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ONLINE PRODUCT REVIEWS: EFFECTS OF STAR RATINGS AND VALENCE ON  
REVIEW PERCEPTION AMONG THOSE HIGH AND LOW IN NEED FOR COGNITION

by

JACQUELYN SCHRECK

A Thesis submitted in partial fulfillment of the requirements  
for Honors of the Major Program in Psychology  
in the College of Sciences  
and in The Burnett Honors College of Sciences  
at the University of Central Florida  
Orlando, Florida

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Thesis Chair: Matthew Chin

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## **ABSTRACT**

The Internet is becoming the main source for all types of tasks, from learning, to working, and shopping. There are many websites one can use to shop. At this point in time almost all stores have a website from which you can order anything you might want from there. Amazon and Ebay are two main websites that sell almost anything you could possibly imagine. As this becomes more prominent, it is important to understand the effects of the Internet and its product reviewers specific to this study on others' decisions. This study seeks to understand the effect of star ratings and valence on review perception between different cognitive levels between individuals. Recognition review perception, and intent to purchase were being measured. Results showed that need for cognition did have an effect on accuracy of recognition and perceived valence. Need for cognition and congruency as well as actual valence had an effect on perceived valence. Need for cognition, actual valence, and congruency all had an effect on purchase intention. This research is important because it is relevant to a growing trend around the world. Technology is already integrated into nearly everyone's lives and it is only going to more so as technology continues evolve. Just as it is becoming more common for people to receive education from online institutions, and for employers to use more Internet based applications, it is only natural consumers will continue the trend of purchasing items online. Learning the social and cognitive influences of online consumers on perception and purchasing intentions is something everyone needs to be aware of.

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## **CHAPTER ONE: INTRODUCTION**

More and more people are shopping online, but the problem is that it is hard to be sure of exactly what you are getting. When people walk to a regular shoe store, buyers are more confident that the shoe is going to fit and that the material is not going to fall apart after a week, but online, how would it be possible to gain this information? Many people have turned to reviews, but again there is a problem. How do consumers know the reviews are from other consumers and not the companies that produce the goods? There are many factors that can contribute to the perceived trustworthiness and usefulness of a review, and it is completely different for each individual.

## CHAPTER TWO: LITERATURE REVIEW

### Review Valence

One factor that can contribute to purchase intention and the perceived trustworthiness of a review is valence. Valence is how positively or negatively someone perceives a product review, in regards to consumer sites. Valence can be all positive, all negative, or a combination of both negative and positive (Pentina, Bailey, & Zhang, 2015). In a 2009 experiment, Park and Lee found that negative reviews have a greater effect than positive ones. On the contrary, Doh and Hwang (2009) tested the impact of review sets, groups of reviews organized to be analyzed together, and found opposite results. They found that positive sets (e.g., sets with predominantly positive reviews) had a greater effect than negative sets (e.g., sets with predominantly negative reviews). According to Salehan and Kim (2015), while negative characteristics may reduce the perceived value of a product, the same cannot be said for positive characteristics raising the perceived value of a product.

Positive reviews were seen as a good way to persuade someone to buy something. Many companies want to remove negative reviews from their sites because they feel like it will decrease their sales (Zhang & Buda, 1999). That has been contradicted on more than one occasion. Although one study done by Chevalier and Mayzlin (2006) found that one-star reviews could negatively affect sales, another study the same year (Clemons, Gao, & Hitt, 2006) found that higher ratings could predict higher sales, but lower reviews could not predict lower sales. The problem with completely positive reviews is that they could be seen as untrustworthy. Previous research has shown that a review that includes both negative and positive aspects of a product (e.g., "I love this water bottle, but it dented from one little fall,") could be seen as more

trustworthy and reliable, and could more affectively persuade the buyer to purchase a product. People tend to become suspicious when they see a lot of positive ratings, but very few negative ratings (Maslowska, Malthouse, & Bernritter, 2017).

Past studies on review valence for box office revenue have had very inconsistent findings. In some studies, review valence was not seen as a determining factor in purchase intention, while some produced results to support the claim. Likewise, while some studies found negative reviews to have a stronger effect than positive reviews, other researchers have not found a significant difference in purchase intention between the two. (Ketelaar, Willemsen, Sleven & Kerkhof, 2015).

One example of past research to find a difference between the impact of negative and positive reviews found that consumers were more influenced by negative reviews, which as a result had more weight than either positive or neutral reviews. Negative reviews are considered more relevant to poor quality, while positive reviews are considered less relevant to good quality (Ketelaar, Willemsen, Sleven & Kerkhof, 2015).

Tsang and Prenderghast (2009) found that negative reviews have a stronger impact, as they hurt more than positivity helps. This suggests that when both negativity and positivity are present rather than just positivity, it will significantly decrease purchase intention. However, when both negativity and positivity are present rather than just negative, it does not significantly increase purchase attention, since negativity is consistently more influential (Tsang & Prenderghast, 2009).

## **Sentiment of the Review**

Sentiment is very similar to valence and they may be hard to separate, or even used interchangeably. Though unlike valence, which is the automatic judgment of a reviews positivity, negativity, and neutrality, sentiment refers to something a little higher in function, attitude. Attitude does include positivity, negativity, and neutrality, but it is actually going one step further. Attitude can entail emotions and feelings, such as frustration, joy, anger, sadness, excitement, and so on (Mohammad, 2015).

There have been many researchers that have studied the influence of sentiment. In a 2013 study conducted by Siering and Muntermann, positive review sentiment was found to be more influential when it came to perceived helpfulness in search goods, items whose qualities do not need to be used for judgment (e.g., cars), while negative sentiment was found to be more helpful in experience goods, goods that are judged based on personal experience (e.g. mattresses). It is hard to know for sure whether negative or positive sentiment has more of an influence. Previous research seems to suggest that positive sentiment reviews are more influential (Pentina, Bailey, & Zhang 2015). Positive sentiment reviews should influence consumers because they evoke positive emotions. Arguably, negative could be more influential because it was seen as more accurate and more likely to be real. However, a study based on Yelp reviews shows that people attribute negative reviews to a subjective reason, not a logical one (Pentina, Bailey, & Zhang, 2015).

## **Types of Goods**

Two main types of “goods,” search goods and experience goods have been taken into consideration in research. Search goods are items like calculators, vitamins, and printers they are things that individuals do not typically have to experience to know how it works. Experience

goods are items such as video games, wine, and mattresses. They are things that individuals need to experience to form an opinion. Since a lot of goods can be perceived as a combination of search and experience qualities, it is important to consider the degree to which they differ. Since search goods have more objective rather than subjective qualities, it is possible that reviews of this nature are seen as more credible (Weathers, Sharma & Wood, 2007).

One way consumers attempt to judge how a product will work is by recalling a past experience. However, in cases where there is no vivid memory, visuals of a product may compensate. Individuals presented with pictures should be more confident in predicting a product's performance, though previous research may contain evidence to suggest that it differs between search and experience qualities. It may not be necessary to look at a vitamin before deciding to purchase, but wanting to look at a car may warrant the need to see it first (Weathers, Sharma & Wood, 2007).

The ability to understand information is more important with search goods than with experience goods, sensory information is more important, since the need to experience the good is prominent. Though it is important to note that pictures for experience goods reduced uncertainty compared to when a picture was not present. Those who have no restricted access to information (e.g., availability to Internet) had the recourses to make more informed opinions with more thought-out decisions (Weathers, Sharma & Wood, 2007).

Continuing the debate of whether or not negative reviews have a greater effect than positive or neutral reviews, past research has found that negative reviews are seen as more useful in the case of utilitarian product (products for task performance) and positive reviews are seen as more useful for hedonic products (products used for recreational purposes) (Salehan & Kim,

2015). Consumers have a lower intention to purchase after seeing negative reviews in the case of search goods. Though this can be seen in experience goods as well, it does not have the same intensity of the negative impact on search goods (Hsu, Yu & Chang, 2016).

Reviews on hedonic products are perceived as less helpful in general than utilitarian products. For search goods, obtaining information from reviews is sufficient enough to make a judgment, but for experience goods, such as hedonic goods, there is more necessity for a sampling of the product. Longer reviews seem to have a positive effect on the perceived helpfulness of a search good product review, since personal experience will not affect judgement, the better. However, since an experience good must be experienced to be judged, longer reviews do not have an effect on experience goods as much (Salehan & Kim, 2015).

### **Influence of Valence on Recall**

One way to test a review's influence is by using a recall task as a technique to test whether positive or negative reviews are more influential. Historically, recall has been stronger for negative reviews (Pang & Qiu, 2016). Pang and Qiu found this to be true in "unchunked conditions." Unchunked reviews are reviews that do not have positive or negative reviews chunked together all in one spot. The reviews are mixed throughout the sequence. In the unchunked condition of the experiment, participants seemed to be more affected by the negative reviews, as recollection was more prevalent in that condition. However, in the same experiment they found that when positive reviews were chunked together and read before negative, those positive reviews had a greater impact and were recalled more easily. As expected, when negative reviews were chunked together and presented first, they had a greater influence and were recalled more easily. Though, it is possible primacy effect played a role.

## **Qualities of Reviews**

Another way reviews can influence their audience is quality of the review. A high-quality review would be a review that stays focused and maintains an objective tone, rather than a subjective one (Mudambi & Schuff, 2010). High-quality reviews provide relevant, comprehensive, and accurate information (Lee & Shin, 2014). As expected, buyers exposed to mostly positive, high-quality reviews were more likely to purchase a product than those exposed to low-quality reviews (Lee & Shin, 2014). Related to review quality, review depth (amount of detail present) was seen as beneficial because the reader was gaining more information. Depth of a review could help consumers decide with more confidence whether they want to buy the item or not. For all products, review depth has a positive effect on perceived helpfulness (Mudambi & Schuff, 2010). Websites like Amazon allow buyers to review a product and then give other consumers the opportunity to rate the review itself on helpfulness. The more helpful the review was as rated by other consumers, the greater the belief that that review was of great quality. Often, when a product does not have many high rated helpful reviews, buyers are led elsewhere for information, specifically to the manufacturers of the product. In this case, they are basing how trustworthy a company is by their reputation (Chen, Dhanasobhon & Smith, 2008).

The way a review is framed can have a significant impact on perceived credibility. Negatively framed reviews are automatically seen as credible since it is highly unlikely that manufacturers would write a negative review on their product, so consumers would not feel the need to question the legitimacy. However, a large number of consumers prefer when a review contains both negative and positive aspects because they believe that with both strengths and weaknesses listed, the review is more objective, and thus more useful. In addition, many past

studies have found that a review including both negative and positive aspects is considered more useful than a review with only neutral statements (Huang, Chen, Yen & Tran, 2015).

### **Decision-Making**

Another factor that heavily impacts the purchase of a product is how one makes decisions. Decisions are often guided by emotion, and anything that was seemingly threatening was avoided. Though, when that threat was considered lesser than the reward, there was not nearly as much avoidance. Conversely, as expected, individuals who felt the risk outweighed the reward avoided the situation. Thus, decisions were made based on the analysis of potential consequences that were learned from past experiences (Bublitz, Alpers & Pittig). For instance, as many as 50% of Internet users perceived online shopping to be risky and would not participate in it due to the fact that certain personal information must be disclosed to a faceless entity (See “Trusting the reviewer”) that was not present (Chang & Wu, 2012).

Chaudhuri (2000) designated two types of risk, emotional risk, and functional risk. Emotional risk raises the awareness that a shopper may not be satisfied with their purchase for any number of reasons. On the other hand, functional risk, with sub-categories financial, personal, and physical risk, poses a more objective risk. Financial risk arises in a situation where you are not guaranteed a warranty or are worried the product cannot be repaired or replaced. Performance risk is the fear that the product will not perform as advertised.

A determining factor in decision-making, as well as risk analysis, is attitude. Lower level risks produce higher intent to purchase attitude. On a non-cognitive level, convenience also plays a significant role in decision-making. Using the internet to shop and purchase products is very appealing to some as it can take a fraction of the time to browse the internet, rather than having to



go from store to store to find a product and make a purchase. Eliminating time commitment and physical exertion, which can be seen as a major burden, is attractive to many consumers (Chang & Wu, 2012).

The presence of multiple review types contributes significantly to purchase decision-making. A regular review is just simply an opinion. Another type of review, comparative review, compares the similarities and differences between the product in question and a similar product. Finally, the suggestive opinion, unlike a regular review that is just an opinion, directs someone toward something specifically. Review length is more likely to be important to someone looking at comparative reviews when determining the helpfulness. However, with regular reviews and suggestive opinions, a decrease in review length is associated with helpfulness, since specificity is an important factor for these two types of reviews. Reviews of this nature that are shorter are seen as more polite and appealing (Quazi, 2016).

### **Perceived Helpfulness**

Review helpfulness is determined by how much a consumer relies on a certain review to come to a final decision, which is strongly associated with intent to purchase. Chen, Dhanasobhon, and Smith (2008) found that book sales were higher with the presence of helpful reviews as rated by the community, though this effect was more prevalent with less popular books, since more popular books can offer more information from multiple sources. Quazi, et al. (2016) found that not only does review content have an effect on perceived helpfulness, number of concepts and length of review contribute to the degree of helpfulness, too. Not only do the quantitative aspects of a review have an effect, but the qualitative aspects, such as reviewer experience, reviewer impact, and reviewer's helpfulness rating, do, too. It should be noted though

that while it may be the case that both qualitative and quantitative aspects are equally valued by most, certain consumer types may be more swayed by one over the other. Three main aspects can determine review helpfulness. Comprehensibility determines the extent to which a consumer can understand what a reviewer is saying. Specificity refers to the extent to which the reviewer has gone to include valuable information. Last, reliability refers to the perceived dependability of a review. (Chua & Banerjee, 2016). There are three competing theories of review helpfulness dependent on valence. The first view states that negative reviews are seen as more helpful than positive reviews. The next view, most relevant to this study, states that extreme positivity or negativity is more helpful than mixed reviews. Finally, the last view states that mixed reviews are the most helpful (Chua & Banerjee, 2016). According to the negativity bias, a bias in which individuals are more affected by negativity than neutrality or positivity, negative reviews should be more effective since they will stand out due to deviating from the norm of staying positive (Salehan & Kim, 2015).

Even when reviews are accurate and reliable, there is still the issue of confirmation bias. When a consumer feels negatively about a product, they will look for negative comments; the same goes for positivity. So while some products may have a large variety of reviews to use in the decision-making process, a significant portion of the reviews can go unused (Salehan & Kim, 2015).

Huang, Chen, Yen, and Tran (2015), also found that contrary to the findings of many past studies, reviewer level of expertise was not a significant predictor for perceived helpfulness, but that it was review framing (the most relevant to this study) that had the most significant impact, as well as a few other characteristics like review extremity, review depth, and product type (search

or experience). In the case of expertise, consumers found customer-written reviews more helpful than reviews written by an expert. Other studies have found a significant correlation between number of words in a review (review depth), and perceived helpfulness, though, the extent to which depth of a review has an effect on perceived helpfulness differs on a product-to-product basis (Huang, Chen, Yen & Tran, 2015).

### **Trusting the Reviewer**

Xu (2014) found that the two factors that led to the perception of trust were profile picture and reputation cue. Reputation cue is the perceived popularity of a reviewer, those reviewers who had the highest number of votes, and most positive comments were the reviews that consumers were drawn toward. There is a strong correlation between cognitive trust, confidence in reviewer competence, and trust led by emotions such as warmth and openness (Xu, 2014).

Social presence, defined as “to which a medium allows users to experience others being psychologically present” has a significant impact on trust in the reviewer. Profile pictures can provide this sensation and forge an emotional connection in the view of the consumer. The most trusted reviewers had both a profile picture present and popularity as voted by other consumers (Xu, 2014).

### **Consumer Expertise**

Novices lack the interest in the learning of extensive knowledge and just want to arrive at a purchase decision. Expert consumers seem to be more influenced by product attributes and objectivity, whereas novice reviewers appear to gear attention toward product benefits (Ketelaar, Willemsen, Slevin & Kerkhof, 2015). Intensive research of a product is characteristically more

commonly found in expert consumers, but these consumers also appear to be less affected by reviews, as they have prior knowledge and counterarguments. On the other hand, novices seem to do little product research, and are not likely to seek out new information, thus, these consumers will base the entirety of their opinion on these reviews (Ketelaar, Willemsen, Sleven & Kerkhof, 2015).

Influence of a review seems to depend on whether or not the consumer is an expert or a novice. Experts appear to fall victim to negativity bias, being more affected by negative reviews than positive. In contrast, novice reviewers seemed to show a slight positivity bias. This can possibly be explained by the fact that experts are more intrinsically interested than novices in the product (Ketelaar, Willemsen, Sleven & Kerkhof, 2015).

Consumers will experience information overload when sifting through hundreds or even thousands of reviews, therefore, a lot of reviews that are read are chosen randomly. Due to this, individuals may not be receiving the best, or the most informative information. In response, it is expected that different cues and signals will catch the readers' attention based on their own intrinsic needs, causing them to choose to some reviews over others (Salehan & Kim, 2015).

### **Consumers' Similarity to Reviewer**

Different types of people influence buyers differently. Variables like how similar you are to someone and whether or not someone is an expert on a certain topic could affect readers differently when looking at reviews. Similarity is judged on many things, for example, education, background, personality, interests etc. (Shan, 2016). When readers knew that reviewers were similar to them, it convinced them that if the reviewer liked it, they will like it, and when someone was perceived as similar to them, it made them seem more trustworthy.

A study conducted by Shan (2016) confirmed that this was true. In addition to wanting the opinion of someone with similar likes and personality, consumers seemed to be drawn toward what an expert had to say. Racherla and Fiske (2012) found that expertise on a product, as opposed to a novice-written review, significantly increases perceived usefulness of reviews. However, since most consumers are novices with no expert knowledge, other novices will find more similarity to the reviewer than an expert consumer, thus experiencing a more trusting attitude toward novice reviews (Ketelaar, Willemsen, Sleven & Kerkhof, 2015).

### **Need for Cognition**

Another very important factor in how a review may influence someone is his or her own intrinsic need for cognition. Need for cognition is a personality characteristic that is measured using the 18-item questionnaire developed by Cacioppo and Petty (1984). People with high need for cognition will look for logic and look at things more in depth; this is considered a central route for decision-making. Individuals with a low need for cognition will look at aesthetics and rely on shortcuts to make decisions; this is considered a peripheral route (Lin, Lee, & Horng, 2011).

Zhang and Buda (1999) found in their study that individuals with a high need for cognition were not as easily affected by a reviews negativity or positivity, but people with a low need for cognition were more affected by negatively toned review. People with a lower need for cognition were more affected by negativity due to the fact that lower need for cognition consumers chose the peripheral route of decision-making. When a product showed that 85% of customers were satisfied and 15% were dissatisfied, low need for cognition customers took it as the product not being good because some people were not happy with it. Instead of looking into

the reasons for the dissatisfaction like someone with a high need for cognition would have, low need for cognition individuals just saw the negativity and moved on (Zhang & Buda, 1999).

### **Rating Systems**

Recently, stars have been implemented as a way not only for people to express their opinion of a product, but as a way for consumers reading the reviews and looking at the stars to easily see how other people feel. For star ratings, the higher the rating, the more it is favored by a user (Chua & Banerjee, 2016). One star or five stars would be considered unfavorable or favorable, while two to four stars would be considered mixed (Chua & Banerjee, 2016).

Results from a study conducted by Liu and Park (2015) showed that reviews with low or moderate ratings were perceived as less useful than reviews with higher star ratings. Maslowska, Malthouse, and Bernritter (2017) found that contrary to popular belief, five-star reviews were not actually perceived as more helpful, because they were too extreme. As a matter of fact, any reviews with more than 4.5 stars decreased the perceived helpfulness of a review. However, they also found that extremely positive reviews could be accepted so long as there was also the presence of lower and mixed reviews, too.

Tsang and Prenderghast (2009) found that review text, not rating, was more influential on purchase intention, how interesting the review was perceptually, and perceived trustworthiness of the review. However, this is subjective due to the possibility that there will be incongruence between rating and text. Though when consistency is present between rating and text valence, it will further strengthen review trustworthiness. It must also be taken into consideration that shorter texts are likely to create a higher reliance on ratings (Tsang & Prenderghast, 2009).

## **Number of Reviews**

As stated earlier, in cases where there is a large volume of reviews, certain reviews will not be read due to the fact that consumers will choose reviews they read by random based on certain cues, usually ones that confirm their preexisting belief about a product. This can be further explained with the theory of selective perception, a theory in which one does not notice, or will quickly forget, something to contradict prior feelings (Salehan & Kim, 2015).

The number of online reviews can be seen as a representation of how popular a product is. The more reviews there are, the more important and popular the product is. People are more willing to buy a product that they can justify as a rational purchase, and seeing that thousands of other individuals just like themselves can create that comfort. The result of a larger quantity of reviews will be an increase in purchase intention (Park, Lee & Han, 2016).

## **False Reviews**

Past studies have found that there is a large portion of online reviews that are not created by actual consumers. It is now recognized that some owners of hotels, especially smaller businesses, will write positive reviews for their establishment. They do not stop there, though. These same hotel owners were also found to write negative reviews about competitors. Additionally, it was estimated that 10.3% of book reviews were fake (Salehan & Kim, 2015).

One way to confirm the legitimacy of a review is to compare the same product in question, anything from books to hotels from two different sources. If one website has a rating of 4 stars for a hotel, but another has a rating of 2 stars for the same hotel, that kind of discrepancy can point to false reviews, whether it be competitors ruining their reputation or the establishment itself trying to provide a more positive message to prospective guests (Salehan & Kim, 2015).

The intent of this research is to test how much rating systems have an effect on a consumer's perception of review valence. It has not been thoroughly tested if stars change how positive or negative a review is perceived. For instance, if a review says great things about a product, but it has only three stars, will that change how you see the product? Will your perception of the review change? Also, how much of an impact do reviews have on people? Will some people be able to recognize more reviews than others? Based on previous studies, the following hypotheses have been formed:

Hypothesis 1: Consumers with high need for cognition will not change their perception of a review's valence just because there is the addition of stars, since they read things in depth.

Hypothesis 2: Consumers with low need for cognition will change their perception of a review's valence according to the addition of stars, since they look at aesthetics over content.

Hypothesis 3: People with higher need for cognition will be able to remember more reviews, and more about the reviews.

Hypothesis 4: People with lower need for cognition will not be able to remember as many reviews, and will remember less about the reviews than people with a higher need for cognition.

Hypothesis 5: People with higher need for cognition will have a weaker desire to purchase merely due to the presence of an incongruent rating.



Hypothesis 6: People with lower need for cognition will have a stronger desire to purchase due to the presence of an incongruent rating.

## CHAPTER THREE: METHODOLOGY

### Design

The experiment used a 2 x 2 x 2 between-subjects design. The first independent variable was need for cognition. Participants were categorized as high or low on the Cacioppo and Petty (1984) need for cognition scale using a median split. The second independent variable was valence. Participants were randomly assigned to levels containing either all positive or all negative reviews. The final independent variable manipulated was the star ratings. Participants were randomly placed in a level with either two- or four-star ratings.

### Participants

After removing data of the participants who failed to correctly answer the accuracy control questions or were statistical outliers, there were 264 eligible valid data left out of the original 392. All participants were undergraduates at the University of Central Florida.

Of the 264 participants, 170 were female and 94 were male. Most of the participants, 202, were between the ages of 18 and 21. Forty-five participants were between the ages of 22 and 30, 10 were older than 30, and seven did not want to specify.

### Materials

**Need for cognition scale.** Developed by Cacioppo and Petty (1984), the need for cognition scale is an 18 question survey that estimates an individual's need for cognition. Participants were given a set of statements such as "I would prefer complex to simple problems" and "Thinking is not my idea of fun." They responded to these statements on a scale of negative four (strongly disagree) to positive four (strongly agree). The highest possible score was a 72,

and the lowest possible score was negative 90. The higher the score, the higher the participant's need for cognition.

## **Procedure**

### *Pilot Study*

A pilot study was conducted to determine which reviews to use in the actual experiment. Data was collected from 50 participants. Students were shown some reviews that were positive and some that were negative, and then were asked how many stars they thought the review should receive. Reviews were chosen from consumer websites such as Amazon and eBay. Upon completion, students that participated were rewarded .25 SONA points. Seven of the reviews that were rated positive and seven of the reviews that were rated negative were used for the main study. Additionally, the review lists shared three neutrally valenced reviews. The reviews averaged to ( $M = 4$ ) in the positive review list, and ( $M = 1.8$ ) in the negative review list.

### *Main Experiment*

Participants were randomly placed in one of four conditions. The first condition consisted of positive reviews with an associated rating of two stars, creating incongruence between the review valence and stars. The second condition consisted of positive reviews with an associated rating of four stars. The third condition consisted of negative reviews with an associated rating of four stars, creating incongruence between the review valence and stars. The fourth condition consisted of negative reviews with an associated rating of two stars. Like with the pilot study, this study was run completely online on SONA. Completion of the following tasks led to a reward of .5 SONA credits.

Participants were shown a photo of a generic stainless-steel water bottle and were asked to pretend they were in the market for a new water bottle. Additionally, the water bottle was \$15 and had “twenty-four different patterns and colors.” No other information was given about the product. Participants were instructed to take time to read and analyze the reviews. Once they finished that task and moved on to the next screen, they were instructed to select the 10 reviews that they recognized from a list of 43 items. The 43 items consisted of the 40 reviews shown to participants in the pilot study, with the addition of three attention checks. Attention checks entailed asking questions that clearly stated, “please click ‘positive,’” and were used to ensure accurate data. Then, participants were asked to respond to a series of statements on a scale of one (strongly disagree) to five (strongly agree) that were created to measure intent to purchase, recollection, usefulness, and other aspects of the reviews. The recognition task came before answering the statements so that the participants had more time to think about the reviews and to think about them more in-depth. There were also questions that clearly stated, “please click ‘positive,’” to ensure accurate data. All data from participants who respond incorrectly was removed from all future analyses. The last item of the experiment that participants were instructed to complete was the 18 statement need for cognition scale followed by a demographics survey.

## CHAPTER FOUR: RESULTS

All statistics were run using IBM SPSS Statistics 24. A series of 2 x 2 x 2 ANOVAs were used to measure recognition accuracy, valence perception, intent to purchase, and duration in seconds reading the reviews. Low need for cognition, positively valenced reviews, and four stars had 30 students. High need for cognition, positively valenced reviews, and four stars had 34 students. Low need for cognition, positively valenced reviews, and two stars had 31 students. High need for cognition, positively valenced reviews, and two stars had 35 students. Low need for cognition, negatively valenced reviews, and two stars had 38 students. High need for cognition, negatively valenced reviews, and two stars had 27 students. Low need for cognition, negatively valenced reviews, and four stars had 32 students. High need for cognition, negatively valenced reviews, and four stars had 37 students. For the interactions observed, t-tests were used to do pairwise comparisons of means.

### **Review Recognition Accuracy**

Attention check items were not included in calculating the accuracy of recognition. Out of a possible 10, participants in the higher need for cognition group recognized significantly more ( $M = 8.06$ ,  $SD = 1.93$ ) of the statements (hits) than participants low in need for cognition ( $M = 7.21$ ,  $SD = 2.15$ ;  $F(1,255) = 11.01$ ,  $p = .001$ ). Out of 29, participants in the higher need for cognition group had significantly less ( $M = 3.14$ ,  $SD = 5.42$ ) false alarms (wrongly choosing “yes”) than participants low in need for cognition ( $M = 6.78$ ,  $SD = 7.70$ ;  $F(1,255) = 20.47$ ,  $p < .001$ ).

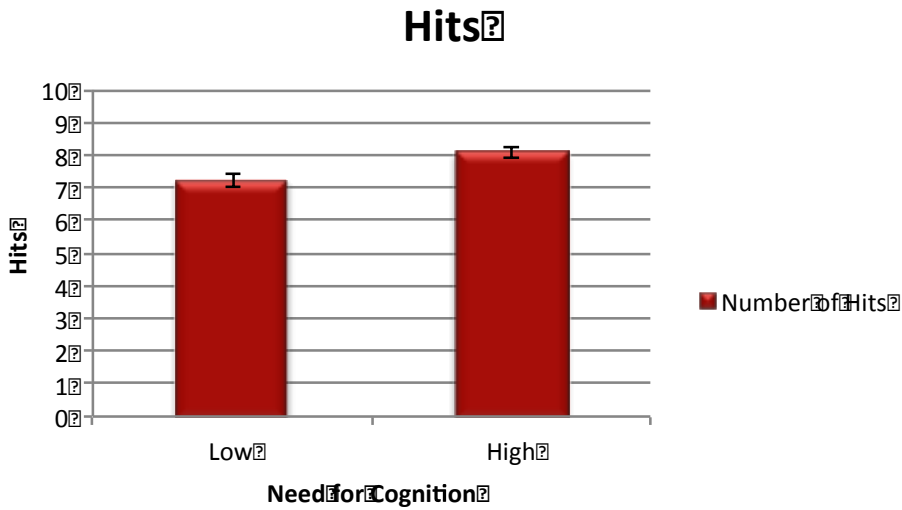


Figure 1. Effect of need for cognition on number of correctly recognized reviews



Figure 2. Effect of need for cognition on number of false alarms during review recognition task

### Perceived Negativity of Review Valence

Those in the negative valence review groups rated the perceived negativity on a Likert scale of one (strongly disagree with this statement) to five (strongly agree with this statement).

As expected, negative reviews were rated as negative ( $F(1,255) = 71.45, p = .000$ ). For the statement “I found these reviews to be negative,” participants who read negative reviews agreed to the statement to a higher degree ( $M = 3.89, SD = 1.01$ ) than those in a group that featured positive valence ( $M = 2.86, SD = 1.03$ ). Congruency also had a main effect on a review’s perceived negativity. When negative reviews had an incongruent associated star rating, the reviews were rated as more negative ( $M = 3.51, SD = 1.07$ ) than the negative reviews with a congruent star rating ( $M = 3.25, SD = 1.20; F(1,255) = 4.84, p < .05$ ).

Two interactions were observed. Valence and congruency had an interaction effect on perceived negativity ( $F(1,255) = 12.90, p < .001$ ), as did valence and need for cognition ( $F(1,255) = 8.80, p = .003$ ). Those in the group with positive reviews and an incongruent associated star rating agreed with the statement “I found these reviews to be negative,” to a greater extent ( $M = 3.22, SD = 1.02$ ) than those in the positive review group with congruent associated stars ( $M = 2.51, SD = .93$ ). Those in the group with negative reviews and an incongruent associated star rating agreed with the statement “I found these reviews to be negative,” to a lesser extent ( $M = 3.81, SD = 1.04$ ) than those in the negative review group with congruent associated stars ( $M = 3.98, SD = .98$ ). Additionally, those high in need for cognition who viewed positively valenced reviews agreed to the statement “I found these reviews to be negative,” to a lesser extent ( $M = 2.73, SD = 1.11$ ) than those lower in need for cognition ( $M = 3.00, SD = .93$ ). High in need for cognition individuals who viewed negatively valenced reviews agreed to the statement “I found these reviews to be negative,” to a greater extent ( $M = 4.12, SD = .90$ ) than those lower in need for cognition ( $M = 3.66, SD = 1.06$ ). Finally, the group with positive reviews with four stars agreed to the statement “I found these reviews to be negative”

to a lesser extent ( $M = 2.50, SD = .93$ ) than those who read positive reviews with two stars ( $M = 3.21, SD = 1.02; t(128) = 4.17, p < .001$ ).

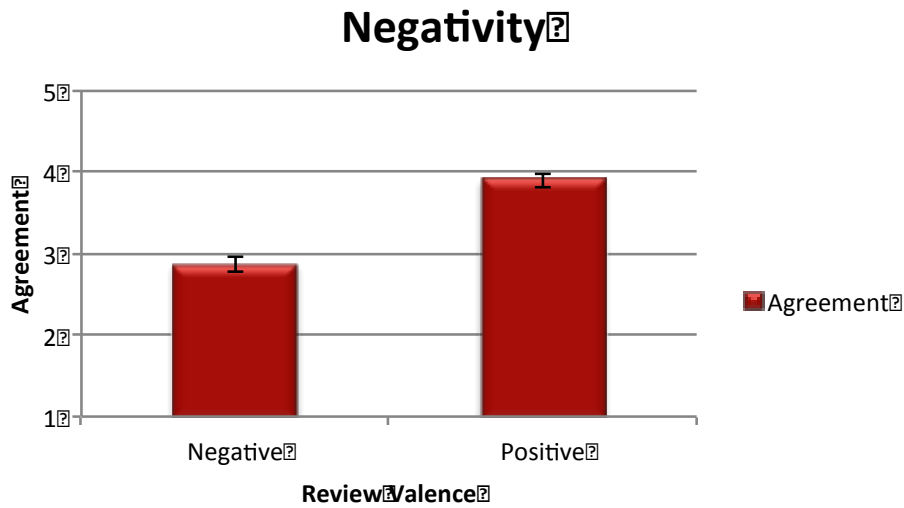


Figure 3. Effect of review valence on perceived negativity

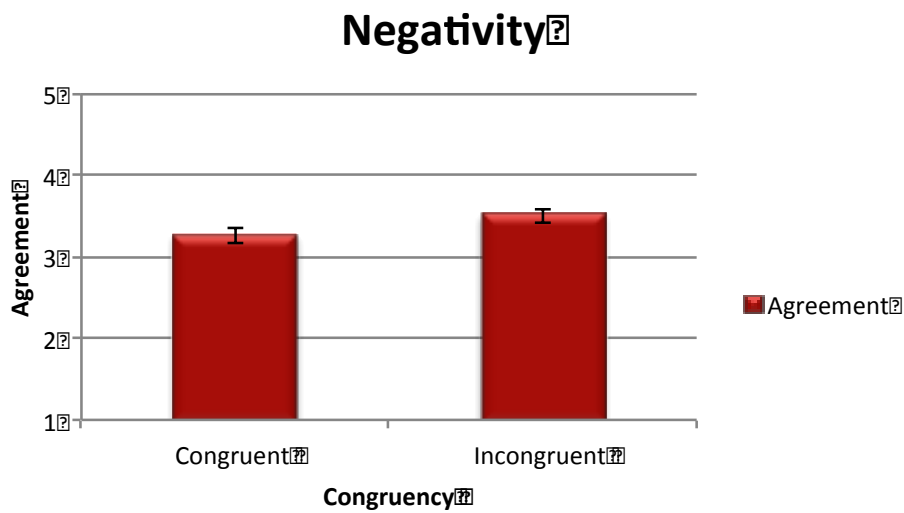


Figure 4. Effect of congruency on perceived negativity



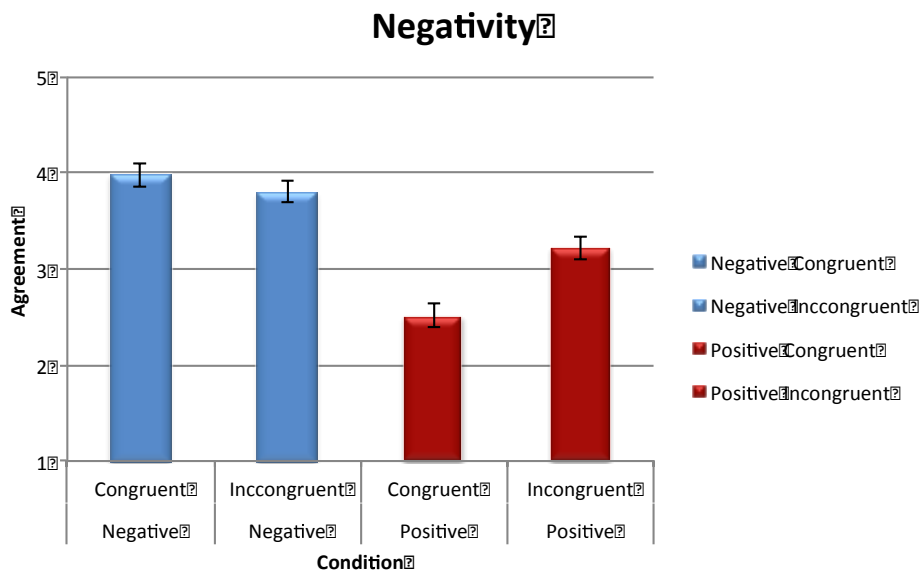


Figure 5. Interaction between congruency and review valence on perceived negativity

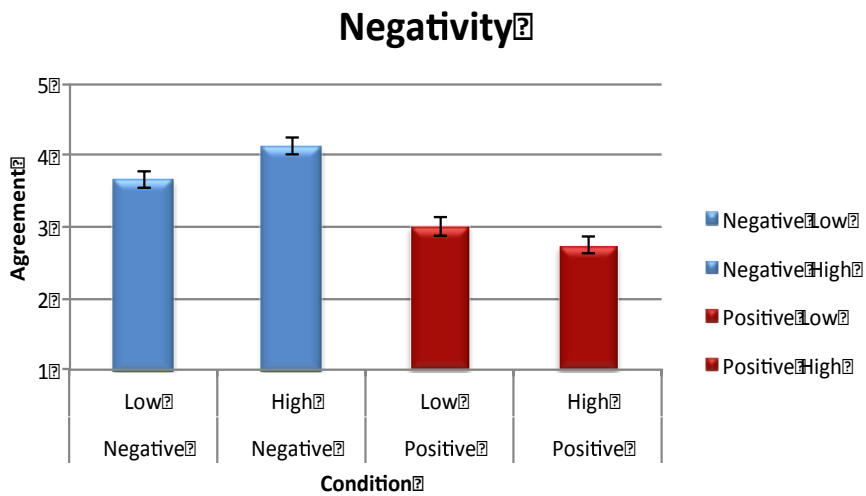


Figure 6. Interaction between need for cognition and review valence on perceived negativity

### Perceived Positivity of Review Valence

Those in the positive valence review groups rated the perceived positivity on a Likert scale of one (strongly disagree with this statement) to five (strongly agree with this statement).

Like with the negative reviews being rated as negative, positive reviews were rated as positive ( $F(1,255) = 96.82, p < .001$ ). For the statement “I found these reviews to be positive,” participants who read positive reviews agreed to the statement to a higher degree ( $M = 3.27, SD = .96$ ) than those in a group that featured negative reviews ( $M = 2.12, SD = .98$ ).

Two interactions were observed. Like with perceived negativity, valence and congruency had an interaction effect on perceived negativity ( $F(1,255) = 10.02, p = .002$ ), as did valence and need for cognition ( $F(1,255) = 8.10, p = .005$ ). Those in the group with positive reviews and an incongruent associated star rating agreed with the statement “I found these reviews to be positive,” to a lesser extent ( $M = 3.05, SD = .96$ ) than those in the positive review group with congruent associated stars ( $M = 3.48, SD = .91$ ). Those in the group with negative reviews and an incongruent associated star rating agreed with the statement “I found these reviews to be positive” to a greater extent ( $M = 2.27, SD = 1.05$ ) than those in the negative review group with congruent associated stars ( $M = 1.96, SD = .89$ ). Additionally, those high in need for cognition who viewed positively valenced reviews agreed to the statement “I found these reviews to be positive” to a greater extent ( $M = 3.35, SD = .98$ ) than those lower in need for cognition ( $M = 3.18, SD = .92$ ). High in need for cognition individuals who viewed negatively valenced reviews agreed to the statement “I found these reviews to be positive” to a lesser extent ( $M = 1.87, SD = .89$ ) than those lower in need for cognition ( $M = 2.37, SD = 1.02$ ). Finally, the group with positive reviews with four stars agreed to the statement “I found these reviews to be positive” to a greater extent ( $M = 3.48, SD = .91$ ) than those who read positive reviews with two stars ( $M = 3.06, SD = .96; t(128) = -2.56, p < .05$ ).

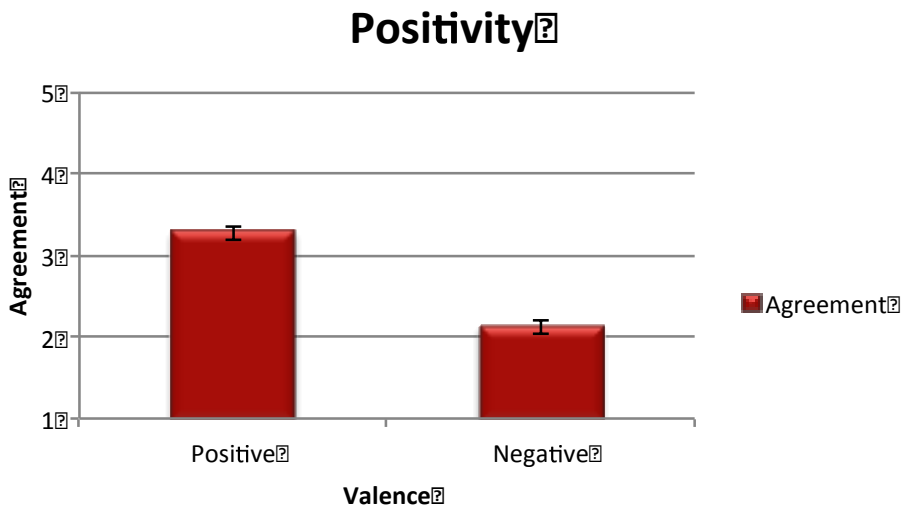


Figure 7. Effect of review valence on perceived positivity

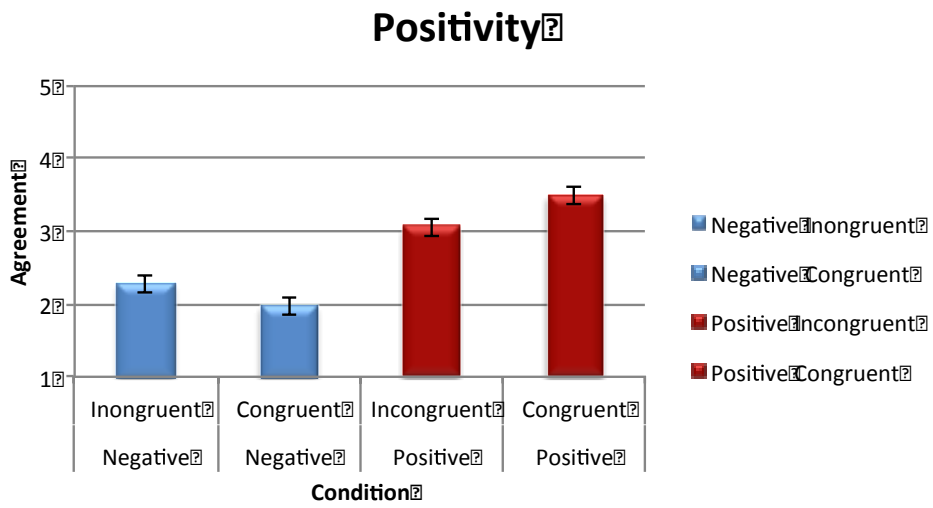


Figure 8. Interaction effect of congruency and valence on perceived positivity

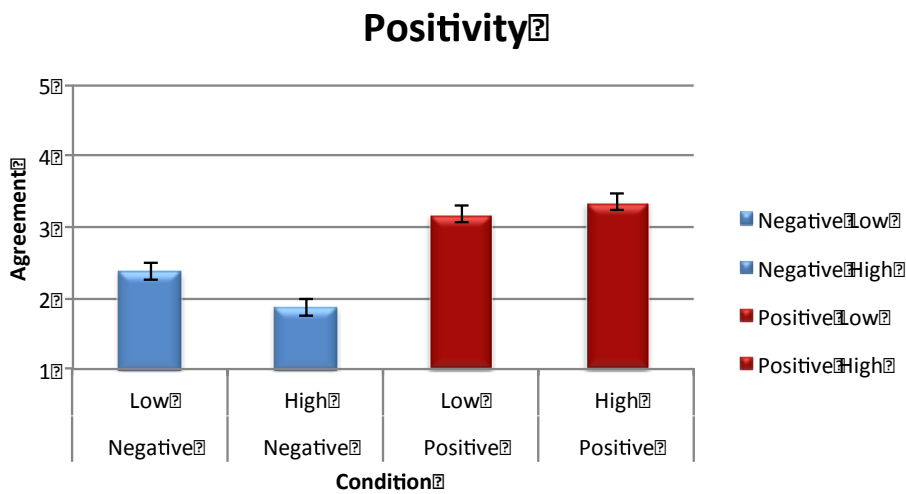


Figure 9. Interaction effect of need for cognition and review valence on perceived positivity

### Intent to Purchase

Valence also had an apparent effect on purchase intention ( $F(1,255) = 54.93, p < .001$ ). As hypotheses five and six predicted, the positive reviews caused more intention to purchase the water bottle than the negative reviews. Intention to purchase was rated on a Likert scale of one (strongly disagree with this statement) to five (strongly agree with this statement). For the statement “After looking at these reviews I would purchase the water bottle,” participants agreed to a higher degree when the reviews were positive ( $M = 2.77, SD = 1.27$ ), than when they were negative ( $M = 1.77, SD = .97$ ).

Two interactions were observed. Valence and congruency had an interaction effect on intent to purchase ( $F(1,255) = 9.42, p = .002$ ), as did valence and need for cognition ( $F(1,255) = 10.89, p = .001$ ). Those in a group with positive reviews and an incongruent associated star rating agreed with the statement “After reading these reviews I would purchase this water bottle” to a

lesser extent ( $M = 2.47, SD = 1.24$ ) than those in a positive review group with congruent associated stars ( $M = 3.06, SD = 1.22$ ). Those in the group with negative reviews and an incongruent associated star rating agreed with the statement “After reading these reviews I would purchase this water bottle” to a greater extent ( $M = 1.89, SD = 1.03$ ) than those in the negative review group with congruent associated stars ( $M = 1.65, SD = .90$ ). Additionally, those high in need for cognition who viewed positively valenced reviews agreed to the statement “After reading these reviews I would purchase this water bottle” to a greater extent ( $M = 2.89, SD = 1.32$ ) than those lower in need for cognition ( $M = 2.65, SD = 1.18$ ). High in need for cognition individuals who viewed negatively valenced reviews agreed to the statement “After reading these reviews I would purchase this water bottle” to a lesser extent ( $M = 1.45, SD = .67$ ) than those lower in need for cognition ( $M = 2.09, SD = 1.11$ ). The difference between those high in need for cognition who read negative reviews and those who were low in need for cognition and read negative reviews was significant ( $t(132) = 3.87, p = .001$ ). Additionally, the group with positive reviews with four stars were more willing to purchase the product ( $M = 3.06, SD = 1.24$ ) than those who read positive reviews with two stars ( $M = 2.48, SD = 1.22; t(128) = -2.67, p < .01$ ). Additionally, the group with positive reviews with four stars were more willing to purchase the product ( $M = 3.06, SD = 1.24$ ) than those who read positive reviews with two stars ( $M = 2.48, SD = 1.22; t(128) = -2.67, p < .01$ ).

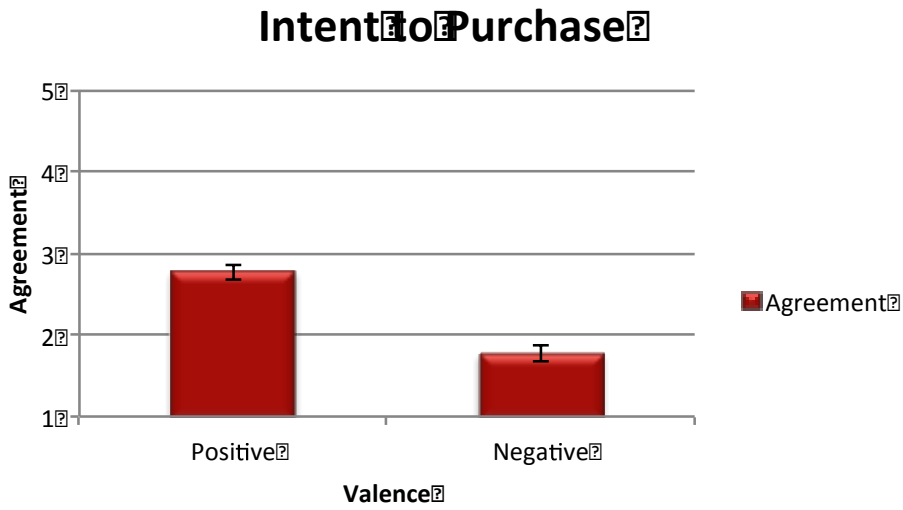


Figure 10. Effect of review valence on intent to purchase

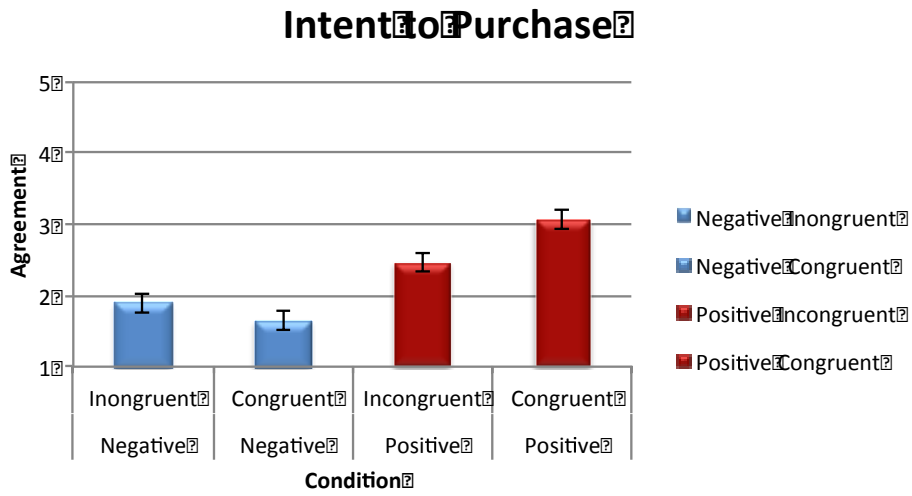


Figure 11. Interaction effect of review valence and congruency on intent to purchase

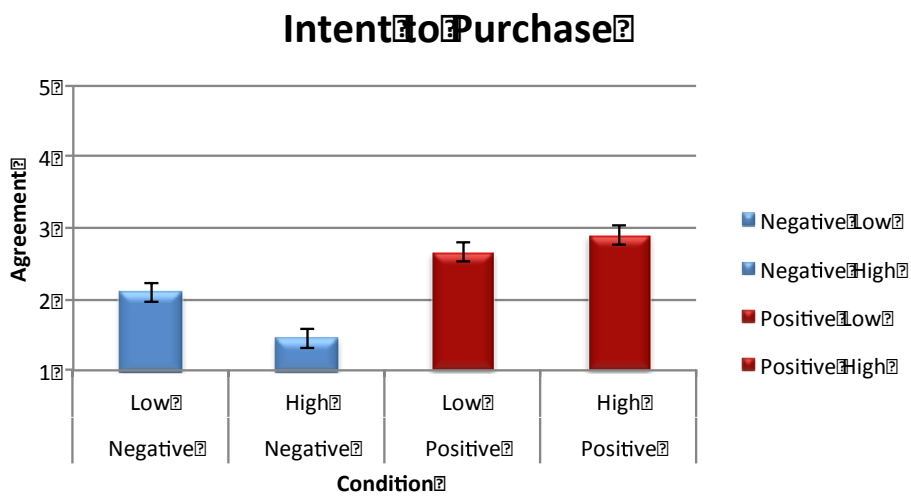


Figure 12. Interaction effect of need for cognition and review valence on intent to purchase

### Time Spent Looking at Reviews

Originally, duration in seconds was not a variable that was going to be measured. Then, the results showed a large range in time spent looking at reviews, from 2.35 seconds to 238.48 seconds ( $M = 60.33, SD = 42.04$ ). In attempt to find an explanation, statistics were run for length of time against all three independent variables. Valence had a main effect ( $F(1,255) = 4.69, p < .05$ ). Individuals who read positive reviews took a significantly longer time reading the reviews ( $M = 65.47, SD = 40.93$ ) than those who saw negatively valenced reviews ( $M = 54.40, SD = 42.56$ ). Need for cognition also had a main effect on duration ( $F(1,255) = 8.94, p = .003$ ). High in need for cognition individuals took a significantly longer time reading the reviews ( $M = 67.57, SD = 41.12$ ) than those lower in need for cognition ( $M = 52.29, SD = 41.59$ ).

### Time Spent Reading Reviews

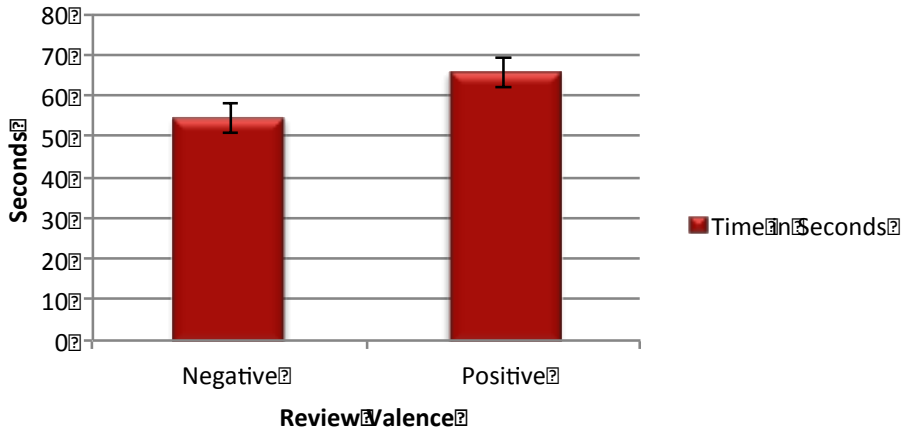


Figure 13. Effect of review valence on time spent reading reviews

### Time Spent Reading Reviews

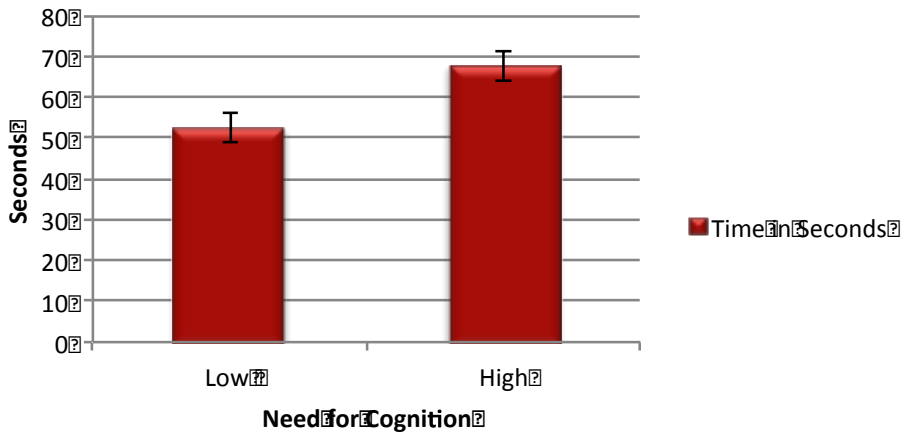


Figure 14. Effect of need for cognition on time spent reading reviews



## CHAPTER FIVE: DISCUSSION

Analysis of data produced evidence to support part of hypotheses three and four. As a whole, individuals high in need for cognition recognized more reviews and had a lower rate of false alarms than those low in need for cognition. This was an expected outcome, as individuals higher in need for cognition are more prone to analyzing on a deeper level (Lin, Lee, & Horng, 2011).

There was evidence to support hypotheses one and two. As expected valence was significant. When a review was negative it was rated as negative, likewise, when a review was positive it was rated as positive. Positive congruent agreed to the least extent to the statement “I find these reviews to be negative” and those in the negative congruent group agreed to the greatest extent. Also, individuals that were high in need for cognition agreed to the statement “I found these reviews to be negative” to a lesser extent than those low in need for cognition when the reviews were positive. Individuals that were high in need for cognition agreed to the statement “I found these reviews to be negative” to a greater extent than those low in need for cognition when the reviews were negative.

When reviews were congruent and positive, participants agreed to the statement “I found these reviews to be positive” to a greater extent than when the reviews were incongruent and positive. When the reviews were congruent and negative, participants agreed to the statement “I found these reviews to be positive” to a lesser extent than when the reviews were incongruent and negative. Also, individuals that were high in need for cognition agreed to the statement “I found these reviews to be positive” to a lesser extent than those low in need for cognition when the reviews were positive. Individuals that were high in need for cognition agreed to the

statement “I found these reviews to be positive” to a greater extent than those low in need for cognition when the reviews were negative.

Data provided evidence to support hypotheses five and six, regarding purchase intention. When reviews were congruent and positive, participants agreed to the statement “After reading these reviews I would purchase this water bottle” to a greater extent than when the reviews were incongruent and positive. When the reviews were congruent and negative, participants agreed to the statement “After reading these reviews I would purchase this water bottle” to a lesser extent than when the reviews were incongruent and negative. Also, individuals that were high in need for cognition agreed to the statement to a lesser extent than those low in need for cognition when the reviews were positive. Individuals that were high in need for cognition agreed to the statement “After reading these reviews I would purchase this water bottle” to a greater extent than those low in need for cognition when the reviews were negative. Additionally, when the reviews were negative, those high in need for cognition agreed to the statement “After reading these reviews I would purchase this water bottle” to a lesser extent than those low in need for cognition.

Valence and need for cognition had an effect on how long participants took looking at the reviews. Those high in need for cognition spent more time looking at reviews than those low in need for cognition. When the reviews were positive, participants spent more time looking at the reviews than when the reviews were negative. This could potentially be due to the fact that, as past research has implied, negative reviews have a greater impact, so they are probably looked at for a shorter period of time since the decision will be easier to make (Park & Lee, 2009).

Finally, results showed that with positive reviews, the amount of stars had an effect on how a statement (e.g., “After reading these reviews I would purchase this water bottle”) was rated. The same cannot be said for negative reviews, as post-hoc t-tests reported no significant differences. This implies that whether or not there is an associated star rating the negativity of a review will be more affective. This is unsurprising, as past studies have already produced evidence that negative reviews have these effects (Park & Lee, 2009).

One limitation was some of the results for purchase intention suggest that participants may not have actually pretended they were in the market for a new water bottle as they were instructed. Even the positive congruent reviews’ intent to purchase was rated, on average, around three (on a scale of one to five), which is “neither agree nor disagree.” Also, the reviews and stars did not look exactly like what would be seen on a website like eBay or Amazon. The fact that they were formatted differently could possibly have created an alternate effect in viewer reception.

The fact that there is a limited amount of data on how rating systems and consumer need for cognition affect review perception and decision making (i.e., intent to purchase) makes this research very valuable for psychology and marketing alike. The results provide strong evidence that need for cognition can greatly change the way someone might read a review. As companies continue to sell their products online (and in person) it is important to take variables like these into consideration, as they could use it to their advantage. On the other hand, it is important for consumers to be aware of the effects of such reviews so they do not fall victim to cognitive shortcuts.

One of the benefits of this study is that it was done entirely online, which is the most realistic setting, so for other studies in the future this is a variable that should remain constant. Perceived trustworthiness should be explored further, as it interacts with congruency and need for cognition. Another variable that is worth looking at might be the addition of “selected from a larger set of [total number of] reviews” on the product that the ten reviews shown were chosen from. It is possible that a larger number of reviews could create a perception of more popularity of the product, changing the perception of the consumer entirely. Additionally, it is possible that one and five stars may reveal different results than two and four. It may be beneficial to compare these effects against one another. Finally, it would also be interesting to explore the effect a reviewer’s picture has on a consumer, since that alone can create an increased sense of trust and relation to the reviewer (Xu, 2014).

## **APPENDIX A: IRB APPROVAL**



University of Central Florida Institutional Review Board  
Office of Research & Commercialization  
12201 Research Parkway, Suite 501  
Orlando, Florida 32826-3246  
Telephone: 407-823-2901 or 407-882-2276  
[www.research.ucf.edu/compliance/irb.html](http://www.research.ucf.edu/compliance/irb.html)

### Approval of Human Research

From: **UCF Institutional Review Board #1  
FWA00000351, IRB00001138**

To: **Jacquelyn L Schreck**

Date: **March 19, 2018**

Dear Researcher:

On 03/19/2018 the IRB approved the following modifications to human participant research until 11/29/2018 inclusive:

Type of Review: IRB Addendum and Modification Request Form  
Expedited Review Category #7; This approval includes a Waiver of Written Documentation of Consent

Modification Type: Minor changes--merged study part 1 and part 2; revised study title; revised study instruments; uploaded revised consent and protocol

Project Title: Online Product Reviews: Effects of Star Ratings and Valence on Review Perception Among those High and Low in Need for Cognition

Investigator: Jacquelyn L. Schreck

IRB Number: SBE-17-13463

Funding Agency:

Grant Title:

Research ID: N/A

The scientific merit of the research was considered during the IRB review. The Continuing Review Application must be submitted 30 days prior to the expiration date for studies that were previously expedited, and 60 days prior to the expiration date for research that was previously reviewed at a convened meeting. Do not make changes to the study (i.e., protocol, methodology, consent form, personnel, site, etc.) before obtaining IRB approval. A Modification Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at <https://iris.research.ucf.edu>.

If continuing review approval is not granted before the expiration date of 11/29/2018, approval of this research expires on that date. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

Use of the approved, stamped consent document(s) is required. The new form supersedes all previous versions, which are now invalid for further use. Only approved investigators (or other approved key study personnel) may solicit consent for research participation. Participants or their representatives must receive a copy of the consent form(s).

All data, including signed consent forms if applicable, must be retained and secured per protocol for a minimum of five years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained and secured per protocol. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

In the conduct of this research, you are responsible to follow the requirements of the [Investigator Manual](#).

This letter is signed by:

A handwritten signature in cursive script that reads "Renea Carver". The signature is written in black ink on a light-colored background.

Signature applied by Renea C Carver on 03/19/2018 02:26:48 PM EDT

Designated Reviewer

## **APPENDIX B: NEED FOR COGNITION SCALE**



1. I would prefer complex to simple problems.
2. I like to have the responsibility of handling a situation that requires a lot of thinking.
3. Thinking is not my idea of fun.
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.
5. I try to anticipate and avoid situations where there is likely a chance I will have to think in depth about something.
6. I find satisfaction in deliberating hard and for long hours.
7. I only think as hard as I have to.
8. I prefer to think about small, daily projects to long-term ones.
9. I like tasks that require little thought once I've learned them
10. The idea of relying on thought to make my way to the top appeals to me.
11. I really enjoy a task that involves coming up with new solutions to problems.
12. Learning new ways to think doesn't excite me very much.
13. I prefer my life to be filled with puzzles that I must solve.
14. The notion of thinking abstractly is appealing to me.
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.
17. It's enough for me that something gets the job done; I don't care how or why it works.
18. I usually end up deliberating about issues even when they do not affect me personally

**APPENDIX C: REVIEWS SEEN BY PARTICIPANTS**

1. Big enough to hold a decent amount of liquid, but small enough to still be portable. Insulation is excellent. Doesn't get moldy like with plastic.
2. Bought this with the intention of giving it to my daughter in kindergarten. It is heavier than expected though and doesn't fit in car cup holders.
3. Decided to go with this for the price! This was way more than what I paid for. Also comes with two lids.
4. Got this for my brother's birthday, and I have one too. We both love it, keeps my water cold all day and keeps hot beverages warm for around 3 hours.
5. Great canisters for water. The screw down top is hard for kids to tighten enough. Maybe they'll get better with practice.
6. Had to return this bottle as the rubber flange around the neck wouldn't seal and the bottle leaked all over the place.
7. I bought this because it was the right size to fit under a Keurig in the morning. The lid design is terrible and has ruined two of my shirts. Don't buy this product if you want clean clothes.
8. I bought this bottle and have been loving it. Beautiful shade of pink for a really affordable price. It keeps my drinks cold all day and overnight.
9. I bought this for my son's lunch pail. It fit perfectly and his water was cold all day. Unfortunately, by lunch the second day of use it was rusted shut.
10. I don't know what's going on if my water bottle is just fault or what but mine had a metallic taste after the water was there for a day towards the end and also it doesn't keep my water too cold.
11. I drink mostly ice water and iced tea! I didn't believe the bottle would keep my drinks cold for 24 hours and without sweating, even though it didn't last 24 hours, it lasted for at least 7. All in all it is a good product.
12. I have only had this bottle for two weeks and have rust spots inside of it. However, the lid is high quality and the metal part of it did not rust.
13. I have quite the collection of stainless steel water bottles & this is hands down my favorite. I love the colors they offer & the top is great!
14. I left cold water and ice on the counter for less than 2 hours and then ice was gone. The water stayed cold, but not THAT cold.
15. I like this bottle better than the more expensive brand. I ordered the leak proof cap that was offered for free. Can't beat it.
16. I love that the wide mouth tops fit all of the different bottles I have purchased from this company. Easy to hand wash.
17. I love this bottle, I do wish I could put it in a dishwasher because it can be hard to clean but overall, a great bottle that I would buy again.
18. I love this water bottle. I gave this water bottle to my daughter. She uses the little strap on it and can attach it to her bag for volleyball. That way she never loses it.
19. I loved the cup and would've given it five stars. Except for all of the sudden after only a few weeks the lid started leaking and the whole bottle essentially deteriorated.

20. I need to drink more water, and needed something that would keep my water cold for at least 8-12 hours. I can't afford to spend too much, so I bought this one. No leaks, kept cold well beyond my expectations.
21. I ordered two bottles, one grey and one pink. Haven't had a chance to use them yet, one came with a minor dent, but the other one looks great.
22. I use this particular bottle for my late night cup of warm milk instead of a regular mug so I don't spill it.
23. I've noticed the vacuum sealed bottles trending and because I need to drink more water and wanna help the environment too.
24. Incredibly disappointing. Water went from boiling hot to lukewarm after only 6 hours - not even close to the promised 12 hours. It's a good looking product, but I had higher hopes.
25. Keeps the water cold but everything breaks easily and gets scratched very easily as well. Now I need to purchase a new lid.
26. Love these and have bought four now. They keep my iced drink cold for hours; sometimes the whole day.
27. Moving from a plastic bottle to stainless steel is a game changer. The health benefits alone are one of the best qualities.
28. One of the best thermos I've ever had. The bad thing is that it dents easily. The dent doesn't affect the insides of the bottle, only how it looks from the outside. Good for cold or hot drinks.
29. Opening is pretty narrow and that makes it hard to clean for someone with decent sized hands like me. Wish they had made the hole larger to make up for that.
30. Says on the actual bottle "Dishwasher safe"... but it faded and had very noticeable white spots and streaks all over it after one wash. Amazon notes "hand-wash only".
31. Some tiny defects in the powder coating, and the lid looks a teeny bit crooked when screwed on all the way but otherwise it seems like a quality water bottle. No leaks and keeping my drinks cold as described.
32. The design is terrible because of the lip on the container, water doesn't come out without a struggle or putting a straw in it.
33. The lid that comes with this bottle is not water tight. Tip it over and water will gush out. Overall though I like the water bottle.
34. The quality of the bottle was far from decent. The bottle had dings and dents and the logo was smeared.
35. This comes with 2 lids, with the coffee lid being awesome since it has a finger hook to carry or attach to a bag using a carabiner or clip.
36. This water bottle is just as fantastic as the description makes it sound. It is one of the best purchases I've made in the past year.
37. This water bottle is way too expensive for the quality I received. My lid leaks and doesn't seal properly so I had to put it sitting up on my side pocket in my bag it then fell out and is now dented and ruined.
38. Usually hot drinks will stay hot for about 3 hours, and warm for about 8. It's taken a few pretty hard drops without the paint chipping as well, which is definitely nice.

39. Was supposed to come with a flip top but only came with a screw on. Kids will likely spill contents everywhere, and it's difficult for little hands to unscrew the top.

## **APPENDIX D: END SURVEY**

1. I felt the star ratings matched up with the review messages.
2. I felt these reviews were of good quality.
3. I felt these reviews were useful.
4. I felt these reviews were understandable.
5. If I saw these reviews on a website like Amazon or Ebay I would consider them reliable.
6. I felt these reviews were logical.
7. I felt these reviews were relevant.
8. I felt these reviews were informative.
9. After looking at these reviews, I would purchase the water bottle.
10. I found the reviews easy to remember.
11. I feel confident that I mostly recalled the reviews accurately.
12. The reviews and ratings did not match.
13. I found these reviews to be positive.
14. I found these reviews to be negative.

## **APPENDIX E: DEMOGRAPHICS**



1. What is your age?
2. What is your gender?
3. How long have you been attending UCF?
4. What is your highest level of education?

## **APPENDIX F: STIMULUS PRESENTED**



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