequence: Low Safety	0.3229	0.0635	16.8607	−0.2781
	(0.2699)	(0.4486)	(11.3325)	(0.6373)
Country: Italy	−0.7169*	−0.8076	−4.7720	0.2409
	(0.3048)	(0.4947)	(12.2329)	(0.5825)
Country: China	−0.2452	−0.6277	31.7455**	−2.0863*
	(0.3031)	(0.5432)	(12.0019)	(0.8913)
Gender	−0.0269	0.9923*	17.9181†	−0.4282
×Beneficiary: Organization	(0.2690)	(0.4769)	(10.2185)	(0.5572)
Gender	0.4921†	0.0421	−3.2389	0.1695
×Consequence: Low Safety	(0.2696)	(0.4710)	(10.1458)	(0.5486)
Country: Italy	−0.1539	0.2132	−14.7193	0.9552
×Beneficiary: Organization	(0.30947)	(0.4999)	(12.8454)	(0.7136)

Continued on next page

Table A.5 – *Continued from previous page*

Variables	p(ethical)	p(honest|unethical)	$p(d_i$|deceptive, unethical)	p(maximum benefit|deceptive, unethical)
Country: China	-0.0004	-0.9711	-29.5382^{*}	-0.1780
$\times$Beneficiary: Organization	(0.3264)	(0.6535)	(13.0249)	(1.0553)
Country: Italy	-0.1292	0.0648	-9.8805	-0.0446
$\times$Consequence: Low Safety	(0.3081)	(0.4947)	(12.8194)	(0.6727)
Country: China	-0.8362^{*}	-0.7351	-19.9533	1.4285
$\times$Consequence: Low Safety	(0.3277)	(0.6585)	(13.0282)	(1.0338)

$^{\dagger}p < 0.10$; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

APPENDIX B

APPENDIX OF DYNAMICS IN ETHICAL DECISION-MAKING IN SUPPLY CHAIN MANAGEMENT - A LONGITUDINAL STUDY

B.1 Experimental Design: Frontend Questions

B.1.1 Introduction

We wish to thank you for participating in this business decision-making encounter. The purpose of your participation is to study how individuals effectively manage projects. As in real-life practices, the successful completion of a business project involves making multiple decisions that are either related or independent to each other. It also requires managers to constantly pay attention to the overall progress of the business in order to achieve better performance.

In this semester-long encounter, you will act as the head of supply management (more like in charge of purchasing) who needs to make contract decisions. Each week, you will be exposed to new information regarding ongoing projects and asked to make corresponding decisions. Please note that you will need to participate **in each and every week** in order to complete the entire encounter and receive course credits. If you forget to or choose not to participate during the week before the deadline, you will NOT be able to continue the rest of the encounter.

But do not worry - you will only need to spend no more than 5 minutes every week in order to progress with the encounter. All you need to do each week is to read several short paragraphs that contain new information and answer very few questions related to the decision at hand.

The first question you will be exposed to will be about the material you read in that respective week. The purpose of this question is to ensure that you read the material carefully and you are well-informed before making the decision. The question will be in true/false format and extremely straightforward. You will need to answer it correctly in order to proceed.

Please note that you will be graded based on your answers to these questions. In other words, how many course credits you will receive as part of your performance in SCMT-364 will depend on

the series of these questions. Please make sure that you answer these questions correctly with your first attempt. Failing to answer them correctly the first time will be seen as not paying attention to the material and therefore will result in zero credit for that week. Again, the questions will be very simple if you read the material carefully enough.

The second and third question will pertain to your decision, given the information that is furnished. The final decisions you make will collectively determine your performance as a manager in this encounter. The final decisions you make will NOT affect how many course credits you will receive. **However, you will receive cash reward of up to $20 based on how you perform (more explanations provided below)**.

We assure you that **all your responses will remain confidential** and only available to the lead principal investigator (Dr. Xenophon Koufteros: xkoufteros@mays.tamu.edu). We have no interest in sharing your individual responses or identifying you to any external party. Therefore, your anonymity will be under strict protection.

The material you will see each week is randomly assigned. In other words, the material you see will be different from other participants'. We would ask that you **please refrain from discussing this exercise with other people throughout the semester, including your fellow students**.

Please answer the following questions correctly in order to proceed.

- (True/False) I do not need to participate in the exercise every week in order to be qualified for completing the entire exercise.

- (True/False) I can still continue to participate in the exercise and receive course credits even if I miss the deadline in a given week.

- (True/False) The course credits I receive will depend on how I answer the first question each week regarding the reading material. In order to receive the credits for the week, I need to answer the corresponding question correctly in my first attempt.

- (True/False) I only need to spend a little time (about 5 minutes) every week. But it is important that I participate every week on time.

- (True/False) The number of course credits I receive will depend on the exact decisions I make every week as well.
- (True/False) The decisions I make every week has nothing to do with the course credits. However, they will determine my performance in the encounter and hence the cash reward I will receive at the end of the semester.
- (True/False) My decisions will not be anonymous so it is OK if I discuss it with other people.

In this encounter, you are assuming your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. The supply management department coordinates with other departments and external suppliers so that the company will have required components and parts in due time to assemble automobile transmissions and sell them to the customers.

Your company just won a lucrative contract to produce about 1 million auto transmission systems for a major customer. Everyone in the company is excited about this business opportunity as it will greatly increase TW Inc.'s profitability in the coming years. As an employee, you expect that the company will give a large bonus in addition to your regular salary. **Needless to say, how much your will receive as a bonus will depend on your performance**.

The direct supervisor is the one who ultimately evaluates the performance of his/her subordinates. In your case, as head of supply management, your performance will be directly reviewed by the Chief Operations Officer (COO) at TW Inc. TW Inc. is a traditional manufacturing company whose major costs come from sourcing raw materials and parts. Therefore, your performance will be largely determined by whether you can effectively control the purchasing costs. In other words, you will receive a better performance evaluation, and hence a higher cash bonus, if the purchasing costs of components and parts are reduced. In contrast, you will receive a bad evaluation and little cash bonus if the costs cannot be reduced.

Your COO has informed you that the cash bonus will be calculated based on the amount of reduction in total purchasing costs you achieve for TW Inc. Therefore, there will be no bonus as-

signed to you if you do not achieve any cost reduction. For each $1 million reduction in purchasing costs, you will receive a personal bonus of $1,000. It is not difficult to save TW Inc. millions of dollars in total purchasing costs because the company will produce about a million transmissions in the next few years. Thus, a small cost reduction of unit purchasing costs will be multiplied by 1 million and translates into a large reduction in total costs. For example, if you manage to lower the unit purchasing costs of a particular component by $10, TW Inc. will save $10,000,000 on purchasing this component in total ($10 per unit * 1,000,000 units). Accordingly, you will receive a personal bonus of $10,000 ($10,000,000/1,000,000 * $1,000). Remember, you will have multiple opportunities of achieving cost reduction because TW Inc. will need to purchase many components and parts.

As participant of this business encounter, you will potentially receive a real cash reward at the end of the semester according to the personal bonus calculated as above. The bonus you receive as head of supply management will be converted to a cash reward by a ratio 1:10,000. For example, if you receive a bonus of $150,000, the cash reward you will obtain at the end of the semester will be $15 ($150,000/10,000). The maximum amount of cash reward will be capped at $20. Therefore, if you receive a total bonus of more than $200,000, your cash reward will be $20.

B.1.2 Basic Information

Please enter your preferred email address. We need this information for two reasons. First, we will need to use your email address to match your responses each week throughout the semester. Second, we will be offering cash awards and we need to communicate with you regarding your exact award. Please remember that your email address will be available only to the principal investigator.

Please remember your choice of this email address and use the same email address every week.

Please enter the last four digits of your UIN (printed on your TAMU ID Card). Again, we will need to match your responses with a subsequent exercise so please remember this number. This information will again be available only to the principal investigator. Your anonymity will not be compromised.

1. What do you identify as your gender?
    - Male
    - Female
2. What is your age?
    - Under 20
    - 20-22
    - 22-30
    - 30-50
    - 50-60
    - Over 60
3. What is your current/aspiring major in college?
    - Accounting
    - Finance
    - Information Systems
    - Management
    - Marketing
    - Supply Chain Management
    - Engineering
    - General Business
4. What is the political party you most identify with?
    - Democratic
    - Republican

- Libertarian
- Green
- Constitution
- I do not identify with any political party

5. How important are your religious beliefs to you?

    - Not Important at all
    - Unimportant
    - Somewhat Unimportant
    - Neither Important nor Unimportant
    - Somewhat Important
    - Important
    - Highly Important

6. I would describe myself as religious.

    - Strongly disagree
    - Disagree
    - Somewhat disagree
    - Neither agree nor disagree
    - Somewhat agree
    - Agree
    - Strongly agree

7. What is the religion you most identify with?

    - Protestant

- Catholic
- Mormon
- Other Christian
- Judaism
- Islam
- Hinduism
- Buddhism
- Other Religion
- No Religion

8. What is your race?

    - White American, European American, or Middle Eastern American
    - Black American or African American
    - Native American or Alaska Native
    - Asian American
    - Native Hawaiians or Other Pacific Islander
    - Hispanic or Latino
    - Foreign National

9. What is your household income (include your parents' household income if you are a dependent)?

    - Less than $24,999
    - $25,000 to $49,999
    - $50,000 to $74,999

- $75,000 to $99,999
- $100,000 to $149,999
- $150,000 to $199,999
- $200,000 or more

B.2 Experimental Design: Decision Scenarios

B.2.1 Scenario 1

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

Your company decided to outsource the production of the transmission case, a major component of the transmission system, to an outside supplier. A few days ago, three competent and trustworthy suppliers submitted their bids with pricing information.

Following the convention in the industry, the bidding prices and cost information are supposed to be kept as confidential knowledge since it discloses their cost and pricing information. Therefore, the way such bidding process works is that bidders have no way of knowing others' bidding prices. Because all these suppliers are more than capable of delivering the products on time and with satisfactory quality, your primary goal as the head of supply management will be to award the contract to the supplier with the lowest purchasing price. Supplier Argo asks for $1,040 per unit, supplier Bestas asks for $1,000 per unit, and supplier Gramatis asks for $1,080 per unit.

Today, the sales director at Argo emailed you and asked if you could disclose the lowest bid you have received. If you choose to do so, they promise to beat this lowest bid by providing an additional 2% discount, which you know will lead to a unit price of $980. With each unit saving $20, your company will end up cutting spent by a total of $20 million in purchasing costs.

- MARKER QUESTION: (True/False) Your primary goal for this contract as the head of supply management is to make sure that you find the most reliable supplier among the three and

award it the contract.

- INTENTION: (Likert Scale) It is likely that I will disclose the lowest bid pricing information I have received to Argo.
- DECISION: (Yes/No) You need to make the final decision now. Would you disclose the lowest bid you have received to Argo and potentially reduce spent by $20 million?
- AWARENESS: (Likert Scale) In this encounter, a supplier is asking me to disclose confidential information.

B.2.2 Scenario 2

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

Gears are considered as some of the most critical parts in a transmission. When combined together, a series of gears adapt the output of the engine to the drive wheels. This process is necessary because the engine speed needs to be properly reduced by the gears in order to generate enough torque for the drive wheels to move the entire vehicle. In addition, by switching between different sizes of gears, the transmission controls the speed as well as the direction of the wheels (in other words, forward and reverse).

TW Inc. typically contracts with Metal Works, a well-established auto gear equipment manufacturer, to procure all the gears for assembly. Metal Works operates in the U.S. and Mexico and has been one of the industrial leaders for many years. Its products are generally considered high quality thanks to Metal Works' state-of-the-art facilities and production practices. Compared to other manufacturers, Metal Works is capable of fabricating raw metal into gears at a very consistent level of accuracy. This makes their gears more reliable because the sliding frictions between gear teeth (one of the major sources of transmission failure) are minimized when the gears are precisely matched with each other.

Recently, however, it was reported that Metal Works has been inappropriately dumping cutting fluid into a river near its main production site in Mexico. Cutting fluid serves as a coolant and lubricant in metal fabrication processes such as cutting and stamping. However, such artificially synthesized fluid is considered toxic to organisms and the environment. The effects on humans, animals, and plants are rather consequential. Technically, Metal Works and other similar manufacturers are "allowed" to dump the fluid into rivers for now since such practice has not been prosecuted by Mexican law enforcement. As a result, your team recommends that TW Inc. should continue to work with Metal Works on the current contract so that TW Inc. can procure high quality gears and fulfill the order on time. There are however other suppliers who can deliver gears of similar quality and within the same timeframe. However, negotiating a new supply contract can result in higher costs because the new supplier may take advantage TW Inc.'s situation and ask for a higher price in the tune of $20 million over the contracted one million units.

- MARKER QUESTION: (True/False) Cutting fluid is used in transmissions to reduce the heat generated during vehicle movements.
- INTENTION: (Likert Scale) It is likely that I will award the contract to Metal Works.
- DECISION: (Yes/No) You need to make the final decision now. Would you award the contract to Metal Works?
- AWARENESS (Likert Scale) In this encounter, an attractive supplier in terms of pricing is problematic because it is damping poisonous cutting fluid into a river in Mexico

B.2.3 Scenario 3 (Dropped after Pretest)

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

You just came back from a business trip to one of your suppliers in India (Tak Corp.). This was your first visit to this supplier's facility. Over the years, TW Inc. has been sourcing alloys from Tak Corp. through a distributor. Given the importance of the production contract your company just received, you decided to personally visit Tak Corp. to make sure that they are prepared for the large order TW Inc. will place over the next few years.

After a tour at Tak Corp.'s headquarters and production site, you concluded that Tak Corp. is fully capable of meeting the TW Inc.'s production requirements. At the end of the trip, you suddenly realized however that you did not see any female workers on the production floor. During a conversation with a production manager at Tak Corp., he told you that the company generally has a policy of hiring only male workers for production-related jobs. This is because women in India do not have a lot of work experience in factories. He also explained that hiring only men helps reduce personnel training costs and avoids disruptions associated with pregnancies.

Based on your calendar, you will need to make a decision shortly. The supplier is very reliable and cost competitive. However, you are worried with your observation that no opportunities are given to women; you are also worried on market reaction if the information was somehow leaked. You estimate that your company can save $20 million over the course of this contract if it awards the contract to Tak Corp.

- MARKER QUESTION: (True/False) Your company has been doing business with Tak Corp. indirectly through a distributor.
- INTENTION: (Likert Scale) It is likely that I will award the contract to Tak Corp.
- DECISION: (Yes/No) You need to make the final decision now. Would you award the contract to Tak Corp.?
- AWARENESS: (Likert Scale) In this encounter, an attractive Indian supplier in terms of pricing is problematic because of its hiring practices.

B.2.4 Scenario 4

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

Pins are small hardware used for fastening objects or material together in manufacturing. For transmissions, TW Inc. relies on a special type of pins, the dowel pins, to align the transmission case with the internal section of the transmission. Although not as complicated as other components, pins used in transmissions are difficult to fabricate due to their small size. As a result, the delicate nature of these pins requires a lot of human labor.

Because pins are commonly used hardware in manufacturing, there are many sellers on the market who can supply the dowel pins according to TW Inc.'s specifications. Although the unit price of pins is low, the total procurement cost is a major concern because TW Inc. will consume millions of pins for its transmission production contract in the next few years. Therefore, you need to pay special attention to the cost of purchasing these pins.

Following standard practice, you solicited and received quotes from three companies. After verifying their qualifications, your team concluded that all three suppliers are fully capable. Therefore, it would make the most sense to select a supplier based mainly on cost considerations. You expect that the bid prices will be similar because there are hundreds of sellers in the market and the competition is severe. However, Sulistyo, an Indonesian company, offers a significantly lower price in the tune of $20 million over the course of the contract.

You have heard rumors in the past that Sulistyo was involved in using child labor and that some children received harsh punishment when not performing according to expectations. Although Indonesian companies are legally allowed to employ children older than 15, these child workers should not be put in hazardous working conditions; it remains unclear whether working in pin-making facilities in Indonesia is harmful to children. However, the noisy and crowded environment in such facilities is clearly harsh to the children, who are essentially not given the opportunity to

receive formal school education. Sulistyo claims that they strictly abide by the child labor laws of Indonesia. You suspect that using many young workers is the reason why the company can submit such a competitive bid - child workers are typically paid much less than adults. However, such practice is completely legal in Indonesia as long as the age of these workers is above 15.

Your assistant has prepared the contract documents which will award the contract to Sulistyo. Sourcing from them will clearly lead to massive cost reduction due to the lower unit price. All you need to do is to sign the documents before they are sent to Sulistyo.

- MARKER QUESTION: (True/False) Only a few suppliers around the world can produce dowel pins.
- INTENTION: (Likert Scale) It is likely that I will award the contract to Sulistyo.
- DECISION: (Yes/No) You need to make the final decision now. Would you award the contract to Sulistyo?
- AWARENESS: (Likert Scale) In this encounter, an attractive supplier in terms of pricing in Indonesia appears to be problematic because it is using child labor.

B.2.5 Scenario 5

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

You only have a few days to select the supplier of transmission pan gaskets. Gaskets are ring-shaped mechanical seals that are used to fill the space between two surfaces in order to prevent leakage. Transmission pan gaskets are the mechanical seal between the transmission itself and the transmission oil pan. The pan holds the automatic transmission fluid which lubricates and cools the transmission during operation. A transmission pan gasket seals the gap between the transmission and oil pan so that the transmission fluid will not leak. It also prevents other liquids or substances

from getting into the transmission. Therefore, although transmission pan gaskets are not very expensive (the typical price for each is around $47), it serves as crucial protection for the entire transmission.

Your team has been in contact with a Turkish supplier named BlackSea Industry. TW Inc. has contracted with BlackSea Industry before and the quality then was reasonable. Your team is considering purchasing transmission pan gaskets from them for the course of the contract because BlackSea Industry is willing to supply their products at a unit price which is $20 cheaper than the other bidding suppliers, leading to $20 million savings. After careful testing, your team suggests that the gaskets made by BlackSea Industry meet all the specifications. However, their gaskets will burn out on average at 54,000 miles, which is sooner than other similar products which have a life expectancy of 90,000 miles.

When a transmission pan gasket burns out, it will fail to seal the gap between the pan and the transmission properly, leading to transmission fluid leak. Transmission fluid leak is one of the most common mechanical failures in automobile transmissions. Fixing a transmission fluid leak may cost around $400. However, the cost can go up to more than $2,000 for a customer if the transmission itself is damaged and demands complete replacement when too much fluid leaks out.

Your team is inclined to select BlackSea Industry because their low unit price can lead to a large cost reduction. The gaskets provided by BlackSea Industry are acceptable in terms of reliability since the transmissions TW Inc. offers have a warranty that covers the first 50,000 miles. However, it is likely that car owners will need to replace the gaskets soon after their warranty expires.

- MARKER QUESTION: (True/False) TW Inc. offers a warranty for its transmissions that covers the first 50,000 miles, however, the gaskets made by BlackSea Industry can last for at least 90,000 miles.
- INTENTION: (Likert Scale) It is likely that I will award the contract to BlackSea Industry.
- DECISION: You need to make the final decision now. Would you award the contract to BlackSea Industry?

- AWARENESS: (Likert Scale) In this encounter, an attractive supplier in terms of pricing in Turkey appears to be problematic because of its low quality.

B.2.6 Scenario 6

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

Springs are small but crucial hardware used in transmissions. Compared to regular springs used in other machinery, springs in transmissions need to be extremely reliable since they are typically housed deep within the complex mechanical structure of the transmissions. Therefore, these springs would be very difficult to replace if they fail. Each transmission requires many such springs and each spring can be costly due to the metals used and the labor involved.

Your department is assessing the possibility of awarding the contract to Luigi Alessi, an Italian hardware maker, as the sole supplier of springs for the transmission production contract your company just secured. Luigi Alessi is a supplier your company worked with in the past.

Finding a new supplier is not easy because the supplier will need to configure their production processes according to TW Inc.'s specifications and start fulfilling large orders shortly. There are many potential suppliers who are capable of producing the springs. However, only Luigi Alessi is willing to commit their production capacity to TW Inc.'s contract, deliver the orders in due time, and offer a total price over the course of the contract which is $20 million lower than the next supplier.

Luigi Alessi, among many similar companies in Italy, has been reported to employ illegal immigrants in their production facilities. These illegal immigrants are typically from Asia or Africa where they suffer from poverty and unemployment due to poor economic conditions. Luigi Alessi provides residence for these immigrant workers. However, these immigrants are not protected by labor laws due to their illegal immigration status. In fear of losing their job or being turned to the authorities and deported, these workers have to comply with the demands of Luigi Alessi's

management. Currently, they are working 16 hours shifts, 6 days a week but they are only paid for an equivalent of 40 hours of work per week.

- MARKER QUESTION: (True/False) Luigi Alessi can only supply a portion of TW Inc.'s order due to capacity constraint.
- INTENTION: (Likert Scale) It is likely that I will award the contract to purchase springs from Luigi Alessi.
- DECISION: (Yes/No) You need to make the final decision now. Would you award the contract to purchase springs from Luigi Alessi?
- AWARENESS:(Likert Scale) In this encounter, an attractive supplier in terms of pricing in Italy appears to be problematic because it is using illegal immigrants.

B.2.7 Scenario 7

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

Your department recently discovered an opportunity to greatly reduce the purchasing cost of transmission fluid filters. These fluid filters are installed in transmissions to keep contaminants out of the transmission fluid. When a fluid filter fails, contaminating particles will enter the transmission and induce a failure.

A Chinese fluid filter supplier, called Yiran Technology, has entered the global market five years ago and quickly become one of the major sellers. Your company has used this supplier in the past. Yiran Technology adopted a very aggressive business strategy and prices its products about 30% lower than the competing products from other countries. It is expected that this can lead to $20 million reduction in cost in comparison to the next lowest bidder. The company is able to do so because it is partially owned by the government. To support the local economy, the government

provides such companies with favorable policies and financial support via tax rebates and zero-interest loans. With such support, Yiran Technology focuses on expanding its market share in the global market.

Other fluid filter producers that are traditionally from North America and Europe were forced to lower their prices in response to Yiran Technology's competition. However, many companies eventually went out of business because, unlike Yiran Technology who receives support from the government, they had to rely on their own financial resources and simply could not survive the price war.

You need to decide whether to start purchasing the fluid filters from Yiran Technology.

- MARKER QUESTION: (True/False) External support from the government was a major reason why Yiran Technology quickly expanded its market share.
- INTENTION: (Likert Scale) It is likely that I will award the contract for transmission fluid filters to Yiran Technology.
- DECISION: (Yes/No) You need to make the final decision now. Would you award the contract for transmission fluid filters to Yiran Technology?
- AWARENESS (Likert Scale **Reverse scaled**) In this encounter, an attractive supplier in terms of pricing in China appears to be great because its manufacturing process is very efficient.

B.2.8 Scenario 8

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

You need to source the transmission modulator, a critical component in the transmission that regulates the timing of gears shifting. A transmission modulator measures the engine's workload

(in other words, how hard an engine works). The transmission then reacts to the modulator accordingly and shifts to the appropriate gears.

The most obvious choice for the additional transmission modulator supplier is a domestic company called Williamson-Robinson. TW Inc. has contracted with Williamson-Robinson for years and established a good collaborative relationship. However, your company did not work with Williamson-Robinson in the last two years because it was found that the owners of the company were not making contributions to social security for all of their employees in order to reduce costs. This violation lead to an investigation by the Social Security Administration and subsequently a financial penalty was imposed. Nowadays, the company is laying off many of the domestic workers and instead is hiring a large number of foreign nationals at its overseas production sites. This significantly reduces labor costs because Williamson-Robinson will not need to pay for the high social security expenses and many other employee benefits which are mandatory for employing U.S. workers.

Williamson-Robinson is working hard to revive its business relationship with TW Inc. They have approached your team earlier this week and offered to supply the transmission modulators at a big discount. This discount will amount to $20 million over the course of the contract. The sales director promised that they will price their modulators almost at cost in order to win the supply contract.

- MARKER QUESTION: (True/False) Williamson-Robinson is laying-off many domestic workers mainly because these workers are not physically fit for producing modulators.
- INTENTION: (Likert Scale) It is likely that I will award the contract to purchase the transmission modulators from Williamson-Robinson.
- DECISION: (Yes/No) You need to make the final decision now. Would you award the contract to purchase the transmission modulators from Williamson-Robinson?
- AWARENESS: (Likert Scale **Reverse scaled**) In this encounter, an attractive domestic supplier in terms of pricing appears to be problematic because of its quality.

B.2.9 Scenario 9 (Dropped after Pretest)

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

Each year, the supply management department performs a comprehensive review of TW Inc.'s existing suppliers. The purpose of this review is to ensure that the suppliers are capable of meeting TW Inc.'s requirements and that they are effectively managing financial and legal risk. The review essentially serves as an internal auditing practice that helps the company evaluate its supply chain partners and establish a reliable supplier base.

During the review, your team discovered that MacMillan Industries, a long time supplier, was found guilty and fined by the Occupational Safety and Health Administration (OSHA) because of unsafe working conditions in its factories. MacMillan Industries supplies a variety of automobile components and parts to TW Inc., including shift kits used in transmissions. The manufacturing process of shift kits largely involves metal cutting, which requires a special fluid used for polishing. Such fluid, however, generates fumes which were found to be unsafe for humans. After OSHA's investigation, MacMillan Industries was required to select another type of fluid for metal cutting instead. However, the company is still under watch from OSHA since the replacement fluid may be harmful to workers as well.

There is no way to be sure about the toxicological properties of the replacement fluid before OSHA's next inspection, which is scheduled nine months from now. MacMillan is willing to sell the shift kids at a cost which is $20 million lower than the next lowest supplier.

- MARKER QUESTION: (True/False) MacMillan's replacement cutting fluid has already been shown to be safe to humans.
- INTENTION: (Likert Scale) It is likely that I will award the contract to purchase shift kits from MacMillan.

- DECISION: (Yes/No) You need to make the final decision now. Would you award the contract to purchase shift kits from MacMillan now?
- AWARENESS: (Likert Scale) In this encounter, an attractive domestic supplier in terms of pricing appears to be problematic because the product floor conditions are unsafe for humans.

B.2.10 Scenario 10

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

You just finished a conference call with Thomas, a sales manager at North Hampton Metalworks, to talk about the recent diplomatic incidents between the U.S. and Iran. Not long ago, the U.S. government officially issued new trade sanctions against Iran that prohibit importing any industrial material, amongst other products, from the country.

Although TW Inc. does not work directly with any Iranian companies, you were worried that your company would unintentionally break the sanctions through its supply chain operations. North Hampton Metalworks is a U.K. based company that supplies steel plates used in transmissions and TW Inc. has done business with them in the past. It turns out that North Hampton Metalworks sources the steel plates from an Iranian company called Hooman due to low costs. Because U.K. does not currently forbid importing steel products from Iran, Thomas promised that TW Inc. can legally purchase these steel plates from Iran since the transactions will be done indirectly through a North Hampton Metalworks subsidiary.

Although feasible from a legal perspective, you need to carefully evaluate this decision because TW Inc. would in effect bypass the sanctions and support the Iranian regime. From a financial perspective, sourcing from North Hampton Metalworks will lead to a significant cost reduction estimated to be $20 million over the course of the contract. The trade sanctions have put Iranian

companies in a very difficult position as they have lost many global customers. Desperate in finding customers, the price Hooman offers to North Hampton Metalworks is much lower than similar companies from other countries.

You will need to respond to Thomas' offer by tomorrow because it will take weeks for North Hampton Metalworks to receive the products from Iran and ship them to the U.S.

- MARKER QUESTION: (True/False) It is illegal for North Hampton Metalworks to purchase steel plates from Hooman because the U.K. imposed trade sanctions against Iran.
- INTENTION: (Likert Scale) It is likely that I will award the contract to purchase steel plates from North Hampton Metalworks.
- DECISION: (Yes/No) You need to make the final decision now. Would you award the contract to purchase steel plates from North Hampton Metalworks?
- AWARENESS: (Likert Scale) In this encounter, an attractive supplier in terms of pricing in the UK appears to be problematic because it is using an Iranian company to produce the steel plates.

B.2.11 Scenario 11

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

A torque converter is the most complicated component in a transmission. It transfers the rotating power from the engine to the transmission, which then adapts the power to the wheels. Similar to clutches in manual transmissions, in automatic transmissions a torque converter separates the power of the engine from the load of the wheels, preventing the engine from being "killed" when it is running but the vehicle has been stopped by the brakes.

Torque converters are essentially a type of "fluid coupling" device that requires complex design and sophisticated engineering. Therefore, only a small number of companies around the world are able to design and produce torque converters as the Research and Development cost is extremely high. This gives such companies a lot of market power to charge a high price because transmission producers, including TW Inc., only have a few options when selecting their supplier of torque converters.

The situation has changed since five years ago when ShuangCheng, a Chinese company, entered the automobile torque converter market. They offered torque converters at almost half of the price regularly seen in the industry and quickly took over a major share of the global market. TW Inc. has done business with them in the past. It is estimated that TW Inc. can save $20 million over the course of the contract if it sources the torque converter from ShuangCheng.

Many of the competing companies suspect that ShuangCheng is able to offer such a low price because they do not have to pay for Research and Development - the company may have been infringing on patents and proprietary techniques of other companies. In fact, ShuangCheng was admonished by the Chinese government under pressure from international companies but still produces torque converters with impunity. As more transmission producers start purchasing from ShuangCheng, it seems that the company will soon dominate the market unless further investigation reveals solid evidence that ShuangCheng capitalizes on the work of other companies.

You need to decide whether TW Inc. will purchase from ShuangCheng. Needless to say, cutting the procurement cost of torque converter almost in half will significantly reduce the overall costs.

- MARKER QUESTION: (True/False) ShuangCheng is able to offer their products at a low price because they spend a lot of resources on researching and developing new technologies.
- INTENTION: (Likert Scale) It is likely that I will award the contract to purchase torque converters from ShuangCheng.
- DECISION: (Yes/No) You need to make the final decision now. Would you award the con-

tract to purchase torque converters from ShuangCheng?

- AWARENESS: (Likert Scale) In this encounter, an attractive supplier in terms of pricing in China appears to be problematic because it is receiving state subsidies.

B.2.12 Scenario 12

This week, you continue to assume your role as head of supply management at TW Inc., a large company that specializes in supplying transmissions to major automobile makers. To help fulfill a major production contract your company has just secured for over the next few years, you have been working hard to coordinate with suppliers to procure necessary components and parts.

Transmission fluid leaks are some of the most commonly seen mechanical problems in transmissions and bad clad seals are often the cause of the problem. There are many clad seals installed in a transmission to keep the transmission fluid from leaking out. Although small, these seals are critical for transmissions to function correctly. Clad seals are mostly made of some specialized and expensive rubber. A large portion of clad seals is made in Brazil, a major exporting country of rubber products.

Bon Gia is a Brazilian supplier of clad seals and TW Inc. has worked with this supplier in the past. However, it was recently revealed that Bon Gia has long been monitored by government agencies and environmental activists. Many companies, such as Bon Gia, locate their production sites in the rain forest. Operating such production facilities in the rain forest has an adverse effect on the environment as they release many pollutants into the air. Although this practice is prohibited by the law, many companies still do so in order to avoid paying high real estate costs. These companies, including Bon Gia, have been admonished and/or fined for breaking the law, but the low fines they paid did not compare to the potential cost of moving their production sites to other locations.

You will soon need to award the contract for clad seals. Bon Gia is a Brazilian supplier that offers the clad seals at a cost which is $20 million lower than then next lowest bidder.

- MARKER QUESTION: (True/False) Many companies in Brazil choose to locate their clad

seal production facilities in the rain forest because of real estate cost considerations.

- INTENTION: (Likert Scale) It is likely that I will award the contract to purchase clad seals from Bon Gia.
- DECISION: (Yes/No) You need to make the final decision now. Would you award the contract to purchase clad seals from Bon Gia?
- AWARENESS: (Likert Scale) In this encounter, an attractive supplier in terms of pricing in Brazil appears to be problematic because it is producing the product in the rain forest.

B.3 Experimental Design: Backend Questions

1. I decided to take the specific actions over the last 10 weeks MAINLY because ... (please complete below in your own words)
2. The decisions I made over the last 10 weeks conform to my moral standards and character.
    - Strongly agree
    - Agree
    - Somewhat agree
    - Neither agree nor disagree
    - Somewhat disagree
    - Disagree
    - Strongly disagree
3. Tell us, in your own words, whether the decisions you made over the last 10 weeks conform to your moral standards and character. If they do not conform, please explain in what way and why you made your specific choices.
4. Acting as the head of supply management, you decided to take the specific actions because (rate from 1: “Strongly disagree” to 7: “Strongly agree”)

- of the money you would personally make
- of the money you could save your company
- contracting with such suppliers would violate ethical standards
- you desire recognition for your efforts to help the company
- you expect that you will get more financial rewards in the future
- you expect that perhaps your boss will reciprocate and offer you recognition such as a promotion for your efforts
- it would be unethical to contract with such suppliers
- you can ensure that your company does not downsize its labor force
- the company might reciprocate in ways to reward your action
- of the degree of certainty/uncertainty of actually receiving the monetary reward

5. Acting as the head of supply management, you decided to take the specific actions because (rate from 1: "Strongly disagree" to 7: "Strongly agree")
    - you feel that you are entitled to the money
    - you feel that the organization deserves to save money
    - it is natural for you to protect the short-term interests of your organization
    - everybody else in your organization would take the same action
    - everybody around your social circle would take the same action
    - it is natural for you to protect the long-term interests of your organization
6. Acting as the head of supply management, you decided to take the specific actions because (rate from 1: "Strongly disagree" to 7: "Strongly agree")
    - you did not want to appear stupid for not taking the opportunity to make more money
    - the probability of getting caught being dishonest is negligible

- the severity of punishment if get caught being dishonest is negligible
- others would take the same action under the same circumstances

7. Share your thoughts in reference to the business scenarios you have encountered in the past 10 weeks.
    - The situations described were realistic
    - I had no difficulty in imagining myself in the situations described
    - I was truly engaged with this exercise
    - I found the exercise to be interesting
    - I believe that decision makers often encounter this sort of situation
    - I gave honest responses regarding this exercise
8. I consider myself to be an honest person (please report your response on the bar below by dragging the bar from 0: “Not at all” to 100)
9. I consider myself to be an ethical person (please report your response on the bar below by dragging the bar from 0: “Not at all” to 100)
10. I consider myself to be an moral person (please report your response on the bar below by dragging the bar from 0: “Not at all” to 100)
11. My perception of myself being a moral person today in contrast to yesterday is
    - Much worse
    - Moderately worse
    - Slightly worse
    - About the same
    - Slightly better

- Moderately better
- Much better

APPENDIX C

APPENDIX OF OVERALL DISCUSSION AND CONCLUSIONS - TOWARDS AN APPROACH OF PROMOTING ETHICAL PRACTICE IN SUPPLY CHAIN MANAGEMENT

C.1 Measurements for Motives

Acting as Jim, you decided to take the specific action regarding Ben because (rate from 1-Strongly Disagree to 7-Strongly Agree)...

Table C.1: Measured Motives

Motive	Statement	Factor Loading
Benefits Dimension (Cronbach's alpha = 0.81)		
Motive 1	...the money you would personally make	0.60
Motive 2	...the money you could save your company	0.56
Motive 3	...you desire recognition for your efforts to help the company	0.74
Motive 4	...you expect that you will get more financial rewards in the future	0.72
Motive 5	...you expect that perhaps your boss will reciprocate and offer you recognition such as a promotion for your efforts	0.78
Motive 8	...I can ensure that my company does not downsize its labor force	0.37
Ethics Dimension (Cronbach's alpha = 0.87)		
Motive 6	...it is unethical to share such information	0.86
Motive 7	...sharing such information violates ethical standards	0.87

C.2 Examples of Verbal Justifications

I decided to take the particular action because (explain in your own words)...

- "because sometimes you need to break some rules to be able to earn more and to live better, and in this case I don't consider it fundamental. But this has to not become a daily habit and it is important to respect the fundamental rules."

- "I believe to have taken the best decision for the company basing on the role I cover in it, on the base of the possible alternatives."

- "It would not have been correct to transmit information received in closed offers to other subjects"

- "1) The aggressive politics of price chosen by the company could be not sustainable for all the duration of the contract: the quality of the product could go down. 2) It could be not a farsighted choice because if the excluded companies had to come to the knowledge of the pact, a possible future relationship with them could be undermined. 3) I could affect negatively the reputation of the company. 4) There is a probability that, accepting the offer, losses can be verified in the future."

- "It deals with an important piece for the auto, the bonus is present in every one of the three offers, it will be enough to accept the greater offer in comparison with Ben's one to get a product of better quality and a higher bonus"

- "I think it is the correct thing to do."

- "because it is the right thing to do. The ethical action was to go with the initial conditions set at the beginning. It is not fair to the other competitors to not be give knowledge of a second bid chance. It is the right thing to do in the situation regardless of what the company situation is or the industry. The bid was specified at the begging and each company should have put forward their best price."