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The Effect of Power on Exploratory Behavior

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THE EFFECT OF POWER ON EXPLORATORY BEHAVIOR

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
at Virginia Commonwealth University

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Abstract

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The relations between power, exploratory behavior, and willingness to take risks were investigated. It was hypothesized that high power would be associated with increases in exploratory behavior, and that this relationship would be mediated by participants' willingness to take risks. In Study One, one-hundred forty-one undergraduates (66% female) completed questionnaires to assess trait power and willingness to take risk, as well as a computer-based research paradigm, BeanFest, to assess exploration. Willingness to take risks correlated positively with exploration. However, the predicted relations involving power were not

observed. In Study Two, power was experimentally manipulated. One-hundred thirty-three undergraduates (61% female) were randomly assigned to a high-power or low-power condition before completing measures of exploration and willingness to take risk. Results indicated no significant differences between the power conditions in exploration or risk propensity. Suggestions for directions that future research should take in order to test the proposed relations are discussed.

The Effect of Power on Exploratory Behavior

Power is a force that has shaped human history. Kings, emperors, and presidents have stood at the command of large armies and waged wars that have impacted the lives of millions of people, directly and indirectly. Religious leaders have dictated the appropriate way that their followers should carry out their daily lives, setting moral standards for people around the world. Multinational corporations and media moguls have spent billions of dollars to influence the opinions of the masses. The construct of power has been pervasive throughout most aspects of human society, but its influence has not been limited to world or group leaders. Power has also been shown to regularly affect the everyday behavior of individuals.

Power can motivate us to action (Galinsky, Gruenfeld, & MaGee 2003), make us more likely to take risks (McClelland & Watson, 1973), and convince us that we can control the uncontrollable (Fast, Gruenfeld, Sivanathan, & Galinsky, 2009). Power guides us to act differently towards our children than our supervisor, moves us to maintain an air of authority over our students while standing humble in the presence of our advisor, and dictates that we should take action in an emergency when we are in charge, but stand passively by when someone else in the room outranks us. Given the broad influence of power, it behooves us to understand how it will guide our everyday behavior and influence the way we negotiate our social worlds. Indeed, a considerable amount of research has been conducted in the last few decades to explore the influence of power. However, one question that has received relatively little attention within this research is how power may influence basic exploratory tendencies.

Throughout our lives, we encounter situations, objects, or people about which we know nothing, and we must decide whether to interact with these novel targets and gather information or whether we should avoid them and assume that they are negative. Novel items may be

harmful, in which case they are better left alone, or they may be helpful, in which case it would benefit us to investigate further. There are a multitude of factors that may influence what would be an otherwise ambiguous decision to interact with or avoid an unknown stimulus in our environment. However, one such factor that may influence our decision-making and behavior to a great extent is the perception of our own power. Specifically, higher levels of power may reduce perceptions of risk associated with novel situations and/or increase willingness to take risks which in turn may increase approach behavior and exploration. Thus, in the present research, the relationship between power and exploratory behavior was investigated with an additional focus on the mediating role of individual risk propensity.

The Power Construct

The concept of power has been pervasive in the social sciences for quite some time. The literature regarding power extends back to the writings of Plato, who viewed power as a force emanating from specified knowledge which was inherent in all forms of human activity. Likewise, Aristotle viewed power as a property present in all complex systems and, thus, power was essential in understanding relational behavior (Ledyae, 1997). Most contemporary definitions of individual power center on an individual's ability to exert influence or control over aspects of the environment such as limited resources and other individuals (see Anderson & Galinsky, 2006; Galinsky et al., 2003; Goldhamer & Shils, 1939; Keltner, Gruenfeld & Anderson, 2003; Manz & Gioia, 1983; Smith & Bargh, 2008; Wrong, 1995).

Russell (1938) defined power specifically as “the production of intended effects” (p. 35) and viewed power as the most fundamental component in the social sciences, analogous in importance to energy in the field of physics. Furthermore, Russell (1938) identified several specific forms of power: (1) traditional power, which is handed down from generation to

generation and is generally accepted as legitimate by the masses through force of habit; (2) naked power, which is more generally thought of as sheer force and is respected in and of itself; (3) revolutionary power, which is the form of power that typically replaces traditional power and generally represents the will of the majority or, at least, a large minority of the population; and (4) economic power, which results from secondary sources (i.e., stored resources that are in demand). In describing these concepts, Russell indicated that some of the greatest tragedies that have been carried out against mankind in human history such as slavery, cruelty to children, and religious persecution are associated with naked power.

Building on Russell's theoretical work, Lasswell and Kaplan (1950) proposed that the construct of power was relational, meaning power can only be present and observable in the context of a social relationship. They saw power as "a special case of the exercise of influence" (p.76). For Lasswell and Kaplan (1950), power was inherently tied to perceived value in that an individual could demonstrate power only by exhibiting the ability to influence the value system (including resources, motives, and desires) of another individual. Similarly, French and Raven (1957) stated that power and influence involved a relationship between two parties and that influence, or the use of power, took place through an intentional act by the power-holder. In more recent theoretical work, Wrong (1995) proposed that power was a mechanism of social control and that power must be used effectively in order for it to exist at all. The foundation of Wrong's (1995) theory of power was that it was an intentional act that occurred between a power-holder and a power-subject. In order for power to exist, the result of the power-holder's actions toward the power-subject must match the power-holder's intentions. Wrong (1995) cited three primary forms of power: (1) force, which occurs when the power-holder is able to physically restrict the freedoms of the power-subject (violence is viewed as the ultimate

embodiment of force), (2) manipulation, which results from the power-holder concealing his or her true intentions from the power-subject in order to achieve the intended results, and (3) persuasion, in which the power-subject freely produces the intended results of the power-holder by accepting the arguments of the power-holder at face value, in the absence of force or manipulation.

Power is different from related constructs such as dominance or authority. Dominance is an act by which an individual can strive to attain power, but it is not *necessary* in order to attain power (Keltner et al., 2003). A dictator rises to power by dominating all opponents and taking control of a country by forceful means; however, national leaders are also elected democratically. Thus, dominance is not a necessary component of power. Likewise, authority results from formal role assignment and gives an individual power, but authority is not necessary in order for one to attain power (Keltner et al., 2003). An individual who is appointed CEO of a large pharmaceutical company commands great power in making decisions that affect the company's employees and stockholders; however, the senior level chemist at the company, though not possessing formal authority in the same manner as the CEO, has power to affect the bottom line of the company because of the specialized knowledge and expertise that he or she possesses.

Thus, power is an omnipresent force in our social interactions. It is a relational construct that describes the ability of one individual to bring about intended effects in another. We can view power as defined by this relationship as the ability of A to influence B in such a way that B produces effects as intended by A. Given the theorized pervasiveness of power, a considerable amount of research has been produced in a relatively short period of time examining the nature of power and its impact on social life. Recent empirical studies regarding power can be grouped

into three primary categories: bases of power, need for power, and consequences of the power motive (Anderson & Berdhal, 2002).

The Bases of Power. In order for an individual to wield power over another, there must be some basis for the power. According to Lasswell and Kaplan (1950), "...the power base is the value which is the condition for participation in decision making..." (p. 83). French and Raven (1957) identified five specific bases of power: rewards (resources used as incentives), coercion (ability to administer punishments), legitimacy (acknowledgement of power by the object), reference (identification with a source of power), and expertise (specific knowledge). Additionally, Wrong (1995) stated that accumulated resources provided a basis for possible power and that these resources must be sufficiently liquid, meaning they must be able to be readily deployed to influence others. Russell (1938) also indicated that resources (material and non-material) contributed to an individual's power base, and that power can take the form of "wealth, armaments, civil authority, and influence on opinion".

In their model of the organizational interrelationship of power and control, Manz and Gioia (1983) theorized that controlling resources was essential for possessing power within an organization. Specifically, the authors argued that when an individual acquired control over key resources within an organization, others became dependent on this individual for distribution of the resources (provided a substitute for these resources did not exist). Thus, this level of dependence represented the power that the individual now possessed within the organization. In an empirical study examining coalition formation and bargaining, Kravitz and Iwaniszek (1984) demonstrated that resources (operationalized in this study as the number of 'votes' that a participant was allotted in a bargaining game) had a significant effect on payoffs. In this study, participants were tasked with forming a coalition to pass a fictitious piece of legislation. Each

participant was randomly assigned a number of votes that they could use in their attempt to pass legislation. Participants were able to team up with each other to form a coalition in order to increase their chances of success and each participant's goal was to be a member of the winning coalition. After all votes were cast, the winning coalition was awarded a prize that the members could divide up in which ever manner they agreed to. Results indicated that participants with more votes had greater influence on whether the legislation passed, and tended to receive a higher overall payoff (after dividing the winnings among members of their coalition) than participants who were allotted fewer votes. In post session questionnaires, several participants commented that the votes came to represent positional power during the game. Thus, participants who were allotted more votes were viewed as more powerful by other participants, and were able to negotiate with other coalition members for higher payoffs at the conclusion of the game, lending support to Manz and Gioia's (1983) theory.

Research has shown that simply being a member of a group with elevated social status or high rank within an organization tends to result in that individual being perceived as powerful. In such instances, the members of the elevated status group (or majority group) tended to perceive more control over their behavior and their outcomes than their counterparts who were part of minority groups (Guinote, Brown, & Fiske, 2006). Additionally, majority group members tend to exert more influence over other individuals in their environment than minorities. Thus, majority members can be viewed as possessing elevated power in their social world from the standpoint that they have a greater ability to influence others (Nemeth, 1986).

Thus, in order to possess power, an individual must have a power base from which the ability to influence others will emerge. This base may consist of material possessions (wealth or limited resources that are needed by others), group affiliation, knowledge, or expertise to name a

few examples. Regardless of the specific source, the power base enables the individual to influence others in a manner that produces intended consequences.

The Need for Power. Other research has examined the degree to which an individual strives to attain and maintain a position of power. Russell (1938) proposed that if power is made available to everyone, those individuals who desire power the most are those who are most likely to have it. This would indicate that some individuals are inherently more motivated to pursue and occupy positions of power than others and that individuals will react differently to possessing or perceiving power. In empirical studies, this motivation to pursue power has been referred to as a need for power, or nPower (Veroff, 1957). The need for power describes a state of being unfulfilled and being motivated to actively pursue powerful roles. This need is fulfilled by taking action and making decisions that influence the lives of others (Magee & Langner, 2008). Individuals with a high need for power tend to show more interest in leadership roles, are rated as more argumentative and as more interested in convincing others of their point, and tend to place less emphasis on social values (Veroff, 1957). There is evidence that the need for power is also associated with a fear of weakness (Nell & Strumpfer, 1978) and a tendency toward extreme risk taking (McClelland & Watson, 1973). Additionally, an individual's need for power affects the degree of power that will be perceived in others. For instance, individuals who have a high need for power tend to view others as more powerful and, thus, perceive higher benefits if they are able to influence them (Imai, 1993).

McClelland (1975) also proposed that certain people are inherently more prone to pursue and achieve positions of power than others. One example is that of an office manager: the role of a manager is to influence others, and therefore, individuals who occupy management related roles are predisposed to pursue power to a greater extent than those who do not. Based on

theoretical work such as this, several studies have linked personality traits with the power motive. Extraversion has been related to the willingness to pursue powerful career positions in women (Winter, Stewart, John, Klohnen, & Duncan, 1998; Olson & Weber, 2004). Additionally, dominance, increased social skills, and charisma have been associated with high power individuals (Keltner et al., 2003). There is evidence that higher levels of power are associated with lower levels of agreeableness (Olson & Weber, 2004). And, studies have shown that communality (one's propensity to take steps to integrate oneself into a larger social unit) is associated with lower levels of trait power, indicating that individuals with higher levels of trait power are less likely to pursue integration into larger social groups (Saragovi, Aube, Koestner, & Zuroff, 2002).

Freeman and Lanning (1989) found evidence that a gender difference may exist in power motivation. Based on scores from the California Psychological Inventory (CPI) which measures personality characteristics, and the Social Orientation Inventory (SOI) which measures social power motivation, the authors demonstrated that men may be more motivated than women to achieve social or organizational power (power over a large group). In this sample, the male participants who were motivated to seek out organizational leadership positions were shown to be high in self-esteem, masculinity, and dominance characteristics. Conversely, women were more motivated than men to achieve interpersonal power (power over another individual). In this sample, the women who were motivated toward interpersonal power positions tended to have lower self-esteem, were more interested in achievements on an individual (as opposed to a group) basis, and showed a desire for individual dominance. Thus, research has shown there to be different types of motivation to attain power, and that these motivations may be moderated by interpersonal differences such as gender.

In more recent research, Magee and Langner (2008) addressed two distinct power motivations in a similar fashion. The authors conducted research examining the differences between personalized power motivation, which refers to an interest in influencing others without regards to the other's interests, and socialized power motivation, in which an individual displays an interest in having a pro-social impact on the lives of others. Across two studies, the authors demonstrated that in the context of a conflict, personalized power motivations were associated with a reduction in deliberations over participants' actions and an increased likelihood to escalate conflict against another party, whereas there were no significant effects for a socialized power motivation. Conversely, in the context of debating health care policy, socialized power motivations were associated with reduced deliberations and a tendency towards more pro-social decision making (e.g., approval of a new life saving drug in a hypothetical construct), whereas there were no significant effects for a personalized power motivation. These findings map nicely onto theoretical work by McClelland (1975), who distinguished between two different ways of expressing power: personal power is expressed more through person-to-person confrontation and is associated with low levels of inhibition, whereas socialized power is expressed through benevolent acts and concern for group goals.

Taken together, it is evident that to a large degree, the need for power stems from individual traits that increase the likelihood that some individuals will pursue positions of power. There are also differences in individual motivations for using power, with some individuals being more likely to pursue power for personal gains, whereas others have more pro-social power motivations.

Consequences of the Power Motive. A significant amount of literature has focused on the outcomes of having power. This involves both the consequences of possessing power for the

individual, as well as the consequences of perceiving power in others. Indeed, the perception of power in others can significantly impact an individual's behavior (Anderson & Berdhal, 2002). For example, Raven (1999) theorized that organized religion is an ultimate form of illusory control stemming from the perception of power. Deities of the major monotheistic religions (i.e., Christianity, Islam, and Judaism) are seen as all powerful and, as such, are perceived as being able to control all aspects of the environment, life on Earth, and the afterlife. Consequently, followers of these religions tend to structure their lives to conform to the perceived wishes of these deities and avoid potential punishment.

The perception of power in an authority figure also leads people to obey. Milgram (1963) demonstrated this in his classic study of obedience in which participants were assigned to administer increasing electric shocks to another participant, or the learner. In reality, the other individual was a confederate and did not receive any electric shocks. However, participants heard prerecorded responses supposedly from the learner through an intercom system. As the severity of the shocks increased, the learner was heard to be in significant pain and distress. Yet, despite hearing cries of pain, most participants continued with the study and kept applying (what they believed to be) real electric shocks to the learner. Although many of the participants were disturbed by their actions and did not want to continue, they did so because an authority figure, the experimenter, told them to continue. The power perceived to be held by the experimenter led participants to act in a way counter to their wants and desires.

In another classic study, commonly known as the Stanford Prison Experiment, Haney, Banks, and Zimbardo (1973) displayed evidence that the perception of power in the self can lead people to become more aggressive and dehumanizing. In this study, participants were randomly assigned to either the role of prison guard or the role of prison inmate. Those assigned to prison

guard quickly became abusive and authoritarian towards their counterparts, whereas those assigned to the role of inmates became submissive and helpless. It was only a matter of hours before participants, who prior to the study were all presumably equals as college students, became absorbed in their roles which were delineated by an imbalance of power.

The consequences of having power have been a relevant topic in the literature on organizational behavior. Reduced power in the work environment has been shown to have negative impacts on the psychological well being of minority group members (Soriano & Ramirez, 1991). Specifically, Chicano participants who perceived themselves as having lower social power and influence in their work environment reported significantly higher levels of anxiety and depression, as well as lower levels of self-esteem, compared to Chicanos who perceived that they had equal status in their work environment. However, the negative consequences of being in a low power position may be moderated by perceptions of one's own power. For example, individuals whose dispositional power (i.e., the power that they perceive themselves as holding) matches the power associated with their job or task role tend to report a greater ability to express who they are and view it as more likely that others will be able to discern their emotions (Chen, Langner, & Mendoza – Denton, 2009). This would indicate that holding a low power job may not be as detrimental to an individual who perceives himself or herself as being less powerful.

There is evidence that power can lead individuals to perceive elevated levels of personal control as well. Lachman and Weaver (1998) demonstrated high socio-economic status (SES) to be associated with higher levels of perceived control and better health. Conversely, lower SES groups reported perceiving more constraints in their life and lower mastery of their trade. Research has shown that this variance in the perception of personal control can even extend to

aspects of our lives that are truly uncontrollable. Individuals primed with high power tend to perceive control over the outcome of events such as the roll of a die (Fast, Gruenfeld, Sivanathan, & Galinsky, 2009), and high power individuals are also more likely to vote due to a perceived increase in their ability to influence election results (Deutchman, 1985; Fast et al., 2009). Thus, there is evidence that power leads to an illusion of control, which may promote differentiated behaviors between high and low power individuals. In particular, high power that leads someone to believe that they can control the uncontrollable may result in reckless behavior and more risk taking.

Indeed, research has shown power to be associated with an increased willingness to take risks in order to win a game (Mindock, 1972). In this study, participants rolled a pair of dice in order to determine how many spaces they were able to move along a game board. The game board was designed so that there were different paths that participants could choose to navigate around the board. However, the paths varied in the extremity of potential gains and losses. The object of the game was to circumnavigate the game board three times as quickly as possible by rolling dice and moving the game piece according to the number rolled. Each space on the board was labeled with a point value, some negative whereas others were positive. In a given turn, participants were awarded points according to the point value associated with the space on which they landed. Participants could choose to navigate their piece around the outside of the board, which contained more overall spaces, but which had less extreme point values on each space (values ranged from -50 points to 50 points). Conversely, participants could opt to take a shorter route through the middle of the board, where point values associated with the spaces ranged from -400 points to 400 points. When rolling the dice, participants in the high power condition were instructed to multiply their roll by a factor of three, whereas participants in the low power

condition moved their piece according to the face value of the dice. This was an important advantage to the participants in the high power condition, as scores were dependent on the speed with which participants were able to navigate completely around the board three times. Results of the study revealed that participants in the high power condition were more likely to chose paths through the middle of the board with much more extreme potentials for gains and losses, whereas participants in the low power condition tended to chose paths around the outside of the board, which presented more moderate gain and loss possibilities.

Research has also provided evidence that the perception of control is linked to an increase in risk taking behavior in driving simulations (Horswill & McKenna, 1999). Increased personal control has also been associated with a decrease in the perception of risk associated with real-world activities such as drug use, dangerous outdoor sports, and sexual behavior (Nordgren, Van Der Pligt, & Van Harreveld, 2007). Conversely, perceiving one's self as less powerful has been associated with an increased perception of threats from others (Anderson & Berdahl, 2002).

It has been shown that the heightened perception of power is not only related to an increase in willingness to engage in risky behavior (e.g., unprotected sex), but also with an increase in overall optimism in assessing risk, as measured by the self-reported likelihood that participants would experience certain positive or negative life events (Anderson & Galinsky, 2006). Across several experimental studies, the authors demonstrated that power led people to be more optimistic about risk, regardless of whether the risks were personally relevant versus more generalized or controllable versus uncontrollable. Repeatedly, across the studies, high power was associated with an increase in risky behavior.

This risk differential has also been observed in the context of social status. Higher status individuals have been shown to be more likely to display antisocial behavior in their interactions,

whereas low status individuals have tended to display more pro-social behavior (Keltner, Young, Oemig, & Monarch, 1998). Hence, in these studies, high status individuals have taken greater social risks than their lower status counterparts. Additionally, more socially anxious individuals show a tendency to perceive greater levels of threat and are more likely to avoid activities that may lead to rewards (Kashdan, Elhai, & Breen, 2008), and social anxiety has been shown to be associated with low social status (Strauss, Lahey, & Frick, 1988). Thus, if status is viewed as a measure of power, it would appear as though power reduces social anxiety and perceptions of social threat, resulting in higher power individuals being more willing to take social risks.

Past work in economics has shown that propensity for risk increases after a successful run in the stock market, presumably because a series of gains will cushion any losses incurred thereafter (Barberis, Huang, & Santos, 2001). In this vein, risk perception can be viewed as the overall ratio of resources possessed versus the potential for loss. If the potential for loss remains constant but the power increases due to a gain in the possession of resources, the risk associated with the potential loss will be perceived as lower. It has also been shown that high power individuals are more attuned to the utilitarian value of social objects than low power individuals (Gruenfeld, Inesi, MaGee, & Galinsky, 2008), which may help explain differential economic behavior between high and low power individuals.

The consequences of power for the power-holder and the subject of power are extensive, from affecting well-being to inducing obedience. Of particular interest is the extent to which power has been shown to influence an individual's willingness to engage in risky behavior. This consequence has broad implications for the relationship between the individual and his or her environment. If powerful individuals are less likely to shy away from risky situations, then they may be more likely to approach and interact with people and objects in their social world. Thus,

at a basic level, power may affect fundamental behavioral tendencies such as approach and avoidance.

Approach / Avoidance Behavior

Approach and avoidance tendencies are some of the most primal, instinctive human behavior patterns discussed in social psychological research. Early literature regarding approach and avoidance behavior revolved around the notion that humans were motivated to move toward objects that produce pleasure and move away from objects that result in pain (Freud, 1920, 1961). Historically, theorists have held the view that this hedonic drive to approach pleasure and avoid pain was at the core of basic human motivation. Research in approach / avoidance behavior has demonstrated that people will generally approach items that they believe to be good and avoid items that they perceive to be bad (see Baumeister, Bratslavsky, Finkenauer, & Vohs, 1991; Taylor, 1991). This sounds quite simple, but there are a considerable number of factors that can influence an individual's construal of what is perceived to be "good" as opposed to "bad", and an object that is viewed as good by one person may appear bad in the eyes of another. For instance, some might view a double espresso as an essential component in the process of waking up and getting the morning off to a good start; however, another person might view the same drink as something that will make them jittery and unfocused all morning and, hence, will avoid it. In pursuit of a clearer understanding of these tendencies, the literature on approach and avoidance behavior has seen expansion of late.

In Higgins' (1997) theory of regulatory focus, approach and avoidance behavior were explained through an understanding of individual goals, current states, and desired end states relative to the achievement of these goals. Regulatory focus explains what has been traditionally referred to as the hedonic approach / avoidance drive, but develops the theory from a markedly

different motivational standpoint. Instead of simply approaching what is perceived to be ‘good’ and avoiding what is perceived to be ‘bad’, regulatory focus explains approach behavior as an individual’s striving to minimize the discrepancy between their current state and their desired end state. Higgins (1997) proposed that people do this by having two primary systems of focus: a promotion focus, which pushes individuals to strive for growth, advancement, and accomplishment; and a prevention focus, which is associated with an individual striving for security, safety, and responsibility. Trying to win a game, hunt for food, or strike up a conversation with a potential mate are all examples of approach behavior through promotion focus. Conversely, trying to not fail a test, staying home to avoid an awkward encounter at a party, or selling off investments to limit financial losses are examples of avoidance behavior through a prevention focus.

The theory of regulatory focus also states that a promotion focus will increase an individual’s sensitivity to positive outcomes and a prevention focus will increase sensitivity to negative outcomes (Higgins, 1997). In this sense, an individual pursuing a goal from the standpoint of a promotion focus should be more aware of the potential benefits that may result from their achievement and less aware of the potential downside of goal pursuit. Therefore, the individual will be more likely to initiate action in pursuit of the goal. Conversely, an individual with a prevention focus will be motivated to minimize any increase in discrepancy between a current state and a desired end state. Thus, these individuals will tend to display more avoidance behavior via their prevention focus. Promotion and prevention foci dictate fundamentally different goal achievement strategies that will influence individual behavior.

Studies by Crowe and Higgins (1997) provide support for regulatory theory. In two studies, the authors demonstrated differences in task performance between individuals randomly

assigned to a promotion focus condition and individuals assigned to a prevention focus condition. When asked to solve an anagram after being given an impossible task, participants who were assigned to the promotion focus condition generated significantly more solutions than those assigned to the prevention focus condition. Participants in the promotion focus condition persisted longer at a difficult embedded figure task than did participants in the prevention focus condition, and when asked to list all the characteristics of a given object, participants in the promotion focus condition listed significantly more characteristics than participants in the prevention focus condition. Furthermore, participants in the prevention focus condition repeated a marginally higher number of characteristics than participants in the promotion focus group, presumably because the prevention focus led participants to limit the likelihood that they would make mistakes of commission, whereas participants in the promotion focus were guarding against errors of omission.

Thus, a promotion focus is associated with approach related behaviors, whereas a prevention focus is associated with avoidance related behaviors. These fundamentally different strategies dictate behavioral responses that influence how an individual will interact with his or her environment. That is, the decision to approach or avoid has specific consequences for how we learn about people, places, and objects in our environment. In particular, this decision will determine whether we gain information or maintain preconceived notions. Of particular interest is the degree to which power influences the decision to approach or avoid.

Power and Approach Behavior

In recent work, Keltner and colleagues (2003) have proposed the Approach/Inhibition Theory of power. This theory posits that high power is associated with positive affect, attention to rewards, automatic information processing, and disinhibited behavior. Conversely, the

authors propose that low power is associated with negative affect, attention to threats, controlled information processing, and inhibition. According to this theory, high power individuals will experience more elevated moods, view others as a means to achieve their goals, and will act in a less socially regulated manner, whereas low power individuals will experience more negative mood states, will see themselves as a means to the achievement of others' goals, and will tend to take fewer social risks. This theory is particularly relevant to the proposed research, as it makes predictions as to the behavioral influences of power. Specifically, the authors propose that elevated power will prompt simple approach behaviors such as entering others' social space and initiating physical contact. The authors also propose that reduced power will lead to increases in behavioral inhibition such that low power individuals will be less likely to verbalize their ideas, will be less actively engaged in group projects, and will generally display increased levels of inhibition and avoidance in most domains of social behavior.

A handful of studies have given empirical support to the propositions of the Approach/Inhibition Theory. Galinsky and colleagues (2003) demonstrated that participants primed with high power were more likely to take a card in a game of blackjack, were more likely to take action to remove an annoying stimulus object from their environment, took more from a common pool of resources when asked how much they wanted, and contributed more to the shared pool when asked how much they would give. Thus, power was shown to prime action.

Anderson and Berdhal (2002) found that participants who were lower in trait levels of power, assessed by measuring personality dominance, were less willing to express their true opinions, were more likely to express agreement with a partner, and were more likely to experience negative emotions than participants who were high in personality dominance, when negotiating with a partner in a task that involved allocation of a shared resource. The authors

also found that manipulating power by randomly assigning half of the participants to a leadership role, and half to a subordinate role, produced comparable effects in a similar task involving the allocation of resources. Those in the low power condition reported feeling more threatened by their interaction partner and were more inhibited in their negotiation responses, whereas high power participants were more likely to express their true attitudes and opinions.

In another test of the Approach/Inhibition Theory of power, Smith and Bargh (2008) demonstrated that participants primed with high power showed a greater propensity to take action and engage in approach related behavior. In the first of three studies, power was manipulated by asking participants to either write about a time when they had control over someone else (high power), about a time when someone else had control over them (low power), or about the preceding day (control). Participants then completed the Behavioral Activation System (BAS) / Behavioral Inhibition System (BIS) scales (Carver & White, 1994). Participants in the high power condition scored more highly than those in the low power or the control condition on the BAS, which has been shown to predict cognitive, affective, and behavioral approach responses. In the second study, power was manipulated through a scrambled sentences task, in which participants had to make a sentence using 4 out of 5 words given to them in random order. In the high power condition, 9 of the 17 word groupings contained a word associated with having power (e.g., authority, controls, privileged) whereas 9 of the 17 groupings in the low power condition contained a word associated with a lack of power (e.g., complied, obey, subordinate). For the control condition, all 17 word groupings contained power irrelevant words. Participants were then asked to participate in a computer task in which they had to move a cursor toward one type of stimulus object that appeared on a computer screen and away from another. High power individuals made the decision to approach or avoid more quickly than low

power individuals. In the third study, participants were randomly assigned to high power, low power, or control groups and primed using the same mechanism as in the first study. When asked to choose a seat while waiting to complete the study, participants primed with high power sat significantly closer to a confederate than those primed with low power.

The research by Smith and Bargh (2008) provides direct support for Keltner and colleagues' (2003) proposal that high power individuals have an elevated propensity for approach behavior as compared to low power individuals. Whereas these findings are interesting, they are limited in the extent to which they can describe the dynamics of human behavior in everyday life. The acts of moving a computer cursor in response to a stimulus or choosing a seat are associated with few, if any, underlying risks or rewards. It is of more practical interest to develop an understanding of the influence that power has on goal motivated decisions and behaviors. Specifically, an understanding of the influence that power has on exploratory behavior would provide insight into human activity that is readily observed in everyday life. Exploration provides a unique dilemma beyond that of a simple approach or avoidance decision in that the object of approach or avoidance is unknown. Thus, the system of risks and rewards associated with that object is subject to more conjecture than it is during interactions with a known object. Studying the effects of power in this context would extend the support for the Approach/Inhibition Theory to a new empirical setting. To date, no findings have been published that have tested Keltner and colleagues' (2003) theory in the context of exploration. Thus, in the proposed studies the main focus was on extending these findings to the context of exploratory behavior.

Exploratory Behavior

We frequently meet new people, are offered new products, embark on trips to new destinations, and sample previously foreign cuisine. Every time we encounter a previously unknown object in our environment, we are faced with a choice. We can either investigate the object, potentially gaining valuable information about how beneficial or harmful the object may be, or we can choose to pass it by, in which case we do not stand to learn anything about the relative value of this new entity. In the case of a truly novel item, this would seem to pose somewhat of an ambiguous decision prospect. If we truly have no prior information about a person, place, or material item with which we come into contact, we presumably should have no motivation to investigate it further; however, we also have no basis for passing it by. Seemingly, we could ponder infinitely over the decision to approach or avoid this new object, but this generally is not the case. We regularly make the choice to approach or avoid novel stimuli, often quickly and without much conscious thought.

Exploration is a form of decision-making. More specifically, it is the decision about whether or not to interact with novel people, objects, or situations in one's environment. Decision making in an exploratory situation typically involves the decision maker having less than optimal information about the object of interest, and this lack of information differentiates exploration from decision making in a known environment. In order to explore, one must first make the decision to approach a novel object in their environment. Once the decision to approach has been made, an individual will receive feedback as to the accuracy of his or her assumptions, and learning will occur. This is a unique type of learning, otherwise known as reinforcement learning. The concept of reinforcement learning describes the actions taken by an individual to approach a novel object, explore the object to gain information about what is

potentially beneficial or harmful about the object, and to repeat behaviors that result in benefits or overall positivity (Sutton & Barto, 1998). Thus, approach related behavior will result in feedback which will either confirm or disconfirm assumptions that were made prior to interaction with the novel object. The learning that occurs in this sense can be thought of as ‘accurate learning’. Admittedly, learning still takes place through avoidance, though in this sense, all that is being learned is in regards to the prior assumptions that were made about the novel object. Because the object was avoided, no further information was made salient to confirm or disconfirm these prior assumptions. From this standpoint, it is more likely for incorrect assumptions to persist through avoidance, and it is likely that this learning will be significantly less accurate than learning that occurs through approach behavior.

There is some evidence that power relates to information gain and learning. Copeland (1994) demonstrated that high power individuals tend to request more information about (previously unknown) potential interaction partners than low power individuals. This indicates that empowered individuals are more attuned to the value in pursuing information when exploring. This is consistent with research that has demonstrated that power and control are associated with an increased perception of informational power (Eyuboglu & Atac, 1991). Thus, individuals with power tend to have a heightened sense of the value of new information. This aligns with research by Raju (1980) who demonstrated that individuals tend to feel less threatened and, thus, tend to approach ambiguous stimuli more readily when they perceive a sense of control over the objects in their environment. The case has been made that exploration is a special case of approach and avoidance behavior directed at novel objects. In order to study this behavior effectively, one must either observe exploration occurring naturally or construct a laboratory environment that effectively mimics the conditions of approach / avoidance behavior

in the context of reinforcement learning. Thus, the discussion turns to a paradigm that has been developed specifically for the purpose of studying exploratory behavior

The BeanFest Paradigm. In their research involving attitude formation through exploration, Fazio, Eiser, and Shook (2004) developed a research paradigm known as “BeanFest” which simulates the unique set of circumstances associated with exploratory learning. BeanFest is a computer based game in which participants are presented with a series of novel stimuli (beans) with which they have no prior experience. Visually, the beans vary in two ways: shape (i.e., from circular, to oval, to oblong) and the degree to which they are speckled (i.e., one to ten speckles). The beans also vary by valence. Half of the beans are positive (i.e., increase points), and half of the beans are negative (i.e., decrease points). Throughout a series of trials, participants are presented with beans and are asked to make a decision to either approach or avoid them. If approached, good beans will benefit the participant’s score in the game, whereas bad beans will be detrimental. If a given bean is avoided, the participant’s score is not impacted in any way; however, the participant does not gain any knowledge as to the nature of the bean, thus mimicking real-life exploration.

In their initial studies, Fazio and colleagues (2004) found evidence for a learning asymmetry, with participants learning negative beans more readily than positive ones. Furthermore, they demonstrated that the asymmetry was due to participants’ exploratory behavior. Given the contingent nature of the feedback during the BeanFest game, individuals only received feedback when they chose to approach beans. As discussed earlier in the context of ‘accurate learning’, when an object is approached and explored, an individual will either receive confirmation that the object is in fact positive or will be made aware that the object is negative and should be avoided in the future. Therefore, it is relatively unlikely that someone

would incorrectly categorize a negative object after a period of learning. Conversely, when an object is avoided, no information is gained about the true nature of the object. Instead, a negative assumption about the valence of the avoided object is developed. In the case of a positive object being avoided, the individual will not receive any disconfirming feedback that would bring attention to the error, thus making miscategorization of a positive object much more likely. Thus, participants who displayed more avoidance behavior had a larger learning asymmetry, learning the negative beans much more readily than the positive, whereas participants who displayed more approach behavior showed a significant reduction in this learning asymmetry.

BeanFest provides an ideal laboratory setting for testing Keltner and colleagues' (2003) Approach / Inhibition Theory of power in the context of exploration. Prior research suggests that power should reduce perceptions of risk and activate approach related response patterns. In an exploratory setting, this should increase the tendency to interact with novel stimuli and increase accurate learning. The present studies served to reduce a gap in the existing literature with regard to this relationship.

Present Research

The purpose of the present research was to investigate power and its effect on exploratory behavior. Keltner and colleagues (2003) recently published their Approach / Inhibition Theory of power, and several studies have found supporting evidence for the theory by examining the effect of power on the tendency to approach or avoid stimuli (see Anderson & Galinsky, 2006; Galinsky et al., 2003; Smith & Bargh, 2008). However, no findings to date have been published that assess the relationship between power and an individual's decision to approach and investigate objects in their environment that are new, unfamiliar, and most likely unknown. This

unique domain of social behavior is important to understand because of its pervasiveness in our social lives. Whenever people start a new job, go on a first date, come across the latest technological gadget, or encounter an unfamiliar face on the bus, they are faced with a decision: To what extent will they interact with, and thus learn about the new people and objects in their environment? Conversely, to what extent will they avoid new experiences (thus potentially holding on to uninformed biases)? To date, it does not appear that any research has been published that has examined the influence of power in this unique social context of exploring the unknown. However, prior research regarding the relationship between power and approach behavior provides a strong theoretical basis for the proposal that power influences behavior in exploratory situations as well. Based on this past research, it was hypothesized that high power would lead to increased approach behavior and exploration. Furthermore, the relation between power and exploration was expected to be mediated by willingness to take risk.

Power has been associated with increased optimism with respect to risks and increased propensity to engage in risky behavior (Mindock, 1972; Horswill & McKenna, 1999; Anderson & Berdahl, 2002), and exploration can be viewed as a risk. When exploring, it is unknown whether the object of exploration will be beneficial or harmful. Avoidance behavior will generally reduce one's risk of exposure to negative consequences while at the same time, reducing the likelihood of benefits. Conversely, approach behavior can increase the likelihood that one will encounter positive outcomes while simultaneously increasing one's exposure to risk. Thus, the outcome of the interaction that follows from the approach behavior is less certain, and the behavior itself (the act of exploring) carries risk. The evaluation of the magnitude of this risk is based on an individual's perception. That is, in the absence of any explicit positive or negative information about a stimulus item, individuals must base their decision of whether to

approach or avoid the object on their evaluation of the risk. Based on previous research, high power individuals should be less likely to perceive risk in approaching a novel target and/or more willing to engage in such risky behavior. Therefore, it was predicted that a significant amount of the increase in exploratory behavior associated with high power participants would be due to increases in willingness to take risks. In other words, increased power would lead to an increased willingness to take risks, which would facilitate exploratory behavior.

In order to examine the association between power and exploration, as well as the potential mediating role of willingness to take risk, two studies were conducted. The first study utilized a correlational design to examine the relationships among trait level power, willingness to take risks, and exploration. Also, the associations between these variables and learning were explored. It was expected that individuals who displayed higher levels of trait power would be more likely to explore and accurately learn about their environment, and that this behavior would be mediated by increases in willingness to engage in risky behaviors. Moreover, higher levels of exploration were expected to be associated with less asymmetry in learning (i.e., more equal learning of positives and negatives).

The second study followed an experimental design to test the causal direction of the relationship between power and exploration. Participants were randomly assigned to either a high or low power condition to test the hypothesis that high levels of power cause increases in exploratory behavior due to an increased willingness to engage in risky behaviors. Once again, the outcome of this relationship on learning was explored.

In both of these studies, it was expected that high power individuals would demonstrate an increased propensity to explore novel objects. It was predicted that this increase in the exploratory behavior of high power participants would be mediated by the participants'

willingness to take risks. Put more simply, individuals who perceive themselves as being more powerful should be more likely to take risks, and specific to the context of exploration, would be more willing to take risks associated with approaching unknown objects in the environment. This increase in the approach related behavior of high power individuals was predicted to have the secondary effect of facilitating more accurate learning. Individuals who approach novel objects should have more opportunities to disconfirm their false negative assumptions, resulting in a more accurate learning of both positive and negative objects that they encounter. Thus, high power participants were expected to learn new objects more accurately than low power participants.

Study 1

Hypotheses

In Study 1, it was expected that the measures of power, willingness to take risks, and exploratory behavior would be positively correlated with one another. Additionally, it was expected that both power and willingness to take risks would be significant predictors of exploratory behavior. However, it was predicted that willingness to take risks would mediate the relationship between power and exploratory behavior. Finally, it was predicted that participants who reported higher levels of trait power would demonstrate less learning asymmetry (more balanced learning of both positive and negative novel objects) in their environment than participants who reported lower levels of trait power.

Method

Study 1 was the first attempt to examine the relations among trait power, willingness to take risks, and exploratory behavior and to explore the mediating role of willingness to take risks. As such, a correlational design was employed. Participants were instructed to play a game

in which their success hinged on their ability to learn and correctly identify previously novel objects. Exploration played a key role in the participant's ability to be successful, as approaching these novel objects was the only way for participants to determine whether they were beneficial or harmful. Participants who reported higher levels of power were expected to report more willingness to take risks and were also expected to demonstrate more exploratory behavior while playing the game.

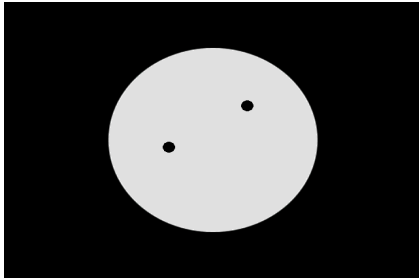
Participants. One hundred fifty-two undergraduate psychology students from Virginia Commonwealth University took part in the study during the fall 2009 semester. All participants were at least 18 years of age at the time of participation and were fluent English speakers. The data from 11 participants were excluded from the analyses due to noncompliance with the BeanFest game instructions and/or bias in questionnaire responses (e.g., the participant answered '5' to all 90 items of the CARE scale).

Of the remaining participants ($N = 141$), 66% were female, and the average age was 19.52 years ($SD = 1.99$). The racial distribution of the sample was 47% White, 26% African American, 13% Asian, 5% Hispanic, 1% Native American, and 8% of the sample reported their race as "Other". Forty-seven percent of the sample reported their religious affiliation as Protestant Christian, 50% reported their hometown as suburban (the metropolitan area of a large city), and 100% of the sample reported their marital status as single. Data from these participants were used in all of the analyses except for those regarding learning. Due to a procedural error in several research sessions, 36 participants were not administered the test phase of the BeanFest game. Thus, analyses involving test phase data are only based on a subset of the overall participants ($n = 105$).

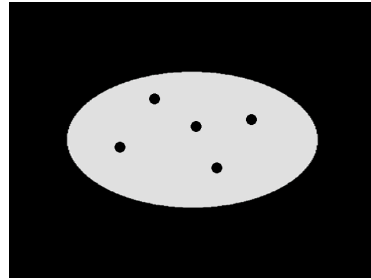
Participants received course credit for their involvement in the study. Additional incentive was provided by entering participants into a raffle for two \$25 Target™ gift cards at the end of the study. Participants' names were entered into the gift card raffle once for every 'win' they achieved during the BeanFest game. By entering participants in a raffle based on their performance, it was expected that they would be motivated to take the game seriously and focus on playing to the best of their ability in order to increase their chances of winning.

Materials / Measures.

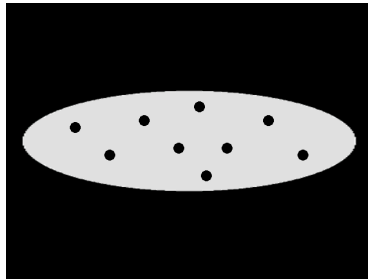
Exploratory Behavior. To assess participants' behavioral tendencies to explore, the attitude formation paradigm, BeanFest (Fazio et al., 2004), was used. BeanFest is a computer game which requires participants to interact with novel stimuli. Participants have a point value that can range from 0 to 100. During the game, participants are immersed in a virtual world of beans which can either help or harm their score. Participants success in the game depends on their ability to navigate the BeanFest world by approaching "good" beans (i.e., beans that increase the participant's score) and avoiding "bad" beans (i.e., beans that decrease the participant's score). Beans vary in two distinct ways: 1) Shape, ten variations of bean shape from perfectly circular to oblong, and 2) Speckles, 1 to 10 dots. During the course of the game, participants are exposed to a total of 36 different variations of beans. The 36 beans were selected such that there is no linear trend between the shape of the beans or the number of speckles and the valence of the beans. Thus, participants cannot learn a simple rule to succeed at the game (e.g., circular beans are positive). Half of the beans have a value of +10, and the other half has a value of -10.



Circular with few speckles



Oval with some speckles



Oblong with many speckles

Figure 1. Examples of BeanFest Beans

To emulate the conditions present during exploratory behavior, participants only received feedback about the value of a bean when they approached it. Once a bean was approached, the participant was informed as to whether the bean was “good” (increased their score) or “bad” (decreased their score). The participant’s score was then updated accordingly and the next bean was presented. However, if a participant chose to avoid a bean, they did not receive any information as to the bean’s value. Thus, the only way for a participant to gain information about beans during the course of the game was through approach behavior.

BeanFest began with a short practice block of 6 trials intended to familiarize the participants with the game and the feedback presented in the display. Participants were informed

that the beans presented in the 6 practice trials held the same value as they would during the regular game. Following the practice phase of the game, participants completed the learning phase of the experiment, consisting of 3 blocks of 36 trials each. Participants began the learning phase with a score of 50 points. During each trial, participants were presented with a bean and were given the option to approach or avoid it. If the participant chose to approach the bean, their score was increased by 10 points if the bean was “good”; however, their score was decreased by 10 points if the bean was “bad”. If at any point during the learning phase, the participant’s score reached 100 points, they were notified that they had won the game, and then started a new game at 50 points. Conversely, any time the participant’s score reached 0 points, they were notified that they had lost the game, and again, began a new game with 50 points. This continued until the participant had completed all 3 learning phase blocks. Thus, all participants were exposed to the same number (108) of learning phase trials. Participants’ exploratory behavior was measured by assessing the ratio of approach to avoid decisions during the learning phase of the BeanFest game. Thus, scores greater than 1 indicate that the participant approached more beans than he or she avoided, and scores less than 1 indicate that the participant avoided more beans than he or she approached.

Learning Asymmetry. The final phase of the BeanFest game is referred to as the ‘test phase’. During this phase, participants were presented with the 36 game beans in a random order and were asked to simply categorize the beans as positive or negative. No feedback was given during this phase. Learning was determined by calculating the percent of beans correctly identified. Of particular interest was the extent to which a learning asymmetry was exhibited in participants’ categorizations. Thus, the percentage of positive beans correctly identified was

subtracted from the percentage of negative beans correctly identified. Larger numbers represent a larger learning asymmetry with negative beans being learned better than positive beans.

Power. Participants' trait level of power was measured using an adapted version of the generalized sense of power scale (Anderson & Galinsky, 2006). The measure consists of 8 questions, each rated on a 7-point Likert type measure anchored at 1 (*Disagree Strongly*) to 7 (*Agree Strongly*). The items displayed strong internal reliability (Cronbach's $\alpha = .87$). The eight items in the scale can be found in Appendix A.

Willingness to Take Risks. Participants' willingness to engage in risky behavior was assessed using the Cognitive Appraisal of Risky Events (CARE) scale (Fromme et al., 1997), which consists of 3 subscales: Expected Risk (ER) (Cronbach's $\alpha = .88$) is a general measure of the participant's perception of risk; Expected Benefit (EB) (Cronbach's $\alpha = .87$) is a measure of the participant's perception that they will benefit from engaging in risky behavior; and Expected Involvement (EI) (Cronbach's $\alpha = .86$) is a general measure of a participant's propensity to engage in risky behavior. Participants are presented with 30 risky behaviors (e.g., Trying/using drugs other than alcohol or marijuana, Rock or mountain climbing) individually and make assessments of each behavior on the three subscales (see Appendix B).

As the EI subscale provides a measure of participants' expectations of their involvement in future risky behaviors, it served as the measure of willingness to take risks in testing the hypotheses of this study. The ER subscale was used as a measure of risk perception and the EB subscale was used as a measure of expected positive outcomes. Whereas these latter two measures are not associated directly with any of the hypotheses of the study, they were used to assess consistency across participant's responses, and validity in the EI measure. More specifically, it was expected that participants who reported higher levels of risk perception (via

the ER scale) would tend to report lower levels of willingness to take risks (via the EI scale). Additionally, it was expected that participants who reported higher levels of expected risk benefit (via the EB scale) would tend to report higher levels of willingness to take risks.

Mood. The Approach/Inhibition Theory of Power (Keltner et al, 2003) proposes that high power will be associated with increases in positive affect, and that low power will be associated with similar increases in negative affect. Additionally, past studies have shown positive affect to be associated with approach behavior, and negative affect to be associated with avoidance (see Ben-Zur, 2009 & Masterson & Crawford, 1982 for a review). As such, it was important to control for mood in order to ensure that any associations between power, exploration, and willingness to take risks were not confounded by differences in affect. Thus, all participants completed the Positive Affect Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS has strong external validity, with correlations between the PANAS and external measures of positive and negative affect ranging from 0.89 – 0.95. Both subscales of the PANAS displayed strong internal reliability: Positive Affect (Cronbach's $\alpha = .90$) and Negative Affect (Cronbach's $\alpha = .80$). The items that constitute the PANAS can be found in Appendix C.

Procedure. Upon arriving for the study, participants were asked to provide informed consent and were given a short overview of the purpose of the study as well as an overview of the BeanFest game. The research sessions were conducted with the cover story that the experimenters were interested in investigating the link between memory and learning. The first portion of the research session was the BeanFest game. Participants were given detailed instructions which explained the object of the game, the game controls, and the elements of the game display that they would see while they played. At the end of the instructions, participants

were also told that for every BeanFest game they won, their name would be entered into a raffle for two \$25 Target™ gift cards. After explaining the BeanFest game and having any of their questions answered, participants completed the BeanFest game, which was comprised of 1 practice round (6 trials) to ensure participants' familiarity with the game controls and display, 3 rounds of game play (36 trials each) in which participants were provided with feedback upon approaching beans, and participants' scores were updated after every trial in which they made the choice to approach the bean. Finally the "test" round was administered in which participants' learning of the game beans was assessed. During the test round, participants did not receive feedback regarding the true value of any beans. Rather, participants were merely asked to indicate whether or not they believed a given bean to be "good" or "bad".

Following the BeanFest game, participants were instructed to complete a series of surveys including the power measure and the willingness to take risks measure. A short demographic questionnaire was also included at the end of the survey packet to capture information concerning gender, age, race, SES, religious affiliation, and marital status. At the completion of the study, participants were debriefed and had the opportunity to ask questions of the experimenter prior to exiting the session.

Results

Means and standard deviations for all variables of interest can be found below. Prior to conducting any analysis, all variables were screened to test the assumptions of normality. The Negative Affect subscale of the PANAS demonstrated significant positive skewness. Upon visual inspection of the frequency distribution of Negative Affect scores, it appeared that there was a substantial floor effect in the subscale, with most participants reporting little or no negative affect. Square root and \log_{10} transformations failed to resolve the skewness, and thus the

Table 1.1.

Means and Standard Deviations for Study 1 Variables

Measure	Mean	SD
Generalized Sense of Power	5.02	.94
Cognitive Appraisal of Risky Events (CARE)		
Perceived Risk (ER)	5.13	.68
Expected Risk Benefit (EB)	2.65	.62
Willingness to Take Risks (EI)	2.74	.83
Exploratory Behavior	1.70	1.07
BeanFest Learning - % Correct	0.60	.11
Learning Asymmetry	0.08	.28
PANAS – Positive Affect	2.50	.85
PANAS – Negative Affect	1.55	.55

Negative Affect subscale was not used in any of the subsequent analyses. The rationale for using the PANAS scale was to control for any effect that mood might have on the analyses. Thus, from a theoretical standpoint, dropping the Negative Affect subscale from the analyses on the basis that most participants reported little or no negative affect should not place the conclusions of the study at any increased risk, as it seems that negative affect did not play a role in the participants' responses, at least to any measurable extent. All other variables met assumptions of normality.

Partial correlation was used to assess the relations between exploratory behavior, power, learning asymmetry, and willingness to take risks while controlling for positive affect. Partial Correlations are presented below.

Table 1.2.

Study 1 Partial Correlations Controlling for Positive Affect

<i>n</i> =102	1	2	3	4	5	6	7
1. Power	-	-	-	-	-	-	-
2. Perceived Risk	.18+	-	-	-	-	-	-
3. Expected Risk Benefit	-.24*	-.50***	-	-	-	-	-
4. Willingness to Take Risks	-.10	-.37***	.49***	-	-	-	-
5. Exploratory Behavior	-.16	-.10	.20*	.19+	-	-	-
6. BeanFest Learning - % Correct	-.06	-.01	.00	.11	-.04	-	-
7. Learning Asymmetry	.06	.13	.08	-.05	-.32**	-.27*	-

+ $p < .08$, * $p < .05$, ** $p < .01$, *** $p < .001$

The three subscales of the CARE scale correlated with each other as expected. Higher risk perception (ER) was associated with lower willingness to take risks (EI), $r(102) = -.37, p < .001$. Additionally, increased expected risk benefit (EB) was associated with increased willingness to take risks (EI) in these same risky activities, $r(102) = .49, p < .001$, and lower risk perception (ER), $r(102) = -.50, p < .001$.

Specific to the hypotheses of the study, analyses revealed a marginal correlation between willingness to take risks and exploratory behavior during the BeanFest game, $r(102) = .19, p = .06$. This indicates that as expected, participants who reported more willingness to take risks tended to approach the novel beans during the BeanFest game more readily than participants who were less willing to take risks. It is also interesting to note that the expected risk benefit was significantly correlated with approach behavior, $r(102) = .20, p = .04$. Participants who perceived greater benefit to taking risks tended to approach more beans. The analyses, however, did not reveal a significant relationship between participants' reported perceptions of power and willingness to take risks, $r(102) = -.10, p = .31$, or between power and exploratory behavior, $r(102) = -.16, p = .11$. Additionally, follow-up analyses revealed a strong positive bivariate correlation between the measures of power and positive affect, $r(141) = .24, p = .004$. Neither of these variables (power or positive affect) were significantly correlated with willingness to take risks or exploratory behavior.

Finally, there was not a significant relationship between power and learning, $r(102) = -.06, p = .53$, or between exploratory behavior and learning, $r(102) = -.04, p = .70$. However, there was a significant relationship, consistent with previous research involving the BeanFest paradigm, between exploratory behavior and learning asymmetry, $r(102) = -.32, p < .01$. In other words, the more beans that a participant avoided, on average, the greater the negativity bias in their learning (i.e., 'bad' beans were more accurately categorized than 'good' beans during the test phase).

Discussion

Study 1 was correlational in nature and intended to assess the relations between power, willingness to take risks, and exploratory behavior. Willingness to take risks showed a

marginally significant relationship with exploratory behavior in the predicted direction.

Participants who reported higher propensities for engaging in risky behavior tended to approach more beans on average than participants who were less inclined to engage in risk. Additionally, participants who perceived greater risk benefit tended to show higher levels of exploration as well. Whereas this was not a hypothesized result, it is consistent with the assumption above that greater perceived benefit of risk will be associated with more willingness to take risks, which should lead to increased exploration. Together, these two results provide additional support for the proposition that risk assessment plays a key role in the exploration of novel stimuli.

Individuals who see more potential benefits in taking risks tend to be more willing to act on these tendencies. Moreover, the relationship between willingness to take risks and exploratory behavior would seem to indicate that even in a seemingly innocuous game such as BeanFest, an individual who reports a greater degree of willingness to take risks in real world situations is also more willing to take a chance on exploring novel game objects in an effort to improve their score in the game. These results should be interpreted with caution, however. The correlational nature of Study 1 limits the ability to infer the direction of the relationship between willingness to take risks and exploratory behavior. Yet, it is more theoretically plausible that a greater propensity for risk taking will lead to more approach behavior, as opposed to approach behavior leading to a greater willingness to take risks; however, a more solid understanding of the causal nature of this relationship was investigated in the second study.

The relationship between perceptions of personal power and exploratory behavior was less clear. Contrary to the hypotheses of Study 1, participants' perceptions of their own power were not associated with willingness to take risks or exploratory behavior. At the same time, it was observed that there was a positive correlation between power and positive affect, which is

consistent with the Approach/Inhibition Theory of Power (Keltner et al., 2003). Those in positions of power are hypothesized to experience more positive mood states. Furthermore, previous research has demonstrated positive affect to facilitate the pursuit of approach related goals (Higgins, 1997). However, positive affect did not correlate with exploratory behavior or willingness to take risk. These inconsistent findings raised concerns about the trait power measure used in Study 1 and the hypothesized associations between the key constructs and power.

Due to the correlational nature of the study, the causal direction of the association between power and positive affect cannot be inferred. Thus, it may be that participants who were dispositionally higher in power tended to report more positive moods or that participants who were in a more positive mood during their participation in the study tended to also report higher levels of power. It is conceivable that more positive moods may have led participants to be more confident in their ability to influence and control others, resulting in higher ratings on the power measure. Additionally, it is possible that the Generalized Sense of Power measure did not capture perceptions of the ability to control or influence other people in the sample population as was expected. It is possible that in a college population, presumably made up of mostly first and second year students, there is a general lack of experience with the ability to control and influence others. With this consideration in mind, there are questions with regard to what the Generalized Sense of Power measure captured in this study. Again, the correlation between power and positive affect may indicate that participants' perceptions of their own power are driven by their current mood rather than perceptions of their ability to control or influence others. If that is the case, responses to the scale items may reflect participants' general mood state rather than trait power.

Another possibility is that the hypothesized relations between power, exploration, and willingness to take risks are incorrect. Study 1 did not reveal differential behavior across the participant sample to indicate that participants who were higher in trait levels of power tended to exhibit more exploratory behavior. This lack of significant findings could be viewed as evidence supporting the absence of a relationship between power and exploration. However, as the results of Study 1 did indicate a relationship between willingness to take risks and exploration, and because the theoretical basis for the relationship based on prior research appears to be strong, the results of Study 1 related to power should be viewed as inconclusive pending further research.

The main hypothesis of Study 1 was that willingness to take risks would mediate the relationship between participants' perceptions of their own power and exploratory behavior. Without significant relationships between power and exploration or power and willingness to take risks, this mediational relationship could not be investigated. In order to gain more clarity into the relation between power and exploratory behavior, Study 2 incorporated an experimental design and manipulated perceptions of power in participants. This research design was intended to provide evidence of the causal nature of the relationship between power and exploratory behavior as well as the relationship between power and willingness to take risks. Additionally, Study 2 used a power manipulation that has been demonstrated to be effective in past research (see Galinsky et al., 2003; Smith & Bargh, 2008). Thus, if the lack of significant findings in Study 1 was a result of ineffectiveness on the part of the trait level power measure that was used, Study 2 should address this shortcoming through the experimental manipulation of power.

Study 2

The purpose of Study 2 was to experimentally test the effect of power on exploratory behavior and to determine whether this effect is mediated by willingness to take risks. To do

this, power was manipulated using a technique used previously by Galinsky and colleagues (2003). Participants were randomly assigned to a high power or low power condition and were asked to play the BeanFest game as in Study 1. By experimentally manipulating the power construct, the aim of this study was to provide evidence that increased levels of power cause increases in exploratory behavior which are mediated by an increase in willingness to take risks.

Hypotheses

In Study 2, it was expected that participants primed with high power would show significantly higher levels of exploratory behavior and willingness to take risks than participants in the low power condition. Additionally, it was expected that both power and willingness to take risks would be significant predictors of exploratory behavior. Once again it was predicted that willingness to take risks would mediate the relationship between power and exploratory behavior. Learning was also examined. It was expected that those in the high power condition would exhibit a smaller learning asymmetry (less discrepancy between the learning of positive and negative stimuli) as a result of their increased exploratory behavior.

Method

Participants. One-hundred sixty-eight psychology students from Virginia Commonwealth University participated in the study for course credit. Data from a total of 35 participants were dropped from the analyses for the following reasons: Non-compliance during the essay portion or missing essay data (7 participants), non-compliance during the BeanFest game (5 participants), incomplete questionnaire data or bias in the questionnaire responses (6 participants), situational factors outside of the experimenter's control (e.g., loud, distracting noises during sessions) (11 participants), other / miscellaneous (e.g., limited fluency in English) (6 participants). Of the remaining 133 participants, 61% were female, 40% were

White/Caucasian, 23% African American, 20% Asian, 4% Hispanic, 1% American Indian, and 13% reported their race/ethnicity as “other” or did not report their race/ethnicity. The average age of the sample was 20.76 years ($SD = 4.53$). The majority of the sample reported their marital status as single (92%), their religious affiliation as Christian (40%), and the size of their hometown as suburban (37%). Participants were randomly assigned to either a high power ($n = 65$) or low power ($n = 68$) condition. According to Cohen (1992), this overall N should reveal a medium effect size with $\alpha = 0.05$ and Power = 0.80 in the analyses that follow.

As in Study 1, additional incentive was provided by entering participants into a raffle for a gift card at the end of the study. Participants’ names were entered into the raffle once for each game they won during the BeanFest activity.

Materials / Measures.

Power Manipulation. Participants’ power levels were manipulated with a priming procedure developed by Galinsky and colleagues (2003). Participants were randomly assigned to a high power or low power condition¹ for which they were asked to recall and write about a previous experience in their life. Participants in the high power condition were instructed to recall and write about a time when they had control over someone else. The instructions for the task were conveyed as follows:

Please recall a particular time when you had power over another individual or individuals. By power, we mean a situation in which you controlled the ability of another person or persons to get something they wanted, or were in a position to evaluate those individuals. Please describe this situation in which you had power – what happened, how you felt, etc.

Participants in the low power condition were instructed to recall and write about a time that somebody else had power over them as follows:

Please recall a particular time when someone else had power over you. By power, we mean a situation in which someone had control over your ability to get something you wanted, or was in a position to evaluate you. Please describe this situation in which you did not have power – what happened, how you felt, etc.

Exploratory Behavior. Exploratory behavior was once again measured by assessing the ratio of approach to avoid decisions for each participant during the BeanFest game.

Learning Asymmetry. As in Study 1, learning was determined by calculating the percentage of positive beans correctly identified and subtracting those from the percentage of negative beans correctly identified, providing a measure of the asymmetry in learning between positive and negative stimulus objects. Larger numbers represent a larger learning asymmetry with negative beans being learned better than positive beans.

Willingness to Take Risks. As in Study 1, participants completed the CARE questionnaire (Fromme et al., 1997) to assess propensity for taking risks. The Expected Involvement subscale ($\alpha = .84$) was used as the measure of willingness to take risks as it is an assessment of the participant's expected involvement in each stated risky activity within the next 6 months. Additionally, The Expected Risk subscale ($\alpha = .90$), used to measure risk perception, and the Expected Benefit subscale ($\alpha = .92$), used to measure expected risk benefit, were included as in the first study to assess consistency across participants' responses and to add validity to the analysis.

Mood. All participants completed the PANAS measure of positive ($\alpha = .86$) and negative ($\alpha = .82$) affect (Watson et al., 1988) to account for mood as a control measure.

Generalized Sense of Power Scale. All participants completed the trait power scale at the end of the study to ensure that there were no differences between the conditions in trait power ($\alpha = .84$).

Procedure. Upon arriving for the study, participants were told that they would be taking part in an experiment that examined the relationship between memory and learning. After a short explanation of the study and after being given an opportunity to ask the experimenter any questions, participants were asked to provide informed consent and were seated at an individual workstation. Participants were randomly assigned to either a high power or a low power condition and were told that they were going to be asked to remember a particular event that occurred in their past, and that they were to write a short essay about this event, including as many specific details as possible. Participants were also told that after writing their essay, they would be asked to complete a short set of survey questions (the PANAS scale) before moving on to the next portion of the study. Participants in the high power condition were asked to recall and write about a time when they had control over another person or persons, and participants in the low power condition were asked to write about a time when someone else had control over them. All essays were completed electronically at the workstation provided. Participants were given 10 minutes to complete the task. If participants were still writing at the completion of the 10 minutes, they were prompted to finish writing and to move on to answering the set of survey questions. After all participants completed their essay and answered the PANAS scale items, they were given instructions for the BeanFest game and completed the BeanFest procedure as outlined in Study 1. At the conclusion of the BeanFest game, participants completed a short survey packet which included the CARE questionnaire, the Generalized Sense of Power Scale, and a short set of demographic questions. After completing all questionnaire items, a debriefing

statement with an explanation of the study and the experimenter's contact information was presented on the workstation screen. At this point, participants were given the opportunity to ask any additional questions and were excused.

Results

As in Study 1, all variables were screened to test the assumptions of normality prior to conducting any analyses. Consistent with Study 1, the Negative Affect subscale of the PANAS measure was positively skewed and kurtotic. However, a \log_{10} transformation corrected the skewness, and the variable was retained for the remainder of the analyses. Additionally, positive skewness in the exploratory behavior measure was corrected with a square root transformation. All other variables met assumptions of normality. Means and standard deviations for all variables of interest can be found in below.

Table 2.1

Means and Standard Deviations for Study 2 Variables.

Measure	Mean	SD
PANAS – Positive Affect	2.85	.72
PANAS – Negative Affect	.18	.14
Exploratory Behavior	1.33	.45
Learning Asymmetry	.11	.28
Willingness to Take Risks	2.54	.77
Generalized Sense of Power	5.06	.93

As a manipulation check, three independent judges, blind to condition, rated each participant's essay on a 9-point rating scale ($1 = no\ power\ at\ all$ to $9 = a\ lot\ of\ power$) (see

Smith & Bargh, 2008). Prior to rating the essays, the raters were trained using examples to ensure a baseline standard for high and low power essays. Inter-rater reliability was very high ($\alpha = .94$), so a composite variable was created by calculating the average of the three rater's scores for each essay. A t -test of the differences in the ratings of participants' essays revealed a significant difference between participants in the high power ($M = 7.07, SD = .96$) and low power ($M = 2.81, SD = .94$) conditions, $t(130) = 25.78, p < .001$, indicating that participants followed instructions during the priming task and wrote about their experiences with power as requested. Additional t -tests revealed no significant differences in positive mood, $t(130) = .60, p = .55$, negative mood, $t(130) = -1.49, p = .14$, or trait level power, $t(130) = -1.16, p = .25$, across the conditions.

Next, analysis of covariance (ANCOVA) using positive and negative affect measures as covariates was used to test for differences between the high and low power groups in the main variables of interest related to the hypotheses of the study (exploratory behavior, willingness to take risks, and learning asymmetry). The analyses indicate that the power manipulation did not lead to differences in exploratory behavior, $F(1, 123) = 2.44, p = .12$, willingness to take risks, $F(1, 123) = 2.34, p = .13$, or learning asymmetry, $F(1, 123) = 1.03, p = .31$. Due to the lack of significant findings, it was not appropriate to proceed with the proposed mediational analyses to investigate the nature of the relationship between power, willingness to take risks, and exploratory behavior.

Bivariate correlations controlling for positive and negative affect were assessed to further examine the nature of the relationships between the main variables of interest in this study. Correlations can be found below. The trait level power measure was not significantly related to the ratings of power in participants' essays, $r(132) = -.09, p = .31$. Consistent with the results of

Study 1, generalized sense of power did not correlate with willingness to take risks, $r(132) = -.03, p = .72$, exploration, $r(132) = .01, p = .91$, or learning asymmetry, $r(132) = .05, p = .56$.

Table 2.2

Study 2 Partial Correlations Controlling for Positive and Negative Affect

<i>Measure (n = 132)</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
1. Essay Rating	-						
2. Exploratory Behavior	-.14						
3. Learning Asymmetry	-.04	-.60***					
4. Perceived Risk	-.07	-.05	.06				
5. Expected Risk Benefit	.15+	.00	-.08	-.31**			
6. Willingness to Take Risks	.12	.13	-.05	-.37***	.47***		
7. Generalized Sense of Power	-.09	.01	.05	.14	-.07	-.03	

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Replicating previous research, learning asymmetry was significantly related to exploratory behavior, $r(132) = -.60, p < .001$. Thus, participants who approached more beans during the BeanFest game tended to demonstrate a more balanced learning of positive and negative beans during the test phase of the game. Additionally, the three subscales of the CARE risk measure were correlated with each other in the expected manner. Higher levels of risk perception were associated with lower levels of expected risk benefit, $r(132) = -.31, p < .01$ and lower levels of willingness to take risks, $r(132) = -.37, p < .001$. Additionally, higher levels of expected risk benefit resulting from participation in risky activities were associated with increased willingness to take risks, $r(132) = .47, p < .001$. However, unlike Study 1, the risk

propensity measures did not correlate significantly with exploratory behavior, $r(132) = .13, p = .17$.

Discussion

In Study 2, an experimental manipulation was used to test the causal nature of the relationship between power, willingness to take risks, and exploratory behavior. Whereas there was evidence to show that participants were compliant during the manipulation and that those in the high power condition did, in fact, include themes that were related to having power and influence over others, the manipulation did not result in the expected differences between groups in willingness to take risks or exploratory behavior. Due to the lack of significance, the proposed mediational relationship could not be tested.

There are several possible explanations for the lack of significant findings in Study 2. The first concerns the power manipulation used in the study. Participants were generally compliant in the essay writing task (participants in the high power condition wrote about having control and influence over others, whereas participants in the low power condition wrote about others having influence over them), the content of the essays, particularly in the high power condition, leaves reason to believe that the manipulation might not have had the intended effect. A number of participants in the high power condition wrote about having control and influence over others as an anxiety provoking experience in which they were uncomfortable with the prospect of having control over the outcomes of another. One participant in particular wrote about an experience in babysitting small children:

“...they make me very uncomfortable, and some, if they don't get their way, will scream until their face turns red... I realized I'm happy just taking direction from people. It's

what I was brought up doing, so being the one to give direction always makes me a bit nervous.”

Another participant wrote about a time managing employees at a summer job:

“For the most part it was pretty easy going, and I treated them as peers. However; toward the end of the summer one of the males started to not perform his job functions correctly, and I had to give him several verbal warnings before further action could take place. I did not like having to warn him, it was somewhat awkward. The male continued to show up late, or not close the required number of accounts. I was forced to fire the male, and firing him was quite awkward, because it created a lot of tension, and he did not go easily and was very argumentative, which only made the choice harder.”

Although there is not statistical evidence indicating the extent to which essays such as these influenced participants’ perceptions of their own power during the experimental session, it is plausible that in this sample population writing about a time when they had the ability to influence others did not necessarily invoke memories of a positive experience associated with power. Rather, many of the participants focused on the negative consequences of being in a position of power. This unanticipated nature of many participants’ essays may have led to heightened anxiety, which may not have activated approach tendencies.

Another potential issue with the manipulation is that there may have been decay in the effect of the priming procedure prior to the measurement of the dependent variables.

Immediately after the priming procedure ended, participants completed the PANAS scale to assess any differences in general mood state that resulted from the manipulation and were then given instructions for the BeanFest procedure. Experimenter reports indicated that it took roughly 5-7 minutes on average to administer the BeanFest instructions and answer any

questions before participants began playing the game. It is quite plausible that there was a significant decay in the effect of the power manipulation over this time period. In future studies, it may be appropriate to consider beginning the experimental session by administering the BeanFest instructions and then conducting the power manipulation immediately before participants begin to play the BeanFest game. This may increase the chances that the effects of the power manipulation carry over into the BeanFest procedure.

Another potential priming strategy when using the BeanFest paradigm would be to follow a procedure similar to that of Galinsky and colleagues (2003). In this study, which examined the relationship between power and participants' propensity to take action to move an annoying fan that was placed in their workspace, participants were first asked to write an essay about a time when they either had power or lacked power (using the same instructions that were incorporated in the present study). However, this manipulation was repeatedly reinforced throughout the measurement of the dependent variable by having participants in the high power condition work on a task to allocate lottery tickets between themselves and another participant whereas participants in the low power condition were instructed to predict the allocation decision that a high power participant would make. A similar reinforcement procedure could be incorporated into the BeanFest paradigm between the three game phase blocks to increase the likelihood that any effects of the manipulation would persist throughout the measurement of the dependent variables.

The results of Study 2 did not show evidence supporting the hypotheses of the study, namely that participants primed with high power would show significantly higher levels of exploratory behavior and willingness to take risks than participants in the low power condition. Furthermore, due to the lack of an effect of the power manipulation, the proposed meditational

relationship could not be tested. Though there was evidence consistent with previous research (Fazio et al., 2004) demonstrating that increases in exploratory behavior were associated with more balanced learning (less discrepancy between the learning of positive and negative beans), the study did not show these differences to be associated with power or willingness to take risks as was hypothesized. Thus, further research is required to investigate the nature of this relationship.

General Discussion

Two studies investigated the nature of the relationship between power and exploratory behavior. Based on previous research stemming from the Approach/Inhibition Theory of Power (Keltner, Gruenfeld, & Anderson, 2003), it was hypothesized that higher levels of power would be associated with increases in exploratory behavior, characterized by a greater tendency to approach novel stimulus items during a computer game. Additionally, it was hypothesized that these increases in exploration would stem from higher levels of willingness to take risks in high power individuals. That is, willingness to take risks would mediate the relationship between power and exploration. Furthermore, it was expected that the increased approach behavior characteristic of exploration would result in more balanced learning of positive and negative stimulus items.

The results of these two studies were largely non-significant and failed to support the hypotheses. Though Study 1 revealed marginal evidence of the expected relationship between participants' willingness to take risks and exploratory behavior, this finding was not replicated in Study 2, and neither study provided evidence for the predicted relationship between power and exploration. It is unclear whether the lack of significant findings should be viewed as evidence against the hypotheses of the studies, or whether problems with the measures, procedures, and/or

samples utilized in these studies masked any evidence that would have supported the hypotheses. Thus, further research is necessary to determine the relations, if any, that exist between these constructs.

One possible explanation for the lack of a clear relationship between willingness to take risks and exploratory behavior is that participants' evaluations of the risky events outlined in the present research (e.g., Making a scene in public; Mixing drugs and alcohol) may only be peripherally representative of the risk associated with approaching or avoiding stimulus items in a computer game. A stronger association between these constructs may be observed if participants evaluated risk items that more closely mimicked the risks that they were presented with during the BeanFest game. Asking participants to report on their perceptions of the risks associated with gaining versus losing resources or winning versus losing in a strategic competition may provide a more representative approximation of the risks associated with BeanFest and, thus, may show a stronger association with exploratory behavior during the game.

There are several possibilities for the lack of significant findings with regard to power. The first concerns the measurement of power. In the first study, the Generalized Sense of Power measure was strongly associated with positive affect. Past research by Anderson & Galinsky (2006) did not investigate the relationship between this particular measure of trait level power and participants' mood state. It appears as though the present study was the first to include affect as a potential covariate when using the Generalized Sense of Power scale, and it is possible that in the first study this measure was tapping into aspects of participants' positive mood state rather than their feelings of power and control. However, this relationship between positive affect and scores on the Generalized Sense of Power scale was not observed in the second study, although there was a marginal correlation with negative affect. This is surprising considering the strong

association that was observed in the first study, but may be due to the timing of the measures. In Study 1, the Generalized Sense of Power measure was used as the primary evaluation of participants' trait level of power and was the first measure presented to participants when they completed their survey. The PANAS was administered at the end of this same survey packet, and thus both measures were presented in relatively close proximity to each other. In the second study, however, the PANAS was presented to participants immediately following the power manipulation at the beginning of the study session and the Generalized Sense of Power Scale was presented at the very end of the study. Between the PANAS measure and the Generalized Sense of Power measure, participants were engaged in the BeanFest task and were asked to complete all other survey measures. Therefore, as the administration of these two measures occurred at conceptually different portions of the experiment across the two studies, it is possible that these differences resulted in an inconsistent relationship between the two measures. It should be considered a possibility that the Generalized Sense of Power measure is assessing something other than trait level power in participants; however, further research would be required before concluding that this measure is associated specifically with positive affect.

Another potential reason for the lack of any observed relationships between power and exploratory behavior may lie in the power manipulation which was incorporated in Study 2. Although this manipulation has been demonstrated to be effective in previous research (see Anderson & Galinsky, 2006; Galinsky et al., 2003; Smith & Bargh, 2008), it is possible that the high power manipulation did not produce the intended effects in this sample population. The content of the essays revealed that many participants recalled specific instances where they possessed the ability to influence others as an anxiety provoking and awkward time. For these participants, it appeared as though increases in personal power were synonymous with added

responsibility, and this was not often viewed as a favorable outcome in the sample population. According to the theory of regulatory focus (Higgins, 1997), it would be expected that these negative emotions in recall would be more likely to promote avoidance behavior than approach behavior, and it is therefore not necessarily surprising that significant differences in exploration were not observed between high power and low power participants. Future research may benefit from using a power manipulation that is more closely integrated with the research paradigm being used to measure exploratory behavior. As participants ostensibly perceive BeanFest as a game in which the aim is to increase points and avoid losing points, it may be beneficial to use a power manipulation that is focused specifically on participants' ability to control resources (instead of other people). Such a task may be of value in future research with college student (or any relatively young) populations as it is plausible that participants in such samples have less experience in positions of power than the general population, and that the experiences that they have had may have very well been anxiety provoking. It is conceivable that this likelihood is increased further in populations with a high degree of variance in the socio-economic backgrounds of the undergraduate student population, such as is the case at Virginia Commonwealth University. As a second alternative, an implicit manipulation of power such as a scrambled sentences priming task such as the one used by Smith & Trope (2006) in order to avoid the possibility of participants becoming aware of the intent of the power manipulation. Either of these alternate priming mechanisms may be preferable in future studies to increase the likelihood that the power manipulation has the desired effect.

Finally, in order to increase the likelihood that even small effects of power can be seen in an experimental study, it may be beneficial to reinforce the power manipulation throughout the procedure following a methodology similar to Galinsky et al (2003) in which subtle

manipulation primes are incorporated throughout the research paradigm. This could be done in the BeanFest paradigm by inserting a scrambled sentences task or word completion task between the blocks of the game phase or test phase of the procedure. This may boost the power manipulation so as to increase the likelihood that high power and low power conditions remain salient in participants, and that any effects of power on willingness to take risks and exploration will be observed.

It is possible that the proposed relations between power, exploration, and willingness to take risks may have been incorrect; however, there appears to be a sufficient number of alternative explanations for the lack of significant findings in the present studies to warrant further investigation. Future studies should take these null findings into account in order to design a program of research that would be sufficient for finding evidence of the proposed relations if they do indeed exist, while also explaining the lack of significance in the present studies.

Conclusion

Although the present research failed to find support for the proposed hypotheses across two studies, there is still a strong theoretical basis to support the continued investigation of the relations between power, risk, and exploratory behavior. The present studies may have illustrated limitations in the measurement and manipulation of the power construct which led to the failure to observe significant relationships. Additionally, the lack of significant findings in the present research may indicate that the relationship between power, risk, and exploration is domain specific. The current research incorporated a general measure of power that contained questions regarding participants' perceived ability to wield control and influence over others. Conversely, the risk measure that was used in the present research focused on risks in the

domains of Illicit Drug Use, Aggressive/Illegal Behaviors, Risky Sexual Activities, Heavy Drinking, High Risk Sports, and Academic/Work Related Behaviors. Lastly, the measure of exploration that was used in the present research measured participants' approach and avoidance decisions in what can be viewed as a competitive game environment. It is conceivable that these measures were tapping into different aspects of social behavior that do not influence one another. If the proposed relationship between power, willingness to take risks, and exploration is domain specific, it may be more likely for significant results to emerge with measures that evaluate these measures across a more similar set of behaviors. For example, as the goal of BeanFest is for participants to gain points and avoid losing points, future research may benefit from incorporating a measure of power that asks participants about their ability to obtain or control resources. Additionally, a power manipulation may focus on participants' past experiences in which they were able to control a substantial amount of resources (high power), or one in which they did not control resources that were necessary to their well being (low power). Additionally, a measure of willingness to take risks that asks questions more directly related to taking risks involving the gain or loss of resources might provide a more predictive measure of participants BeanFest behavior.

Although the present research did not find support for the proposed hypotheses, the theoretical basis for the relationship between power, willingness to take risks, and exploratory behavior is strong. Information from the present work can be used to inform the measures and procedures to be used in subsequent research. Future studies should continue to investigate the nature of these relations using domain specific measures of power, risk, and exploration which may provide more fertile grounds for the nature of the relations to emerge.

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Footnote

¹ Several previous studies using power manipulations have incorporated a control condition as well (see Anderson & Galinsky, 2006; Gruenfeld et al., 2008; Smith & Bargh, 2008; Smith & Trope, 2006); however, none of these studies found significant differences between the low power and control conditions. Thus, the proposed research did not incorporate a control condition in the power manipulation.

Appendix A

Generalized Sense of Power Scale Items

In rating each of the items below, please use the following scale:

1	2	3	4	5	6	7
Disagree	Disagree	Disagree a	Neither	Agree a	Agree	Agree
Strongly		Little	Agree nor	Little		Strongly
			Disagree			

In my relationships with others . . .

_____ I can get people to listen to what I say.

_____ My wishes do not carry much weight.

_____ I can get others to do what I want.

_____ Even if I voice them, my views have little sway.

_____ I think I have a great deal of power.

_____ My ideas and opinions are often ignored.

_____ Even when I try, I am not able to get my way.

_____ If I want to, I get to make the decisions.

Appendix B

Cognitive Appraisal of Risky Events (CARE) Scale

Instructions: For each of the activities listed below, we are interested in understanding 3 different ratings concerning your feelings toward the activity. For expected risk (ER), please rate the likelihood that a negative consequence would occur if you were to participate in the activity. A negative consequence is defined as one in which you might become sick, injured, embarrassed, or that you might lose money, suffer legal consequences, fail a class, or feel bad about yourself. Likewise for expected benefit (EB), please rate the likelihood that a positive consequence would occur if you were to participate in the activity. A positive consequence is defined as one in which you would experience pleasure, win money, feel good about yourself, etc. For expected involvement (EI), please rate the likelihood that you will engage in each activity during the next 6 months. Please rate these likelihoods according to the following scale:

1	2	3	4	5	6	7
Very			Neither			Very
Unlikely			Likely nor			Likely
			Unlikely			

Cognitive Appraisal of Risky Events (CARE) Scale

I. Illicit Drug Use

- 1) Trying/using drugs other than alcohol or marijuana

2) Smoking marijuana

1) Mixing drugs and alcohol

II. Aggressive and Illegal Behaviors

2) Grabbing, pushing, or shoving someone

3) Driving after drinking alcohol

4) Making a scene in public

5) Disturbing the peace

6) Damaging/destroying public property

7) Hitting someone with a weapon or object

8) Slapping someone

9) Punching or hitting someone with fist

10) Getting into a fight or argument

III. Risky Sexual Activities

1) Leaving a social event with someone I have just met

2) Sex without protection against pregnancy

3) Sex without protection against sexually transmitted diseases

4) Involvement in sexual activities without my consent

5) Sex with multiple partners

6) Sex with someone I have just met or don't know well

IV. Heavy Drinking

1) Drinking alcohol too quickly

2) Drinking more than 5 alcoholic beverages

- 3) Playing drinking games

V. High Risk Sports

- 1) Rock or mountain climbing
- 2) Playing non-contact team sports
- 3) Snow or water skiing
- 4) Playing individual sports

VI. Academic / Work Behaviors

- 1) Missing class or work
- 2) Not studying for exam or quiz
- 3) Leaving tasks or assignments for the last minute
- 4) Failing to do assignments
- 5) Not studying or working hard enough

Appendix C

The PANAS

Instructions: This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way RIGHT NOW, that is, at this very moment. Use the following scale to record your answers:

very slightly or not at all	a little	moderately	quite a bit	extremely
1	2	3	4	5

interested

irritable

distressed

alert

excited

ashamed

upset

inspired

strong

nervous

guilty

determined

scared

attentive

hostile

jittery

enthusiastic

active

proud

afraid

Vita

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