The Role Of Automatic Mood On Risk Appetite

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THE ROLE OF AUTOMATIC MOOD ON RISK APPETITE

by
Makail Johannesson

A thesis submitted to the faculty of The University of Mississippi in partial fulfillment of the requirements of the Sally McDonnell Barksdale Honors College.

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ABSTRACT

Numerous studies over the past few decades have indicated links between subtle psychological influences and decision-making. It is often thought that individuals make conscious choices based on their preferences regardless of whether those preferences are optimal or not. However, it has been shown that most of our behaviors, judgements, and decisions are often a product of unconscious influences. These influences are significant in both simple and complex life situations, including the realm of financial decision making. In this experiment, participants primed with positive evaluative stimuli reported a more positive mood while those primed with negative evaluative stimuli reported a more negative mood. Further, a positive mood significantly increased risk appetite in a tower game, while a negative mood decreased risk appetite, although insignificantly. Lastly, although there were links between unconscious evaluation and mood, and between mood and risk appetite, the unconscious evaluation did not seem to affect risk appetite.
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INTRODUCTION

In each of our lives, unconscious influences not only affect behavior, but also attitudes and even mood. Most would agree that mood is not a product of conscious choice – if it was, who would ever choose to be in a negative mood? If not a product of conscious choice, then it must emerge unconsciously, or, automatically. The product of environmental stimuli brewing in the unconscious mind is attitudes and behaviors that emerge, if not consciously, then *automatically*.

While unconscious influences can directly affect behavior, they can also do so indirectly. For example, an individual may experience a shift in mood unwillingly because of a particular change in their environment. That mood in turn, can then alter behavior. An example of behavior that can be altered, and one that this paper explores, is risk appetite. It may be somewhat intuitive to think about mood affecting risk appetite if you think about two identical twins at a Blackjack table. One of the twins was just recently divorced while the other had just met the love of his life. Will the twins exhibit identical risk appetite at the Blackjack table? Psychological research would suggest no.

If there is a supposed link between mood and risk appetite, and if mood can emerge unconsciously and automatically, then the implications of these effects on financial risk assessment deserve our attention.

While behavioral economics has mostly been limited to micro-level decision making, a potential significant relationship between automatic mood and financial behavior, particularly risk appetite, pose warranted suggestions on a macroeconomic scale.
Empirical evidence, especially from the periods during the economic recovery following the 2008 global financial crisis, has hinted at the idea that credit growth is more than just a computation of interest rates and the monetary base (Stiglitz, 1999; Drees et al., 2012; Dell’Ariccia et al., 2014). From a broader perspective, credit growth is in essence determined by risk appetite. However, while interest rates and the money supply may play a large role in risk appetite, it is important to explore other potential contributors, such as mood.

This paper explores the role of automatic mood on risk appetite and whether that role is significant. Most research and dialogue in economics regarding decisions over risk often revolve around interest rates, capital structure, and other fundamentals. While these decisions appear to be strictly analytical, circumstances and scenarios where these decisions may no longer be analytical, or at least less so, should be an area of interest within economics.

The idea that we often approach analytical decisions unconsciously not only poses significance in how we view economic decision making, but also challenges the assumption of free will within humanity. For this reason, proper acknowledgment of how significant unconscious motivators, including mood, are to our behavior is necessary.

This paper reviews published literature on the workings of the unconscious mind and how it influences mood and behavior, particularly financial behavior and risk appetite. An experiment was conducted to measure the role of automatic mood on risk appetite by priming individuals for a positive or negative mood before their participation in a game that measured their propensity for financial risk taking behavior.
The results showed mood can emerge automatically and unconsciously, and mood can in turn affect risk appetite. Although both of these links were present, there was no link between the evaluative stimuli used in the priming and risk appetite.

Many see behavioral economics as a threat or a substitute for traditional economic theory, as the two sometimes contradict each other. Instead, behavioral economics should be viewed as a complement rather than a substitute. Incorporating psychology into economics allows us to embrace the ambiguity of the subject. By definition, ambiguity is, “the quality of being open to more than one interpretation.” In this sense, markets can be both efficient and inefficient at the same time, which is why in 2013 the Nobel Prize in economics was awarded to both Eugene Fama and Robert Shiller, whose theories directly contradict each other. So while much of the findings in behavioral economics are perceived as an attack on more traditional theories, they should be perceived as a supplement to a given topic. This paper does not intend to dispel any previous models or theories about risk appetite, but rather shine the light on potential factors that may be frequently overlooked, though deserving of attention.

One facet of traditional economic theory that this paper does challenge however, is the argument that individuals make conscious decisions that may be sub-optimal, but nonetheless consistent with their preferences. For example, an individual who chooses not to save for retirement may be acting sub-optimally in the sense that they are forgoing the potential benefit of retirement income, but perhaps it is their preference to forgo retirement income – after all, we do not know the preferences of all individuals. The problem with this argument is not the assumptions over preferences, but rather the assumption over conscious decisions.
Growing research out of psychology has imposed a limit on conscious behavior in our daily lives, while highlighting the influence of nonconscious means in our moment-to-moment behavior. In a 1999 psychology paper titled, “The Unbearable Automaticity of Being,” authors John A. Bargh and Tanya L. Chartrand describe their core thesis as, “most of our day-to-day actions, motivations, judgments, and emotions are not the products of conscious choice and guidance, but must be driven instead by mental processes put into operation directly by environmental features and events.”

Perhaps the hypothetical individual who was opting not to save for retirement did not reach their conclusion because of their free will and complete awareness of their preferences, but because before speaking with their financial advisor they saw their real estate agent’s face on a park bench subliminally reminding them of their significant monthly mortgage payments, and subconsciously decided to forgo the concept of another recurring monthly withdrawal. Conversely, perhaps the individual failed to notice the park bench, and instead was handed a brochure by their advisor with a photo of an elderly couple on the front, and all of a sudden valued retirement income and decided to save. In each case, if asked, the individual might say they made a conscious decision about their savings and that it had nothing to do with park benches or brochures. A myriad of literature however, shows great influence of the park benches, brochures, and many other sources of unconscious motivators.
LITERATURE REVIEW

Mood, Risk Appetite, and Financial Behavior

Automation within financial behavior is not always a direct relationship. A mental representation distinct from the financial domain can be activated, which can in turn influence financial behavior. One example of this is mood. Bechara and Damasio (2004) have pointed to emerging evidence out of neuroscience that suggests rational decision making depends upon prior emotional processing. Emotions differ from moods in that they are more immediate responses rather than a gradually developed condition, however, a growing body of literature has also suggested that mood can play a significant role in various forms of analytic reasoning, such financial behavior.

Schwarz and Bless (1991) highlighted the influence of an individual’s affective state on his or her cognitive performance during a given task. They hypothesized that positive moods signal safety while unpleasant moods signal danger, thus, decision-makers will be more likely to lack logical consistency when in a positive mood, and therefore will be more reliant on the use of heuristics, whereas decision-makers in a negative mood use a more analytical approach with more attention to detail.

This hypothesis was supported by Park and Banaji (2000) when they found participants in a positive mood to have a heightened reliance on use of racial stereotypes when judging a person to be a criminal, politician, or athlete.

While mood can affect a present decision in a given environment, it can also play a role in predictions about the future. For example, a positive mood has shown to be connected with optimism (Nygren et al., 1996). In a pair of experiments, positive affect
participants expressed optimism by significantly overestimating probabilities associated by winning, relative to losing. Although the positive affect participants were more optimistic than the control participants, they were less likely to actually gamble when a real loss was possible, but only when the potential loss was large. When the potential loss was small, they were more likely than the control participants to gamble. This was true even though the actual probability for the large losses were small whereas the probability was moderate or large for the small losses. These results are also consistent with Schwarz and Bless’ hypothesis, as it appears the positive affect participants were more likely to rely on the use of biases and heuristics, which in this case was loss aversion (Kahneman & Tversky, 1979), as those in a positive mood shied away from the large potential losses but resumed optimism when potential losses moderated.

Wright and Bower (1992) found the effect of mood on predictions about the future to be present in not only positive moods, but negative ones as well. Relative to control subjects, they found “happy” subjects recorded higher probabilities for positive events and lower probabilities for negative ones. Conversely, “sad” people expressed pessimism by recording lower probabilities for the positive events and higher probabilities for the negative ones.

Optimism and pessimism can also be viewed as risk perception. Slovic and Peters (2006) describe human risk perception as having two functions: risk as feelings, and risk as analysis. They label risk as feelings as “the affect heuristic”, illustrating how people judge risk not only by what they think about a given situation, but also by how they feel about the situation. Thus, people in a pleasant mood often perceive risk to be low, while those in an unpleasant mood often perceive risk to be high.
Positive moods signal safety, and negative moods signal danger. These assertions as well as various research suggests that those in a positive mood often perceive events as opportunities, while those in a negative mood perceive events as threats (Mittal & Ross, 1998).

A myriad of studies has proven these hypotheses. Deldin and Levin (1986) found that subjects in a positive state were more willing to accept risk in a hypothetical medical operation while subjects in a negative state were less willing to accept the risk.

These ideas have also been applied to a financial context. Au et al. (2003) found foreign exchange traders in a positive mood were more likely to make less accurate decisions while also taking unwarranted risks and express overconfidence. Grable and Roszkowski (2008) also found through survey data that being in a positive mood was positively associated with a higher level of financial risk tolerance.

Cohen-Charash et al. (2013) created mood indices through the collective mood of investors from various press reports. They found that positive investor mood depicted on a given trading day, predicted increases in NASDAQ prices, while negative investor mood predicted decreases in NASDAQ prices.

A large body of psychological evidence has indicated a strong relationship between sunshine and a positive mood. Research has shown that duration of bright sunlight is directly related to the production of serotonin – a neurotransmitter that helps regulate mood – in the brain (Lambert et al., 2002). Growing off this, Hirshleifer and Shumway (2003) measured the relationship between stock returns from twenty-six countries and sunshine over a fifteen-year period. After controlling for seasonal returns, they found days of sunshine to be significantly correlated with stock returns, while rain
and snow were unrelated. While these results can be interpreted in multiple ways, they are consistent with the evidence of sunlight affecting mood, and mood affecting asset prices (Shu, 2010).

Another way our environment can potentially shape decisions over risk is elevation. Esteky et al. (2018) found via data from over 3,000 hedge funds, that as the elevation of hedge fund managers’ office increased, they were more willing to take risks resulting in more volatility within the fund. The effect remained true even after controlling for total assets, fund strategy, and other factors as well. In the same study, the researchers also conducted “elevator pitches” for investment decisions. They found that people were much more likely to invest in the risky decision (relative to the safe one), when going up compared to going down. The idea behind this is that individuals feel more powerful in higher elevations, while research suggests feelings of power lead to more risk-taking behavior (Anderson & Galinsky, 2006).

**Automatic Mood and Behavior**

It would not be a dubious claim to say that our emotions are not a result of conscious choice. But what about moods? To understand this, we must first understand the difference between emotions and moods. Moods tend to develop more gradually than emotions and typically are not immediate responses to events in the environment (Bargh & Chartrand, 1999). So while emotions follow their eliciting stimuli closely or even immediately, moods are usually more remote from their cause. For example, an individual can wake up in a bad mood one morning as a result of a confrontation that took place the previous evening (Ekkekakis, 2013). In this case however, it does not seem
likely that there was intention to be in a bad mood, but rather a result of mental processes – an affective experience that occurs without conscious choice.

A consequence of mood acquisition lacking conscious choice is the potential difficulty in deciphering the source of our mood. If certain evaluations can become automatic, perhaps these evaluations being made in our current environment can contribute to our mood without our knowing. In a study courtesy of Chartrand & Bargh (1999b), subjects were subliminally presented with nouns associated with attitudes that were either strongly positive (e.g. music, friends), strongly negative (e.g. cancer, cockroach), mildly positive (e.g. parade, clown), or mildly negative (e.g. Monday, worm). Following the priming, which was framed as a “reaction-time” task, subjects moved on to an “unrelated” experiment, which was two self-report mood measures, including the Multiple Affect Adjective Check List (MAACL). On both mood measures, the researchers found a direct relationship between the evaluative nature of the subliminally presented stimuli and mood. Strongly negative attitude objects produced the saddest mood, while strongly positive objects produced the happiest mood. As hypothesized by Chartrand and Bargh, without conscious awareness or choice, whether an individual is making mainly positive or mainly negative evaluations within an environment, changes in his or her mood appear as a result. Also, since moods last longer than short-lived evaluations, they seem to be somewhat of a moving average of the general favorability of one’s environment. This is a way in which automatic, unintended evaluations serve as a signaling function in terms of the overall safety or danger one finds themselves in a particular environment.
These automatic evaluations that signal positivity or negativity can lead to corresponding behavior. In an experiment, half the subjects were instructed to push a lever away from them if the stimulus word presented was positive in evaluation, and pull the lever toward them if negative, while the other half was instructed to do the opposite. The researchers found the subjects to have a faster response when pulling the lever upon positive words, rather than pushing, and pushing the lever faster upon negative ones, rather than pulling. In the second experiment, void of the conscious goal to evaluate, half the subjects were to just push the lever as soon as they saw the word appear, whereas the other half would pull. Again, the reaction-time was faster for those pushing upon negative words compared to positive, and faster for those pulling upon positive words compared to negative, despite no instruction in the experiment implying evaluation (Chen & Bargh, 1999). It appears that objects can be perceived as good or bad immediately and unintentionally – in just milliseconds a corresponding behavior can follow such an automatic evaluation.

These immediate evaluations would not have evolved over time if they were not efficient. A meta-analysis by Ambady and Rosenthal (1992) covered various predictions such as the effectiveness of a teacher, the quality of a therapist, whether the individual was lying or telling the truth, how he or she was going to vote, how depressed or anxious he or she was, etc. The time in which the predictor observed the individual under review ranged from half a minute to 4-5 minutes. The researchers found that the predictions made under 30 seconds resembled no difference in accuracy than the predictions resulting from 4-5 minute observations – the more immediate pick-up of information seems to offer just as accurate an evaluation as the leisurely conscious observations. Other
evidence has shown similar results. In another study, researchers found personality judgements from a group of observers who did not interact with whom they were evaluating but could only see them, to have reached unanimity in personality judgement nonetheless (Albright, Kenny, & Malloy, 1988). Zajonic (1980) argued feelings (or preferences) often precede cognitive processes, thus, our preferences as well as many other evaluations or judgements may be made literally before we know it.

Priming Theory

The term “priming” refers to the nonconscious activation of representations or associations in memory during an unrelated task. As a research technique, one can use stimuli to prime for a particular trait or stereotype that influences behavior, without conscious intention from the subject. This idea that our perception (social, environmental, etc.) is an automatic psychological process is a widely accepted phenomenon (Bargh & Chartrand, 1999).

The link between automatic perception and behavior has been demonstrated in countless priming experiments. In perhaps one of the most well-known priming experiments, Bargh, Chen, and Burrows (1996) found that when subjects were primed with words related to elderly stereotypes (e.g., Florida, sentimental, wrinkle), their behavior was more in line with the elderly stereotype. This behavior included walking more slowly down the hallway after leaving the experiment, compared to the subjects primed with words unrelated to the stereotype. The researchers also found that those who had been primed for the elderly stereotype had been more forgetful than the control participants in remembering features of the room where all subjects had previously participated in a separate experiment.
Priming does not just induce trait behavior, but also “behavior matching.” In another experiment, Chartrand & Bargh (1999a) had subjects work on a task in two sessions, each time with a different confederate (someone part of the experiment but whom the subject believes is a fellow participant). The confederate in the first session either rubbed his face or shook his foot, while the confederate in the second session did whichever quirk the first confederate did not do. Both sessions were video recorded and the researchers found that the subjects rubbed their face more times in the presence of the face-rubbing confederate, compared to the foot-shaking confederate, and shook their foot more in the presence of the foot-shaking confederate, compared to the face-rubbing confederate.

In the second stage of this study, the researchers conducted another experiment, including the same task and set-up, however this time the confederates intentionally mimicked the behavioral quirks and posture of the subjects. Compared to a control condition, subjects who had been mimicked had reported a smoother interaction and found the confederate to be more likeable. In each experiment, subjects had no awareness of what was going on, indicating a link between automatic perception and social interactions.

Goals and Motivations

Why is “behavior matching” vulnerable to unconscious influences? Perhaps social goals and motivations, such as being liked, are rooted in one’s memory and are often activated without our knowing. Bargh and Chartrand (1999) argue that most of our environmental responses (i.e. judgements, decisions, and behavior) do not solely derive from information available in the environment, but rather how that information relates to
whatever goals we are mentally pursuing. Automatic activation of these goals emerge when we no longer needed conscious choice for desired behaviors in response to anticipated results of that behavior. Think of the first time an individual drives a car, and how much conscious guidance goes in to managing the task of driving. Eventually, the results of driving behavior become anticipated and the task of driving becomes a much more unconscious one. As conscious capacity is freed up from not having to coordinate the lower level components of the skill (i.e., driving), it can then be used towards higher-level components of the skill (i.e., talking, using the radio, or thinking about other events in your life, all while driving) (Bargh & Chartrand, 1999).

From an evolutionary perspective, this is obvious. Full conscious guidance of all judgements, decisions, and behaviors would greatly limit us in the tasks we are able to carry out, as well as the social interactions we are able to have. Automatic self-regulation in a situation is much more efficient and effortless than standard conscious thinking. Think of an ancient hunter encountered by a foreigner from a different tribe. If the hunter takes the time to consciously evaluate the situation, and actively think about what he is perceiving, then it may be too late, as the foreigner who automatically perceived the hunter as a threat, sent a spear through his chest.

In the case of unconscious driving behavior, the individual is aware of their desire to attain driving skills – they are at least conscious of the driving process becoming automatic. However, processes can become automatic without the desire to attain a skill, but simply from a frequency and consistency of use of the same set of mental processes under the same circumstances. Therefore, goals and motives themselves can eventually become automatically activated by certain situations. For example, the motivation to gain
the love and respect of one’s parents can be fulfilled by the goal to have a successful career and family, which can be associated with various plans and strategies, such as studying hard in school (Bargh & Chartrand, 1999).

Consider the motivation to have a strong self-image. Spencer, Fein, Wolfe, and Dunn (1998) found that threats to one’s self-image automatically activate the goal of restoring the threatened self-image. A common method to do this is by denigrating others, especially those of lower power and status within a given society. The researchers showed that subjects who had received a blow to their self-esteem through negative feedback regarding their abilities, displayed evidence of having stereotyped minority group members even under conditions where stereotyping normally does not occur (i.e., during an attention demanding task).

Nonconscious goal activation has also been shown on a neurophysiological scale. Subjects who were primed to evaluate stimuli (thinking they were just listening to names of stimuli, and not actually evaluating them) displayed identical patterns of brain activation unique to evaluative responses, as subjects pursuing the same goal consciously (Gardner et al., 2002).

Conscious goal pursuit does not stop at either achievement or failure, as the result tends to affect one’s mood. Research has shown that mood can also be affected by the success or failure of a nonconscious goal pursuit. In an experiment, an achievement goal was primed in half the participants before they completed anagram tasks described as a “fun” time-filler. The anagrams were either quite simple or very difficult and had to be completed in what was told to be the “average” amount of time. The subjects in the achievement-primed condition registered a worse mood following the difficult anagram
task than the easier one, meanwhile the control group’s mood was unaffected by anagram difficulty (Chartrand, 1999). It appears when mood emerges unconsciously, it is a response to a pre-existing goal or motivation.

Automaticity and Financial Behavior

Automaticity plays a significant role in most of our moment-to-moment behaviors we carry out throughout a given day. While one may think these behaviors are mostly limited to more casual situations (e.g. driving), a growing body of literature has pointed to an influence from unconscious processing towards more complex evaluations. Financial behavior is one example of a set of actions often thought to derive from conscious assessments.

Mantovani and Galvão (2017) primed individuals by exposing them to sports brands that represent either high or low audacity (i.e. Nike or Topper). The participants exposed to the brands with high audacity traits expressed a higher rate of risk taking in financial decisions. The researchers found the effect to be moderated by the individual’s experience within financial markets. That is, participants with a habit to invest demonstrated more risk appetite after exposure to the Nike brand (high audacity) versus the Topper brand (low audacity), whereas participants with a low habit to invest did not demonstrate any significant differences in risk appetite (risk perception was the same among both groups). The results are consistent with Bargh and Chartrand’s emphasis on goals and motivations and their unconscious activation from environmental stimuli. Risk tendency was only affected in individuals with experience in the financial market – those with a pre-existing goal relating to financial risks that can be activated through brand
priming. Conversely, a lack of pre-existent mental representation (i.e., experience in the financial market) will not result in a new motivational state through priming.

In another experiment, researchers found that by priming individuals with cues associated with winning (i.e., reminders of past wins), they became more risk seeking. Individuals primed with cues associated with relative losses however, expressed little change in risk appetite (Ludvig, Madan, & Spetch, 2015).

In the introduction, a hypothetical was described where an individual suddenly became more inclined to save for retirement upon visualizing a brochure with elderly people on the front. This hypothetical was inspired by an actual study by Hersfield et al. (2011) who used priming to manipulate time preferences. They found that subjects who interacted with realistic computer translations of their future selves demonstrated an increased tendency to accept future monetary rewards over immediate ones. In a similar study, Israel, Rosenboim, and Shavit (2014) primed subjects with photos of elderly people, who reduced their present preference, while photos of vacation scenes increased present preferences.

Not only can words and images activate unconscious responses, but even more subtle forms of stimuli such as color can influence behavior. Bazely, Cronqvist, and Mormann (2017) found that investors tend to be more risk averse when potential losses are displayed in red. Further, when shown past returns for a stock in red, future expectations were reduced. Consistent with the hypothesis, the effects were muted in China, where red is not used within the industry to indicate financial losses (there would not be a proper association in memory or representation activated from losses displayed
in red). Other controls used such as the use of different colors, as well as colorblind investors further confirmed the color red’s influence on risk appetite.

Although all these studies appear to counter the notion that most financial behavior derives from conscious choice, it is important to recognize the significance of context. Aldrovandi et al. (2017) found that the impact of priming effect differed depending on the financial context of a given situation. The researchers had participants fill out a questionnaire, which in the negative priming condition, was printed with a background of a dark tornado (control condition had no distinct background). The study consisted of hypothetical decision-making situations framed in different financial contexts. The data showed that the negative priming resulted in less appetite for risk. This effect however, was confined only to the hypothetical gambling scenarios, whereas the other hypotheticals, which included situations involving pension, investment, and salary, displayed no significant effect from the negative priming. The authors argued that perhaps gambles are often assessed by how lucky one is feeling in a given moment, which is more vulnerable to priming effects, whereas an investment scenario requires a more analytic assessment which could involve factors not directly included in the description of the scenario (e.g., current state of economy). On the other hand, this context effect could also be explained by Mantovani and Galvão’s brand priming experiment, where the priming only influenced the participants with experience in the financial market. Perhaps the findings of Aldrovandi et al. showed negative priming to have an effect on the gambling scenarios but not others because most participants likely have experience with “simple” gambles, but not within the financial market, and therefore may have lacked a pre-existing goal to be activated.
When conducting behavioral priming experiments where a particular behavior belongs to a certain niche rather than one that is more universal, it is important to note the experience of the participants within that niche. For example, when Dijksterhuis and Knippenberg (1998) exposed three groups of participants to a professor stereotype, a secretary stereotype, and a control (no exposure to any stereotype), an activity to measure intelligence was administered and found those exposed to the professor stereotype performed better than the other groups, suggesting improved intelligence from the prime. The stereotypes that were exposed are likely to be recognized by most potential participants (at least within Western culture), and the intelligence activity was general enough to not be biased towards any particular niche. Therefore, in theory, this form of priming would have a similar effect on the task for most people. If the same priming had been done but individuals were then given a financial intelligence activity, it may only be those with some financial education who would be affected by the prime. Another assumption is that the goal of intelligence is nearly universal, and was likely activated during the priming in Dijksterhuis and Knippenberg’s experiment. The goal of intelligence within the financial domain may be more limited to those with some experience in the financial domain.

Gilad and Kliger (2008) accounted for this potential ambiguity when priming the risk attitudes in financial decision making. The study consisted of two populations, one including investment advisors from large commercial banks as well as accountants from CPA firms, and the other containing undergraduate economics students. Participants from both populations were then randomly assigned to either a risk seeking or risk aversion group, and were primed for their respective group by reading a short story and having to
list adjectives from the story. The story for the risk seeking group was about a man’s financial success from gambling during a trip to the casino, whereas the risk aversion story involved a man who stayed clear of gambles at the casino and avoided large losses by doing so. The researchers found the risk seeking group to assign higher monetary values to investments compared to the risk aversion participants. They also found the priming to have more influence on the risk attitudes of the professionals than on the students. While this may be due to the level of experience among the participants, and whether certain goals were activated or not, as already proposed in this paper, the authors suggest an alternative explanation. They attribute the difference to professional’s tendency to use less of an analytic approach, and more of an intuitive one when making investment decisions, whereas students often possess the opposite.

Contrary Evidence

Despite a decent amount of literature highlighting a relationship between mood and risk, contradicting research exists as a source of skepticism. For example, Kliger and Levy (2002) found positive mood to be associated with less appetite for risk among investors.

In a similar contradiction, Hockey et al. (2000) found negative mood to be associated with increased risk appetite, but only when the negative mood was induced by fatigue, rather than the more typical induction via anxiety or depression. These findings however, are speculatively consistent with the Schwarz and Bless (1991) hypothesis that a positive mood results in reliance on heuristics whereas a negative mood leads to a more analytic approach. One may speculate that fatigue likely leads to reliance on heuristics rather than careful analytics, while anxiety or hostility are likely more related with the
analytic approach. This speculation is supported by Hirshleifer et al. (2018) who found decision fatigue associated with more heuristic decisions.

EXPERIMENT

The experiment was designed to measure the role of automatic mood on risk appetite. Participants were exposed to a priming task meant to induce either a positive or negative affect by being exposed to evaluative stimuli. Affect was measured using the Multiple Affect Adjective Checklist-Revised (MAACL-R) immediately after the priming task. Following the checklist, participants would play a tower game (i.e., Jenga) with monetary incentives for performance. The more blocks an individual pulled while maintaining a standing tower, the higher their reward. However, if the tower collapsed at any given moment, participants would receive nothing for the tower game. This task was designed to measure risk appetite. A regression analysis was conducted following the experiment to measure relations between all three stages: evaluative stimuli, mood, and risk appetite.

Methodology

A standard regression analysis was used to determine if the positive and negative conditions in the priming task had an effect on mood relative to the control condition. Another regression analysis was used to determine if the participant's mood (MAACL-R score), regardless of the priming, had an effect on the amount of blocks pulled (i.e., risk appetite). Lastly, a final regression analysis was used to determine if the positive and negative conditions in the priming task had an effect on the amount of blocks pulled...
relative to the control condition. Suspect observations were removed for all regression analyses.

Given an already small sample size divided into three different conditions, p-values less than 0.1 were interpreted as statistically significant.

Participants

Data for this study was obtained through voluntary participation from students at The University of Mississippi. An invitation to participate was sent to all undergraduates within the Sally McDonnell Barksdale Honors College as well as students in the University of Mississippi Investment Club.

Students were incentivized to participate by offering a guaranteed payment of $2 for completing the experiment, with the opportunity to earn significantly more in an “economic behavior” game.

The online signup sheet was publicly accessible, so it is possible that students outside of the two groups mentioned signed up for the experiment via word of mouth.

Thirty-seven participants in total completed the experiment -- 54% were male and 46% were female. There were no participants who were completely eliminated from the data set. However, certain measures were in some cases dismissed for certain suspect observations. For example, the data for blocks pulled by a participant who failed to properly complete the task was eliminated, however the priming condition and MAACL-R scores of that same participant could still be used.

Of the 37 participants, 14 were in the positive condition, 12 in the negative condition, and 11 in the neutral condition.
Measures & Materials

The experiment was conducted in the economics laboratory room at The University of Mississippi. A different desk with privacy panels was used for each of the three stages of the experiment. Although only one participant occupied the room at any given moment, the privacy panels were an efficient way to separate each task, both literally, and mentally for the participant.

The evaluative stimuli used to prime participants were laminated cutouts of various nouns typed out. Each condition contained seven nouns that participants ranked using another laminated sheet numbered 1 through 7. The nouns in the positive condition were: Birthday, Friends, Music, Smile, Friday, Vacation, and Miracle. The nouns in the negative condition were: War, Cancer, Cockroach, Prison, Monday, Poison, and Tornado. Lastly, the nouns in the neutral (control) condition were: Plant, Road, Book, Pen, Stone, Water, and Building.

Affect was measured using the Multiple Affect Adjective Checklist-Revised (MAACL-R) created by Lubin and Zuckerman (1986). The checklist contains 132 “affect adjectives” (e.g. alone, bored, enthusiastic, peaceful, etc.). Words that a participant thinks describes how they feel in their current state are bubbled in, however, of the 132 adjectives, only 66 are scorable. The checklists are manually graded to determine raw scores for states of anxiety, depression, hostility, positive affect, and sensation seeking. The sums of anxiety, depression, and hostility are added up as a raw dysphoria (negative affect) score, while positive affect and sensation seeking scores are added up as the raw PASS (positive affect) score.
Because some individuals bubble in a greater proportion of the 132 adjectives on the checklist, the raw scores are not the most appropriate measure for comparison across groups. A better way to compare scores across groups is using the t-scores from the norms tables created by Lubin and Zuckerman. These tables provide appropriate measures of affect given a specific demographic (i.e., college males and females).

During the tower game, a standard set of Jenga blocks were used. The tower consisted of 53 wooden blocks – 18 levels of 3 blocks stacked perpendicularly. While playing the game, each participant consulted a sheet highlighting the payout structure (Table 1 and Figure 1).

The amount of blocks pulled by a participant was used as a measure of their risk appetite. Regardless of a proceeding standing tower, commitment to withdrawing a block indicates acceptance of a certain level of risk. The risk of a collapsing tower increases as more blocks are pulled since the tower becomes less stable. To compensate the participant for bearing more risk with each additional block pulled, the corresponding monetary reward increases marginally more than from the previous block pulled. A

<table>
<thead>
<tr>
<th>Blocks Pulled</th>
<th>Payout</th>
<th>Blocks Pulled</th>
<th>Payout</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$0.01</td>
<td>23</td>
<td>$9.00</td>
</tr>
<tr>
<td>2</td>
<td>$0.10</td>
<td>24</td>
<td>$9.80</td>
</tr>
<tr>
<td>3</td>
<td>$0.20</td>
<td>25</td>
<td>$10.60</td>
</tr>
<tr>
<td>4</td>
<td>$0.30</td>
<td>26</td>
<td>$11.50</td>
</tr>
<tr>
<td>5</td>
<td>$0.40</td>
<td>27</td>
<td>$12.40</td>
</tr>
<tr>
<td>6</td>
<td>$0.60</td>
<td>28</td>
<td>$13.30</td>
</tr>
<tr>
<td>7</td>
<td>$0.80</td>
<td>29</td>
<td>$14.30</td>
</tr>
<tr>
<td>8</td>
<td>$1.10</td>
<td>30</td>
<td>$15.30</td>
</tr>
<tr>
<td>9</td>
<td>$1.40</td>
<td>31</td>
<td>$16.30</td>
</tr>
<tr>
<td>10</td>
<td>$1.70</td>
<td>32</td>
<td>$17.40</td>
</tr>
<tr>
<td>11</td>
<td>$2.10</td>
<td>33</td>
<td>$18.50</td>
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<tr>
<td>12</td>
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<td>34</td>
<td>$19.70</td>
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<td>13</td>
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<tr>
<td>14</td>
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<td>36</td>
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<tr>
<td>15</td>
<td>$3.80</td>
<td>37</td>
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</tr>
<tr>
<td>16</td>
<td>$4.40</td>
<td>38</td>
<td>$24.50</td>
</tr>
<tr>
<td>17</td>
<td>$5.00</td>
<td>39</td>
<td>$25.90</td>
</tr>
<tr>
<td>18</td>
<td>$5.60</td>
<td>40</td>
<td>$27.20</td>
</tr>
<tr>
<td>19</td>
<td>$6.20</td>
<td>41</td>
<td>$28.60</td>
</tr>
<tr>
<td>20</td>
<td>$6.80</td>
<td>42</td>
<td>$30.00</td>
</tr>
<tr>
<td>21</td>
<td>$7.50</td>
<td>43</td>
<td>$31.40</td>
</tr>
<tr>
<td>22</td>
<td>$8.20</td>
<td>44</td>
<td>$32.90</td>
</tr>
</tbody>
</table>

Table 1. Presented to each participant, highlighting monetary payment structure numerically. Figure 1. Graphical representation of Table 1, also presented to participant.
higher amount of blocks pulled represents a higher appetite for risk, as the participant risks losing more and more money by withdrawing more and more unstable blocks.

Hypotheses

*Hypothesis 1:* Participants in the negative prime condition will record a higher dysphoria score, and a lower PASS score on the MAACL-R compared to the neutral condition. Further, participants in the positive prime condition will record a higher PASS score, and a lower dysphoria score on the MAACL-R compared to the neutral condition.

*Hypothesis 2:* There will be a positive relationship between positive affect and risk appetite as participants with higher PASS scores will have a greater appetite for risk during the tower game, and will therefore pull more blocks than those with lower PASS scores. Further, there will be a negative relationship between negative affect and risk appetite as participants with higher dysphoria scores will have a smaller appetite for risk during the tower game, and will therefore pull less blocks than those with lower dysphoria scores.

*Hypothesis 3: Hypothesis 1 will contribute to hypothesis 2 as participants in the negative prime condition will have a smaller appetite for risk in the tower game relative to the neutral condition, meanwhile participants in the positive prime condition will have a greater appetite for risk in the tower game relative to the neutral condition.

Procedure

Upon arriving in the lab, participants were asked to sit at a designated desk for a word-ranking task. The task entailed ranking the seven words in front of them (the words
were either from the positive, negative, or neutral condition) in the order they think the words appear most frequently in the English language.

Immediately following this task, participants were asked to complete the MAACL-R at a different desk, where their responses would be anonymous. These first two stages of the experiment were designed to model a similar experiment by Chartrand, van Baaren, and Bargh (2006). In their experiment, participants were presented with either positive, negative, or neutral stimuli by having certain words flashed on a screen. Participants would have to press a key to indicate whether the word appeared on the left or right hand side of the screen. Following this task, participants were asked to complete the MAACL. Chartrand et al. found participants briefly primed with negative words reported a significantly more negative mood than those briefly presented with positive words.

The last stage of the experiment, and unrelated to the Chartrand et al. study, invited participants to the third desk where a block tower was set up with the payout structure printed out beside it (Figure 1). The rules of the game were explained to the participant: each block pulled and successfully stacked on top of the tower, while maintaining a standing tower, would result in the corresponding reward from the payout schedule. If the tower collapses at any moment, the participant would receive nothing (except for the fixed pay of $2 for completing). Participants were told they could exit the game at any time and collect their reward based on how many blocks they had successfully removed. Standard rules of Jenga were also followed such as only being able to manipulate the tower with one hand and stacking blocks perpendicularly, in order to maintain consistency among participants.
Following the tower game, participants filled out a survey indicating their gender, experience playing Jenga, and whether or not they thought the word-ranking task influenced their decision making in the tower game.

The amount of blocks pulled and MAACL-R scores for each participant were recorded for data analysis.

Results

The sign of the point estimates for mood scores were consistent with hypothesis 1, although not all results were statistically significant (it is important to acknowledge the small sample size of this experiment when interpreting the insignificance of various results). The t-scores used were obtained from norms tables representing a standard distribution of either college males or females. Participants in the neutral condition scored a mean t-score of 51.91 for PASS and 52.09 for dysphoria, which translates to 0.191 and 0.209 standard deviations above the mean of 50 in a standard distribution, respectively.

Participants in the positive condition scored a mean t-score of 53.75 for PASS (.375 standard deviations above the mean of a standard distribution) and 41.75 for dysphoria (.825 standard deviations below the mean of a standard distribution). The mean PASS t-score was 3.55% higher for those in the positive condition relative to the neutral condition, and 7.14% higher relative to the negative condition. The mean dysphoria t-score was 19.85% lower for those in the positive condition relative to the neutral condition, and 26.10% lower relative to the negative condition.

Participants in the negative condition scored a mean t-score of 50.17 for PASS (.017 standard deviations above the mean of a standard distribution) and 56.50 for
dysphoria (.650 standard deviations above the mean of a standard distribution). The mean PASS t-score was 3.36% lower for those in the negative condition relative to the neutral condition, while the mean dysphoria t-score was 8.47% higher for those in the negative condition relative to the neutral condition. Data for mean t-scores across priming conditions can be seen in Figure 2.

![Figure 2](image.png)

**Figure 2.** Mean t-scores for PASS and dysphoria across positive, neutral, and negative conditions. A t-score of 50 represents the mean of a standard distribution for college males or females.

Although the relationships anticipated from the priming were present, the only effects that were statistically significant were the effects of the positive and negative prime conditions on dysphoria scores. Those in the positive condition reported significantly lower dysphoria scores than those in the neutral condition ($p=.085$) and those not in the positive condition ($p=.015$). Those in the negative condition reported significantly higher dysphoria scores than those not in the negative condition ($p=.065$).
While those in the positive condition reported higher PASS scores, the results were not significant. These findings imply the priming had a much stronger effect on negative mood, which is consistent with the findings from Chartrand et al. (2006) that hypothesis 1 was modelled after.

Table 2. Mean PASS and dysphoria t-scores across various conditions with corresponding p-values

<table>
<thead>
<tr>
<th>Condition</th>
<th>PASS t-score</th>
<th>Dys t-score</th>
<th>p-value</th>
<th>Condition</th>
<th>PASS t-score</th>
<th>Dys t-score</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>53.75</td>
<td>41.75</td>
<td>0.615</td>
<td>Positive</td>
<td>53.75</td>
<td>41.75</td>
<td>0.375</td>
</tr>
<tr>
<td>Neutral</td>
<td>51.91</td>
<td>52.09</td>
<td>0.085</td>
<td>Non-positive</td>
<td>51</td>
<td>54.39</td>
<td>0.015</td>
</tr>
<tr>
<td>Negative</td>
<td>50.17</td>
<td>56.5</td>
<td>0.634</td>
<td>Negative</td>
<td>50.17</td>
<td>56.5</td>
<td>0.383</td>
</tr>
<tr>
<td>Neutral</td>
<td>51.91</td>
<td>52.09</td>
<td>0.455</td>
<td>Non-negative</td>
<td>52.87</td>
<td>46.7</td>
<td>0.065</td>
</tr>
</tbody>
</table>

Given that positive and negative affect are not mutually exclusive (Larsen et al., 2017), another regression analysis was conducted to measure the relation between priming condition and the difference between a participant’s PASS and dysphoria scores. The difference essentially measures which affect is more extreme relative to a standard distribution. For participants in the positive condition, their PASS scores were significantly higher than dysphoria scores ($p=.030$) relative to those not in the positive condition. Meanwhile, for participants in the negative condition, their dysphoria scores were significantly higher than PASS scores ($p=.082$). These results indicate that the priming affected not only the extent of one’s mood, but also the dominance of either a positive or negative mood over the other.
Table 3. Independent variables are priming conditions with dependent variables: mood scores and risk appetite. Standard errors in parentheses.

<table>
<thead>
<tr>
<th></th>
<th>Positive–Neutral</th>
<th>Negative–Neutral</th>
<th>Positive–Non Positive</th>
<th>Negative–Non Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PASS t-score</td>
<td>1.84</td>
<td>-1.74</td>
<td>2.75</td>
<td>-2.70</td>
</tr>
<tr>
<td></td>
<td>(3.62)</td>
<td>(3.62)</td>
<td>(3.05)</td>
<td>(3.06)</td>
</tr>
<tr>
<td>Dysphoria t-score</td>
<td>-10.34*</td>
<td>4.41</td>
<td>-12.64**</td>
<td>9.80*</td>
</tr>
<tr>
<td></td>
<td>(5.83)</td>
<td>(5.83)</td>
<td>(4.94)</td>
<td>(5.13)</td>
</tr>
<tr>
<td>PASS minus Dys</td>
<td>12.18</td>
<td>-6.15</td>
<td>15.39**</td>
<td>-12.51*</td>
</tr>
<tr>
<td></td>
<td>(8.00)</td>
<td>(8.00)</td>
<td>(6.78)</td>
<td>(6.96)</td>
</tr>
<tr>
<td>Risk Appetite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blocks Pulled</td>
<td>-0.61</td>
<td>-1.45</td>
<td>0.12</td>
<td>-1.17</td>
</tr>
<tr>
<td></td>
<td>(3.52)</td>
<td>(3.43)</td>
<td>(3.03)</td>
<td>(2.95)</td>
</tr>
</tbody>
</table>

The sign of the point estimates for blocks pulled were consistent with hypothesis 2, although not all results were statistically significant. The PASS score on the MAACL-R was positively and significantly related to blocks pulled from the tower ($p=.064$).

Meanwhile, dysphoria scores were negatively but insignificantly related to blocks pulled from the tower ($p=.341$).

These findings are consistent with the hypothesis of Schwarz and Bless (1991) highlighted during the review of mood and financial behavior in the introduction. They hypothesized that positive moods lead to a greater reliance on heuristics by an individual as one is more likely to lack logical consistency, given that positive moods signal safety. On the other hand, negative moods lead to a more analytic approach to decision-making, given that negative moods signal danger. For these reasons, it is intuitive to anticipate a
greater influence of the PASS scores on blocks pulled than those of dysphoria. Another regression analysis on blocks pulled and both the PASS score and dysphoria scores confirmed that the PASS score was more dominant.

**Figure 3.** Scatter plot showing participant’s PASS t-score and the amount of blocks they pulled from the tower

Another relation explored was not the specific value of the t-scores but whether the t-scores lie above or below the mean of 50 for a standard distribution, had an effect on blocks pulled. A supplemental analysis for *hypothesis* 2 was conducted where the mean blocks pulled for participants with a PASS t-score over 50 was measured relative to PASS t-scores under 50. The same was done with dysphoria scores. Essentially, risk appetite for those with “above average” positive/negative affect was measured relative to those with “below average” positive/negative affect.

Participants with PASS t-scores greater than 50 pulled an average of 19 blocks, 17.07% more than those with PASS t-scores less than 50 (*p*=.313). Conversely,
participants with dysphoria t-scores greater than 50 pulled an average of 15.33 blocks, 26.29% less than those with dysphoria t-scores less than 50 ($p=.146$).

**Figure 4.** Average blocks pulled for participants with PASS and dysphoria t-scores above or below the mean of 50 for a standard distribution

<table>
<thead>
<tr>
<th>Risk Appetite Blocks Pulled</th>
<th>PASS t-score&gt;50</th>
<th>PASS t-score&lt;50</th>
<th>Dys t-score&gt;50</th>
<th>Dys t-score&lt;50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.77</td>
<td>-2.77</td>
<td>-4.03</td>
<td>4.03</td>
</tr>
<tr>
<td></td>
<td>(2.70)</td>
<td>(2.70)</td>
<td>(2.70)</td>
<td>(2.70)</td>
</tr>
</tbody>
</table>

**Table 4.** Independent variables are moods scores with dependent variable being risk appetite. Standard errors in parentheses.

***$p<0.01$***

**$p<0.05$**

* $p<0.10$
Consistent with hypothesis 2, although not statistically significant, participants recording an above average positive affect pulled more blocks relative to those with a below average positive affect. Further, participants with a below average negative affect pulled more blocks relative to those with an above average negative affect.

As mentioned, positive and negative affect are not mutually exclusive. Although the priming was significantly associated with the difference between the PASS and dysphoria scores, the difference was not significantly associated with blocks pulled. However, although not statistically significant, participants with a PASS t-score at least fifteen points (1.5 standard deviations) greater than their dysphoria score, pulled an average of 20.33 blocks, 35.33% more than participants with a dysphoria t-score at least fifteen points greater than their PASS score (15 blocks).

When exploring the relationship between automaticity and financial behavior in the introduction, research from Mantovani and Galvão (2017) was cited as an example where priming effects were only significant when participants had a pre-existing mental representation of a particular motivational state. In the study, priming only affected financial behavior for those individuals who had experience within the financial market.

Applying this idea to data from the tower game, the influence of affect was compared between participants who were either a frequent Jenga player, or had played more than five times, to participants who had either never played, or had played less than five times.

Among the participants with more experience playing Jenga, the PASS t-score was more positively and significantly related to blocks pulled from the tower ($p=0.047$) than those with less experience playing Jenga ($p=0.324$).
Figure 5, Panel (a) & Figure 6, Panel (b). Scatter plots comparing the relationship between positive affect and risk appetite among participants who had more or less experience playing Jenga.

(a) Less Jenga Experience
(b) More Jenga Experience

<table>
<thead>
<tr>
<th>Risk Appetite</th>
<th>PASS t-score</th>
<th>Dysphoria t-score</th>
<th>PASS minus Dys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blocks Pulled</td>
<td>0.24*</td>
<td>-0.08</td>
<td>0.09</td>
</tr>
<tr>
<td>(More Experience)</td>
<td>(0.12)</td>
<td>(0.08)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Blocks Pulled (Less Experience)</td>
<td>0.35**</td>
<td>-0.06</td>
<td>0.11</td>
</tr>
<tr>
<td>(More Experience)</td>
<td>(0.16)</td>
<td>(0.11)</td>
<td>(0.08)</td>
</tr>
<tr>
<td>Blocks Pulled</td>
<td>0.20</td>
<td>-0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>(Less Experience)</td>
<td>(0.20)</td>
<td>(0.13)</td>
<td>(0.09)</td>
</tr>
</tbody>
</table>

Table 5. Independent variables are mood scores with dependent variables being risk appetite. Standard errors in parentheses.

***p<0.01
**p<0.05
*p<0.10

Since there was a relation between PASS score and blocks pulled, but not between dysphoria score and blocks pulled, the “experience effect” was limited to only the former.

Despite various consistencies in the results with hypothesis 1 and hypothesis 2, hypothesis 3 was not confirmed – there was no relation between priming condition and risk appetite. Whether a participant was in the positive (p=.864) or negative (p=.675)
condition did not affect their risk appetite in the tower game, relative to those in the neutral condition. Further, there was no association between the positive condition ($p=0.969$) and blocks pulled, relative to non-positive conditions, and no association between the negative condition ($p=0.696$) and blocks pulled, relative to non-negative conditions. Regardless, participants indicated no suspicion of the words in the priming task influencing their decision making in the tower game.

Discussion

As expressed in the literature review and shown in this experiment, strategic decisions are often affected by unconscious influences. Participants exposed to positive evaluative stimuli reported a significantly stronger positive mood than those who were not. These participants also reported a significantly lower negative mood than the control condition.

Participants exposed to negative evaluative stimuli reported a significantly stronger negative mood than those who were not. These participants also reported lower positive moods than the control condition but the results were insignificant.

Although the priming conditions showed no influence over risk appetite in the tower game, affect alone was influential. Participants reporting a greater positive mood were significantly more likely to pull more blocks in the tower game. This effect was also much stronger for participants with more experience playing Jenga. Participants reporting a greater negative mood pulled less blocks, however the results were insignificant.

The findings from this experiment are consistent with a myriad of literature. The influence of positive or negative stimuli on mood was consistent with the findings of Chartrand et al. (2006). The relationship between positive, but not negative mood, and
risk appetite in the tower game supports the Schwarz and Bless (1991) hypothesis that individuals are more likely to rely on heuristics and biases when in a positive mood. The less significant relationship between risk appetite and negative mood suggests participants approached the tower with a more analytical perspective rather than a heuristical one. These conclusions are also consistent with the greater amount of literature that has indicated a relationship between positive affect and risk but less supportive of a relationship between negative affect and risk (Grable and Roszkowski 2008; Au et al. 2003; Nygren et al. 1996; Park and Banaji 2000).

Mantovani and Galvão (2017) found priming effects to be moderated by lack of experience within the dependent variable. Positive affect being more influential for those participants with more experience playing Jenga is consistent with Mantovani and Galvão’s conclusion and the hypothesis of Bargh and Chartrand (1999) stating that motivational states are often only influenced by unconscious factors when there is a pre-existing mental representation to be activated.

It appears the direct role of automatic mood on risk appetite is nonexistent given the findings of this experiment. However, the findings did indicate a role of automaticity on mood and a role of mood on risk appetite.

There are some potential methodology failures that may be responsible for various ambiguities in this experiment. The obvious flaw in the study is the small sample size. The luxury of a robust sample was unattained with 37 participants distributed among three conditions. The small sample also lead to a large variance in data points. For example, the amount of blocks pulled in the tower game ranged from as little as five blocks to as much as thirty-eight. While most averages for blocks pulled remain between
16-19, a difference in four blocks over averages appears significant intuitively, but is not statistically due to the large variance over individual data points.

The small sample size also magnified the influence of outliers or extreme data points on the analysis. While suspect observations were removed, it was difficult to remove any other data given the already small sample.

Another potential flaw is the validity of the MAACL-R responses. Although participants were told their responses would be anonymous, the fact that the researcher was a fellow student rather than a more socially distant peer, may have influenced the participant’s comfort level with selecting certain responses. Additionally, self-response checklists or surveys are automatically prone to validity issues due to both honesty issues and actual knowledge or awareness of oneself.

Another imperfection was the tower game. The tower game may bear some flaws as a measurement for risk appetite as it is less of a gamble given the amount of control a participant has over the outcome. Subjectively speaking, it appeared some participants were clearly more advanced strategically in their approach to the Jenga game. This was not attributed to experience as experience bore no relationship with blocks pulled. The strategic differences however, do not appear to be stark enough to discredit blocks pulled as a reasonable measure of risk appetite.

While it seems counterintuitive that the priming conditions affected mood, and mood affected risk appetite, but the priming conditions did not affect risk appetite, it is possible that the gap between the exposure to the evaluative stimuli and the tower game was too timely for the priming effects to maintain their influence.
Also, while mood was measured before the tower game, it is also possible that the introduction to the game may have altered one’s affect (i.e., the prospect of playing a fun game as well as the prospect of earning money).

Further research that could supplement this topic (besides replications of this experiment that address the flaws discussed) would be exploring the role of mood on risk appetite from a more macro perspective. While this experiment attempts to identify the role of automatic mood for an individual's risk appetite, it would be interesting to explore the role of collective mood on the market’s risk appetite. Risk appetite within financial markets eventually leaks into the overall economy. Whether they may not be aware of it, investor mood may have significant implications.

The ambiguities of these types of experiments highlight part of what they set out to explore, that human decisions are not products of optimal conscious choice, but products of countless influences. The findings of this experiment do not indicate that automaticity and mood are everything, but that automaticity and mood are something.

Traditional economic theory tends to have a distaste for ambiguities, as they are a barrier to reaching a conclusion. Research into the unconscious mind, and perhaps much of behavioral economics, often does not make blanket statements and conclusions, but rather points out the fact that there is a lot of factors that go into behavior and decision making – factors that we are aware of, and ones that we are not.

Behavioral economics, and experiments like this one, will likely never result in some eureka moment that will bring forward sweeping policy changes and new business models. But they will allow us to acknowledge the ambiguities in economic decision
making while appreciating the complexities in understanding why humans do what they do.

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