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Affective Influences on Conceptual and Perceptual Priming

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Affective Influences on Conceptual and Perceptual Priming

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ABSTRACT

Suggested by previous research in the field of behavioral economics, the priming effect provides strong evidence for the limitation of the expected utility theory as people do not always make decisions to maximize their utility but rather follow the impulse affected by the priming effect. This study looks at the effect of priming on consumer behavior and how moods influence the effectiveness of priming. Although many research has studied priming effects in different contexts, little research has focused on the affective influences on perceptual and conceptual priming. Supported by the previous research on affect and decision-making, this study is built on the hypotheses that good moods increase the effectiveness of perceptual priming in comparison to bad moods, and bad moods decrease the effectiveness of conceptual priming in comparison to good moods. This study observed and compared the effectiveness of perceptual and conceptual primings in happy and unhappy conditions. Our results provide weak evidence to support our hypotheses.

This paper is structured as follows. Section 1 and 2 introduce topic and provide a theoretical background of the study. Section 3 and 4 discuss details about methodology and regression models used in this study. In section 5 and 6 provide the data analysis, results and the limitations of the study. Finally, section 7 conducts a general discussion and summary of the study.

Section 1: Introduction

Imagine that Tommy lives in New York City, and his friend Jenny asks him to go shopping with her. They decide to meet in the shopping district. Tommy walks by multiple stores, with different logos displayed in front of each store. He notices a logo for Ralph Lauren along the way. Since the weather is nice, and Tommy had not been out of his apartment for a few days, he is in a good mood. On the other hand, Jenny just broke up with her boyfriend, and her heart is broken.

She walks by Times square and sees an ad for DKNY. Now Tommy and Jenny finally meet. Tommy decides to buy a new shirt, so they enter a Macy's department store. Unlike Tommy, Jenny does not know what she wants, but she wants to buy a ton of clothes to feel better about herself on one of the worst days of her life (at least it is what she thinks at the moment).

Is Tommy more likely to choose a polo shirt from Ralph Lauren? How likely is Jenny going to buy products from DKNY? In this scenario, both individuals are under the effect of priming, which refers to "an improvement in performance in a perceptual or cognitive task, relative to an appropriate baseline, produced by context or prior experience" (McNamara, 2005). More specifically, suppose that Tommy is affected by perceptual priming, which focuses on the form of stimulus (a Ralph Lauren's polo logo in isolated context), while Jenny is under the effect of conceptual priming, which focuses on meaning (a DKNY's ads that focus on fashionable lifestyle). Does their affect (mood) have an influence on their purchase decisions?

Previous studies indicate that conceptual and perceptual priming influence decision-making behavior subconsciously. In addition, mood has been found to have an impact on judgments; good mood encourages intuitive thinking while bad mood triggers elaborative thinking (Kahneman, 2013). This lead to a hypothesis that perceptual priming (as a logo) may be more effective when people are in good mood, and conceptual priming (as an ad) may be more effective when people are in bad mood as the primings correspond to the type of thinking endured by mood. Priming theory has been vastly applied in marketing strategies and has been found to influence people's decisions in different ways. Meanwhile, people's judgments are frequently impacted by their moods. Understanding affective influences on perceptually and conceptual priming adds important insights into consumer judgment and decision-making. Although many research has studied the effect of perceptual priming, conceptual priming, and affective influence on consumer

behavior, to the author's knowledge, no research has examined their combined effect. Consequently, the goal of this study is to examine affective influences on conceptual priming and perceptual priming.

<div align="center">Section 2: Theoretical Background</div>

To establish a better understanding of the objective and methodology of this study, it is important to discuss several concepts relevant to this study. To this end, this section will provide an overview of the field of priming, conceptual and perceptual priming, and how affect influences behavior.

Expected Utility Theory

Traditional economics is based on the assumption that people are rational. Built on this principle, economists have developed theories seeking to interpret people's behaviors and activities for centuries. Among all, the expected utility theory, also known as decision theory, is the heart of traditional economics. The theory provides a normative explanation to economic decisions; that is individuals make decisions based on expected utility. Essentially, expected utility theory is a theory of rational choice, suggesting a way to predict the outcome of people's choices. The rationale is to gain the maximum utility one can possibly gain. When a rational being is facing a decision, he/she evaluates the utility from each possible options and selects the one that maximizes utility (Steele & Stefánsson, 2015).

Among the common utility functions, perfect substitute good model is the best model to present customers' preference in a scenario when they are making a purchase decision (such as choosing between two brands of coffee beans). The utility function for two perfect substitute goods takes the following form: $U(X, Y) = \alpha X + \beta Y$, where α and β are the given parameter values. The value of α and β determine the slope of the indifferent curve. In most of the cases, customers are

constrained by a budget line (BL). The intersection of BL and indifference curve is the optimal

bundle, determining the decision that maximizes utility (See figure 1).

Figure 1
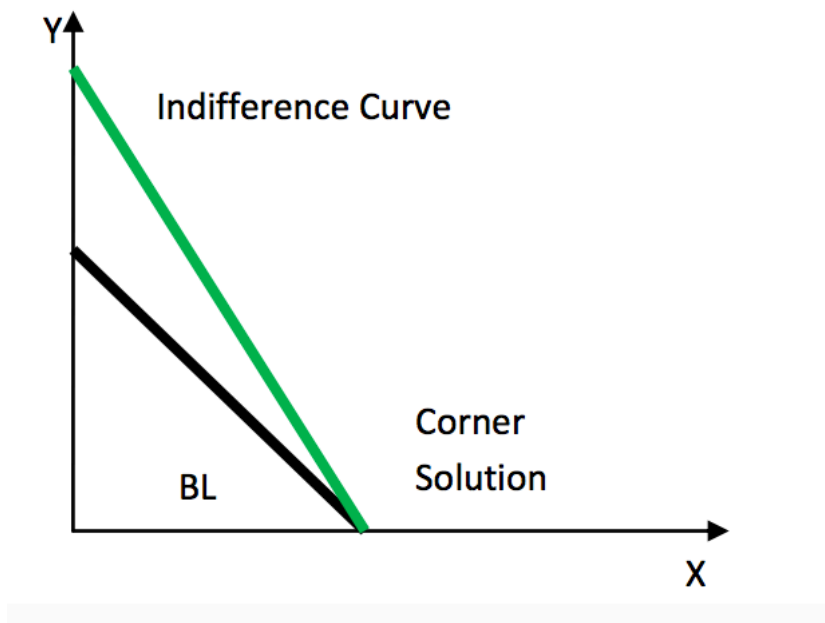
Traditional economists suggest that people make rational decisions based on their

attitudes/preferences, which are unique depending on each individuals' situation, such as

preference (reflected in α and β) and budget (reflected BL). However, researchers in behavioral

economics demonstrate the limitations of expected utility theory: people often fail to maximize

their utility because of ambiguity in preference. They do not weigh good and bad information

equally, and they use reference points when evaluating choices. With respect to the latter, as

pointed out by prospect theory (Kahneman and Tversky, 1979) reference points are key when

people are weighing opinions. In restaurants, entrées often come at different prices. Usually, there

will be expensive items and some with lower prices. According to expected utility theory, people

will choose the entrée that maximizes their utility; in this case, the one that provides the greatest

value. However, this is often not the case. Instead, people likely choose the second most expensive

dish. Are they then making an irrational decision? How is it possible that most of the people have a similar preference and choose the second most expensive product? The answer is simple: people frame the value of choice in terms of benefits gained from choosing the less expensive item based on a reference point. In this case, the decisions are made based on relativity; they won't order the most expensive, so they order the second (Ariely, 2009). Knowing the limitations of expected utility theory, one of the most fundamental theories of traditional economics, is important for a comprehensive understanding of how people make decisions. Again, this study examines the influence of affect at perceptual and conceptual priming on decision-making. The results and implications of this study provide more evidence regarding the limitations of expected utility theory, particularly with respect to the mood's impact on primings as a way to enhance our understanding of decision-making.

Priming

Among methods to influence people's decisions discovered by behavioral economists and psychologists, the findings of priming effects are game changers. The priming effect refers to an implicit memory effect whereby one's response to a stimulus is affected by their exposure to a prior stimulus (Kahneman, 2013). Since first explored in the 1960s (Segal, 1966), priming has been highly researched and applied in many areas.

The "Florida effect" study, a classic priming experiment, gives a textbook example for the understanding of priming effects (Bargh et al 1994). In the experiment, researchers asked students, who were mostly between eighteen to twenty-two years old, to pick four words out of a five words set, and make several sentences. The five-words sets contained words associate with old age such as "Florida, forgetful, and bald." After the task, participants were asked to complete another task in an office down the hall. The real purpose of the experiment was to test the walking

pace of the participants by measuring the time it took them to walk to the office. The finding was remarkable: participants who made sentences with old-age related words walked significantly slower than the participants in a control group, who made sentences with neutral words. In addition, none of the experimental participants reported awareness of the difference in their own behavior (Kahneman, 2013). This finding demonstrates that priming can affect people's behaviors, and that the influence of priming can occur without conscious attention.

In another demonstration of the strong yet unconscious influence of priming, researchers at Newcastle University set up an "honesty box" in an office kitchen to collect money for coffee or tea taken by office members. Researchers posted a list of suggested prices and a poster above the price list. Every ten weeks, the researchers replaced the poster with new images, showing either eyes or flowers. The amount of money collected in the "honesty box" was counted at the end of each week. Here, again the results were remarkable: the amount of money contributed changed significantly depending on whether eyes or flowers images were displayed on the poster. On average, the money collected in the "eyes weeks" was two times more than the money collected in the "flowers weeks." In addition, none of the office members reported awareness of the priming influencing their behavior (Kahneman, 2013).

The findings of priming effect studies have given strong evidence to the limitation of expected utility theory. That priming can influence people's decisions in significantly unconscious ways reveals that people often fail to make rational decisions. And interestingly, with respect to priming, it can be done in many different ways including perceptual, conceptual, repetition, contextual and masked. This study concentrates specifically on conceptual and perceptual priming, and hence in the following sections, only these two primings will be discussed.

Conceptual & Perceptual Priming

Compared to other forms of priming, conceptual priming is based on the meaning of a stimulus. It refers to "the temporary enhancement of conceptual fluency of a representation, rendering the stimulus more accessible in memory (Lee, 2002)." In short, it positively influences the information retrieval from implicit memory. As an example, a mattress will prime bed because conceptually, mattress and bed belong to the same category. In a consumer context, research has found that people who are shopping for cars and who are primed by "oil" or "safety" in advertising will desire to purchase cars that are more fuel-efficient or have more safety features respectively. Research has also found that people who engaged in conversions about certain products end up more likely to purchase those products (Minton, 2016). Conceptual priming is a powerful tool used in marketing strategies to increase sales of products.

While conceptual priming focuses on the meaning of a stimulus, perceptual priming focus on the form of a stimulus (Lee, 2002). When people are exposed to a stimulus, "the representation of the feature become activated and strengthen temporarily (px)." Perceptual priming enhances the perceptual fluency of a stimulus, causing the stimulus to be more accessible or outstanding in subsequent encounters (Lee, 2002). Visual priming is one form of perceptual priming. For example, previous exposure to the world "dog" to observers will increase the likelihood to think of "dog" when observers see "d_g". Previous exposure to the world "cake" will increase the likelihood to think of "cake" instead of "coke" when observers see "c_ke". The same thing can happen to consumers who are exposed to a brand's logo and then find themselves choosing products from many brands, in which the same visual stimulus (the logo) is presented as one of the brands. Recalling the scenario in the introduction, Tommy was perceptually primed by the logo of Ralph Lauren on his way to meet Jenny. When he saw a Ralph Lauren polo shirt among many other

brands, the Ralph Lauren stimulus is strengthened subconsciously and the Ralph Lauren logo becomes more stand-out as a result. This can lead Tommy to a higher likelihood to purchase a Ralph Lauren polo shirt.

To better understand the effectiveness of conceptual and perceptual priming, we first need to understand the how people remember: explicit and implicit memory. Explicit and implicit memory are two types of long-term memory. Explicit memory refers to a person's conscious recollection of occurred events or experiences. Naming all of the states in the United States is an example of explicit memory; it requires intentional recollection of information to perform a task. The demonstration of the knowledge of the event is the key requirement to measure the involvement of explicit memory (Lee, 2002). Different from explicit memory, implicit memory refers to subconscious or automatic memory. Swinging a baseball bat is an example of implicit memory; one does not have to consciously recall how to perform the task in order to complete it. While implicit memories are not consciously recalled, they still exert influence on how we behave. Related to the focus of this study, conceptual and perceptual priming do not occur in explicit memory but instead in implicit memory.

While conceptual and perceptual priming takes place in implicit memory, they are argued to be distinct constructs of memory. Conceptual priming goes through a "top-down process" whereas perceptual priming does the opposite. They affect human's behavior in different types of the decision-making process; conceptual priming affects performance in memory-based performance and perceptual priming affects performance in a stimulus-based decision. Lee (2002) suggests that brand choice decisions may involve a memory-based decision process or stimulus - based decision process. She defines a memory-based decision as "one in which the consumer chooses a brand from a product category on the basis of information retrieved from memory," such

as recalling a restaurant for a family dinner or recalling a beverage from a bar. Alternatively, stimulus-based decisions happen in environments where relevant information already physically exists (Lee, 2002). For example, a stimulus-based decision takes place when a consumer is trying to choose an item among several brands in a supermarket.

In examining how conceptual and perceptual priming affects subsequent brand choice decisions, Lee (2002) conducted an experiment whereby 112 undergraduate business major students were told to participate in a marketing experiment aimed to evaluate customer awareness and preferences toward certain brands in several product categories. Researchers divided students into two groups. They applied two variables, perceptual priming or conceptual priming, to each of the group by showing brands' name in isolation to group 1 and in sentence context to group 2. Then, half of the participants in each group were given 45 seconds to write down as many brands as possible, recalling from their memory, in several target categories (a memory-based decision task). The other half of the participants in each group were asked to recommend one brand out of two that presented the way as in each of the different product categories (a stimulus-based decision task). By comparing the results from each group, researchers noticed that participants exposed to brand names in isolated context (perceptual priming) performed better at choosing the primed brand names when they were asked to choose it among several brands (stimulus-based decision), while participants exposed to brand names in a sentence (conceptual priming) performed significantly better in listing the primed brand when they were asked to recall it from memory (memory-based decision). Hence, brands presented in an isolated context benefit more in a stimulus-based decision while brands presented in a sentence or a meaningful context benefited more in a memory-based decision. This indicates that perceptual priming has a stronger influence

on stimulus-based decisions and conceptual priming has a stronger influence on memory-based decisions.

These findings have suggestive implications for marketing strategies, especially with respect to advertising: marketers should have a strong understanding of how their target audience makes purchase decisions. A perceptual priming strategy, instead of conceptual priming strategy, would likely be more effective when target audience makes stimulus-based decisions, and a conceptual priming strategy would likely be more effective when target audience make memory-based decisions. In this study, stimulus-based decision task and memory-based decision task are used in the measurement of the effectiveness of perceptual priming and conceptual priming, which will be discussed in the methodology section.

At what conditions is priming more or less effective? Many study have examined the effect of priming duration on priming effect. Research suggests that presenting the priming stimulus in a short duration provides positive priming, while presenting stimuli for a longer duration results in less effective or negative priming ((Huber and O'Reilly, 2003; Zago et al., 2005; Voss and Gonsalves, 2010; Faivre and Kouider, 2011; Miyoshi and Ashida, 2014). In a neural network model of perceptual identification, Huber and O'Reilly (2003) found that longer perceptual priming duration results in the adaptation of stimulus. Therefore, it decreases the magnitude of pre-activation later and as a result a less effective perceptual priming effect. On the other hand, Zago (2005) looked at the effect of prime duration on long-term repetition priming. The results suggest that the magnitudes of behavioral priming become lower when perceptual priming duration increases. While these two studies focus on perceptual stimulus, a study conducted in Kyoto University also suggest that a short prime presentation provides a higher conceptual priming

magnitude while a longer prime presentation provides a lower conceptual priming magnitude (Miyoshi, Kimura, & Ashida, 2015).

Affective Influence on Decision-making

In Thinking Fast & Slow, Daniel Kahneman suggests that the operation of our thinking consists of two systems, which he refers to System 1 and System 2. System 1 "operates automatically and quickly with little to no effort and no sense of voluntary control." It takes charge of automatically identifying impressions and feeling, and conducting instant responses. On the other hand, System 2 takes "information" collected by System 1 and translate it into thoughts (Kahneman, 2008). Previous research has demonstrated that affect (mood) has a significant influence on the operation of System 1 and System 2. When people are in good moods, System 1 dominates the operation of thinking; people tend to act based on their "feelings" or "intuitions." However, when people are in bad mood, System 2 tends to be more active, and people act more suspiciously and less intuitive accordingly.

Around the 1960s, in order to identify the essence of creativity, a psychologist named Sarnoff Mednick invented a test, called the Remote Association Test (RAT). His idea is that creativity is "associative memory that works exceptionally well." For example, the test asks participants to think of a word that is associated with "cottage," "Swiss," and "Cake," or "dive," "light," and "rocket." For the first word set, the answer is "cheese" and for the second the answer is "sky." The ability to call out a word from associative memory is creativity. Serval German psychologists put in two interesting questions to the study: do people feel intuitive that a triad of words shares association before they actually know the association, and how does mood influence the performance?

To answer these questions, researchers first asked participants to recall a happy or a sad time in their lives for a few minutes. This put the participants in either good or bad mood. Researchers then presented a series of triads of words, half of which have a strong association and half of which did not. All participants were given 2 seconds to solve the question, which was short enough so that participants did not have time to figure out the actual answer. After each triad of words, participants would press one of two keys to decide whether they think the words have an association to each. There were two surprising findings. First, the accuracy of participants' guesses was significantly higher than if allowed a longer time of thinking. More importantly, the mood effect on intuitive performance was powerful. Putting participants in a good mood prior to the task resulted in doubled accuracy. On the other hand, putting participants in a bad mood prior to the task completely disables intuitive thinking. Essentially, cognitive ease resulted from good moods and cognitive strain from bad moods change. As Daniel Kahneman concludes in his book, Thinking Fast & Slow, "mood evidently affects the operation of System 1: when we are uncomfortable and unhappy, we lose touch with our intuition (Kahneman, 2008)."

This finding is particularly important as related to the current study. Credit to the previous researchers, the concepts of perceptual priming, conceptual priming, cognitive ease, and System 1 & 2 become the theoretical foundation of the hypothesis examined in this study, which will be discussed in the following section. Nonetheless, previous research rarely focuses on the affective influences on particularly perceptual priming and perceptual priming. If good mood encourages System 1 thinking, would it also strengthen perceptual priming effect and enhance performance on a stimulus-based decision? In addition, if bad mood discourages operation of System 2, would it influence conceptual priming effect and enhance the performance of memory-based decisions?

The findings of this study should not only provide evidence to the limitation of traditional economic theory but also enhance the implications of perceptual and conceptual priming

Section 3: Overview

The last section discussed how good moods enhance performance in intuition; after people are asked to recall a happy moment, performance of judgment based on intuition enhances significantly. Bad moods, on the other hand, discourage intuition and encourages elaboration, meaning that people make effortful judgment instead of intuitive ones. Research in priming also indicates that conceptual priming affects performance on memory-based decision tasks, while perceptual priming affects performance in stimulus-based decision tasks. Hence, combining these founding, the aim here is to examine whether putting people in a good mood might increase the effectiveness of perceptual priming and whether putting people in a bad mood might increase the effectiveness of conceptual priming in this study. I conclude these in two hypotheses:

Hypothesis 1: Prior exposure to a product in perceptual stimulus has a better effect on influencing decision-making when people are in good mood. In other words, in comparison to people in bad mood: presenting a brand name in an isolated context (vs. in a product description) should lead to a) greater perceptual priming and b) greater stimulus-based choices.

Hypothesis 2: Prior exposure to a product in context has a stronger effect on influencing decision-making when people are in bad mood. In other words, in comparison to people in good mood: presenting a brand name in a product description (vs. in an isolated context) should lead to a) greater conceptual priming and b) greater memory-based choices.

Section 4: Methodology

To examine the two hypotheses, a survey was sent via email and posted in social media and Amazon Mechanical Turk to recruit participants. In terms of demographics, participants are

mostly domestic and international students in Skidmore College and other people who are interested in taking the survey on Amazon Mechanical Turk. Student participants recruited were also mostly junior and senior business major students in Skidmore College. All of the participants were over 18 years old. About 53% of the participants were between 21 to 30 years old, 19% of them were between 18 to 20 years old, 14% of them were between 31 to 40 years old and 14% were over 40 years old. 13% of the participants did not have English as their first language which could potentially lead to misunderstanding of the survey but the influences were expected to be limited. In terms of income level, 23% of the participants have annual household income lower than $20,000, 20.5% of them reported an annual household income between $20,000 and $34,999, 12% of them reported an annual household income between $35,000 and $49,999, 12% between $50,000 to $74,999, and about 32% reported an annual household income above $75,000. In addition, about 75% of the participants have a college degree or are currently enrolled in bachelor degree program. About half of the participants were male and half of the participants were female. In total, 185 people participated in this study.

In the beginning of the survey, participants were randomly assigned into one of two mood conditions. In the positive mood condition (Mood=1), participants were asked to recall and write down a moment when they were extremely happy. In the negative mood condition (Mood=0), participants were asked to write down a moment when they were extremely unhappy. To enhance the effect of mood induction, the survey required participants to describe these moments in the least 100 words.

Participants were then randomly assigned to the experimental group or the control group. In the experimental group, participants were asked to look at 10 objects including fire, a rabbit, a sweater, a window, a skateboard, a batman logo, a tree, a book, a bag of a pack of Higher Ground

Roaster coffee beans and a box of Coco Pops cereal in random order, the latter two represented test brands. However, half of the participants in experiment group saw the 10 items/objects presented in photos (perceptual priming, Perci=1 Conci=0) and the rest of them saw the 10 items/objects presented in descriptions (conceptual priming, Conci=1). In control group, participants were not exposed to any form of priming (Perci=0, Conci=0). (See table 1)

Afterward, all participants in both experimented and control groups were given five word-scramble tasks in which they were asked to rearrange several letters into meaningful words. This filler task served as a distractive task to prevent the participants from seeing the purpose of the study and also created a gap of time between the perceptual/conceptual priming tasks and the stimulus-based/memory-based decision tasks. All participants were then asked (in a scenario) to recommend brands to their "friend" who just opened a new grocery shop. For this questions, half of the participants in both the experimental and control groups were asked to choose one brand among three in each product category (stimulus-based decision task). The true purpose of this question was to examine weather participants will choose the primed brands, which are Higher Ground Roaster coffee and Coco Pops cereal (Choosehgi=1, Choosecocoi =1). The rest of the participants in both groups were asked to recall and write down some brands in each category (memory-based decision task). The true purpose of this question was to examine whether the participants would recall the primed brands, which are Higher Ground Roaster coffee and Coco Pops cereal (Recallhgi=1, Recallcocoi =1). (See table 1)

At the end of the survey, all participants were asked to answered a few demographic and preference questions, including their attitude about chocolate/cereal/fair traded good, self-perception of healthy lifestyle, gender, household income, and language familiarity. Participants were asked "how often do you consume fair-traded goods?", "Do you like chocolate?", "How

often do you drink coffee?", "How often do you eat cereal?", and "How healthy are you?" Throughout the survey, all questions were answered in the same order. In addition, participants were allowed to exit the survey at any time if they felt uncomfortable, and at the end of the survey, participants had the option to withdraw from the study without submitting their responses. Participants who completed the survey wrote down their email address to enter into a drawing to win a $25 amazon gift card, and then a debriefing was presented at the end of the survey. Each participant recruited from Amazon Mechanical Turk received a $2 compensation.

Table 1
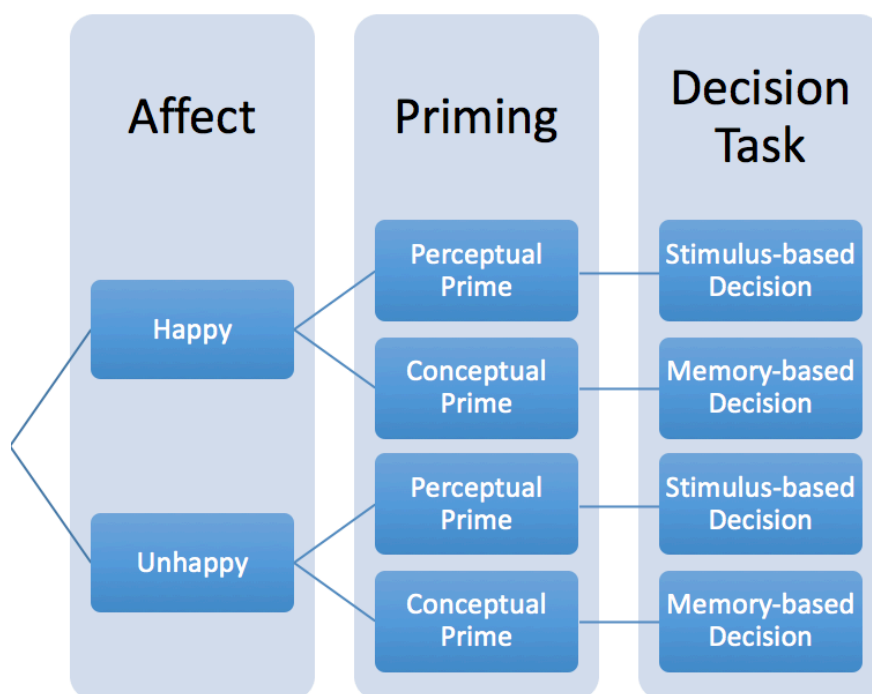
Note that the two target products used in the study were Higher Ground Roaster coffee and Coco Pops cereal. Instead of choosing brands such as "Starbucks," and "Cocoa Puffs, products without strong reputation and brand names in order to avoid strong personal preference on individual products. In expectation, the priming effect should work the best when products are

perceived indifferently to consumers, meaning there is no personal preference involved in one's decision-making process. For example, suggested by previous research (Lee, 2002), when customers are in a grocery store and see series of products with unfamiliar brand names, customers tend to buy the products that they were primed to (such as ads). However, the priming effect (as ads) may not be as effective if customers know exactly what they want; that is when customers have a strong personal preference. For example, a Starbucks fan will be more likely to buy a pack of Starbucks coffee beans when he or she is in the grocery store looking at various brands of coffee beans.

In addition, in order to include the variables associated with the influence of personal preference on products. In the last section of the survey, participants were asked the following: "how often do you consume fair-traded goods?", "Do you like chocolate?", "How often do you drink coffee?", "How often do you eat cereal?", and "How healthy are you?" These questions are asked because of several reasons. First of all, people who often consume coffee/cereal are more likely to choose the products with strong personal preference. When customers frequently consume certain products, they are more likely to be familiar with the product categories. For example, if a customer eats cereal for breakfast every day, the chance of him/her not knowing many cereal brands is relatively low. In this study, participants who consumed coffee/cereal more than three times a week were defined as "frequent consumers." Secondly, people who like chocolate flavor/fair-traded goods are more likely to choose the chocolate flavor cereal/ fair-traded goods without the effect of any form of priming. For example, consumers who support fair trade goods are more likely choose a fair-traded product among other products that are not fair-traded. In the regression models, the variables "Likechoi" and "Buyfairti" reflect individual's personal attitude of chocolate and fair-traded goods. Participants who consume fair-traded product "very frequently"

or "always"/responded "Chocolate is a must" in the survey were defined as customers with a strong personal preference toward chocolate and fair-traded goods. People who perceive themselves living in healthy lifestyle are less likely to choose unhealthy foods. Since chocolate flavor cereal is widely perceived as unhealthy food with high sugar content, people who perceive themselves living in healthy lifestyle may be less likely to choose or recall Coco Pops cereal. Participants who perceive themselves "healthy" or "very healthy" in the survey was defined as customers living in healthy lifestyle (Healthi).

The affective influence on perceptual and conceptual priming were analyzed in four sets of regression models. There were 4 dependent variables and 13 independent variables. The four dependent variables are "choosing Higher Ground Coffee (Choosehgi)," "choosing Coco Pops cereal (Choosecocoi)," "recalling Higher Ground Coffee (Recallhgi)," and "recall a chocolate flavor cereal (Recallcocoi)." Since the four dependent variables used in this study are dummy variables, this study uses four probit regression models to evaluate how mood effects the effectiveness of conceptual and perceptual priming. The coefficients of independent variables in probit regression represent the change in likelihood holding the other variables constant.

The empirical setting, the baseline specifications adopted are as the following:

Choosehgi = β0 + β1Perci + β2Buyfairti + β3Drinkcoffi + εi (1)

Choosecocoi = β0+ β1Perci + β2Likechoi + β3Eatceri + β4Healthi + εi (2)

Recallhgi = = β0 + β1Conci + β2Buyfairti + β3Drinkcoffi + εi (3)

Recallcocoi = β0+ β1Conci + β2Likechoi + β3Eatceri + β4Healthi + εi (4)

Dependent variables equal to 1 if participants chose Higher Ground Coffee, chose Coco Pops cereal, recalled Higher Ground Coffee, or recalled a chocolate flavor cereal. Dependent

variables equal to 0 if they did not choose or recall the target products. The independent variables are explained as the following.

Mood (Moodi) is a dummy variable indicating whether participants were in the happy mood or an unhappy mood. (unhappy = 1, and happy = 0) This dummy is not included as one of the independent variables but instead served as a condition variable when running the regression since the purpose of this study was to investigate the difference in the effectiveness of priming when people are in different mood. For each set of the regression model, there were two regression conditions (regress "if mood==1" vs "if mood==1").

Similar to the experiment conducted in the study by Lee (2002), perceptual priming (Perci) is a dummy indicating whether participants were primed by the perceptual stimulus (the photos). These participants were also asked to complete stimulus-based decision tasks (choosing brands among others in 10 categories). Coefficients are expected to be positive according to Lee's research (Lee, 2002). Perc = 1 when participants were primed by perceptual priming and Perc = 0 when they were not. In addition, the coefficients were expected to be higher when people were in a good mood (if Moodi == 1) rather than in a bad mood (if Moodi == 0). Also similar to the experiment conducted by Lee (2002), conceptual priming (Conci) is a dummy indicating whether participants were primed by the perceptual stimulus (the descriptions). Those participants were also asked to complete memory-based decision tasks (recalling brands among others in 10 categories). Coefficients are expected to be positive(Lee, 2002). Conc = 1 when participants were primed by perceptual priming and Perc = 0 when they were not. In this setting, the coefficients were expected to be higher when people were in a bad mood (if Moodi == 0) rather than in a good mood (if Moodi == 1).

Preference on fair-traded goods, in which participants who "always" or "very frequently" buy fair-traded goods are categorized as "prefer fair-traded good," (Buyfairt = 1) and participants who "occasionally," "rarely," "very rarely," and "never" buy fair-traded goods are categorized as "not prefer fair-traded goods." (Buyfairt = 0) Coefficients are expected to be positive in conceptual priming model of "Higher Ground coffee". Preference on chocolate: participants who answered "Chocolate is a must" are categorized as "prefer chocolate flavor," (Likecho = 1) and participants who answered "Take it or leave it," or "No" are categorized as "not prefer chocolate flavor." (Likecho = 0) Coefficients are expected to be positive since participants who prefer chocolate might be more likely to choose or recall Coco Pops Cereal and recall chocolate flavor cereal. Knowledge on coffee and cereal brands: participants who often consume coffee or cereal may know more about coffee and cereal brands which can potentially decrease the effect of priming. Participants who consumer coffee or cereal more than 3 times per week are categorized as knowledgeable consumers on coffee and cereal (Drinkcoff = 1, Eatcer = 1). Participants who consumer coffee or cereal less than 3 times per week are categorized as less knowledgeable consumers on coffee and cereal (Drinkcoff = 0, Eatcer = 0). Coefficients are expected to be negative. Healthy lifestyle: participant considered themselves as "healthy" or "very healthy" are categorized as living in healthy lifestyle (Health = 1), and participants who answered "moderately healthy" or "not healthy" are categorized as not living in healthy lifestyle (Health = o). Participants who considered themselves livening in healthy lifestyle may be less likely to choose or recall chocolate flavor cereal. Coefficients are expected to be negative.

Section 5: Results

Overall, suggested by the marginal effects and p-values, the results provide weak evidence to support the major hypotheses in this study. This section will discuss the results of 4 groups of

probit regressions, including: 1) perceptual priming in good mood and bad mood (Higher Ground Roaster), 2) perceptual priming in good mood and bad mood (Coco Pops), 3) conceptual priming in good mood and bad mood (Higher Ground Roaster), and 4) conceptual priming in good mood and bad mood (Coco Pops).

1. $Choosehg_i = \beta_0 + \beta_1 Perc_i + \beta_2 Buyfairt_i + \beta_3 Drinkcoff_i + \varepsilon_i$ (1)

Perceptual priming in good mood and bad mood (Higher Ground Roaster) looked at the effect of perceptual priming (Perci), the frequency of buying fair-traded goods (Buyfairti), and frequency of drinking coffee (Drinkcoffi) on the likelihood of choosing Higher Ground Roaster in stimulus-based decision task (Choosehgi). This study expects the coefficient of priming effect in good mood condition to be higher compared to in bad mood condition. By comparing the results from regressions in good and bad moods conditions, the marginal effect of priming effect was higher in good mood than it was in the bad mood. In good mood, after looking at the photo of a pack of Higher Ground Roaster coffee, participants were 1.5% more likely to choose it when they were asked to recommend a coffee brand (See Table 2). However, in bad mood, after looking at the photo of a pack of Higher Ground Roaster coffee, participants were 13.6% less likely to choose it when they were asked to recommend a coffee brand (See Table 3). The marginal effect is higher in good mood condition, which is consistent with the expectation. However, the results also show extremely high p-values of .921 in good mood condition and .397 in bad mood condition, indicating that results are statistically insignificant and unreliable. It is important to note that the marginal effect of priming in the bad mood setting is negative, which is contradictory to the findings of Lee's study (2002). In addition, the Pseudo R2s in both conditions are close to 0, suggesting a poor fitness of the models.

Table 2. Choosing Higher Ground Roaster in Good mood

VARIABLES	(1) dF/dx	(2) Robust Std. Err.	(3) P>|z|
perc	.0147963	.1508874	0.921
buyfairt	-.0024241	.1638782	0.988
drinkcof	.0027064	.1202438	0.982
Pseudo R^2	0.0003		

Table 3. Choosing Higher Ground Roaster in Bad Mood

VARIABLES	(1) dF/dx	(2) Robust Std. Err.	(3) P>|z|
perc	-.1363498	.1525735	0.397
buyfairt	.0378921	.2050515	0.856
drinkcof	.0576299	.1436538	0.688
Pseudo R^2	0.0175		

2. $Choosecocoi = \beta0 + \beta1 Perci + \beta2 Likechoi + \beta3 Eatceri + \beta4 Healthi + \epsilon i$ (2)

Perceptual priming in good mood and bad mood (Coco Pops) looked at the effect of perceptual priming (Perci), attitude to chocolate coffee (Likechoi), the frequency of eating cereal (Eatceri), and healthy lifestyle on the likelihood of choosing Coco Pops in stimulus-based decision task (Choosecocoi). This study expects the coefficient of priming effect in good mood condition to be higher compared to in bad mood condition. The results of this regression group are similar to the results in the first group (perceptual priming, Higher Ground Roaster). The marginal effect of priming effect was slightly higher in good mood (.0274391) than it was in the bad mood (-.0332896). In good mood, after looking at the photo of a box of Coco Pops, participants were about 2.7% more likely to choose it when they were asked to recommend a cereal (See Table 4). On the

other hand, in bad mood, after looking at the photo of a pack of Higher Ground Roaster coffee, participants were about 3.3% less likely to choose it when they were asked to recommend a cereal brand (See Table 5). Similar to the results from the first regression group and consistent with the expectation, the marginal effect is higher in good mood condition. However, p-values remain extremely high in good and bad mood condition (0.863 vs. 0.849), indicating that results are statistically insignificant and unreliable. Again, the marginal effect of priming in the bad mood setting is negative, which is contradictory to the findings of Lee's study (2002). In addition, the Pseudo R2s in both conditions are close to 0, suggesting a poor fitness of the models.

Table 4. Choosing Coco Pops in Good Mood

VARIABLES	(1) dF/dx	(2) Robust Std. Err.	(3) P>|z|
perc	.0274391	.1575628	0.863
likecho	.2668466	.134964	0.064
eatcer	-.0868599	.1830084	0.646
health	-.1078806	.1481288	0.466
Pseudo R^2	0.0563		

Table 5. Choosing Coco Pops in Bad Mood

VARIABLES	(1) dF/dx	(2) Robust Std. Err.	(3) P>|z|
perc	-.0332896	.1766508	0.849
likecho	.1407837	.1391829	0.317
eatcer	.1240479	.1901346	0.503
health	-.1012375	.1423874	0.475
Pseudo R^2	0.0350		

3. Recallhgi = β0 + β1Conci + β2Buyfairti + β3Drinkcoffi + εi (3)

Conceptual priming in good mood and bad mood (Higher Ground Roaster) group aimed to investigate the effect of conceptual priming (Conci), the frequency of buying fair-traded goods (Buyfairti), and frequency of drinking coffee (Drinkcoffi) on the likelihood of recalling Higher Ground Roaster in memory-based decision task (Recallhgi). This study expects the coefficient of priming effect in bad mood condition to be higher compared to in good mood condition. However, among all the recorded survey responses, only one participant recalled Higher Ground Roaster coffee in memory-based decision task. As a result, the regressions were unable to investigate the marginal effect in both mood conditions. The priming effect in this regression group is expected to be large in the negative direction which is which is contradictory to the findings of Lee's study (2002).

4. Recallcocoi = β0+ β1Conci + β2Likechoi + β3Eatceri + β4Healthi + εi (4)

This regression group studies the conceptual priming in good mood and bad mood (Coco Pops). It investigates the effect of perceptual priming (Perci), attitude to chocolate coffee (Likechoi), a frequency of eating cereal (Eatceri), and healthy life-style on the likelihood of recalling Coco Pops in memory-based decision task (Recallcocoi). The coefficient of priming effect in bad mood condition is expected to be higher compared to in good mood condition. According to the results, the marginal effect of priming effect is slightly higher in bad mood (-.1080351) than it is in the bad mood (-.1844637). In bad mood, after looking at the description of Coco Pops cereal, participants were about 10.8% less likely to recall it when they were asked to recommend a cereal (See Table 6). On the other hand, in good mood, after looking at the photo of a pack of Higher Ground Roaster coffee, participants were about 18.4% less likely to recall Coco Pops (See Table 7). Similar to the results from the first regression group and consistent with the

expectation, the marginal effect is higher in bad mood condition. However, contradictory to the expectation and previous research on conceptual priming (Lee, 2002), the priming effect are both negative. In addition, p-values remain high in both mood conditions (0.115 vs. 0.325), which again indicates that the results are statistically insignificant and unreliable. Moreover, the Pseudo R2s in both conditions are relatively low (0.0969 vs. 0.0621), suggesting a poor fitness of the models.

Table 6. Recalling Coco Pops in Good Mood

Table 6. Recalling Coco Pops in Good Mood

VARIABLES	(1) dF/dx	(2) Robust Std. Err.	(3) P>|z|
conc	-.1844637	.1512412	0.115
likecho	.0922906	.0775954	0.216
eatcer	-	-	-
health	-.0183735	.0840109	0.824
Pseudo R^2	0.0969		

Table 7. Recalling Coco Pops in Bad Mood

VARIABLES	(1) dF/dx	(2) Robust Std. Err.	(3) P>|z|
conc	-.1080351	.1271899	0.325
likecho	-	-	0.339
eatcer	-.0972775	.1029717.	-
health	-.1167476	.1065711	0.259
Pseudo R^2	0.0621		

Section 6: Limitations

Overall, the results provide weak evidence to support the hypotheses in this study. Although perceptual priming is more effective in good mood conditions and conceptual priming is more effective in bad mood conditions, the coefficients are statistically insignificant in all regressions groups. More importantly, the negative signs of the coefficients of both perceptual and conceptual priming are the opposite to the results from previous research, of which the hypotheses in this study is built upon. This became the major issue of this study. In this section, we will discuss the possible explanations of this unexpected phenomena.

One possible explanation of the negative priming effect can be due to the nature of the method used in this study. As discussed in previous sections, in order to investigate the affective influence on the effectiveness of priming, a survey was conducted and distributed to the participants. In both perceptual and conceptual priming groups, participants were asked to look at 10 objects in photos (perceptual priming group) or descriptions (conceptual priming group). In surveys, instead of face-to-face experiments, participants may be less willing to spend time on each question. The survey did not inforce a minimum amount of time on each page so the participants were able to click on the "next" button rapidly without spending enough time looking at the photos or descriptions. Therefore, it is possible that participants might have skipped or spent less time looking at the photos and descriptions. In addition, although the responses were recorded anonymously, a few participants reported in person that they found the first part of the survey discouraging since they did not expect short essay questions (Recall a happy/unhappy moment in your life) in the survey. Hence, it is possible that the short essay questions made participants impatient while answering the rest of the survey, including the test of looking at photos or descriptions. In order to verify this possibility, the response times of each participant were added

up and taken the average. On average, each participant spends 9.13 mins on each survey, although an entire survey is estimated to take 10 to 15 mins to finish. This suggests a possibility that most participants did not spend enough time looking at the photos and descriptions, which led to the failure of priming effect. In the future study, the survey should enforce a minimum amount of time on each page for a reasonable amount of time so that the participants are unable to click on the "next" button without noticing the photos and descriptions of the objects.

The negative signs of priming coefficients can also be potentially caused by sample size bias. Sample size bias is a bias in which a sample is unable to represent the intended population. About 50% of the participants recruited were senior or junior students from Skidmore College, and most of them are business major students. Compared to students with other majors, business major students, especially for those who specialize in marketing and advertising, may be more likely to realize the purpose of the study, causing a bias on their behavior while taking the surveys. Knowing the intention of study would discourage instinctive behavior while completing the survey. On the other hand, another 50% of the participants were recruited from Amazon Mechanical Turk. Those participants are professional survey taker who take survey regularly in daily basis. Therefore, they are able to finish the survey in a minimum amount of time. In order to verify this possibility, the response times of each participant recruited from Amazon Mechanical Turk were added up and taken the average. On average, each participant spends 8.60 mins on each survey, which is about half minute shorter than the average of all responses. This result supports the hypothesis that the survey failed to prime participants with the target objects (Higher Ground Roaster coffee and Coco Pops cereal). In general, it is difficult for researchers to avoid sample size bias. One thing researcher can possibly do is to recruit students from all majors in future research.

Another possible explanation is the notability of photos and descriptions used in the survey. In order to prevent participants from knowing the intention of the study, 10 objects were presented in photos or description. These include fire, a rabbit, a sweater, a window, a skateboard, a batman logo, a tree, a book, a bag of a pack of Higher Ground Roaster coffee beans and a box of Coco Pops cereal in random order, the latter two represented test brands. It is possible that priming participants in 10 objects is too overwhelming and therefore decrease the priming of the two target brands. In addition, the photo of Higher Ground Roaster can be somehow unclear, or too small while it was displayed in a smaller device such as a smart phone. The sentences in those descriptions can also be too long, discouraging participants to read them with full effort. The visibility of the photos and readability of the descriptions are two potential factors that discourage participants to be primed by a perceptual or conceptual stimulus of the target brands, which led to the failure of priming. To ensure the notability of the priming stimulus, future research should be conducted in experiment instead of a survey to make sure participants spend enough time looking at the photos or reading the descriptions.

Last but not the least, a few participants reported that the filler task, between the perceptual /conceptual priming tasks and the stimulus-based/memory-based decision tasks, was difficult and time-consuming. As discussed in the methodology section, the filler task served as a distractive task to prevent the participants from seeing the purpose of the study and intended to create a gap of time between the perceptual /conceptual priming tasks and the stimulus-based/memory-based decision tasks. In the filler task, participants were asked to reorganized the letters: "a n r o e g" (orange), "e s a p k" (speak), "o o d f" (food) and "e r e g n" (green) into meaning words. A few participants reported in person that the first two sets were difficult to reorganize. The high difficulty of the filler task can be discouraging for participants to complete the rest of the survey

with effort. It is possible that the filler task has taken the participants too much time and the priming effect had diminished by the time they started the stimulus-based/memory decision tasks. In addition, about 13% of the participants do not have English as their first language. Limited fluency of English can lead to misunderstanding the questions and description, and low sensitivity on brand names, which decreases the priming effects. However, the influences of language fluency are expected to be limited because most of the participants (international students) have a high level of English fluency and speak English in a daily basis.

Section 7: General Discussion

This study is the first to investigate the affective influences on perceptual and conceptual priming. Unfortunately, the results provide weak evidence to support the hypotheses that good mood improves the effectiveness of perceptual and bad mood improves the effectiveness of conceptual priming. In all groups, except for conceptual priming group with Higher Ground Roaster, comparing the results in good mood and bad mood conditions, the effects of priming are different in expected directions. However, due to the large p-values, the null hypotheses could not be rejected. In other words, the results are statistically insignificant. More importantly, this study found the priming effects to be negative in some regression groups, which is noteworthy for future study. These phenomena suggest that there is a high possibility that this study failed to prime the participants with the intentional stimulus (perceptual stimulus and conceptual stimulus). However, it is not clear that what causes the ineffective priming. Although the possible explanation was discussed in the previous section, the study itself could not provide enough evidence to verify the possible explanations. Hence, future research can focus on what decreases priming effect in a survey conditions and the overloaded priming effects.

Nevertheless, good moods and bad moods did seem to have an impact on participants' behavior according to the results. This study found that the average time spends on a survey for each participant in a good mood is slightly shorter than it is for each participant in a bad mood. On average, participants in good mood spent about 9.04 minutes on each survey while participants in bad mood spent about 9.23 minutes. This implies that good mood might encourage participants to act more intuitively and resulted in a shorter response time on a survey. On the other hand, consistent with the previous finding on the cognitive strain, bad mood leads to effortful thinking and elaboration which results in a longer response time on a survey.

Recalling the scenario in the introduction, Tommy and Jenny are doing some shopping at a Macy's department store. Is Tommy more likely to choose a polo shirt from Ralph Lauren when he is in a good mood or bad mood? In good mood or bad mood is Jenny more likely to recall DKNY when she is figuring out what to buy? The answers to these two questions remained unsolved. Being the examples of ineffective priming effects, the major contribution of this study is that it pointed out the importance of priming conditions. As many research focused on how priming effect influences consumers' behavior, few researchers investigate what decrease or eliminate priming effects. Last but not the least, this study should be replicated, improved and conducted in experiments of which priming effects are to be successfully conducted. The study would have major implications in marketing and adverting if the hypotheses are supported by the results. Marketers will be able to design and distribute advertisings in more efficient ways. First of all, if good mood increases the effectiveness of perceptual priming, perceptual-stimulus-based advertising will be more effective if they are displayed in places where people are in good moods, such a product placement in a comedy. If bad mood increases the effectiveness of conceptual priming, conceptual-stimulus-based advertising will be more effective if they are displayed in

places where people are in bad moods, such as advertising displayed near a cemetery. Therefore, it is necessary and beneficial to replicate, improve and conduct the study of affective influences on perceptual and conceptual priming in an experiment setting to verify the hypotheses again in the future.

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