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Financial Decision-Making and the Normalization of Deviance

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FINANCIAL DECISION-MAKING AND THE NORMALIZATION OF DEVIANCE

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Dedication

For my grandparents, Usha Ranadive and Padmakar Ranadive

For my mother, Smruti Ranadive

FINANCIAL DECISION-MAKING AND THE NORMALIZATION OF DEVIANCE

by

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Abstract

Two perspectives have dominated the discourse on the causes of the financial crisis of 2008. The first attributes the financial crisis to intentionally malevolent behaviors, whereas the second attributes it to the natural market fluctuations. However, there is still a third, possible perspective. While the first two perspectives focus on the intention of the actors, the third perspective focuses on the response of the observers. This is what Vaughan (1996) refers to as "normalization of deviance". In normalization of deviance actions or decisions that are initially regarded as aberrant or atypical are re-conceptualized and adopted as the new criterion. The aim of the present study was to examine the relationship between normalization of deviance, the dark triad and risk-taking behavior. The dependent variable was the amount of money invested. Participants were 171 students from the University of Texas at El Paso between the ages of 18 and 51 years. The data were analyzed using a repeated measures Multi-level Modeling framework. The first hypothesis stated that normalization of deviance would predict risk-taking such that the participants in the normalization of deviance condition would invest significantly greater amounts of money than those in the no-normalization of deviance condition. This hypothesis was not supported. The second hypothesis stated that there would be significant interaction between normalization of deviance and the Dark Triad. This hypothesis was not supported. Exploratory analysis revealed that prior loans was a significant predictor. Although the hypotheses were not supported, the current study contributed to the existing literature in three ways. Firstly, the study examined the construct of normalization of deviance in the new context of financial decisions. Second we developed a new paradigm to examine the construct. Lastly, a more robust statistical model was used to analyze the data.

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Introduction

"I had a sick feeling in my stomach. I knew what financial crises felt like, and they felt like this."

- Timothy Geithner, former President & CEO NY Fed,

Stress Test (2014), pp. 117.

As a result of the financial crisis of 2008, in the twelve months between 2008 and 2009, U.S. families lost about 17 trillion dollars in wealth, two and half million families filed for bankruptcy and about 8.3 million people lost their jobs. In the following twelve months, between 2009 and 2010, about 300 banks filed for bankruptcy (Financial Crisis Inquiry Report, 2011; American Bankruptcy Institute (n.d); Federal Deposit Insurance Corporation (n.d.).

Two perspectives have dominated the discourse on the causes of the financial crisis. The first attributes the financial crisis to intentionally malevolent behaviors, whereas the second attributes it to the natural market fluctuations. According to the first perspective, it was the avarice of the bankers, unscrupulousness of the politicians and dereliction of duty by the regulators that led to the financial crisis. They argue that bankers recklessly gambled with people's life-savings, pocketed the profits and left the taxpayers to foot the losses. Politicians colluded with banks to remove the legal safeguards that protected ordinary citizens. Regulators turned a blind eye to the reckless risk-taking by banks and failed to reign in Wall Street greed. (Greenwald, 2011; Johnson & Kwak, 2011; Taibbi, 2014).

The second perspective dismisses the notion that intentionally malevolent behavior was the cause of the financial crisis in 2008. Instead, individuals subscribing to this perspective argue that financial booms and busts are normal in a free market economy (Geithner, 2014). They cite the examples of the Dutch Tulip boom & bust of 1636, the South Sea boom & bust of

1720 and more recently the tech boom & bust of late 1990s. According to them there was nothing intentionally malevolent about the behavior; it has happened in the past and it will continue to happen in the future (Foote, Gerardi & Willen, 2012; Mckay, 2011; Nocera, 2011).

However, there is still a third, possible perspective. While the first two perspectives focus on the intention of the actors, the third perspective focuses on the response of the observers. This is what Vaughan (1996) refers to as "normalization of deviance". In normalization of deviance actions or decisions that are initially regarded as aberrant or atypical over time are re-conceptualized and adopted as the new criterion. She describes the normalization of deviance as a five step process as follows:

1. Indication of possible risk
2. Recognition of increased risk
3. Re-assessment of risk
4. Adoption of increased risk as new criterion
5. Implementation of decision

Normalization of deviance has been speculated to play a role in a wide variety of engineering problems and repeated failures to address those problems. One example comes from the Ford Motor Company's failure to properly position the Ford Pinto's gas tank which made the Pinto prone to catching fire upon collision. Documents revealed by newspaper exposés starting from 1976 as well as in the course of the criminal trial showed how the managers and executives knew of the hazard but repeatedly failed to recall the dangerous vehicle. The indication that the placement of fuel tank might be a problem came from tests carried out on two other models – a Toyota and a Capri. These cars were remodeled such that the fuel tank was situated behind the rear axle to resemble Pinto's design. When these cars were driven into an obstacle, like a wall,

at 20 mph during testing, the fuel tank cracked. The cars started dripping gasoline and consequently failing the test. However, the Pinto itself was not crash tested before been sold to customers. Later when the company did crash test the Pinto, it failed the test. The fact that the Pinto was failing crash test was a clear sign of increased risk. The Ford executives deliberated on how they could ameliorate the problem. However, they eventually reassessed the risk as not being grave enough to warrant immediate changes in the design. They decided to wait until stricter standards were imposed by National Highway Traffic Safety Administration. In the meantime, the company decided to go ahead with producing more Pintos and selling them to customers (Cullen, Cavender, Maakestad & Benson, 2006).

Dennis Gioia (1992), who served as one of the Ford employees responsible for recall decisions during part of the Pinto crisis in an article discusses his own lack of struggle with the decision not to recall the Pinto. This first-hand account of the decision-making process at Ford bears a close resemblance to the five step process outlined by Vaughan (1996).

[*Indication of Possible risk]*

> "One of these new files concerned reports of Pintos "lighting up" (in the words of a field representative) in rear-end accidents…Was there a problem? Not as far as I was concerned… I do, however, remember being disquieted by a field report accompanied by graphic, detailed photos of the remains of a burned out Pinto in which several people had died. Although that report became part of my file, I did not flag it as any special case." (pp.381-382)

[*Recognition of Increased risk*]

> "…, I later saw a crumpled, burned car at a Ford depot where alleged problem components and vehicles were delivered for inspection and analysis…The revulsion on seeing this incinerated hulk was immediate and profound. Soon afterwards, and despite the fact that the file was very sparse, I recommended the Pinto case for preliminary department review concerning possible recall." (pp.382)

[*Reassessment of Risk*]

> "After the usual round of discussion about criteria and justification for recall, everyone voted against recommending recall – including me. It did not fit the pattern of recallable standards; the evidence was not overwhelming that the car was defective in some way, so the case was actually fairly straightforward." (pp.382)

Dennis Gioia later in the article recollects how the employees at Ford genuinely did not think that the Pinto was an unsafe car. In fact, at least three of them drove a Pinto or had bought one for their family member, including the author.

In both these cases, the problem unfolded over time, the employees were aware of the problem, yet were unable or unwilling to see the seriousness of the problem and therefore failed to do something about it. Thus it seems clear that the deviant acts of the organization were normalized in the minds of both the leaders and the employees.

Evidence for the existence of the construct of Normalization of Deviance comes from a series of laboratory studies conducted by Dillon and Tinsley (2008). In one of their study 46 participants comprising of NASA employees and undergraduate engineering students were asked to maneuver a spacecraft on Mars through inclement weather. They were told that this craft

which was on an 11 day mission on Mars had been maneuvered by the computer for the first five days. On day six the study participants were asked to take charge of the spacecraft. They were given periodic weather forecasts since driving the craft in bad weather could lead to irreparable wheel damage two out of five times. Any damage to the wheels would end the mission immediately.

At this point half the participants were informed that thrice in the first five days the spacecraft had faced and driven through inclement weather. The other half of the participants were told that in the first five days the craft had faced and driven through favorable weather. For Day 6 they were told the weather department had forecasted violent storms. The participants were faced with the dilemma of whether to drive on and risk damaging the wheels or stay put and protect the wheels. The researchers found that those participants who were told that the spacecraft had driven through previous storms were significantly more likely to risk driving on than those without such information. In other words, for the experimental group the risky decision to drive through bad weather was reassessed in the light of the information that the craft had driven through previous storms. For them driving through violent storms became normalized and therefore the apparent choice when faced with the dilemma. On the other hand, for the control group the decision to drive through a storm was and continued to be an atypical or aberrant choice and therefore avoided.

Could normalization of deviance have played a role in the financial crisis of 2008? Some anecdotal evidence suggests that this indeed may have been the case. In his book *Stress Test* (2014) the then President & CEO of the New York Fed Timothy Geithner narrates an incident that follows the same five step decision-making pattern explicated by Vaughan (1996).

[Indication of Possible Risk & Recognition of Increased Risk]

"That concern grew when our gradual increases in the short-term federal funds rate failed to boost long-term interest rates, a situation Greenspan dubbed the "conundrum"…The Fed wasn't fueling the credit boom with loose policy anymore – we raised rates to 5.25 by 2006 well above the underlying inflation rate – but there was still an awful lot of money sloshing around." (pp. 109)

[Re-assessment of Risk]

"We spent a lot of time back then trying to figure out how far the credit and housing booms were going to go and how they might end. A lot of internal Fed work and academic studies suggested that the run-up in home prices was justified by economic fundamentals and that in any case sharp nationwide price drops had little historical precedent. …Fed economists projected that even if there were a 20 percent nationwide decline in housing prices, it would cause only about half the economic damage of the bursting of the dot-com bubble." (pp. 109-110)

[Adoption of increased risk as the new standard & Implementation of decision]

"…I had seen in Japan and Thailand how lavishly financed real estate booms can end in tears. But I took much comfort in analyses downplaying the risk of large nationwide declines, which hadn't happened in the United States since the Depression." … "We

> believe that, absent some large, negative shock to perceptions…the effects of the expected cooling in housing prices are going to be modest," I said during a rate-setting meeting in 2006." (pp. 110)

What psychological processes might be playing a role in Normalization of Deviance? In other words, why did people agree to assume increasing risk? Both individual and group level processes might be playing a role here. Individual level processes help us determine whether to term an object, event or course of action as risky. However, according to Slovic (1997) "risk is inherently subjective," which means that some degree of bias invariably creeps in at various junctures during the risk assessment process. Additionally, according to Slovic (1997) risk is "socially constructed," which means that risk is conceptualized in collaboration with other members of the group. Hence, group level processes are also involved in our decision to term something risky. Thus, it is both individual and group level processes that i) encourage risk-taking, and ii) discourage risk aversion.

Individual Level Processes

Bounded Rationality: According to Simons (1991) who proposed the theory of bounded rationality, the efficacy of human decision-making is often compromised by the cognitive limitations of the human brain. These cognitive limitations constrain both the quantity and quality of possible options that an individual can generate and/or foresee. The individual tries to cope with these limitations in two ways, either through "approximate optimization" or through "satisficing." An individual faced with a sophisticated problem is said to engage in approximate optimization when he/she concedes some of the complexity of the problem but generates the closest-ideal solution. On the other hand an individual is said to engage in satisficing when he/she is able to preserve the complexity of the problem but generates a solution that is merely

passable. In sum, our limited cognitive capacities force us to compromise on either the quality of the problem or the quality of solution.

How do our limited cognitive capacities play a role in normalization of deviance and induce increased risk-taking? Our limited capacities force us to rely on "heuristics and biases" in judgment and decision making (Tversky and Kahneman, 1974). Specifically relevant to normalization of deviance are:

1. Outcome Bias: According to Baron and Hershey (1988) outcome bias refers to the tendency to value the outcome of a decision in a manner that is extraneous to the efficacy of the decision. Empirical evidence for outcome bias comes from one of the experiments carried out by Dillon and Tinsley (2008). In their study participants read about a manager who decided to forego equipment inspection before the launch of a satellite. Three groups read three different outcomes of this decision. The first group read a scenario where the launch was an outright success i.e. there were no glitches after the decision was made leading to a favorable outcome. The second group read a scenario where the launch was a fortuitous success i.e. although there were glitches after the decision was made luck was the main factor in leading to a favorable outcome. The third group read a scenario where the launch was a complete failure i.e. there were glitches after the decision was made leading to an unfavorable outcome. Post hoc tests revealed that while participants clearly distinguished between failure and success, they made no significant distinction between fortuitous success and outright success.

   Outcome bias might be one of the reasons why large part of the financial industry failed to see how deviant their behavior was. Before the financial crises, the banking industry took numerous ill-considered risks. However, they did not suffer many negative

consequences of their risky decisions and in some cases even earned profits. They interpreted these successes to mean that the behavior was not deviant and continued to taking increasing risks.

2. Naïve optimism – According to Weinstein (1980), naïve optimism or "unrealistic optimism" refers to the conviction often held by people that there is a greater probability of good incidents happening to them and lesser probability of bad incidents happening to them. Weinstein asked 1,258 students to the rate the probability of encountering 18 positive and 24 negative incidents in their life. He found that students rated the likelihood of encountering positive incidents as significantly higher than average and encountering negative incidents as significantly lower than average.

In a study by Yang, Markoczy and Qi (2007) the researchers correlated participants' score on naïve optimism with their choice of credit card. They found that participants who scored higher on naïve optimism often opted for credit cards with a higher APR than was advantageous to them since they were overly optimistic about how often they paid back on time the credit card debt they had acquired. Another example of unrealistic optimism comes from the financial markets during early 2000. At that time there was a strongly held belief by many in the financial market that the housing prices will continue to increase. Some were projecting increases in housing prices from anywhere between 2% and 11%. In reality, for nearly a 100 years from late 1900s to early 2000 US housing prices had increased at the rate of 1% annually. By those standards projecting such a drastic increase in housing prices was incredibly optimistic (as cited in Foote, Gerardi & Willen, 2012). Thus naïve optimism might have worked in two ways in the financial sector. One, the banks were extremely optimistic that the housing market

would keep growing and two, even if they took on large amounts of debt they would be able to pay it back.

A related concept is the 'law of increasing optimism' given by Landau and Chisholm (1995) wherein the greater the time lapse since the previous crisis the greater is the conviction that a new one will not come to pass. For example, it had been approximately 70 years since the Depression. With each passing year people felt more optimistic that another Great Depression would not occur. Hence, starting from 1986 onwards the safeguards put in place after the Depression were systematically removed (Geithner, 2014; Johnson & Kwak, 2011).

3. Risk as emotion – This "risk as feeling" perspective was proposed by Loewenstein, Weber, Hsee & Welch (2001). According to this perspective, while determining the riskiness of a course of action emotional evaluations at times conflict with cognitive judgments. When such a conflict arises, it is often emotional evaluations that propel behavior. Empirical evidence for this comes from a follow up to the experiment mentioned earlier where participants tried to decide whether or not to drive a spacecraft on Mars through inclement weather. The researchers assessed, among other variables, the role of "felt-risk" and a positive perspective. They found that those in the experimental condition, who had information that the craft had driven through bad weather on the previous days, reported significantly lower "felt-risk" and more optimism about driving through inclement weather than those in the control group who had no such information (Dillon & Tinsley, 2008).
4. Illusion of Control –According to Langer (1975) "illusion of control" refers to the tendency of people to estimate the likelihood of personal success as far greater than

realistically warranted. Experimental evidence comes from a group of six studies where the researchers made various skills salient in a game of chance. The participants consistently overestimated how much control they had over the outcome even though the outcome was completely determined by chance (Langer, 1975).

Moreover employees who overestimate their ability to control outcomes can negatively affect a company's bottom line. Fenton-Ocreevy, Nicholson, Soane & Willman (2003) examined the relationship between illusion of control and work productivity. Participants in their study were drawn from four different banking corporations. The researchers found that there was a moderate negative correlation between illusion of control and traders' ability to regulate risk and earn profits for the banks.

5. Change Blindness – It refers to our inability to notice changes in our visual field under certain conditions (Simons & Chabris, 1999). This phenomenon is especially likely to operate when change happen slowly (Simons, Franconeri, & Reimer, 2000). Failure to notice key changes in the visual field has also been found to occur in regards to perceptions of other peoples' behavior. Specifically, participants were less likely to notice behavior that became less ethical over time if it changed incrementally. In an experiment, participants were shown a jar filled with coins. They were then shown a number which was supposed to reflect approximately the number of coins in the jar. Their task was to decide if the assessment was exaggerated (leaving some room for error). Every time they identified the overestimation correctly they were rewarded. In the sudden-change condition the assessment was exaggerated suddenly over one trial, i.e. from trial 10 to 11, while in the incremental change condition the assessment was

increased steadily by a few cents from trials 2 to 10. From 11th to 16th trial the estimated figures were the same for both the conditions. Despite the reward for detecting overestimated numbers, participants agreed with the numbers significantly more often in the incremental change condition than in the sudden-change condition (Gino & Bazerman, 2009).

6. Escalation of Commitment – When people think the alternative they selected led to poor outcomes, they respond by devoting more resources to the selected alternative. In a study by Staw (1976) with 240 students the researchers manipulated the first independent variable as accountability (self v/s other) and the second independent variable as decision outcomes (positive versus negative). The dependent variable was the amount of money invested. Analysis of the data showed that participants devoted more money to a choice they had made earlier but one that subsequently had a negative outcome. More recently Moon (2001) examined the correlation between escalation of commitment and a sense of obligation and need for achievement. They found that a sense of obligation was negatively related to escalation of commitment while an achievement orientation was positively related to escalation of commitment.

In summary, our limited cognitive capacities lead us to underestimate the role of luck in our success, overestimate our control over outcomes while simultaneously blinding us to the progressively increased risk we are taking keeping us committed to what has essential become a losing proposition.

As mentioned earlier, our ideas of risk do not develop in a vacuum, but are developed in collaboration with other people. Other members of the group often influence our ideas of risk and our response to it.

Group Level Processes

One of the most widely studied and replicated group level phenomena that influences decision-making, and consequently risk assessment, is ***Groupthink*** (Janis, 1972). Members of a tightly-knit group in order to achieve unanimous decisions either fail to employ a thorough search for alternative solutions or even when they do, fail to thoroughly evaluate these alternative solutions. This narrow, rigid manner of thinking, according to Janis (1972), is Groupthink. Groupthink is thus characterized by impoverished critical thinking, hypothesis testing and ethical decision-making. Some reasons that lead to groupthink are:

1. The illusion of immunity – Members of a group think they are immune to the negative consequences of their risky decisions.
2. The illusion of consonance – Members of a group believe that since they all reached the same decision therefore it must be the right one. The members emphasize points of agreement that enhance group harmony and de-emphasize points of disagreement that could rupture group harmony.
3. Withholding personal reservations – The members of group hesitate to share any uncertainties they might feel towards the efficacy of the decision to avoid being censured by the group.
4. Self-designated mindguards– Even when an individual expresses doubts about the decision there are people in the group who actively discourage this expression making it more difficult for a critical analysis of the decision to occur.

Research has found evidence of groupthink in the series of decisions that led to the launch of the Challenger shuttle. In one study researchers examined documents and transcripts of testimony provided to the Presidential Commission investigating the launch and eventual

explosion of the shuttle. Researchers identified 88 statements that could be categorized from the document and transcripts. Results indicated that 58 of these statements showed evidence of groupthink. Specifically these statements were characterized by a push for consonance in decisions, presence of self-designated mindguards, and stifling of contrary viewpoints – both one's own and other's (Esser & Lindoerfer, 1989).

Thus, the group influences the individual members by censoring disagreements, leading the members to believe that there is absolute agreement about the decision, and that they are impervious to negative consequences of the decision.

Interaction of Individual and Group Level Processes – Social Learning

However, neither the group nor the individual are passive recipients of information. A third mechanism through which individuals and, indirectly, the group learns is through ***social learning***. It is the result of the interaction between the individual and the group. According to social learning theory (Bandura, 1977), an individual and his/her environment are engaged in a relationship where both seek out and mutually reinforce each other's behavior. Moreover, an individual acquires behaviors as much by attending to others' behaviors and the outcomes as through first hand experiences.

Two experiments demonstrate how groups affect individual risk-taking and how individuals, in turn, affect group risk-taking. In an experiment 167 participants who were university students were divided into groups of six. They were presented with a questionnaire that listed a series of options. The participants had to choose between a risky and a non-risky option. Each participant had to complete this questionnaire three times - first individually, second as a group through group debate, and third individually again after the group debate. The total risk score was computed by summing over the options. The lower the score the more risk

seeking the individual or group while the higher the score the more risk averse the individual or group. Results indicated that i) when compared to individual scores before the debate with group scores on the risk assessment questionnaire, groups were more risk seeking than individuals, and ii) when compared to individual scores before the group debate with individual scores after the debate, individuals made riskier decision after the group debate. The researchers therefore concluded that a group can affect an individual members' willingness to take risks (Wallach, Kogan, & Bem, 1962). In another experiment 81 participants were divided into groups of three to six. In the experimental group a confederate was planted as one of the group members while the control groups had no confederate. The confederate either chose a risky option or a non-risky one. Results indicated that the groups where the confederate had chosen the risky option tended to choose more risky options while groups where the confederate had chosen the non-risky option tended to choose the non-risky options. The researchers concluded that an individual can affect the group's willingness to take risks (Middleton & Warren, 1972).

Thus, both the individual and the group are engaged in a cyclical relationship where each learns from and is shaped by the other.

Financial Decision-Making and Personality Psychology

The efficacy of financial decision-making is not always compromised by bounded rationality, groupthink and social learning. Sometimes decision-making is compromised because of innate personality traits. For instance, the Dark Triad of personality traits, consisting of Machiavellianism, psychopathy, and narcissism, has been linked to increased risk-taking.

There are some similarities and differences in the three dark triad traits. All three show a lack of concern for the well-being of others in the pursuit of their goals. However, Machiavelli's are more far sighted and are able to delay gratification better than the other two personality types. They can be kind or cruel to others and forge coalitions to accomplish their goals depending on the circumstances. Psychopaths on the other hand are myopic and unable to delay gratification. They often engage in high cost behavior with minimal benefits. Finally, narcissists tend to think too highly of themselves and set goals that are often beyond their reach. They seek validation from others. They usurp goods and services from others because they believe they are superior to others. (Jones & Paulhus, 2011)

A study found that the higher the total score on the Dark Triad the greater the amount of money risked in a game of blackjack. Of the three traits, narcissism accounted for most of the variance in the amount of money risked by the participants (Crysel, Crosier, & Webster, 2013). Jones (2013) found that individuals who are high in any of the Dark Triad traits cannot be trusted with other people's money. Specifically, individuals high in Machiavellianism and psychopathy were willing to anonymously risk someone else's money for personal profit. Further, among those who made such risks, narcissism was associated with losing more money. In a separate study that involved consequences, individuals high in psychopathy persisted in risking someone else's money for personal gain, even in the face of punishment (Jones, 2014). Lastly, research has confirmed that there is a large number of such individuals who are drawn to business (Babiak, Neumann, & Hare, 2010). Anecdotal evidence seems to support this finding. For instance, recently when five major banks were found guilty of fixing the foreign exchange, one Barclay bank employee was reported as saying, "If you ain't cheating, you ain't trying." (Corkery & Protess, 2015).

Potential Contributions of the Study

Most of the research in the area of normalization of deviance has been carried out in the areas of engineering (Dillon & Tinsley, 2008), natural calamities (Dillon, Tinsley & Cronin, 2011) and terroristic activity (Dillon, Tinsley & Burns, 2014). However, it has not yet been studied in the context of financial decisions. The current study would add to the literature by expanding our understanding of this construct in the area of monetary decisions.

Secondly, in the previous studies the outcome variable of risky behavior has been examined as a binary variable in the area of normalization of deviance. For example, whether to drive a spacecraft through inclement weather (Dillon & Tinsley, 2008), whether to evacuate when faced with a natural calamity (Dillon, Tinsley & Cronin, 2011). This study will examine risky behavior as a continuous variable.

Thirdly, the existing studies do not take into consideration a key aspect of the construct which is time. Participants in the paradigm mentioned earlier make decisions only once about whether or not they would commit to the course of action. However, normalization of deviance unfolds gradually over time. Hence, the paradigm needed to study this should take that into consideration. The current study measures the outcome at multiple times so that the trajectory of the decision-making process could be examined more closely.

Thus, the current study hopes to add to the literature by examining normalization of deviance in a new context of financial decision-making, developing a new paradigm specifically to study financial decision-making and using a more robust statistical technique to analyze data. .

The aim of the study is to examine the construct of normalization of deviance over time in the laboratory setting. We examine whether i) exposure to normalization of

deviance induced individuals to take increasing monetary risks, and/or ii) inherent personality traits like the dark triad induced individuals to take increasing monetary risks.

We hypothesize that the normalization of deviance (NOD) would be a predictor of monetary investment such that participants in the NOD condition would invest more money over trials than participants in the No-normalization of deviance (No-NOD) condition. This is because NOD makes risk taking more acceptable. Having seen risk taking pay off the participants on their part would be induced to take risk with money as well. We will be testing only a minor component of NOD, specifically how exposure to NOD followed by positive outcome influences financial risk taking.

Our second hypothesis is that NOD will interact with the dark triad personality traits such that for every unit increase in dark triad score there will be an increase "in the slope of the regression of" investment on NOD (Preacher, 2016). Past research has shown that those high on the dark triad traits tend to be more risk seeking. Exposing such individuals to NOD which makes risk taking more acceptable is likely to exacerbate these risk seeking tendencies leading to an interaction between the two.

Methods

Participants

Participants (N = 172) were recruited for this study at the University of Texas at El Paso through the Sona System and using flyers and in-class announcements. A majority of the participants were introductory psychology students. Participants were compensated for their time with either course credit or a nominal amount of $15. Of these 172 participants, one failed to read the scenarios and their data was removed from analyses. The data reported here are on 171 participants.

A majority of the 171 participants were female (68.4%), Hispanic (81.3%), English-Spanish bilingual (71.3%) and US. Citizens (92%). Their ages ranged from 18 to 51 years (M_{age} = 22.11, SD_{age} = 5.70). The data were collected between spring 2016 and fall 2016.

Design

The study was a one factor between-subjects design (normalization of deviance (NOD) versus no-normalization of deviance (No-NOD)). Participants were randomly assigned to either the NOD or No-NOD condition. The dependent variable was amount of money invested during each trial. All participants played a minimum of 14 trials and a maximum of 25 trials.

Materials

Short Dark Triad – In order to assess the Dark Triad traits in brief fashion, I used the Short Dark Triad or SD3 scale (Jones & Paulhus, 2014; Appendix A). The SD3 consists of three subscales that capture each Dark Triad trait (Machiavellianism, psychopathy, and narcissism) with 9-items per trait. All participants were scored on a 1 (Strongly Disagree) to 5 (Strongly Agree) Likert-type scale. After reverse scoring appropriate items and adding the items to create a composite, Machiavellianism (e.g., "it is not wise to share your secrets") demonstrated adequate internal

consistency (α = .71). The same was true for narcissism (e.g., "I insist on getting the respect I deserve" (α = .74) and psychopathy (e.g., "I will say anything to get what I want" (α = .77). Research on the SD3 subscales has shown strong convergent validity, with the original Dark Triad measures (Jones & Paulhus, 2014).

Narcissistic Personality Inventory-16 (NPI-16; Ames, Rose & Anderson, 2006; Appendix B) – The third construct of the Dark Triad, Narcissism, will be assessed using the 16-item version of the NPI. This scale is presented in binary format (narcissistic option vs. non-narcissistic option) and correlates .90 with the full 40-item version of the scale. It has a test-retest reliability of .85. This scale was added because the internal consistency of the SD3 narcissism subscale has had issues with non-Caucasian samples (Jones, Neria, & Smith, in preparation).

Financial Decision-making game

For this study we developed twenty-five scenarios (Appendix C) that narrated the story of a fictitious company, called *ChipTech*, over the course of its 20 year life, from its inception to ascent to its eventual decline. These scenarios were developed by searching through the business sections of newspapers and magazines for case histories of real companies, the crises they experienced and their response to these crises. Each of the 25 scenarios had three sections – a background, a dilemma and a decision. The background gave a short description about the company at a particular time-point (for example, ChipTech's beginnings as a startup in Silicon Valley in 1995). The dilemma gave information about two mutually exclusive business activities (for example, staying in Silicon Valley versus moving to Seattle). Lastly, the decision gave information about the business activity that the Board of Directors chose to pursue (e.g. deciding to move to Seattle). However, intentionally left out from these scenarios was the amount to be invested (which was the dependent variable and decided by the participant). Furthermore

scenarios for Trial 2 and Trial 4 were slightly different for the two conditions. This was because the NOD was manipulated in those trials. For both these scenarios, while the background and the dilemma were the same, the decision made by the Board of Directors differed between the two conditions. For the NOD condition, the Board opted to live with the increased risk. For the No-NOD condition, the Board decided to take steps to mitigate the risk. A summarized version of the scenarios is as follows:

Scenario 2

> ChipTech had hired 20 new employees for its production plant. As per the Human Resource policies, new employees had to go through the Standard Operating Procedures training within a month of hire. The department in charge of producing the microchips, however, felt that it would be impossible to set aside 20 employees for training and meet the quarterly production goals at the same time. All managers, except two, believed that employees had learned the procedures on their own. (Dilemma) The Board of Directors had to decide whether to delay training for the 20 new employees.

NOD condition

> …the Board felt they had enough evidence that the ***new employees had gathered a basic understanding*** of the procedures on their own. They ***decided to delay training*** for the 20 new employees.

No-NOD condition

…the Board felt they had enough evidence that the ***new employees had not gathered a basic understanding*** of the procedures on their own. They ***decided not to delay training*** for the 20 new employees.

Scenario 4

ChipTech found that its microchips were overheating at low temperatures. In fact, one batch of microchips exploded due to overheating injuring two employees. The Board of Directors had to decide whether to go ahead with mass production or go back and redesign the chips.

NOD condition

The Board concluded that although exploding microchips due to over-heating could be a concern there was ***not enough evidence to delay production***. The Board of Directors decided to ***go ahead with mass production*** of microchips.

No-NOD condition

The Board concluded that exploding microchips due to over-heating was a concern. There was ***enough evidence to delay production***. The Board of Directors decided to ***go back and redesign microchips***.

I also developed 25 outcomes corresponding to each of these 25 scenarios. Each outcome revealed the result of the decision made by the Board of Directors. The outcomes were either profits or losses as a percentage of the investment. Most of the outcomes were randomly assigned, with a few exceptions. Specifically, all participants experienced a profit outcome on trials one to five and trials 14, 15 and 25. Trials one to five were assigned a profit outcome because the manipulation was embedded in these trials. Since outcome on the previous trial could potentially interfere with the manipulation scenario of the current trial, I decided to control for that by assigning all five trials a profit outcome. This allowed for the manipulation to

take full effect. I also assigned a profit outcome to Trial 14, Trial 15 and Trial 25. After the 14th trial, participants were given a choice to either stop or continue with playing more trials. Since some participants might choose to stop at this point it would make Trial 14 the last trial for those participants. Hence, Trial 14 was assigned a profit outcome. For those participants who chose to continue Trial 15 was assigned a profit outcome so that it would serve as reward for continuing. Lastly, trial 25 was assigned a profit outcome since it was the last trial for everyone in the study. This trial was assigned a profit outcome to ensure that the participant left the study in a positive mood.

All the twenty-five scenarios and twenty-five outcomes were pasted on individual 8x11 index cards. The scenarios and outcomes were then organized alternately such that a scenario card was followed by an outcome card making a total of fifty cards in a set. All participants irrespective of the condition saw the same order of cards. I made two sets, one for NOD condition and the other for No-NOD condition. All the cards for the two conditions were exactly the same except for scenario 2 and scenario 4.

Practice scenarios and outcomes. I also designed three practice scenarios with corresponding outcomes (Appendix D). The practice scenarios were for a completely different company and unrelated to the study scenarios.

Excel file. I developed an excel file to calculate the amount of profit and loss on each investment decision as well as the earnings of the participant (Appendix E).

Monopoly money. I had monopoly money in the denominations of 20, 10 and 5 totaling $100 to represent the amount in company's bank account at the start of the trials.

Real Quarters. $2 to $3 worth of quarters were also kept in plain view of the participants.

Procedure

The study was divided into two parts. The first part was administered online while the second part was administered in the lab. For part one of the study, participants were provided a link to an online survey on Qualtrics.com. After completing the informed consent they were asked to complete two scales of SD3 and the NPI. Participants were given the freedom to complete the online survey from on or off campus. Participants were asked to complete the part one part one online survey at least 12 hours before completing part two or the inlab part of the study.

For part two of the study, participants came into the laboratory to complete the financial decision-making part of the study. Participants were again asked to read and sign an informed consent form. They were then randomly assigned to either the NOD or the No-NOD condition. Following this they were given instructions for part two of the study (See Appendix G for the details).

They were told that they will be reading the case history of a real company and the decision they make are real ones that the company faced. They will be playing the role of the head of the financial department and their job title is Chief Financial Officer (CFO). It was their job to decide how much of the company's money to invest into a business activity that the Board of Directors has chosen. In other words, in the scenarios they read, the Board of Directors decided in what business activity to invest, but the participants decided how much to invest . They were informed that at the start of the trials the company has a $100 million dollars in its bank account as represented by monopoly money. They could invest anywhere between $1 million and the total money in the company's bank account. They were then explained how the excel file was set up (e.g. where they would see the amount they invested, how much money they earned or lost etc.). They were told that their task was to pick up a card from the top of a stack

of cards on which will be the background information of the company and the dilemma called crossroad that the Board of Directors faced. Also on the card was the decision that the Board of Directors made. After this the participants were asked to decide the amount of money in the business activity that the Board of Directors had chosen. The amount they decided was entered into the excel file. After that they were asked to pick up another card from the top of the stack which informed them about the outcome of their decision.

Participants were told that some outcomes made them profits others made them losses. They were informed that for every $10 million in monopoly money they earned for their company they will earn themselves a quarter (¢25) in real money. For every $10 million in monopoly money they lost their company they would lose a quarter (¢25) in real money. They were free to keep the money they earn during the study at the end of the study. The goal was to make as much profit as possible for the company. They were informed that the four participants who make the most profit for the company will be awarded a $25 gift card. The participants first practiced with three rounds of practice trials. (See Appendix B for details). The participants were encouraged to ask questions during the practice trails. The experimenter answered any questions the participants had and then started the main trails. The amount of money that the participants chose to invest was entered directly on to the excel file. After the 14th trial they were informed that they could choose to stop at any point after this trial. They were asked if they wanted to stop or continue. The reason for allowing participants to drop out was so that we could carry out an exploratory analysis to see if the number of participants who drop out from the NOD condition is significantly different from those in the No-NOD condition.

During the trials we tried to ego involve the participants by using i) scenarios drawn from real life ii) real money participants could earn, and iii) a chance to win $25 gift card.

After the main trials participants were filled out a basic demographics questionnaire that also asked about their broad financial status like whether they had loans or insurance (Appendix E). Finally participants were paid their winnings, compensated for their time with research credit or money, debriefed, thanked and escorted out of the lab.

Results

I analyzed the data using a repeated measures multilevel modeling (MLM) framework (Snijders & Bosker, 2012) with IBM SPSS software version 21 (2012; Heck, Thomas, & Tabata, 2011). I followed the recommendations laid out by Hayes (2006) for building and running the various MLM models.

The repeated measures MLM was used to analyze the data since it offers some clear advantages over repeated measures analysis of variance (ANOVA). The repeated measures ANOVA makes two key assumptions. The first is homogeneity of variance, in other words, that all the elements along the diagonal in the variance-covariance matrix are identical. The second is compound symmetry, in other words, all the elements on the off diagonal in the variance-covariance matrix are identical. At times the rigid assumption of compound symmetry is replaced with the less rigid assumption of sphericity, in other words, the differences between covariances or the off diagonal elements is identical (Keppel & Wickens, 2004)l. However, these assumptions hardly ever hold. Repeated measures MLM is robust to the violations of these assumptions. Repeated measures MLM is also robust to different participants completing different number of trials, different participants starting and ending different trials at different times. Due to all these reasons, repeated measures MLM is a better statistical technique to analyze the current data.

Data Cleaning. If a student completed the survey multiple times the one closest in time to the inlab part was used. If a student completed the in-lab part more than once only the first one was used.

The means for the manipulation trials - Trial 2 and Trial 4 – were first examined to determine whether the manipulation was successful. For Trial 2, the mean investment for NOD

condition (*M* = 6.95, *SD* =10.383) was smaller than for No-NOD condition (*M* = 8.39, *SD* =10.101). However, this difference was not statistically significant, *t*(169) = -.913, *p* = .362. For trial 4, the mean investment for NOD condition (*M* = 8.78, *SD* =12.813) was smaller than for No-NOD condition (*M* = 18.45, *SD* =19.438). This difference was statistically significant, *t*(169) = -3.907, *p* <.01. Since both groups responded significantly differently, I concluded that the manipulation had been successful (See Appendix H for details).

I therefore proceeded with model testing. The data were organized at two levels with the trials (t) nested within participants (i). Thus the trials were at level one and the participants were at level two. I had one level one predictor – time and four level two predictors – Normalization of Deviance, Machiavellianism, Psychopathy and Narcissism. A maximum likelihood (ML) estimator was used for all the models since I wanted to compare the different models based on their Log likelihood (Snjider & Bosker, 2012, pp. 89). I used an unstructured variance covariance matrix for estimating the random effects.

I first fitted the null model which is so called because it has no predictors. This model helped us answer the question whether an MLM framework is actually appropriate for this data. In other words, whether there is substantial unexplained variance at level two.

Level 1

$\text{Investment}_{ti} = \beta_{0i} + e_{ti}$

Level 2

$\beta_{0i} = \gamma_{00} + u_{0i}$

Reduced form

$\text{Investment}_{ti} = \gamma_{00} + u_{0i} + e_{ti}$

In the equation above, γ_{00} average investment of all participants across all trials, u_{0i} refers to variation between participants and e_{ti} refers to the variation within trials.

Analysis showed that the average amount (γ_{00}) invested across all 171 participants across all trials was 19.261 and this was significantly different from zero, $t(171) = 17.179$, $p < .001$, $SE = 1.121$. The u_{0i} was examined in order to determine whether there was leftover variance in the model at the level of participants. It is shown by the Greek letter $\hat{\tau}_{00}$ in the variance-covariance matrix. The unexplained variance ($\hat{\tau}_{00}$) was 203.893 (*Wald Z* = 8.77, $p < .001$) and this was significant. However, the total variance that can be attributed to differences between participants still needed to be determined. The leftover variance between trials,e_{ti}, is shown by the Greek letter $\hat{\sigma}^2$ was 276.444 (*Wald Z*= 45.299, $p < .001$). Using this information the intra-class correlation coefficient was calculated with the formula below, where $\hat{\tau}_{00}$ represents the unexplained variance between participants and $\hat{\sigma}^2$ represents the unexplained variance within trials.

$$ICC = \frac{\hat{\tau}_{00}}{\hat{\tau}_{00} + \hat{\sigma}^2} = \frac{203.89}{203.89 + 276.44} \approx .4245$$

The ICC for the null model was .4245. This can be interpreted as 42.45% of the variance in the amount invested can be attributed to variance between individuals. In other words, there are in fact differences between participants in how much they invest on an average across trials leading to the conclusion that the data lends itself to an MLM analysis.

The second model was then tested where a level-one predictor (Time) was added to the model. I tested two time functions – linear time and quadratic time. This allowed us to determine the shape of investment curve. I coded trial 1 as time 0 (zero). This means that the intercept can be interpreted as the investment of the participant when time is 0 that is, a participant's

investment at trial 1. The slope of quadratic time was fixed in order to ensure that the model is identified.

Table 1: Parameter Estimates for the Three Models Examining the Relationship between NOD and Investment

			Model 1 Null Model (No Predictors)	Model 2 Level-1 Predictor (Time)	Model 3 Level-2 Predictor (NOD)
Fixed components					
	Intercept	$\hat{\gamma}_{00}$	19.261*** t (171) = 17.179 S.E = 1.121 CI: 17.047, 21.474	14.955*** t (224.756) = 11.650 SE = 1.284 CI: 12.425, 17.485	16.073*** t (196.354) = 9.046 SE= 1.777 CI: 12.569, 19.577
	Linear Time	$\hat{\gamma}_{10}$	-	0.741*** t (1642.596) = 5.223 SE = .1419 CI: 0.463, 1.020	.746*** t(785.277) = 4.605 SE =0 .162 CI: 0.428, 1.064
	Quadratic time	$\hat{\gamma}_{20}$	-	-0.023*** t (3933) = -4.687 SE =0 .005 CI: -0.033, -0.014	-0.023*** t(3933) = -4.687 SE = 0.005 CI = -0.033, -0.014
	NOD	$\hat{\gamma}_{01}$	-	-	-2.172 t(171) = -0.908 SE = 2.393 CI: -6.895, 2.551, $p = 0.365$
	NOD * Time_Lin	$\hat{\gamma}_{11}$	-	-	-0.010 t(171) = -.063 SE = 0.152 CI: -0.309, 0.290, p = .950
Variance of random components					

Intercept variance	$\hat{\tau}_{00}$	203.893*** Wald Z = 8.77 SE = 23.24 CI: 163.061, 254.950	211.065*** Wald Z = 7.940 SE = 26.582 CI: 164.897, 270.158	209.887*** Wald Z = 7.934 SE =26.455 CI: 163.945, 268.703
Slope variance	$\hat{\tau}_{11}$	-	0.809*** Wald Z = 7.584 SE = 0.107 CI: 0.625, 1.048	0.809*** Wald Z = 7.589 SE = 0.107 CI: .625, 1.048
Intercept *Slope covariance	$\hat{\tau}_{01}$	-	-5.0758 Wald Z = -3.869 SE = 1.312 CI: -7.647, -2.504	-5.081*** Wald Z = -3.880 SE = 1.310 CI: -7.648, -2.514
	$\hat{\sigma}^2$	276.444*** Wald Z= 45.299 SE = 6.103 CI: 264.738, 288.668	229.643 Wald Z = 44.345 SE = 5.179 CI: 219.715, 240.021	229.644*** Wald Z = 44.345 SE = 5.179 CI: 219.715, 240.021
Deviance (-2LL)		36673.416	36187.937	36186.817
Δ Deviance		- -	Model 1- Model 2 χ^2 (4) = 485.48*	Model 2-Model3 χ^2 (2) = 1.119*

*p<.05, **p<.01, ***p<.001

Level 1

$$\text{Investment}_{ti} = \beta_{0i} + \beta_1 \text{Time\_Lin}_{ti} + \beta_2 \text{Time\_Quad}_{ti} + e_{ti}$$

Level 2

$$\beta_{0i} = \gamma_{00} + u_{0i}$$

$$\beta_{1i} = \gamma_{10} + u_{1i}$$

$$\beta_{2i} = \gamma_{20}$$

Reduced form

$$\text{Investment}_{ti} =$$

$$\gamma_{00} + \gamma_{10} \text{Time\_Lin}_{ti} + \gamma_{20} \text{Time\_Quad}_{ti} + u_{0i} + u_{1i} \text{Time\_Lin}_{ti} + e_{ti}$$

Analysis showed that the intercept γ_{00} was 14.955 and this was significantly different from 0 (zero), $t(225) = 11.650$, $p < .001$. There was significant unexplained intercept variance [$\hat{\tau}_{00} = 211.065$, *Wald Z* = 7.940, *SE* = 26.582, $p < .001$].

The slope for linear time γ_{10} was .741 and this was significant, $t(1643) = 5.223$, $p < .001$. In other words, for every unit increase in trials the investment increases by .741 million and this increase is significant, holding all else constant. There was significant unexplained variance for linear time [$\hat{\tau}_{11} = 0.809$, *Wald Z* = 7.584, *SE* = 0.107, $p < .001$]. The slope for quadratic time γ_{20} was -.023 and this too was significant $t(3933) = -4.687$, $p < .001$.

Model fit between model 1 and model 2 was also compared. Specifically, I compared the difference in Deviance (-2Log Likelihood) between model 1 and model 2. The deviance was

reduced by 485.48 from model 1 to model 2 and this was a significant reduction [$\chi^2(4) = 485.48$, $p < .05$]. This means that model two fits the data better than model one.

In the third model a level-two predictor was tested to determine if it could explain the unexplained variance in the intercept and slope. Here, No-NOD was coded as 0 (zero) while NOD was coded as 1. I added NOD as a level-two predictor to both the intercept and the slope of linear time of the previous model.

Level 1

$$\text{Investment}_{ti} = \beta_{0i} + \beta_1 \text{Time\_Lin}_{ti} + \beta_2 \text{Time\_Quad}_{ti} + e_{ti}$$

Level 2

$$\beta_{0i} = \gamma_{00} + \gamma_{01} \text{NOD}_i + u_{0i}$$

$$\beta_{1i} = \gamma_{10} + \gamma_{11} \text{NOD}_i + u_{1i}$$

$$\beta_{2i} = \gamma_{20}$$

Reduced form

$\text{Investment}_{ti}=$

$$\gamma_{00} + \gamma_{01} \text{NOD}_i + \gamma_{10} \text{Time\_Lin}_{ti} + \gamma_{11} \text{NOD}_i * \text{Time\_Lin}_{ti} + \gamma_{20} \text{Time\_Quad}_{ti} + u_{0i} + u_{1i} \text{Time\_Lin}_{ti} + e_{ti}$$

Analysis revealed that the intercept γ_{00} was 16.073 and significantly different from zero [t (196.354) = 9.046, *SE*= 1.777, $p < .001$].

The intercept for no-normalization of deviance γ_{01} was -2.172. That is, from NOD to No-NOD condition the investment dropped by 2.172, holding all else constant. However, this decrease was not significant, $t(171) = -0.908$, $SE = 2.393$, $p = .365$. Thus, NOD was not a significant predictor of investment.

The interaction of condition and linear time was also not significant γ_{11} = -0.010, *t*(171) = -0.063, *SE* = 0.152, *p* = .950; see Figure 1]. In the Figure 1, the black line represents investment by NOD condition while the dashed line represents the No-NOD condition. The X-axis represents the 25 trials while mean investment is represented on the Y-axis.

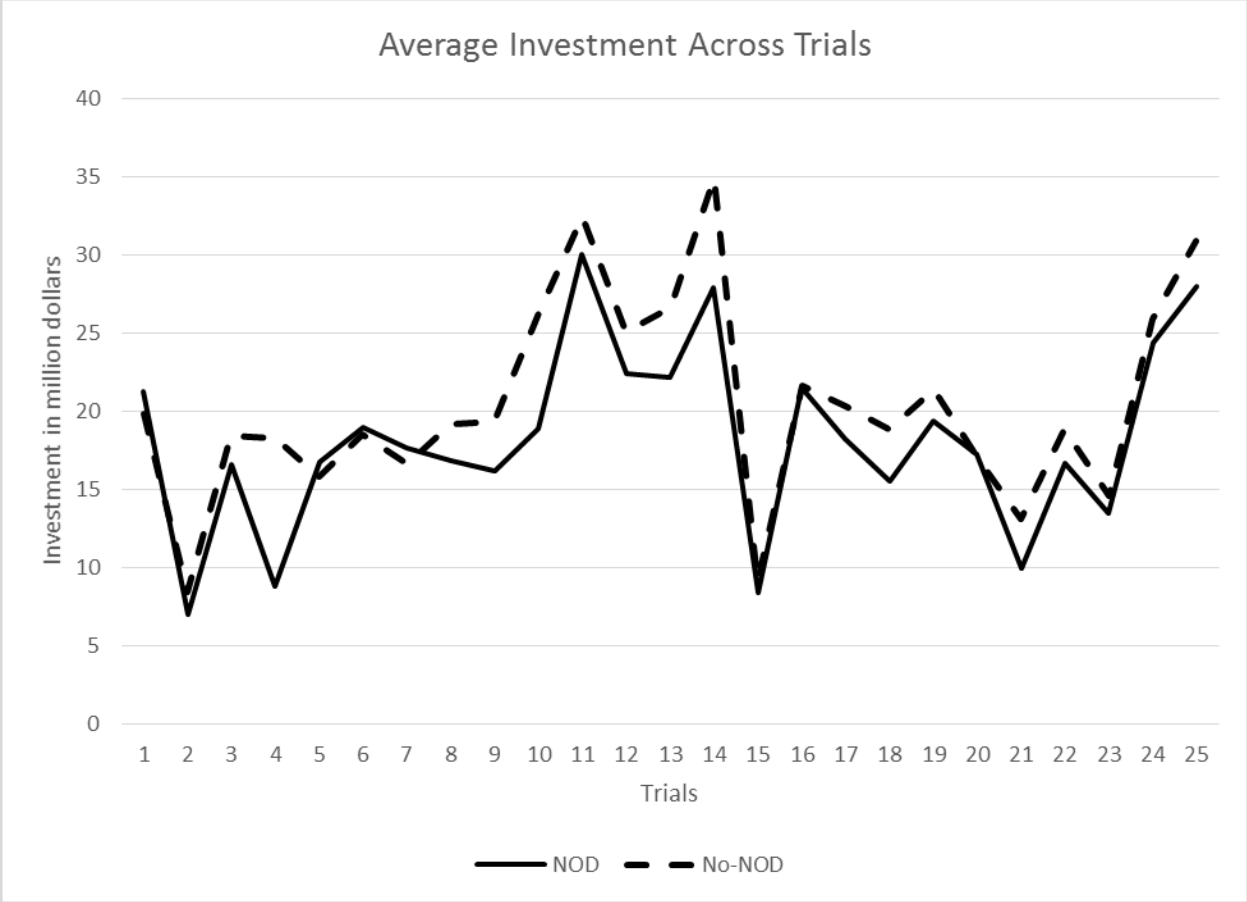

Figure 1: Average investment across trials by condition.

The unexplained variance continued to be significant [$\hat{\tau}_{00}$ = 209.887, *Wald Z* = 44.345, *SE* =5.179, *p* < .001; $\hat{\tau}_{11}$= .809, *Wald Z* = 7.589, *SE* = 0.107, *p* < .001]. This indicates that more predictors could be added to the model. I also compared model fit between model 2 and model 3. Specifically we compared the difference in deviance (-2LL) between model 2 and model 3. There was a significant reduction in deviance [$\chi^2(2) = 1.119$, *p* < .05].

Finally, I explored a fourth model wherein I examined the interaction between condition and each of the dark triad traits. There was no significant interaction between NOD and Machiavellianism [γ = -0.323, t(175) = -.803, SE = 0.402, p = 0.423], between NOD and Psychopathy [γ = 0.356, t(175) = 0.580, SE = 0.614, p = 0.563] and between NOD and Narcissism [γ =0.592, t(173) = 0.950, SE =0.623, p = 0.344].

Exploratory Analysis

The means for the trials immediately following Trial 4 which was the second manipulation were explored. I found that NOD participants invested a little more than No-NOD condition for three consecutive trials immediately following Trial 4 (Trial 5: M_{NOD} = 16.72 versus $M_{No\text{-}NOD}$ =15.81, Trial 6: M_{NOD} = 18.92 versus $M_{No\text{-}NOD}$ = 18.46; Trial 7: M_{NOD} = 17.67 versus $M_{No\text{-}NOD}$ =16.63). However, this difference was not statistically significant (Trial 5: t(169) = .321, p = .749; Trial 6: t(169) = .171, p = .865; Trial 7: t(169) =.328, p = .749).

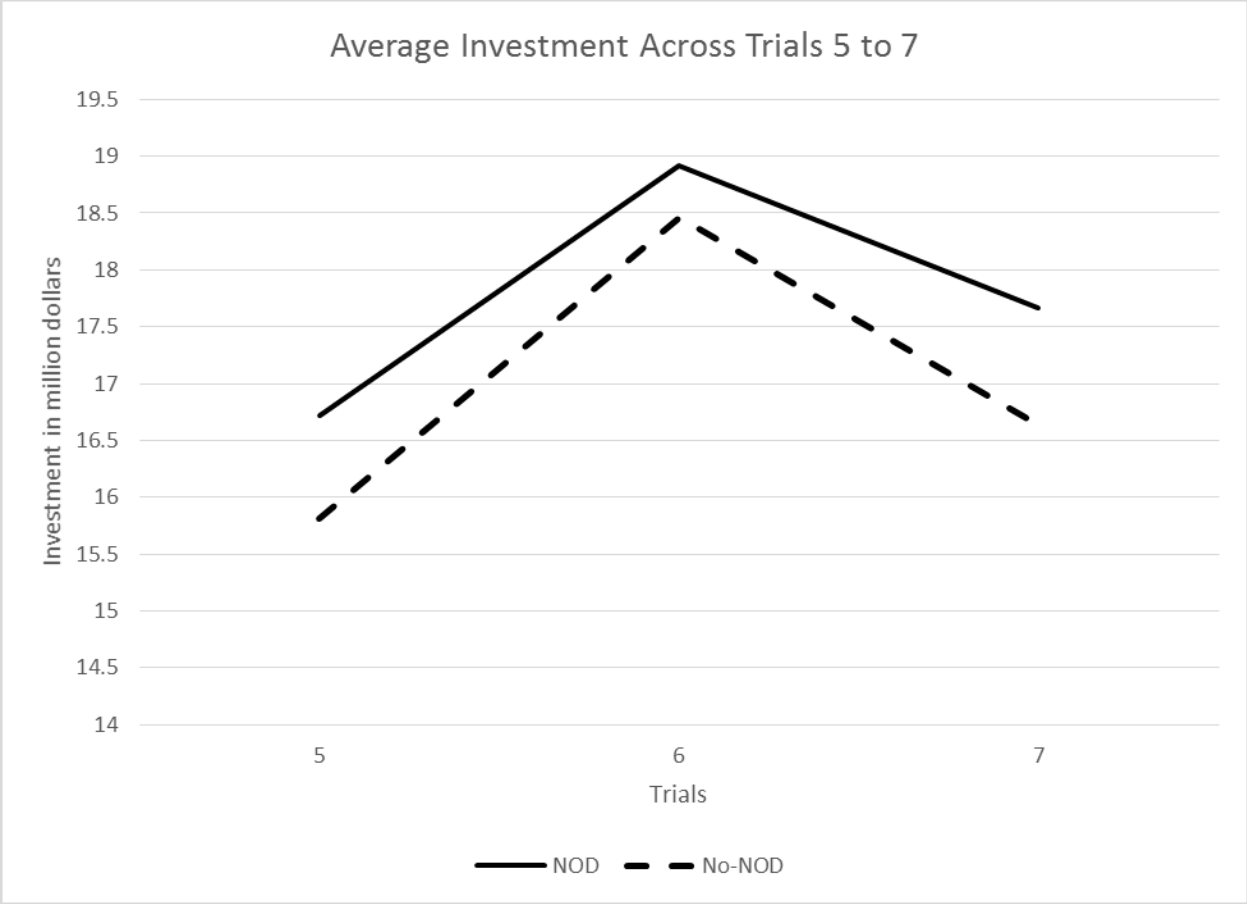

Figure 2. Average investment across Trial 5 to Trial 7.

After experiencing their first loss on Trial 7, NOD present participants invested at consistently lower rates from trial eight onwards and stayed below No-NOD participants for most of the remaining trials (except trial 20). After the first loss the NOD participants became risk averse and continued to be consistently risk averse for most of the remaining trials.

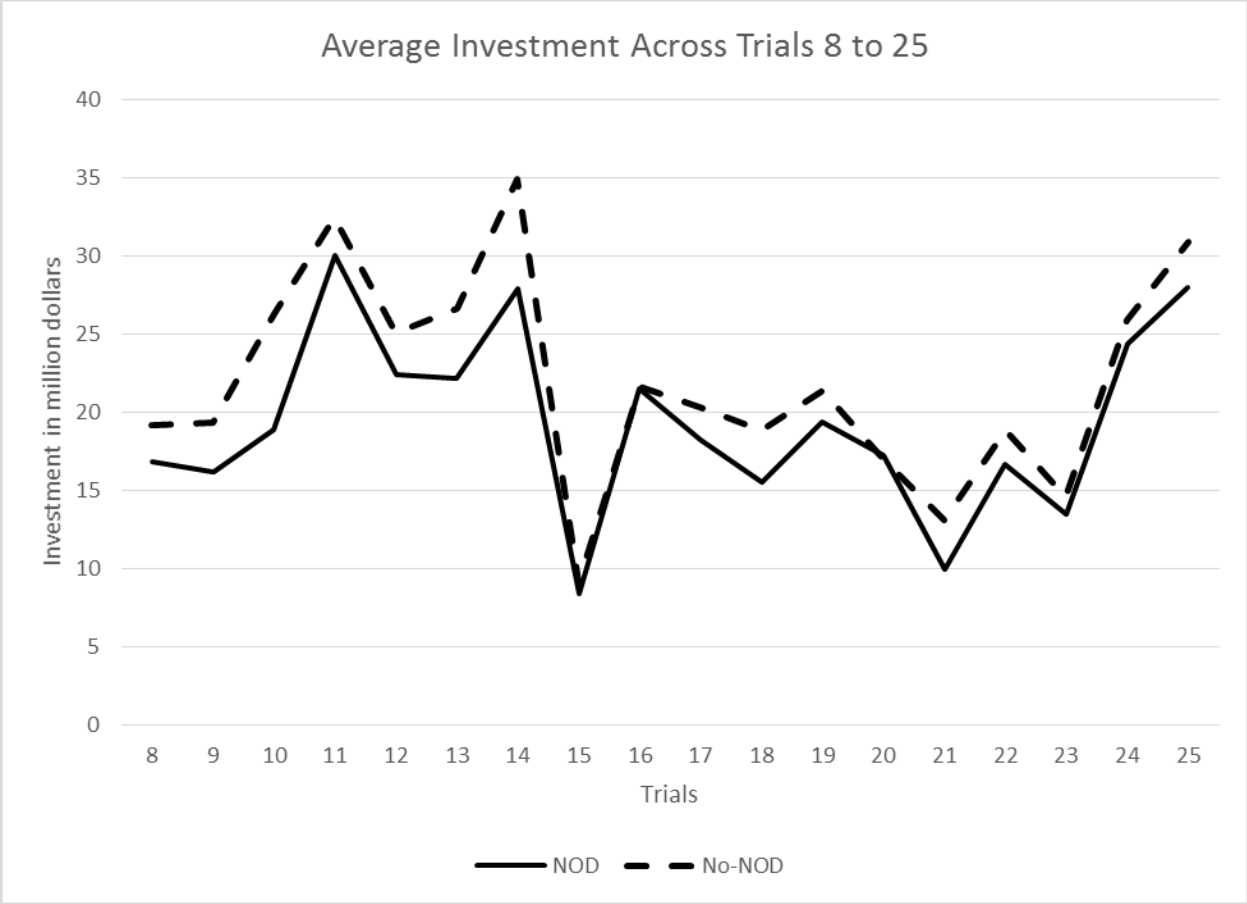

Figure 3. Average investment across Trials 8 to Trial 25.

I also carried out a Chi-square to examine whether more participants chose to continue in one condition in comparison to the other immediately after Trial 14. However, there was no significant difference between participants who chose to continue playing in NOD condition compared to No-NOD condition (χ^2 (1, 171) = .001, p = .980)

I examined one demographic variable to assess whether it predicted investment - prior loans (e.g. student loans, car loans, mortgage, etc.). Approximately 42% of the participants did not have any kinds of loans while 53% of the participants had some kind of prior loan. The variable 'loans' was a significant predictor of investment, $\hat{\gamma}_{01} = 3.815$, $t(171) = 2.363$, $p = .019$.

This indicates that as we move from having no loans to having prior loans the investment increases by approximately 3 million and this increase is significant.

I tested a second exploratory model. Since NOD was not a significant predictor I removed it as a predictor from the model and added the three dark triad traits to examine whether personality traits by themselves predict investment.

Level 1

$$\text{Investment}_{ti} = \beta_{0i} + \beta_1 \text{Time\_Lin}_{ti} + \beta_2 \text{Time\_Quad}_{ti} + e_{ti}$$

Level 2

$$\beta_{0i} = \gamma_{00} + \gamma_{01}\text{Mach}_i + \gamma_{02}\text{Pscypath}_i + \gamma_{03}\text{Narc}_i + u_{0i}$$

$$\beta_{1i} = \gamma_{10} + \gamma_{11}\text{Mach}_i + \gamma_{12}\text{Psypath}_i + \gamma_{13}\text{Narc}_i + u_{1i}$$

$$\beta_{2i} = \gamma_{20}$$

MODEL 2 Reduced form

$$\begin{aligned}\text{Investment}_{ti} = {} & \gamma_{00} + \gamma_{01}\text{Mach}_i + \gamma_{02}\text{Pscypath}_i + \gamma_{03}\text{Narc}_i + \gamma_{10}\text{Time\_Lin}_{ti} \\ & + \gamma_{20}\text{Time\_Quad}_{ti} + \gamma_{11}\text{Mach}_i\text{Time\_Lin}_{ti} + \gamma_{12}\text{Psypath}_i\text{Time\_Lin}_{ti} \\ & + \gamma_{13}\text{Narc}_i\text{Time\_Lin}_{ti} + u_{0i} + u_{1i}\text{Time\_Lin}_{ti} + e_{ti}\end{aligned}$$

Analysis showed that the grand intercept was no longer significantly different from zero [$\hat{\gamma}_{00}$ =14.720, $t(172) = .959$, SE =15.347, $p = .339$. Similarly, the slope for the linear time was no longer significant, $\hat{\gamma}_{10} = 0.355$, $t(177) = 0.362$, $SE = 0.981$, $p = 0.718$. The intercept for Machiavellianism (γ_{01}) was 0.255, $t(171) = 0.898$, $SE = 0.285$, $p = .371$. That is, for every unit increase in Machiavellianism score, the investment increased by about a quarter of a million. However this increase was not significant. The intercept for Psychopathy (γ_{02}) was -0.199, $t(171) = -0.483$, $SE = 0.413$, $p = .630$. That is, for every unit increase in Psychopathy score the investment decreased by about 0.20 million. However, this decrease was not significant. The intercept for Narcissism ($\hat{\gamma}_{03}$) was -0.15. That is, for every unit increase in Narcissism scores the

investment decreased by 0.15 million. However, this decrease was not significant, $t(171) = -0.385$, $SE = 0.390$, $p = 0.701$. The interaction between the three Dark Triad personality traits and linear time was also not significant (see Appendix J for details).

The unexplained variance continued to be significant, $\hat{\tau}_{00} = 209.212$, *Wald Z* = 7.930, *SE* = 26.383, $p < .001$; $\hat{\tau}_{11} = -5.142$, *Wald Z* = -3.930, *SE* = 1.308, $p < .001$; $\hat{\sigma}^2 = 229.644$, *Wald Z* = 44.345, *SE* = 5.179, $p < .001$]. In other words, additional predictors could be added to the model.

Finally, we tested a piecewise growth model for trials 4 to 7 using a different dependent variable, 'percent risked'. One of the advantages of piecewise growth is that it enables us to test different trends for different groups of (consecutive) trials (Curran, Obeidat, & Losardo, 2010; Chou, Yang, Pentz, & Hser, 2004). In our study we tested a model where for trials 1 to 4 it is assumed that there is no change in slope and a linear trend for trials 5 to 7. We also used a different 'percentage risked' as a dependent variable because percentage risked might more accurately measure the amount of risk undertaken by the participant than 'investment'. Two participants might invest the same amount of money but might be undertaking different amounts of risk depending on the amount they had at hand or how much money they had earned up to that trial. For example, suppose two participants on trial 4 invested 4 million. However, participant one had 5 million at hand while participant two had 10 million. In that case, participant one is clearly the more risk seeking of the two for investing 4 million out of 5 million or 80% of his money while participant is less risk seeking of the two since for investing only 4 million out of 10 million or 40% of his money. We calculated the percent risked for each participant for each trial. Using percent risked as the DV we reanalyzed the data using piecewise growth with Mplus version 7 (Muthén & Muthén, 2012).

We examined trials 4 to 7 using three slope functions (See Appendix K for details. Specifically, we examined whether there was a significant growth from trial 4 to trial 5 (slope 1), from trial 5 to 6 (slope 2) and from trial 6 to 7 (slope 3). Analysis indicated that participants in the NOD condition had a significantly steeper slope 1 by 10.211 points than those in No-NOD condition (S.E. = 2.428, $p < .01$). The other two slopes were not significant (*Slope 2* = -0.263, *S.E.* = 2.451, $p = 0.914$; *Slope 3* = 0.259, *S.E.* = 2.916, $p = 0.929$). Furthermore, we also examined the relationship between the intercept and the three slopes. There is a significant negative relationship between intercept and slope 1 ($\gamma = -86.154$, *S.E.* = 18.805, $p < 0.01$) and a significant positive relationship between intercept and slope 3 ($\gamma = 43.431$, *S.E.* = 21.413, $p = 0.043$). The relationship between intercept and slope 2 although negative is not significant ($\gamma = -15.489$, *S.E.* = 17.820, $p = 0.385$).

Finally, there is still significant unexplained variance remaining in the model for the intercept ($\gamma = 213.77$, *S.E.* = 23.118, $p < 0.01$), slope 1 ($\gamma = 248.16$, *S.E.* = 26.84, $p < 0.01$), slope 2 ($\gamma = 252.89$, *S.E.* = 27.35, $p < 0.01$) and slope 3 ($\gamma = 357.95$, *S.E.* = 38.711, $p < 0.01$). This indicates that additional predictors could be added to the model. Since NOD was the primary variable of interest, no additional variables were added to the model. However, future studies should consider adding time variant and invariant covariates to further explain the residual variance in the model.

In summary, piecewise growth analyses look encouraging but need to be cross-validated on a fresh sample.

Discussion

The aim of the present study was to examine normalization of deviance (NOD) in a laboratory setting. Specifically I examined i) whether exposure to NOD encouraged individuals to take monetary risks, and ii) whether callous-manipulative personality traits like the Dark Triad interacted with NOD.

The first hypothesis was that NOD would predict monetary investment such that participants in the NOD condition would invest more money over trials than participants in the No-NOD condition. This hypothesis was not supported. There was no significant difference in investment between participants in the NOD condition compared to no-NOD condition across the 25 experimental trials. These results contradict the findings of previous studies that risky behavior becomes normalized for the individuals who are exposed to it repeatedly (Dillon & Tinsley (2008). However, there were two aspects of the current experiment that were different from Dillon & Tinsley (2008). First, two important constraints were placed on participants in the previous studies. First, participants had a specific target to meet, i.e. the spacecraft had to reach a prespecified destination on Mars, and second, participants were penalized for being excessively risk aversive, i.e. they lost $5 of their remuneration of $20. In the current experiment, no such constraints or penalties were imposed. Most participants in our study had very little financial decision-making experience. For such participants setting specific targets would have led to a large number failing to meet those targets. This might have led to poor response rate and/or high attrition rate. The absence of these constraints may have freed participants to make the best decision for their company, rather than engage in risky behavior. Thus, the former study might have evoked a sense of achievement in participants of their study, whereas the current experiment might have evoked a sense of obligation to the company in the

participants. This explanation would be align with the findings of Moon (2001) who found that a sense of achievement was positively correlated with an escalation of commitment whereas a sense of obligation to the company was negatively correlated with escalation of commitment. Thus, the present task may have failed to engage participants in the right frame for NOD to lead to an escalation of risk.

Another potential difference is in terms of the amount of cognitive load that was placed on the participants in the two experiments. In a previous study using a similar paradigm of the Mars spacecraft, the researchers found that participants in the no-cognitive load and No-NOD condition were significantly less likely to normalize deviance (Dillon & Tinsely (2005). In the current study participants did not have to divide their resources between the targets they were trying to reach, trying to retain their remuneration and the investment. They could devote all their cognitive resources to the scenario and their own investment decision. This could have weakened the relationship between NOD and investment. Thus, the low cognitive load on the participants in my experiment might have freed the participants to make effective decisions.

Exploratory analysis of the first and second NOD exposure or Trial 2 and Trial 4 found that on Trial 2 there was no significant difference between the NOD and No-NOD participants in their amount of investment while there was a significant difference between participants on Trial 4 with NOD participants investing significantly less than No-NOD participants.

One prior study examined the number of exposure to NOD exposures and its influence on risky behavior (Dillon, Tinsley & Burns, 2014). They found no significant difference between participants who experienced No-NOD and one NOD exposure. For those who experienced no NOD and three NOD exposures, they found significant differences between participants, wherein participants in the NOD condition were more likely to engage in risky behavior. The study did

not look at two NOD exposures. We examined two NOD exposures versus none and the degree of risk taking behavior. Similar to the previous study, one exposure did not lead to any significant differences between the experimental and the control group. However, the second NOD exposure led participants to invest significantly less than No-NOD exposure participants. Although this might on the face of it contradict previous empirical study it is in line with the five step NOD process where during step 2 there is a recognition of increased risk. In other words, participants sensed there was something atypical or even egregious about the behavior and responded to it by being extremely cautious.

We investigated the trials immediately following the second exposure, i.e. trials 5, 6 and 7. These showed a slight although not significant increase in investment by NOD participants compared to No-NOD participants. This extreme risk averse behavior in the aftermath of NOD but risk seeking behavior in the following trials hints towards the role of outcome bias in leading to risky decision. Because the risky decision did not have negative consequences individuals might feel more confident about future risky decision and become risk seeking.

Exploratory analyses of Trial 8 revealed that the investment size of the NOD participants dropped below that of the No-NOD participants though not significantly. In the trial previous to this drop, participants had experienced a loss outcome for the first time. Thus, having experienced a loss on the previous trial, all participants became risk averse on the subsequent trial with NOD participants slightly more so than No-NOD participants. Moreover, NOD participants continued to be more risk averse for most of the remaining trials.

The second hypothesis was that the NOD would interact with traits that compose the Dark triad of personality (i.e., Machiavellianism, narcissism, psychopathy). This hypothesis was also not supported. There was no significant interaction between NOD and scores on any of the

Dark Triad traits. These findings seem to contradict previous findings that the Dark Triad are linked with high levels of risk (Crysel, Crosier, & Webster, 2013). However, Crysel and colleagues used a measure of the Dark Triad (The "Dirty Dozen;" Jonason & Webster, 2010) that has fallen into disrepute (e.g., Miller et al., 2012). Further, the framing of the study as a business decision making task as compared to a gambling task may have influenced risk behavior in the two studies differently. Specifically, Crysel and colleagues (2013) examined amount risked in the game of blackjack whereas the current study was framed as a decision making study in business. Thus, the present study could have motivated individuals to make the best decision.

It should be noted that the Dark Triad traits are not associated with poor decision making in all financial contexts. For example, Jones (2013) found that risking one's own money on a bad decision was uncorrelated with all three Dark Triad traits (Jones, 2013; Study 1). However, when someone else would suffer the losses, individuals high in psychopathy and Machiavellianism were willing to make a bad decision. However, Jones (2014) found that only those high in psychopathy persisted in making selfish decisions when they could be punished. Thus, it is surprising in the present study that psychopathic individuals did not engage in higher levels of investment for risk-based decisions.

Thus, when individuals high in the Dark Triad have 'no skin in the game' they seem to be more risk prone, especially when someone else would pay for the losses. However, in the current study, participant's profits and losses were tied to the company's profits and losses. Further, studies on risk behaviors and the Dark Triad (using appropriate assessments) found no effect for Dark Triad and risk when personal profit was tied to decision making (Carré & Jones, 2016).

Finally, we examined one demographic variable that might be a predictor of investment. Analysis revealed that having prior loans was a predictor of the amount invested such that those with prior loans invested significantly higher amounts of money than those with no prior loans. Loans might be an indirect indicator of financial knowledge. Previous studies have shown that financial knowledge has low to moderate correlation with financial risk seeking (Wang, 2009). Thus, participants who have financial loans might possess more financial knowledge, might feel more confident about handling money and therefore be more open to taking on financial risks.

Limitations

The study had three main limitations. The first limitation was is the design of the study. The study did not put substantial cognitive load on the participants. This allowed participants to devote ample resources to decision-making and they were able to avoid engaging in deviant behavior.

A second limitation was that most of the students lacked financial experience. A majority of the participants came from introductory psychology classes. Financial knowledge is an important predictor in determining how much financial risk individuals assume. Therefore the decision making of the participants might not necessarily reflect the decision-making of individuals with more financial expertise.

A third limitation of this study was that a majority of the participants making investment decisions in the study were female. In the financial sector, decision-making is predominantly in the hands of males. For example, according to Equal Opportunity Commission (2015) in the monetary goods and services sector, while 50% of entry and middle management positions are held by women, women hold only 30% of upper management positions. According to another report although 45% of those employed in Standard & Poor 500 companies are women, they

hold only 25% of upper management positions and a meager 5% of the top position in companies. (Catalyst, 2016). Prior studies indicate that there are sex differences in risk behavior with men often tending to assuming more risk than women (Powell & Ansic, 1997; Byrnes, Miller & Schafer, 1999). Therefore, the decision-making of the participants in the sample may not reflect the decision-making in the financial sector.

Future Directions

In the future, studies could examine the role of achievement in normalization of deviance, for example by making specific targets salient and imposing penalties for failing to meet them. Studies could also examine how cognitive load might play a role in normalization of deviance. Specifically, they could probe how cognitive load interacts with normalization of deviance in investment decisions. Studies could also try to parse the effects of profits as compared to losses on normalization of deviance, for example by introducing loss at different trials for different groups. Future research could also investigate the role of financial knowledge and its interaction with normalization of deviance, for example by recruiting participants from business schools.

Contributions of the current study

Although in the current study normalization of deviance was not found to significantly predict risky behavior, the study did contribute to the existing literature on normalization of deviance. Firstly, the current study examined the construct of normalization of deviance in the new context of financial decisions. Second, we developed a new paradigm to investigate normalization of deviance. Lastly, compared to previous studies, a more robust statistical model was used to analyze the data.

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Appendix A

The Short Dark Triad

Instructions: Please indicate how much you agree with each of the following statements
1 – Disagree strongly
2 – Disagree
3 – Neither agree nor disagree
4 – Agree
5 – Agree strongly

Machiavellianism

1. It is not wise to tell your secrets.
2. I like to use clever manipulation to get my way.
3. Whatever it takes, you must get the important people on your side.
4. Avoid direct conflict with others because they may be useful in the future.
5. It's wise to keep track of information that you can use against people later.
6. You should wait for the right time to get back at people.
7. There are things you should hide from other people to preserve your reputation.
8. Make sure your plans benefit yourself, not others.
9. Most people can be manipulated.

Psychopathy

1. I like to get revenge on authorities.
2. I avoid dangerous situations. (R)
3. Payback needs to be quick and nasty.
4. People often say I'm out of control.
5. It's true that I can be mean to others.
6. People who mess with me always regret it.

Appendix B

Narcissism Personality Inventory – 16 item.

Instructions: There are sixteen paired statements. For each pair choose the one that is closest to your feeling.

- I know that I am good because everybody keeps telling me so
- When people compliment me I sometimes get embarrassed

- I like to be the center of attention
- I prefer to blend in with the crowd

- I think I am a special person
- I am no better nor worse than most people

- I like having authority over people
- I don't mind following orders

- I find it easy to manipulate people
- I don't like it when I find myself manipulating people

- I insist upon getting the respect that is due me
- I usually get the respect that I deserve

- I am apt to show off if I get the chance
- I try not to be a show off

- I always know what I am doing
- Sometimes I am not sure of what I am doing

- Everybody likes to hear my stories
- Sometimes I tell good stories

- I expect a great deal from other people
- I like to do things for other people

- I really like to be the center of attention
- It makes me uncomfortable to be the center of attention

- People always seem to recognize my authority
- Being an authority doesn't mean that much to me

- I am going to be a great person
- I hope I am going to be successful

- I can make anybody believe anything I want them to
- People sometimes believe what I tell them

- I am more capable than other people
- There is a lot that I can learn from other people

- I am an extraordinary person

- I am much like everybody else

Appendix C

ChipTech, a software company, was formed by a group of young graduates from Stanford University as a small start-up around 1995. At that time it made a name for itself manufacturing microchips for home and office computer. In 1997 the company had to make the first of many important decisions. The existing factory and office in Silicon Valley were too small to meet the needs of a growing company.

Crossroad 1: The Board of Directors had to decide whether to move its factory to Bakersfield, California and its offices to Seattle. Having a production plant in Bakersfield would give ChipTech easy access to the local oil and natural gas industry, petroleum refineries and mining companies. Moving its office to Seattle would give it an opportunity to network with other tech companies like Amazon and Google. However, there was no guarantee that this move would benefit the company.

Decision 1: The Board of Directors decided to move the factory to Bakersfield and office to Seattle. They left it to their Chief Financial Officer, that is you, to decide how much to invest in this business activity. How much of the company's money would you like to invest?

Outcome 1: ChipTech earned a 3% profit on its investment by moving the production plant to Bakersfield and office to Seattle.

Around the same time, ChipTech also hired 20 new employees for its production plant. As per the Human Resource policies, new employees had to go through the Standard Operating Procedures training within a month of hire. The department in charge of producing these microchips, however, felt that it would be impossible to set aside 20 employees for training and meet the quarterly production goals at the same time. The company had already missed one deadline. If the company did not meet the quarterly goals it would greatly reduce the profits. It was a very stressful time for all the employees.

The Board of Directors called a meeting of the managers to discuss the problem. Most managers reported that there had been no major accidents which according to them showed that the new employees had learned the procedures on their own. Two managers, however, disagreed with this assessment. The first manager said she had seen at least one new employee almost get hit by a cargo truck most probably because he was unaware of the safety rules. The second manager reported that he had also seen four or five new employees walking around the silicon processing room without masks. These masks are mandatory in the room where silicon is processed to prevent inhaling poisonous chemicals. He said he ordered the new employees to go to the health care center immediately so the doctor could test them for dangerous chemicals.

Crossroad 2: The Board of Directors had to decide whether to delay training for the 20 new employees. However, there was no guarantee that the decision to delay training would help the company achieve its production goals.

Decision 2: Based on the discussion with managers, the Board felt they had enough evidence that the new employees had gathered a basic understanding of the procedures on their own. They decided to delay training for the 20 new employees. They left it to their Chief Financial Officer to decide how much to invest in the production of microchips. How much of the company's money would you like to invest?

Outcome 2: ChipTech made a 10% profit on its investment by delaying training and focusing on production

Soon after, the company decided to expand into Asia. This was a completely new territory for the company.

Crossroad 3: The Board of Directors had to decide whether to partner with a firm in Asia. Partnering with an Asian firm would help ChipTech sell its product to a larger market. But there was no guarantee the partnership would succeed.

Decision 3: The board of directors decided to invest in partnering with a firm in Asia. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 3: ChipTech made a 2% profit on its investment by partnering with a firm in Asia.

In 1998, ChipTech expanded into making specialized heat-resistant microchips for companies that often work deep inside the core of the earth like those that mine for metals. Heat-resistant microchips are microchips that are expected to withstand heat from anywhere from 392^{o} F to 482^{o} F Unfortunately, the company found that its microchips were overheating at much lower temperatures. In fact, one batch of microchips exploded due to overheating injuring two employees. The two employees had to be rushed to the emergency room after been badly burned by these exploding microchips.

Crossroad 4: The Board of Directors had to decide whether to go ahead with mass production or go back and redesign the chips. There was no guarantee that redesigning would prevent overheating. The Board had a long discussion on how to deal with this issue. They took a closer look at the evidence to see if it was serious.

Decision 4: The Board concluded that although exploding microchips due to over-heating could be a concern there was not enough evidence to delay production. The Board of Directors decided to go ahead with mass production of microchips. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 4: ChipTech earned an 8% profit on its investment by going ahead with mass production of microchips even though exploding microchips due to over-heating was a problem.

Crossroad 5: By this time, ChipTech had been around for a while. The market landscape had changed quite a bit since the company first started. The Board of Directors had to decide whether to invest money into market research. Market research might help ChipTech recognize its own strengths and weaknesses, identify new clients as well as better understand needs of the existing clients. On the other hand, it might not tell them anything new.

Decision 5: The Board of Directors decided to invest money into market research. How much of the company's money would you like to invest?

Outcome 5: ChipTech made a 4% profit on its investment in market research.

In 1999, ChipTech wanted to try to increase its popularity in the U.S. markets. Hiring a prestigious advertising firm could help it run advertisements not only on traditional platforms like television and radio but also on newer platforms like the internet. Of course, if they put in more money towards advertisements they would have less money for other activities.

Crossroad 6: The Board of Directors had to decide whether to hire a prestigious advertising firm. There was no guarantee that it would make them popular.

Decision 6: The Board of Directors decided to hire a prestigious advertising firm. They left it to their Chief Financial Officer to decide how much to invest into advertising. How much of the company's money would you like to invest?

Outcome 6: ChipTech made a 12% profit on its investment in advertising.

Around 2000, the Board of Directors realized that the demand for microchips from mining companies had not grown in the past five years. They need to expand into new markets. Entering the market for self-driving cars seemed like the most logical choice. The market for self-driving cars was relatively new at that time. Most companies were still testing the prototypes and no one really knew how long it would take for a company to build a fully functional self-driving car.

Crossroad 7: The Board had to decide whether to expand into other markets. There was no guarantee they would find customers.

Decision 7: After much deliberation, the Board of Directors decided to expand and enter the market for self-driving cars. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 7: ChipTech made a 6% loss on its investment in self-driving cars.

Crossroad 8: The following year in 2001, in order to gain visibility ChipTech had to decide whether to sponsor a convention like Comic-con. They would invite video game players, also called gamers, from all over the country. It would be a fun, high energy event lasting a week. The downside however, was that the event might fail. This would give them bad reviews in all technological magazines ruining the company name.

Decision 8: In the end, the Board of Directors decided to sponsor a convention. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 8: ChipTech made a 9% profit on its investment.

The competition in the microchip market was getting intense. In order to attract new customers and hold on to old ones, ChipTech had to figure out ways that would help it stand out from other companies.

Crossroad 9: ChipTech had to decide whether to offer free maintenance services to its clients. The Board did not know if this would be enough to keep their lead in the market.

Decision 9: The Board of Directors decided to invest in offering free maintenance services to its clients. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 9: ChipTech made a 6% profit on its investment by offering free maintenance services to its clients.

In late 2001, another company started making attempts to forcibly take over ChipTech.

Crossroad 10: The Board of Directors had to decide how to deal with this attempt at hostile takeover by its competitor.

Decision 10: The Board of Director decided to fight this takeover. They left it to their Chief Financial Officer to decide how much to invest in fighting this takeover. How much of the company's money would you like to invest?

Outcome 10: ChipTech made a 2% loss on its investment to fight the takeover.

It had been about a decade since the company was established. A lot of the equipment in ChipTech's production plant was old and outdated. This was slowing down the process of building microchips as well as tracking clients, deliveries, and supplies.

Crossroad 11: The Board had to decide whether to update the existing equipment and software. No one could be sure that it would actually help improve the process. New technology might have its own problems. For instance, employees might not know how to use the new equipment delaying the tracking of client, deliveries, and supplies.

Decision 11: The Board decided to update the existing equipment and software. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 11: ChipTech made an 11% profit on its investment in updating equipment and software

In early 2002, the government announced that it was looking for a new supplier of microchips for its many programs and departments. ChipTech would have to compete with other firms to win this contract.

Crossroad 12: The Board of Directors had to decide whether to compete for a government contract. Competing for the government contract would mean moving talented managers and engineers from development of microchips and customer service to work on this new project. This could interfere with existing functions of the company.

Decision 12: The Board of Directors decided to compete for the government contract. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 12: ChipTech made a 3% loss on its investment in competing for a government contract.

Crossroad 13: At the beginning of 2003, ChipTech had to decide whether to license its product. The benefit of licensing would be that ChipTech would receive a substantial sum of money per year for its product. At the same time they could protect their design by placing limits on the other company's ability to develop its own product. However, the downside was that it might reveal the design of the microchips, which is a trade secret, to ChipTech's competitors.

Decision 13: The Board of Directors decided to license its product. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 13: ChipTech made a 4% profit on its investment by licensing its product.

Crossroad 14: In late 2003, ChipTech felt the need to diversify. The Board of Directors had to decide whether to buy another company. One that looked especially attractive was TechOne, which specialized in making water-resistant microchips. Water-resistant microchips are used in machines that work deep under the water mapping ocean floors and sea-beds, studying sea creatures and vegetation. There was no guarantee that buying TechOne would help ChipTech make profits.

Decision 14: The Board of Directors decided to acquire the company specializing in water-resistant microchips. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 14: ChipTech made a 10% profit on its investment by buying TechOne.

In 2004, ChipTech was sued by one of its clients for poor service.

Crossroad 15: The Board of Directors had to decide whether to fight the lawsuit. There was no guarantee that they would win the lawsuit. If they lost they would have to pay the fees of the lawyers, court fees and a large compensation to their client.

Decision 15: The Board of Directors decided to fight the lawsuit that they provided poor service. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 15: ChipTech made a 4% profit on its investment by fighting the lawsuit.

In 2005, ChipTech started facing many issues with employee satisfaction. Employees were demanding better pay and better working conditions. Employees were getting into arguments with their co-workers. There was a general feeling that people weren't been promoted fast enough. Employees wanted more opportunities, for instance to improve their knowledge and skills through traditional and online classes.

Crossroad 16: The Board of Directors had to decide whether to spend money on improving employee satisfaction. However, even if they invested money into this, there was no guarantee it would work. Employees might still feel dissatisfied with their work and co-workers.

Decision 16: The Board of Directors decided to invest money in improving employee satisfaction. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 16: ChipTech made a 5% loss on its investment in programs trying to improve employee satisfaction.

By the end of 2006, trying to keep smart, talented employees became a struggle for ChipTech. Employees started leaving ChipTech so they could go work for the competition.

Crossroad 17: The Board of Directors had to decide whether to put money into retaining their employees. The company could provide longer leaves for new parents, flexible work hours, and better health care to make ChipTech more attractive. Of course, there was no guarantee all these perks would work and help keep employees.

Decision 17: The Board of Directors decided to invest money in trying to retain their employees. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 17: ChipTech made a 4% loss on its investment on perks trying to retain employees.

One of ChipTech's competitors, PrimaCorp, released a new line of microchips that were heat resistant. ChipTech suspected that PrimaCorp had obtained the secret designs illegally.

Crossroad 18: The Board of Directors had to decide whether to take legal action against PrimaCorp. There was no guarantee that ChipTech would win the fight.

Decision 18: The Board of Directors decided to sue PrimaCorp for violation of patent laws. They left it to their Chief Financial Officer to decide how much to invest in the lawsuit. How much of the company's money would you like to invest?

Outcome 18: ChipTech made a 1% loss on its investment in the lawsuit again PrimaCorp.

Crossroad 19: ChipTech had to decide whether to collaborate with private companies that were building space shuttles like Tesla. There was no guarantee the company would make any profit.

Decision 19: The Board of Directors decided to invest in space technology. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 19: ChipTech made a 9% profit on its investment.

Crossroad 20: In 2010, ChipTech had to decide whether to hire a famous actor to promote its brand. The actor could use his or her celebrity status to promote the brand. The actor could wear ChipTech t-shirts at award shows and tweet how awesome the product was. The celebrity could also give away free stuff to his/her fans to promote ChipTech. However, there was no guarantee it would work. .

Decision 20: The Board of Directors decided to hire a celebrity to act as their brand ambassador. They left it to their Chief Financial Officer to decide how much to spend on hiring a celebrity. How much of the company's money would you like to invest?

Outcome 20: ChipTech made a 7% profit on its investment by hiring a famous actor to promote their product.

In 2011, ChipTech was threatened with legal action by the local community for dumping toxic waste in nearby rivers. ChipTech challenged the evidence. It hired a public relations officer to give interviews to the media denying the accusations. The company had to decide whether to go to court.

Crossroad 21: The Board of Directors had to decide whether to fight the accusations of environmental pollution in court. There was no guarantee ChipTech would win.

Decision 21: The Board of Directors decided to fight the lawsuit in the courts. They left it to their Chief Financial Officer to decide how much to invest in the court battle. How much of the company's money would you like to invest?

Outcome 21: ChipTech made an 8% profit on its investment by fighting environmental pollution accusations.

Crossroad 22: ChipTech had to decide whether to make another attempt to enter a foreign market. This time it targeted South America. There was no guarantee that it would succeed in finding consumers for their product.

Decision 22: The Board of Directors decided to partner with a local firm in South America that was already manufacturing microchips for movie studios. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 22: ChipTech made a 5% loss on its investment by attempting to enter into South American markets.

By 2012, sales of microchips had been falling for some time. Because of which, ChipTech was making fewer and fewer profits each year.

Crossroad 23: The Board of Directors had to decide whether to get a loan from an investment bank to try to get over the bad phase. There was no guarantee a loan would help them get through the decreasing profits.

Decision 23: The Board of Directors decided to acquire a loan from an investment bank. They left it to their Chief Financial Officer to decide how much of the loan to invest in the business activity. How much of the company's money would you like to invest?

Outcome 23: ChipTech made an 8% profit on its investment by taking a loan from an investment bank.

By 2014, the competition between ChipTech and other microchip manufacturers was growing intense. Microchips developed by other companies combined heat and water resistant capabilities. Consumers did not want to spend on ChipTech's product which provided heat and water resistance separately. ChipTech was rapidly losing its share of the microchip market.

Crossroad 24: The Board of Directors had to decide whether to invest in making similar heat-water resistant microchips to get their clients back. There was no guarantee that they would be able to invent such a microchip.

Decision 24: The Board of Directors decided to invest in developing similar microchips that had both heat-water resistant capabilities. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 24: ChipTech made a 2% loss on its investment in developing heat-water resistant microchips.

By 2015, ChipTech had tried and failed to keep up with the technological advancement in the microchip industry. They had to make one final attempt to save the company.

Crossroad 25: The Board of Directors had to decide whether to move the headquarters of ChipTech to another country where it would not have to pay as many taxes. However, there was no guarantee it would succeed.

Decision 25: The Board of Directors decided to move the headquarters of ChipTech to Ireland. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 25: ChipTech made a 3% profit on its investment by moving its headquarters to another country.

No-Normalization of Deviance Condition

Around the same time, ChipTech also hired 20 new employees for its production plant. As per the Human Resource policies, new employees had to go through the Standard Operating Procedures training within a month of hire. The department in charge of producing these microchips, however, felt that it would be impossible to set aside 20 employees for training and meet the quarterly production goals at the same time. The company had already missed one deadline. If the company did not meet the quarterly goals it would greatly reduce the profits. It was a very stressful time for all the employees.

The Board of Directors called a meeting of the managers to discuss the problem. Most managers reported that there had been no major accidents which according to them showed that the new employees had learned the procedures on their own. Two managers, however, disagreed with this assessment. The first manager said she had seen at least one new employee almost get hit by a cargo truck most probably because he was unaware of the safety rules. The second manager reported that he had also seen four or five new employees walking around the silicon processing room without masks. These masks are mandatory in the room where silicon is processed to prevent inhaling poisonous chemicals. He said he ordered the new employees to go to the health care center immediately so the doctor could test them for dangerous chemicals.

Crossroad 2: The Board of Directors had to decide whether to delay training for the 20 new employees. However, there was no guarantee that the decision to delay training would help the company achieve its production goals.

Decision 2: Based on the discussion with managers the Board felt they had enough evidence that the new employees had not gathered a basic understanding of the procedures on their own. They decided not to delay training for the 20 new employees. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 2: ChipTech made a 10% profit on its investment by not postponing training.

In 1998, ChipTech expanded into making specialized heat-resistant microchips for companies that often work deep inside the core of the earth like those that mine for metals. Heat-resistant microchips are microchips that are expected to withstand heat from anywhere from 392o F to 482o F. Unfortunately, the company found that its microchips were overheating at much lower temperatures. In fact, one batch of microchips exploded due to overheating injuring two employees. The two employees had to be rushed to the emergency room after been badly burned by these exploding microchips.

Crossroad 4: The Board of Directors had to decide whether to go ahead with mass production or go back and redesign the chips. There was no guarantee that redesigning would prevent overheating. The Board had a long discussion on how to deal with this issue. They took a closer look at the evidence to see if it was serious.

Decision 4: The Board concluded that exploding microchips due to over-heating was a concern. There was enough evidence to delay production. The Board of Directors decided to go back and redesign microchips. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Outcome 4: ChipTech earned an 8% profit on its investment by delaying the production of microchips and redesigning them.

Appendix D

Practice Trial 1 Crossroad 1 Decision 1
Quench is a juice manufacturing company owned by Ms. Samantha Richardson, a third generation juice manufacturer. The company was founded in 1948 by Ms. Richardson's grandfather. Ms. Richardson took over the company from her father in 1983. Quench originally owned vineyards and produced only grape juice. However, during the late 1970s, the money from grape juice production started decreasing. Times were tough. The company was facing a lot of competition from soda manufacturers.

Practice Trial Crossroad 1: The Board of Directors had to decide whether to expand its business into manufacturing other fruit juices besides grapes. However, there was no guarantee that the plan would work. Consumers might not like the taste of the new fruit juices and not buy the new products.

Practice Trial Decision 1: The Board of Directors decided to expand its business activity into manufacturing other fruit juices. They left it to their Chief Financial Officer, that is you, to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Practice Trial Outcome 1: Quench made a 4% profit on its investment by expanding its fruit juice line.
Practice Trial Crossroad 2: In 1980, the company had to decide whether to change its logo to give it a younger, more modern look. This was not an easy decision. If the company changed its logo, its long-time consumers might not recognize the product and Quench might lose consumers. On the other hand if Quench did not change its logo, the product might look old and outdated and fail to attract newer, younger consumers. Thus, there was no guarantee that changing the logo would work.

Practice Trial Decision 2: The Board of Directors decided to change the company logo. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

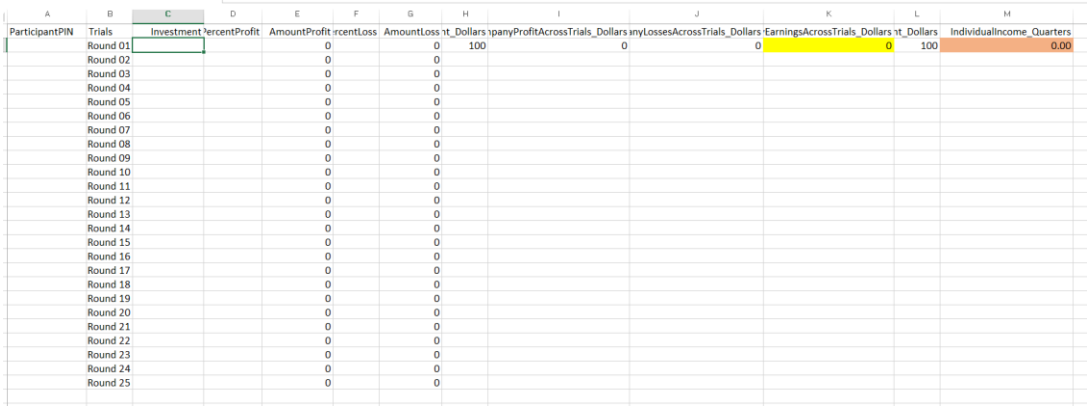
Practice Trial Outcome 2: Quench made a 5% loss on its investment by changing its logo.

Practice Trial Crossroad 3: In 1990, there was a growing awareness among consumers about artificial flavors and sweeteners in food products and its effects on health. Consumers had started avoiding drinks with such ingredients. Quench had to decide whether to continue using artificial ingredients in its fruit juices or to move in the direction of becoming more organic. There was no guarantee that going organic would help them gain consumers or make profits.

Practice Trial Decision 3: The Board of Directors decided go organic. They left it to their Chief Financial Officer to decide how much to invest in the business activity. How much of the company's money would you like to invest?

Practice Trial Outcome 3: Quench made a 2% profit on its investment by going organic.

Appendix E



A	B	C	D	E	F	G	H	I	J	K	L	M
ParticipantPIN	Trials	Investment	PercentProfit	AmountProfit	rcentLoss	AmountLoss	nt_Dollars	panyProfitAcrossTrials_Dollars	nyLossesAcrossTrials_Dollars	EarningsAcrossTrials_Dollars	nt_Dollars	IndividualIncome_Quarters
	Round 01			0		0	100	0	0	0	100	0.00
	Round 02			0		0						
	Round 03			0		0						
	Round 04			0		0						
	Round 05			0		0						
	Round 06			0		0						
	Round 07			0		0						
	Round 08			0		0						
	Round 09			0		0						
	Round 10			0		0						
	Round 11			0		0						
	Round 12			0		0						
	Round 13			0		0						
	Round 14			0		0						
	Round 15			0		0						
	Round 16			0		0						
	Round 17			0		0						
	Round 18			0		0						
	Round 19			0		0						
	Round 20			0		0						
	Round 21			0		0						
	Round 22			0		0						
	Round 23			0		0						
	Round 24			0		0						
	Round 25			0		0						

Appendix F

PIN: _____

Demographics Questionnaire

Sex: Male Female

Age: _____ years

Are you a U.S. Citizen: Yes No

Ethnicity:

African-American _____
Caucasian, Non-Hispanic _____
Latino _____
Native American Indian _____
Asian-American _____
Other _____

What language(s) do you speak?

English _____
English and Spanish _____
English and Other(s) _____
Please indicate which other language(s): _____

Which year are you in college?
Freshman Sophomore Junior
Senior

In the study that you just took part in, did any of the crossroads stand out for you? If yes, please list all that apply and explain.

_____

_____

In the study that you just took part in, did any of the decisions stand out for you? If yes, please list all that apply and explain.

_____

_____

In the study that you just took part in, did any of the outcomes stand out for you? If yes, please list all that apply and explain.

_____

_____

What do you think the study was about?

_____

_____

Are you currently employed?

_____

What jobs have you held in the past?

_____

Do you have insurance? If yes, list all that apply.

_____

Do you have any loans? List all that apply.

_____

Appendix G

Instructions for Participants

"For this study you will be reading the case history of a real company and the decisions you will be making are real ones that the company faced. During the trials, you will be playing the role of the head of the financial department. Your job title is Chief Financial Officer. It is your job to decide how much of the company's money to invest into a business activity that the Board of Directors has chosen. In other words, the Board of Directors will decide what business activity to invest money in but it will be your job to decide how much money to invest into the business activity. The company has a $100 million in its bank account at the start of the trial as represented by the monopoly money here. You can invest anywhere between $1 million and the total amount in the company's account. You can only invest in whole numbers or round figures. The amount will be noted on the excel file.

Let me take a moment to explain how the excel file is set up. Column A is where your PIN has been entered. Column B is where the different rounds or the trials are listed. Column C is where the amount you invest will be noted. Following this is column D where the percentage profit is noted while in column E the actual amount of profit in dollars for each trial is noted. Column F is where the percentage loss is noted while in column G the actual amount of loss in dollars for each trial is noted.

Column H shows the amount that the company's bank account holds at the start of the trial. Column I shows the profits across different trials. Column J shows the losses across different trials. Column K shows the company's earnings across different trials. Column L shows the total amount in the company's bank account. Column M shows your income in quarters.

You will pick a card from the top of the stack and read the card. On the card will be the background information about the company, and the dilemma, called crossroad, facing the Board of Directors. Also on the card will be the decision the Board of Directors made. Following this you will be asked to decide the amount of money you would like to invest into the business activity chosen by the Board of Directors. After this you will pick up another card from the stack which will indicate what the outcome of the decision was. Some outcomes will make you profits while others will make you losses. For every 10 million in monopoly money you earn for your company, you will earn yourself a quarter in real money. For every 10 million in monopoly money you lose the company you will lose a quarter in real money. For example, if you earn 50 million for the company you will earn yourself 5 quarters. If you lose the company 30 million you will lose 3 quarters.

You are allowed to keep the quarters that you earn during the study when you leave the study. You will be shown a total of 25 cards. After the 14th trial you can choose to stop at any time you want. The goal is to make as much profit as you can for the company. The four participants who make the most profit for the company will be awarded a $25 gift card. If there's a tie, a lucky draw will be used to decide the four people who receive the gift card.

Do you have any questions so far? [Answer the questions the participant asks. If they don't have any questions continue with the instructions.]

"Before we begin the actual trials, we will first do a practice round with three trials. You should feel free to ask questions any time during the practice trials. [The RA will answer any questions and clarify any doubts the participant might have.]

Once the practice trials are completed, the RA will start the main study.

"Shall we start the actual trials?"

Instruction after the 14th trial

"You have reached the 14th trial. From here on you can choose to stop at any point. Would you like to stop or would you like to continue?"

Appendix H

Trials, Outcomes, Means and Standard Deviations for all 25 trials.

		NOD (N= 88)		No-NOD (N = 83)	
Trial No.	Outcome (%)	Mean	SD	Mean	SD
1	+3	21.27	21.944	19.81	19.175
2	+10	6.95	10.383	8.39	10.101
3	+2	16.60	17.462	18.45	19.438
4	+8	8.78	12.813	18.22	18.140
5	+4	16.72	17.680	15.81	19.260
6	+12	18.92	16.983	18.46	18.375
7	-6	17.67	20.327	16.63	21.240
8	+9	16.82	20.455	19.19	17.408
9	+6	16.16	14.381	19.35	20.406
10	-2	18.84	17.988	26.30	24.006
11	+11	30.03	24.210	32.42	24.492
12	-3	22.41	18.436	25.05	23.061
13	+4	22.13	19.209	26.58	23.220
14	+10	27.92	24.052	34.87	26.324
15	+4	8.39	12.934	9.10	11.890
16	-5	21.47	22.796	21.58	22.962
17	-4	18.18	22.156	20.31	20.450
18	-1	15.52	19.275	18.86	23.041

		NOD (N= 88)		No-NOD (N = 83)	
19	+9	19.36	23.807	21.33	25.214
20	+7	17.24	26.996	17.05	20.793
21	+8	9.90	14.907	13.08	17.899
22	-5	16.69	20.997	18.80	22.411
23	+8	13.49	20.451	14.58	19.649
24	-2	24.35	27.729	25.92	25.555
25	+1	27.94	34.039	30.84	32.944

Appendix I

Parameter Estimates for the Exploratory Models Examining the Relationship between Financial Loans and Investment

			Model A (Loans)
Fixed components			
	Intercept	$\hat{\gamma}_{00}$	12.367 t(199.963)=7.389 SE = 1.674 P < .001 CI: 9.067, 15.668
	Linear Time	$\hat{\gamma}_{10}$	0.791 t(870) =4.995 SE = 0.158 P < .001 CI: 0.480, 1.102
	Quadratic time	$\hat{\gamma}_{20}$	-0.023 t(3933) = -4.687 SE = 0.005 P <.001 CI:-0.033, -0.014
	Loan	$\hat{\gamma}_{01}$	3.815 t(171) = 2.363 SE = 1.614 P = .019 CI:0.628, 7.001
	Loan * Time_Lin	$\hat{\gamma}_{11}$	-0.073 t(171) = -0.706 SE = 0.104 P = .481 CI:-0.278, 0.132

			Model A (Loans)
Variance of random components			
	Intercept variance	$\hat{\tau}_{00}$	203.295 Wald Z = 7.897 SE = 1.289 p < .001 CI: 158.615, 260.562
	Slope variance	$\hat{\tau}_{11}$	0.806 Wald Z = 7.580 SE = 0.106 p < .001 CI: 0.623, 1.044
	Intercept*Slope covariance	$\hat{\tau}_{01}$	-4.927 Wald Z = -3.824 SE = 1.289 p < .001 CI:-7.452, -2.401
		$\hat{\sigma}^2$	229.644 Wald Z = 44.345 SE = 5.179 p < .001 CI: -7.452, -2.401
	Deviance (-2LL)		36182.261

Appendix J

Model for Examining the Relationship between Dark Triad Traits and Investment

			Model B Three Level-2 Predictor (Mach, Narc & Psypath)
Fixed components			
	Intercept	$\hat{\gamma}_{00}$	14.720 t(171.307) = .959 SE =15.347 CI: -15.572, 45.013 p = 0.339
	Linear Time	$\hat{\gamma}_{10}$	0.355 t(176.222) = 0.362 SE = 0.981 CI: -1.581, .292 p = 0.718
	Quadratic time	$\hat{\gamma}_{20}$	-0.023*** t(3933) = -4.687 SE = 0.005 CI: -0.033, -0.014
	MACH	$\hat{\gamma}_{01}$	0.255 t(171) =0.898 SE = 0.285 CI: -0.306, 0.817 p = .371
	PSYPATH	$\hat{\gamma}_{02}$	-0.199 t(171) =-0.483 SE = 0.413 CI: -1.014, 0.616 p = 0.630

	NARC	$\hat{\gamma}_{03}$	-0.150 t(171) = -0.385 SE = 0.390 CI: -0.921, 0.620 p = 0.701
	NOD * Time_Lin	$\hat{\gamma}_{11}$	-
	MACH* Time_Lin	$\hat{\gamma}_{11}$	0.013 t(171) = 0.706 SE = 0.018 CI: -0.023, 0.048 p =0.481
	PSYPATH * Time_Lin	$\hat{\gamma}_{12}$	-0.004 t(171) = -0.157 SE = 0.026 CI: -0.056, 0.048 p = 0.876
	NARC* Time_Lin	$\hat{\gamma}_{13}$	0.003 t(171) =0.130 SE = 0.025 CI: -0.046, 0.052 p = 0.897
Variance of random components			
	Intercept variance	$\hat{\tau}_{00}$	209.212*** Wald Z = 7.930 SE = 26.383 CI: 163.399, 267.869
	Slope variance	$\hat{\tau}_{11}$	0.806*** Wald Z = 7.579 SE = 0.106 CI: 0.622, 1.044
	Intercept *Slope covariance	$\hat{\tau}_{01}$	-5.142*** Wald Z = -3.930 SE = 1.308

		CI:-7.707, -2.578
	$\widehat{\sigma}^2$	229.644***
		Wald Z = 44.345
		SE = 5.179
		CI: 219.715, 240.021
Deviance (-2LL)		35852.713
Δ Deviance		Model 2-Model B χ^2 (6) =335.223*

*p<.05, **p<.01, ***p<.001

Appendix K

Piecewise Growth

MODEL: I S1 | PTRSKD4@0 PTRSKD5@1 PTRSKD6@1 PTRSKD7@1;

I S2 | PTRSKD4@0 PTRSKD5@0 PTRSKD6@1 PTRSKD7@1;

I S3 | PTRSKD4@0 PTRSKD5@0 PTRSKD6@0 PTRSKD7@1;

I S1 ON CDTQTT CMach CPsych CNarc;

I S2 ON CDTQTT CMach CPsych CNarc;

I S3 ON CDTQTT CMach CPsych CNarc;

PTRSKD4@0 PTRSKD5@0 PTRSKD6@0 PTRSKD7@0;

I	ON			
	CDTQTT	-9.539	2.253	-4.233	0.000
	CMACH	0.195	0.267	0.732	0.464
	CPSYCH	-0.301	0.387	-0.779	0.436
	CNARC	-0.432	0.366	-1.181	0.238
S1	ON			
	CDTQTT	10.211	2.428	4.206	0.000
	CMACH	-0.052	0.288	-0.180	0.857
	CPSYCH	0.052	0.417	0.124	0.901
	CNARC	-0.126	0.394	-0.319	0.750
S2	ON			

CDTQTT	-0.263	2.451	-0.107	0.914
CMACH	-0.150	0.290	-0.516	0.606
CPSYCH	0.268	0.421	0.637	0.524
CNARC	0.214	0.398	0.537	0.592

S3 ON

CDTQTT	0.259	2.916	0.089	0.929
CMACH	0.475	0.345	1.375	0.169
CPSYCH	-0.232	0.500	-0.464	0.643
CNARC	0.283	0.474	0.596	0.551

S1 WITH

I	-86.154	18.805	-4.581	0.000

S2 WITH

I	-15.489	17.820	-0.869	0.385
S1	-122.696	21.332	-5.752	0.000

S3 WITH

I	43.431	21.413	2.028	0.043
S1	18.281	22.835	0.801	0.423
S2	-212.930	28.187	-7.554	0.000

Intercepts

PTRSKD4	0.000	0.000	999.000	999.000
PTRSKD5	0.000	0.000	999.000	999.000
PTRSKD6	0.000	0.000	999.000	999.000
PTRSKD7	0.000	0.000	999.000	999.000
I	17.863	1.611	11.089	0.000
S1	-2.646	1.736	-1.524	0.127
S2	2.378	1.752	1.357	0.175
S3	-2.237	2.084	-1.073	0.283

Residual Variances

PTRSKD4	0.000	0.000	999.000	999.000
PTRSKD5	0.000	0.000	999.000	999.000
PTRSKD6	0.000	0.000	999.000	999.000
PTRSKD7	0.000	0.000	999.000	999.000
I	213.767	23.118	9.247	0.000
S1	248.163	26.838	9.247	0.000
S2	252.888	27.349	9.247	0.000
S3	357.946	38.711	9.247	0.000

Appendix L

Mean, SD and Range for the Dark Triad

	Mean	*SD*	*Range*
Machiavellianism	27.66	5.29	11 to 42
Psychopathy	13.47	3.53	6 to 24
Narcissism	27.59	3.42	16 to 32

Appendix M

Study Two

The current study can be looked at as a first of a series of studies that examines the construct of normalization of deviance. Study two could specifically focus on unpacking step three of NOD or the reassessment of risk stage. More specifically, this study could take a closer look at the various social and psychological process that influence risk assessment and therefore influence behavior. Unlike the current study where participants were experienced only two exposures of NOD, the second study should consider exposing participants to multiple exposures of NOD which are in the order of increasing strength. The study could be designed as a cross between psychological forces such as social norms (e.g., the "Bystander Effect"; Darley & Latané, 1968) or obedience to authority (e.g., Milgram, 1963). From the former study we might borrow the aspect of vague nature of emergency and the participants' failure to extend help while from the latter study we might borrow the aspect of incremental increase of stimuli. Study two design could involve a vague signal of risk, and due to the reassessment of that risk, the participant may make no attempt to reduce the risk. The signal of risk would increase incrementally at each trial and at each trial the participant continues to make no attempt to reduce the risk. In other words, exposed to increasing risk the participant responds with inaction.

The second study should also consider reducing the number of trials from 25 to 7 (or 10). The trials could be reduced using the feedback received from the participants of the current study. Having fewer trials would make the increase in signal of risk both practically easy to accomplish for the experimenter and plausible for the participants to buy into. The outcome of the trials should be restricted to positive or favorable to the participant. The current experiment has shown that NOD participants respond differently to a negative outcome (or loss) and this

might be the reason for losing the effect. Hence restricting the outcome to a positive ones would help sustain the effect of NOD.

The second study can be designed as a financial decision study or a non-financial decision study. If it is designed as a financial decision study, the invested amount should be between 1 million and 5, 7 or 10 million which will reflect a regular Likert-type scale, instead of 1 to 100 as was in the current study. This reduction in amount would make things easier for participants to grasp. Most importantly, the dependent variable should not be the amount invested since it might not be an accurate measure of risk seeking behavior. For example, suppose two participants on trial 4 invested 4 million. However, participant one had 5 million at hand while participant two had 10 million. Participant one is clearly the more risk seeking of the two for investing 80% of his money while participant two invested only 40% of his. Thus, perhaps a more sensitive dependent variable should be the percentage of the amount risked, which is the percentage of amount invested out of the amount at hand. For example if the participant had 5 million at hand and invested 2 million, percentage risked = (100x2)/ 5 = 40%. In terms of covariates, the study should consider measuring both time invariant covariates like the current study as well as time varying covariates. Important time invariant covariates or participant level covariates that could be measured are personality traits like financial risk seeking, optimism. Important time variant covariates or trial level covariates that could be measured are optimism at each trial, riskiness of each decision.

If the study is designed as a more behavioral study the researcher could use a confederate to manipulate the reassessment of risk. The decision game could be played in pairs where one person in the pair is a participant while the other is a confederate. Study two could explore which one of the two competing explanations might be involved in the reassessment of risk - risk as a

rational mathematical calculation or risk a subjective emotional experience (Slovic, Finucane, Peters, E., & MacGregor, 2004; Dillon & Tinsley, 2008). Also, the current study tested only a component of NOD. Since NOD can be both the cause and the effect future studies should examine this further and tease those two things apart. Finally, the results of the study could be analyzed using a structural equations modeling (SEM) framework or a multi-level structural equations modeling (ML-SEM) framework.

Vita

Dilata Ranadive earned her Bachelor of Arts in Psychology from St. Xavier's College, Mumbai in 2003. In 2014 she received her Master of Arts degree in Experimental Psychology from The University of Texas at El Paso.

While pursuing her degree, Dilata worked as a Teaching Assistant at Department of Psychology and as a (PhD) Research Associate at the Graduate School. In 2015, Dilata interned with the El Paso Juvenile Probation Department (EPJPD) where she carried out program evaluation for the department.

Dilata presented the findings of her thesis at the American Psychology and Law Society conference. She was awarded the Dodson Research Grant for her dissertation titled, 'Financial Decision-making and Normalization of Deviance'. Her dissertation was supervised by Dr. Daniel Jones and Dr. James Wood. Dilata's research interests are in program evaluation, Juvenile Justice and Normalization of Deviance.

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