

THESIS

VISUAL CUES AND THE BANDWAGON EFFECT: DO IMAGES AND REVIEW VOTES  
MAKE ONLINE REVIEWS MORE CREDIBLE?

Submitted by

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## ABSTRACT

### VISUAL CUES AND THE BANDWAGON EFFECT: DO IMAGES AND REVIEW VOTES MAKE ONLINE REVIEWS MORE CREDIBLE?

Using the dual-process theory, this study aims at examining the impact of customers-uploaded images and the number of review votes on consumers' perceived credibility of the review, attitudes, and purchase intention towards the reviewed product. In the experiments, 256 participants participated in a 2 (image: images vs. no images)  $\times$  2 (review vote: a large review vote vs. a small review vote) between-subjects factorial design. The results show that review votes have significant positive impact on participants' perceived credibility, attitude, and purchase intention. The study also found significant impact between the relationships among perceived credibility, attitude, and purchase intention, as well as the mediated effect of attitude on the relationship between perceived credibility and purchase intention. However, in case of the customers-uploaded images, there is no significant impact of images on perceived credibility, attitude, and purchase intention found in this study. The study discusses its theoretical and empirical implications and limitations.

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## CHAPTER 1. INTRODUCTION

When people think about getting a new charger cable for their phone, they take out laptops, open Amazon.com, and search “iPhone 11 charger” for suitable products. Reading those reviews helps people finalize the decision regarding which product they are going to buy. According to research data, nearly 95% of consumers read online reviews prior to making purchasing decisions (Spiegel Research Center, 2017). 93% of local consumers use online reviews to determine if a local business (i.e. a restaurant or a store) is favorable and whether they choose to visit it (BrightLocal, 2017). The search for online reviews has become a common customer behavior in today’s marketplace.

Traditionally, prior to the internet, customer-to-customer information exchanges regarding products and services solely relied on word-of-mouth (WOM). However, as social media has become more expansive, WOM conversations started to shift into digital space, which is referred to as electronic word-of-mouth (eWOM). eWOM is defined as the customer-to-customer information exchange within the digital space. One of the representative eWOM communications is customer reviews, where customers can share their experiences of certain products they bought or services they used. There are numerous crowdsourced online review sites (i.e. Yelp, Google Reviews, TripAdvisor) or online shopping sites (e.g. Amazon) where users can search, read, and author customer reviews related to products or services. Although the people who provide product reviews on sites are generally strangers, they are perceived to be more reliable than formal business reviews in newspapers or magazines. This is because user-generated reviews, similar to the opinions of friends or family, are trusted more than the critical reviews published in mainstream media publications or advertising (Bronner & Hoog 2010; Mauri & Minazzi, 2013; Nieto & Hernandez, 2014; Wu & Lin, 2015; Lee & Youn’s, 2009).

Whether in person or online, user reviews always appear to outweigh their media counterparts. However, there are still differences between WOM and eWOM, as eWOM is also critiqued to provide less social interaction and social cues as compared to interpersonal communication (Einwiller 2003; Choi, Seo & Yoon, 2017; Park & Lee, 2009). To cope with consumer concerns about review reliability and authenticity, online review sites have developed many features that help blur the gap between online and interpersonal WOM. This in turn, would help eWOM consumers make better purchase decisions (Liang, DeAngelis, Clare, Dorros & Levine, 2014, Pelsmacker, Dens & Kolomiets, 2018, Sundar, 2007; Xu, Schmierbach, Bellur, Ash, Oeldorf-Hirsch & Kegerise, 2012). For example, these features include allowing users to upload the images of the product and vote on other reviews to determine the reviews' helpfulness or usefulness (See Figure 1 and Figure 2).

Dual-process theory (DPT) is a helpful framework when it comes to understand persuasive messages and how people receive and process persuasive messages. According to DPT, features like customer-uploaded images and review votes serve as heuristics cues (information that requires less cognitive effort to process) in user information processing and affect their perception, both towards the review and the reviewed products or services (Pelsmacker et al., 2018; Cheung et al., 2009; Lin & Wu, 2017). While content-related systematic cues (e.g. source credibility and argument quality) require a more comprehensive, analytical perception and information processing, heuristic cues allow recipients to consider less information and entail less thoughtful evaluation in order to form their judgments and perceptions (Dillard & Pfau, 2002). To understand what factors contribute to the power of user-generated reviews online, this study examines users' perceptions of review credibility and how different heuristic cues affect the users' perceived credibility of the review. In addition, this

study also tries to understand how perceived credibility of the review affects customers' attitudes and purchase intention toward the reviewed product.

bradybunch  
 ★★★★★ **Reliable Printer!**  
 August 26, 2019  
 Style: OfficeJet Pro 9015 | Configuration: Printer | **Verified Purchase**

Where to start with this compact but mighty printer. First HP has always been my go-to printer to get the job done. The HP Office Jet Pro 9015 is an all one printer that is part of the instant ink program. It prints, scans, copies and faxes. The design of the printer is nice and requires less room then other business printers. The feature of being able to print or scan from my phone is excellent. The scanning function is quick, and we can scan to our email. The double-sided scanning makes life easier, not having to flip over the paper. Setting up the printer is painless and simple; just follow the screen instructions and you will be printing in no time. With the 9015 printer you have connectivity options, WIFI direct, self-healing WIFI and ethernet network for direct connections. The printer has a small 2.7" touchscreen, which I do wish was larger for us mature adults (not going to say the word old or senior). The screen is easy to navigate. The instant ink feature is nice and will see how it plays out. You can sign up directly with HP for the instant ink program. The printer does a nice job printing in black and/or color. A crisp printing every time. The printer has several handy features which you can experiment with simply browsing the menu screen, as there were not many documentations included with the printer. There is a sleep mode on the printer and an option for timed power on and power off. A handy printer for home or a small office. The tray holds about 250 sheets of paper. The printer has exceeded my expectations. Definitely worth the purchase.

One person found this helpful  
 Helpful Comment Report abuse

Figure 1. Example of an Online Review on Amazon

Lauren T.  
 San Jose, CA  
 175 friends  
 124 reviews  
 71 photos

Share review  
 Embed review

★★★★★ 11/22/2016  
 1 photo 1 check-in

I found San Francisco in Fort Collins. The social was a swanky joint, dimly lit with hanging filament bulbs and sporting old school decor. We happened to make it in right during their Social Hour which meant discounted apps and drinks.

Our waitress, Molly, was awesome! She made my first drink--tasted like a gin lemonade--and recommended the wine on special which was amazing! We also had the \$12 cheese and meat plate which was the perfect snack.

If I'm ever back in Fort Collins, I will definitely be back.

image uploaded by the reviewer

Useful 4 Funny Cool

Figure 2. Example of an Online Review on Yelp

Online reviews are an important part of people's decision-making when buying products or services (Xie, Miao, Kuo, & Lee, 2011, Cheung & Thadani, 2010; Doh & Hwang, 2009; Plummer, 2007). External information such as reviews from other customers helps consumers reduce uncertainty and risk before making purchase decisions (Olshavsky, Granbois 1979). However, not all online reviews are considered credible and motivate purchase intention. Customers tend to adopt eWOM information as highly credible (Cheung & Lee, 2008; Cheung et al., 2009; Chu & Kamal, 2008; Senecal & Lerman, 2007; Zhang & Watts, 2008; Huang et al., 2009; Kumar & Benbasat, 2006).

Previous research on eWOM has found that many factors affect people's perception of information credibility such as argument strength, argument quality, recommendation sidedness, review consistency, valence, and so on (Cheung & Lee, 2008; Cheung et al., 2009; Chu & Kamal, 2008; Senecal & Lerman, 2007; Zhang & Watts, 2008; Huang et al., 2009; Kumar & Benbasat, 2006). Previous eWOM credibility literature focuses on the text-based message itself. However, despite the textual messages, features other than text such as review votes and customer-uploaded images (who serve as vital heuristic cues) can also shape users' perception towards review credibility (Metzger, Flanagin, & Medders, 2010; Shan, 2016). Many review sites allow users to vote the reviews with "useful", "helpful" or "like" clicks to indicate the perceived usefulness of these reviews. Customers can upload images to show the reality of the products they bought and thus increase the credibility of reviews. However, limited studies have investigated the direct effect of these new heuristic cue-based features (customer-uploaded images and review votes) on consumers' perception and behavioral intention. So, how do these heuristic cue-based features in online reviews affect consumer perception of the review? Do these features make purchase decisions easier for consumers? The impact of these features on

users' perceived credibility of online reviews, attitude, and purchase intention needs to be investigated more in the eWOM credibility study.

### **1.1 Goals and Research Problems**

The first purpose of this study is to examine the impact of two heuristic cues in online reviews, the customer-uploaded images and the review votes, and their interaction effect on the review credibility, attitude, and purchase intention in an e-commerce site setting. Secondly, this study aims to examine the relationships among perceived credibility of the review, attitude, and purchase intention towards the reviewed product. Lastly, this study investigates the mediation effect of attitude on the relationship between perceived credibility and purchase intention toward the reviewed product. Dual-process theory, which emphasizes the persuasive effectiveness of non-text-based or heuristic cues, was used as the theoretical framework of this study. In summary, the study explores the following research problems: Do heuristic features (i.e. images and review votes) make the online review more credible? Would reviews with both images and review votes generate the strongest impact of the perceived credibility in a review? And how does the perceived credibility of the review affect their attitude and purchase intention towards the reviewed product?

Theoretically, this study informed researchers in the academic field by expanding the scope of eWOM credibility into heuristic cues (images and review votes) provided by the consumers. Practically, this study provided public relations experts with meaningful insights concerning how consumers view reviews online, what they care about in terms of review credibility, and the role online reviews play in purchase decision-making. Lastly, this study empirically tested the effectiveness of the review vote feature and images, providing meaningful insights to the review sites as well.

## **1.2 Organization of Thesis**

This thesis is organized into six chapters. Chapter 1 introduces the study and gives the motivations of the study, relevant research, and questions that it will answer. Chapter 2 provides a more in-depth review of the existing literature that relates to the study and Chapter 3 covers the instruments, materials, and data collection methods that were used in its execution. Chapter 4 reviews the results and analysis of the gathered data, and Chapter 5 provide a discussion of these results and their implications, study limitations, and recommendations for future studies. The study conclusions are covered in Chapter 6.

## CHAPTER 2. LITERATURE REVIEW

### 2.1 From Word-of-Mouth (WOM) to Electronic-Word-of-Mouth (eWOM)

Traditionally, customer-to-customer information exchange about products and services relied on WOM, which was found in previous research as more trustworthy and reliable than information from marketing (Katz & Lazarsfeld, 1955). WOM relied on interpersonal communication as people shared experiences about the latest products purchased or restaurants they went to. WOM is widely considered as one of the most influential factors of customer behavior (Mahajan, Muller & Bass, 1990). The majority of WOM research shows that WOM has a stronger persuasive impact on customer attitude and behavior than other commercial-related communication achieved by traditional mass media (advertising in print media, television) (Cheung & Thadani, 2012; Borgida & Nisbett, 1977; Grewal et al., 2003; Herr, Kardes, & Kim, 1991). For example, Herr et al. empirical study found that face-to-face communication was more persuasive than printed media such as newspapers and magazines (1991).

WOM has shifted into digital discourse; a form of communication commonly referred to as eWOM. eWOM is defined as the customer-to-customer information exchange related to the usage or characteristics of products through internet-based technology (Litvin, 2008). When eWOM emerged, the large-scale, high volume, anonymous, and ephemeral nature of the internet influenced this interaction. By lowering the cost of information gathering and transferring, the Internet reduced the distance between consumers and desired information, increasing the speed at which consumers can obtain eWOM. The Internet has nurtured a great community for consumer exchange and discussions related to goods and services. Although eWOM remains distinct from formal critical reviews in the news or other mass media outlets, it is not the same as the interpersonal communication that preceded it (Cheung & Thadani, 2010). For example,

Computer-Mediated Communication (CMC) literature argues that consumer-to-consumer interactions occur in a computer-mediated environment that lacks non-verbal and social cues (Einwiller, 2003). The shift from WOM to eWOM is, in essence, a shift from interpersonal communication to computer-mediated communication. Unlike WOM, where information is typically obtained from individuals one already knows, recommendations online are typically from unknown individuals. The anonymous nature of eWOM makes it difficult for users to use the source to determine the credibility of the information (Chatterjee, 2001; Choi et al., 2017; Steffes & Burgee, 2009; Zhao & Xie, 2011). Choi et al describe it as “lacking ties with the communicator” or a “weak tie relationship.” (2017, p. 497) Despite these weak ties, eWOM still demonstrates influence on peoples’ purchasing decisions and has attracted considerable attention from researchers and the industry.

eWOM is an important part of people’s product evaluation and decision making when purchasing products or services (Ho et al., 2012; Sparks & Browning, 2011; Vermeulen & Seegers, 2009; Wen, 2009; Lee & Lee, 2009; Park, Lee & Harris, 2010; Hong & Park, 2012; Plummer, 2007). Consumers use external information to reduce uncertainty and perceptions of risk before making purchases (Olshavsky & Granbois 1979). Reviews written by previous customers reduce the cognitive load of product evaluation and make consumers’ buying decisions easier (Ye, Law, & Gu, 2011). Previous eWOM research about motivations for reading online reviews found that people seek out eWOM as an “informational input” in specific purchase decisions, using eWOM for both its support and community aspects as well as its entertainment value (Schindler & Bickart, 2003). Customers tend to use eWOM information that has a high perceived credibility (Cheung & Lee, 2008; Cheung et al., 2009; Chu & Kamal, 2008; Senecal & Lerman, 2007; Zhang & Watts, 2008; Huang et al., 2009; Kumar & Benbasat, 2006).

However, not all online reviews are considered credible enough to motivate purchase intentions. Customers tend to adopt eWOM information with high perceived credibility (Cheung & Lee, 2008; Cheung et al, 2009; Chu & Kamal, 2008; Senecal & Lerman, 2007; Zhang & Watts, 2008; Huang et al, 2009; Kumar & Benbasat, 2006).

## **2.2 eWOM Credibility**

Previous research has shown source credibility as a significant element in evaluating persuasive messages (Hovland, Janis, & Kelly, 1953). Source credibility refers to the extent to which receivers consider the information to be believable or not (Eisend, 2006; Goldsmith, Lafferty, & Newell, 2013). The three main dimensions for source credibility are expertise, trustworthiness, and attractiveness or likeliness (Lafferty et al., 2002; Ohanian, 1990). Perception of credibility plays a role more than forming impressions of the messages but affects receivers' attitudes towards the message and behavior intention toward the message (Hovland et al., 1953; Cheung & Thadani, 2014).

Literature in persuasion and eWOM shows that people tend to adopt the information with high perceived credibility (Cheung et al., 2009). Therefore, credibility is a crucial concept when considering the influence of eWOM. According to Cheung et al. (2008), eWOM credibility refers to the degree of belief users have in the reviews they read on the Internet. Compared to advertising or marketer-created messages, user-generated information is generally perceived as more independent, credible, and trustworthy (Bronner & Hoog 2010; Mauri & Minazzi, 2013; Nieto & Hernandez, 2014). Customers prefer to trust other customers over a business (Filiari, 2016; Nieto & Hernandez, 2014). This can likely be explained by the perception that reviews from other customers are genuine without a vested interest in the product, while the information from the marketers is associated to promote and sell targeted products (Bickart & Schindler,

2001). Studies in the tourism industry also indicate the irreplaceable impact customer-to-customer communication has on consumer intention toward intangible product consumption, like choosing a travel agent (Litvin & Goldsmith, 2008). In addition, there may also be differences in where customer-generated reviews appear. Compared to the reviews posted on brands' websites, the reviews posted on independent product review sites are often seen as more trustworthy because, again, the reviewers' trust information from other customers more readily than information from marketers or brands (Wu & Lin, 2015; Lee & Youn, 2009). This may be because businesses have the power to filter or even edit customer reviews on their sites, which may influence users' perceptions of their authenticity or completeness (Wu & Lin, 2015; Lee & Youn, 2009).

Previous research on eWOM has found that many factors affect people's perception of information credibility (Cheung & Lee, 2008; Cheung et al., 2009; Chu & Kamal, 2008; Senecal & Lerman, 2007; Zhang & Watts, 2008; Huang et al., 2009; Kumar & Benbasat, 2006). Previous research looks into various dimensions of the message including the textual element of the message such as argument strength, argument quality, recommendation sidedness, message length, and so on. (Cheung et al., 2009; Lim & Heide, 2015; Shan, 2015; Zhang & Watts, 2008). Perceived credibility of information is one of the most important factors affecting consumers' attitudes and behavior (Shan, 2017; Lim & Heide, 2015). In eWOM literature, how people perceive the credibility of eWOM influences the effectiveness of the persuasive message and receivers' behavior (Hovland et al., 1953; Petty and Cacioppo, 1986; Cheung & Thadani, 2014). These behaviors include information adoption (Cheung, Lee, & Rabjohn, 2008; Filieri & McLeay, 2014 ) and purchase intention (Lee & Lee, 2009; Park & Lee, 2008; Park, Lee, & Han, 2007; Senecal & Nantel, 2004; Smith, Menon, & Sivakumar, 2005).

### **2.3 eWOM and Social Interaction**

Although computer-mediated communication like eWOM is characterized as lacking social interaction and networking compared to interpersonal communication, many review sites have developed various features to increase opportunities for these interactions. For example, many review sites have a business profile section, which provides users with information related to images of the products, products' details, and customer reviews. Online review sites also provide a sense of community. Many sites such as Yelp or Google Reviews have features that allow users to engage with each other. For example, Yelp allows users to connect with other users as friends and create personal profiles on the platform. Many review sites also allow users to vote the reviews with "useful" or "helpful" clicks to indicate the perceived helpfulness or usefulness of these reviews (Liang et al., 2014). Previous eWOM research shows that product descriptions, reviewer profiles, and perceived review usefulness have an impact on customers' attitudes and purchase intentions (Wu & Lin, 2016; Shan, 2015; Xu, 2014). These specific features of user-generated reviews may also shape users' perceptions towards reviews and thus, the products and services.

### **2.4 Persuasiveness and eWOM Communication: Dual-Process Theory**

DPT is a helpful framework within which to examine factors of the impact of persuasive messages (Deutsch & Gerrard, 1995; Hovland et al., 1953; Zhang & Watts, 2003). DPT categorizes the influence of the received messages into two types: informational influence and normative influence (Deutsch & Gerrard, 1995). Informational influence refers to the influence resulting from additional information associated with messages such as content, message, and source. Normative influence refers to the influence of the social norms or expectations associated with being part of a group or community.

Elaboration Likelihood Model (ELM) and Heuristic Systematic Model (HSM) are two information-processing models under DPT aimed at explaining how people receive and process persuasive messages (Petty & Cacioppo, 1986; Dillard & Pfau, 2002; Chaiken, 1980). ELM argues that people take two different routes when processing persuasive messages, the central route or the peripheral route depending on receivers' ability and motivation (Dillard & Pfau, 2002). The central route processing entails careful evaluation of the arguments contained within the message, whereas the peripheral route processing entails less thoughtful evaluation by using heuristic cues of the messages (Dillard & Pfau, 2002).

Heuristic-Systematic Model (HSM) is a similar theory to ELM, which posits two information processes, the heuristic process and the systematic process (Dillard & Pfau, 2002; Chaiken, 1980). Similarly to the central route proposed in ELM, systematic processing involves a more comprehensive, analytical perception and information processing in which the perceiver accesses, scrutinizes, and integrates all informational input (e.g. source credibility and content) for its relevance and importance to their judgment task (Uleman & Bargh, 1989). Heuristic processing is a more limited processing mode involving less cognitive effort compared to systematic processing. In heuristic processing, people are less motivated and consider less information.

Previous eWOM credibility research has used dual-process theory to examine eWOM credibility (Pelsmacker et al., 2018; Shan, 2015; Cheung et al., 2009; Cheung et al., 2008; Park & Lee, 2007; Park & Kim, 2008; Chu & Kamal, 2008; Zhang & Watts, 2008). For example, Pelsmacker et al. (2018) looked into the impact of text valence, star ratings, and rated usefulness in online reviews' impression through the lens of dual-process theory and found that the influence of rated usefulness is stronger for people who are susceptible to interpersonal

influence. Lin and Wu (2017) investigated the impact of review votes on the perceived trustworthiness of the review and found that review votes are positively related to the perceived review trustworthiness. Both review votes and the perceived trustworthiness of the review have an impact on product attitude and purchase intention. Based on previous research, content-related cues such as information quality and relevance are considered as central route and systematic processing factors, while non-content-related factors such as reviewers' profile, star rating, and review votes of the review often serve as heuristic cues as they required less cognitive effort to process and considered as peripheral route and heuristic processing (Baek, Ahn, & Choi, 2012; Cheung, Sia, & Kuan 2012; Pelsmacker, Dens, & Kolomiets, 2018).

## **2.5 Customer-Uploaded Images**

According to DPT, informational influence refers to the influence resulting from additional information associated with messages such as content, message, source, and so on. When reviewers upload images related to the products and services in their reviews, readers can see additional information about the item being reviewed such as a photograph of clothing worn by the purchaser or a picture of the food at a restaurant. The photographs reflect the reality of the products emphasized in dual-process theory and provide heuristic cues.

The literature on visual communication also suggests that visual aids can strengthen the message richness by demonstrating the reality of a product, and thus, strengthening the credibility of the review (Clow, James, Kranenburg, & Berry 2006; Mukherjee, 2002; Babin & Burns, 1997). Aesthetic and visual elements play a role more than the perception of "pretty" or "not pretty," but affect the impression of trust and credibility (Phillips & Chaparro, 2009; Chang, Kuo, Hsu, & Cheng., 2014; Lindgaard et al., 2006; Robin & Holmes, 2008; Clow et al., 2006). Visual aids designed to supplement and clarify a persuasive message can affect attitude change

and message credibility (Seller, 2003). For example, previous research shows that aesthetic visual design can generate more trust and perceived credibility towards the websites and brands. It is common to see consumers complain about the product images provided by the brand that did not accurately represent the real product consumers received. As discussed previously, consumers view reviews from other consumers as more credible. Therefore, customer-uploaded images are likely to generate more credibility toward the review compared to a review without images.

The effect that images have on information processing is well studied (Broilo et al. 2016). Previous studies also show that visual presence tends to generate a more positive attitude toward the message and described subjects (e.g. reviewed products). Research in advertising and public relations shows that the image related to the brand, such as a product's image, affects consumer perception and evaluation of the brand (Keller, 2008). Advertising literature shows that using visual elements in ads can enhance the recall and effectiveness of the advertising message (Clow et al., 2006; Mukherjee, 2002; Babin & Burns, 1997; Leong et al., 1996). Previous research also shows that people tend to have a more positive attitude towards ads with visual elements and have a higher opportunity to recall the ad's message (Babin & Burns, 1997; Leong et al., 1996). Hoffman and Daugherty's (2013) study on reviews' visual elements, message valence, and brand influence on consumer attention on Pinterest found that positive images of pizzas attracted more attention from the audience than text-based reviews. In addition, Di, Sundaresan, Piramuthu, and Bhardwa's (2014) study also shows positive evidence that images in the review help increase buyer's attention, trust and conversion rate.

Therefore, the images of the product uploaded by the reviewer are believed to generate a more positive attitude towards the reviewed product. Previous research also shows that consumer

purchase intention is directly influenced by specific product attributes, such as product images (Wang, Li, Barnes, & Ahn, 2012). In other words, people are more likely to purchase products or services online if images are presented in the review. However, it may also not be the case when the images uploaded by the reviewers are not good as studies often used high-quality and well-designed product images. Overall, compared to a review without images, reviews with customer-uploaded images will generate higher perceived credibility, a more positive attitude, and higher purchase intention by adding visual and heuristic cues. The hypotheses are stated as follows:

**H1:** Participants exposed to the review with customer-uploaded images will have a) higher perceived credibility of the review, b) more positive attitude toward the reviewed product and c) stronger purchase intention toward the reviewed product than a review without images.

## **2.6 Bandwagon Effect and Review Votes**

Users' vote on the review is a feature of many online review platforms. For example, Amazon and Yelp have “helpful” buttons and Google Reviews provides users a “like” button. These functions are usually located under the review content box and allow users to indicate if they feel existing reviews are useful, and the interface usually provides a count of the number of votes users have made. Users can find the product reviews by scrolling down to the customer review area on the product detail page and cast their vote on any product review on that page. At the end of each review, you'll be asked "Was this review helpful to you?" Click Yes or No and your vote will be counted (Amazon.com). Figures 1 and 2 show some examples of the review and review votes on Yelp.com and Amazon.com.

Review votes serve as heuristic cues in information processing, which reflect the preferences and expectations of users, communicating norms around what types of reviews are considered more or less in line with community needs or preferences. This sense of community

approval contributes to the communication of social norms around expectations for effective reviews. This normative influence affects people's perception of persuasive messages according to the dual-process theory and the theory of the bandwagon effect (Sundar, 2008).

According to the theory of the bandwagon effect, individuals tend to follow how the majority thinks or acts when these acts or thoughts are "endorsed" by a large group of people (Sundar, 2007; Xu et al, 2012). The number of review votes indicates the number of other users who find the review "helpful", "likable", or "useful", which serve as a heuristic cue of the group expectations. Users' perception of the social expectation and endorsement of individual reviews affects how they will perceive the review and thus affect their attitude and behavior in decision making. The more people endorse the review, the higher the perceived credibility of the review users will have (Sundar, 2008).

Previous eWOM researchers also looked into the effect of review votes through the lens of DPT and as a form of the bandwagon effect. For instance, Wu and Lin (2017) have proved that review votes positively predict perceived review trustworthiness. Several articles also look into the effect of review votes on the perceived usefulness of the reviews. For example, Pelsmacker et al (2018) examined the impact of text valence, star rating, and rated usefulness on online review. The study found out that the influence of review votes on review impression is stronger for people who are more susceptible to interpersonal influence. Overall, review votes serve as heuristic cues that reflect the social expectations of the reviews' trustworthiness, likeability, and usefulness. The number the votes reflect the "endorsement" of the review, which is likely to affect users' perception of the review credibility. Therefore, when users see a high number of review votes, they are more likely to find the reviews more credible.

Furthermore, it has been demonstrated that review votes have a direct impact on attitude and purchase intention on reviewed products. Sundar et al. (2008) found out that the star-rating and sale-ranking system on Amazon directly influences the perception of the popularity of the product, and thus increases customers' purchase intention towards the product. Sparks and Browning (2011) found that the presence of review votes led to higher online hotel booking intention. Fu's (2012) study found that on a video-sharing site, the number of viewer counts of a video positively predicts its future viewing popularity. Wu and Lin's (2017) study also indicated that review votes have a direct or indirect effect on their attitude and purchase intention toward the technology product. Thus, the second set of hypotheses are as follows:

**H2:** Participants exposed to a review with a large number of review vote will have a) higher perceived credibility of the review, b) more positive attitude toward the reviewed product and c) stronger purchase intention toward the reviewed product compared to a review with a small number of review vote.

## **2.7 Interaction Effect Between Images and Review Votes**

According to Sundar, Knobloch-Westerwick, and Hastall (2007), when multiple cues are presented together, their effects are more likely to be understood in combination with each other rather than as separate pieces of information. Previous eWOM credibility research has found that heuristic cues have shown an interaction effect and generate a stronger impact on the information processing of the persuasive message. For example, Lim and Heide (2015) examined the effects of review valence and reviewer profiles (i.e., number of reviews and number of friends) on the perceived credibility of a restaurant review on Yelp.com. This study found a three-way interaction effect among the number of friends, the number of reviews, and the receiver's familiarity with Yelp.com on perceived competence dimensions of credibility. For the

participants who are familiar with Yelp (Yelp users), when the reviewers had written many reviews, the number of friends was positively related to the perceived competence of the review credibility. And the perceived competence of review credibility in this condition (with high review numbers and high friends) was higher than any other conditions. Sparks and Browning's (2011) study also looked into various interaction effects among different cues including review valence, review frames (positive v.s. negative), reviewed target (core features vs. customer service feature), and star ratings. The study found a significant interaction effect between frame and star rating on the trust of the hotel. Participants' trust of hotel is higher when the framing of the review is positive and include a star rating. And the effect is not significant without star rating. With a combination of different heuristic cues, the visual evidence of the product provided by other customers and a large review vote is believed to generate a stronger positive impact in terms of credibility, attitudes, and purchase intention. Therefore, the third hypothesis is stated as follows:

**H3:** There is a two-way interaction between images and review votes. When images are presented in the review, the effect of review votes will be greater in terms of a) perceived credibility of the review, b) attitude towards the reviewed product, and c) purchase intention towards the reviewed product than images are absent.

## **2.8 Perceived Credibility, Product Attitude, and Purchase Intention**

### **2.8.1 Credibility and Attitudes**

Literature in source credibility shows that how consumers perceive the credibility of online reviews affects people's attitude towards the reviewed product (Birno1, 2004; Erdem & Swait 2004; Shan, 2016; Lee, Park & Han, 2007). Previous research has shown that the higher perceived source credibility, the more positive attitude users will have towards the product and

services. Literature on eWOM credibility has shown a similar pattern. For example, Lim and Heide (2015) look into the perceived credibility of the online reviews on Yelp and found that the higher perceived credibility of the reviews consumers have, the more positive attitude consumers generated towards the reviewed restaurants. Therefore, it is reasonable to assume that with higher perceived credibility of online reviews, the more positive attitudes consumers will have towards the products.

**H4:** Credibility will be positively associated with attitudes.

### **2.8.2 Attitudes and Purchase Intention**

Attitudes are critical to decision-making and behaviors. People tend to engage in relationships with people they like, purchase the items they value and avoid behaviors that are viewed negatively (Plummer et al., 2017). Previous research indicates that attitude is a vital psychological variable and predictor of behavior (Miniard, Obermiller, & Page, 1983; Summers, Belleau, & Xu, 2006). By understanding consumers' attitudes toward the reviewed product, researchers were able to better predict behavior intention such as purchasing decisions. Marketing and public relations literature has shown that the more positive attitude a customer has towards a product is often associated with increased purchase intention toward the product (Erdem & Swait, 2004; Maathuis, Rodenburg, & Sikkel, 2004; Chang, Cheung, & Lai, 2005). For this reason, online reviews have been recognized as an effective marketing strategy for product sales (Chevalier & Mayzlin, 2006).

**H5:** Attitudes will be positively associated with purchase intention.

### **2.8.3 Credibility and Purchase Intention**

Previous literature said that customers perceive interpersonal communication related to the product and services as more a dependable source of information than marketer-generated

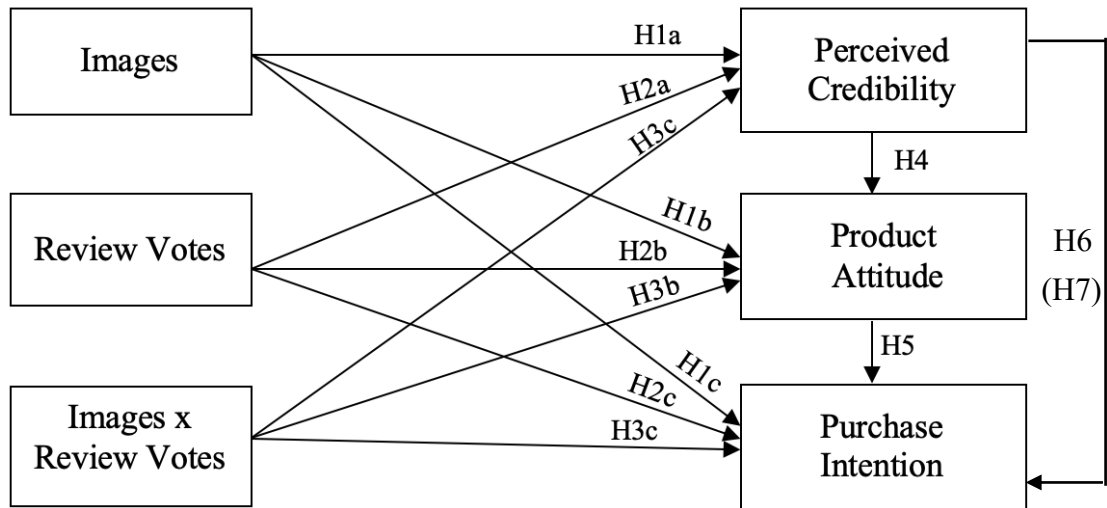
content (Mangold & Faulds, 2009). If consumers find an online review credible, they are likely to use it to make their purchase decisions. Previous eWOM studies have also proven the effect of perceived credibility of the review on consumers' purchase intention. For example, Nowak and McGloin (2014) found that review sources perceived to have more credibility are more persuasive and have more influence on purchase intention. Bataineh (2015) also found the direct positive impact of eWOM credibility on purchase intention. Thus, hypothesis 6 is stated as follow:

**H6:** Credibility will be positively associated with purchase intention.

#### **2.8.4. The Mediating Role of Attitude**

Previous eWOM studies have looked into the mediating role of attitude on the relationship between credibility and purchase intention. For example, Chin, Isa, & Alodin's (2019) study found a significant mediating effect of attitude towards the brand on the relationship between endorser credibility and purchase intention towards the brand. Kudeshia and Kumar (2017) also found that brand attitude mediates the relationship between positive eWOM and purchase intention towards the brand's products. Previous eWOM studies have also explored the indirect effect of credibility on purchase intention through various mediators. For example, Rao and Rao (2019) examined the indirect effect of eWOM credibility on purchase intention through brand images, and Tien, Rivas, and Liao (2019) explored the indirect effect of eWOM credibility on purchase intention through eWOM adoption in social networking sites. However, limited studies have examined the exact mediating role of attitude on perceived credibility of the review and purchase intention towards the reviewed product. Thus, hypothesis 7 is stated as follow:

**H7:** Attitude towards the reviewed product will have a mediated effect on the relationship between perceived review credibility of the review and purchase intention towards the reviewed product.



**Figure 3.** Conceptual Model of the Study

## CHAPTER 3. METHODS

### 3.1 Pretest

The pretest was conducted after receiving IRB approval of research, which examined the effectiveness of message manipulation and order of survey questions. The goal of the pretest was to ensure there are no technical problems with the survey process, to assess the manipulation in the four conditions, and to ensure that the survey was asking questions that were in alignment with the goals of the study. Two manipulation check questions were developed and asked for each independent variable during the pretest. These include two “No” or “Yes” questions: “I’ve seen the images uploaded by the reviewer in the review” and “I’ve seen the number of users who have found the review helpful”; and two questions which were evaluated on a 7-point scale from “1 = strongly disagree” to “7 = strongly agree.” These are “There were images of the copy machine included in the review” for the image manipulation and “A large number of people found the review helpful” for the review vote manipulation.

The pretest was conducted in the March of 2019, 60 participants were recruited from Amazon’s Mechanical Turk (Mturk) and each of them was compensated with \$0.4 to complete the survey. After collecting the data, 30 out of 60 participants answered the “Yes” and “No” manipulation check questions correctly (50%). After filtering out those who answered the “Yes” and “No” manipulation check questions incorrectly, the final sample size of the pretest is 30. Independent samples t-test was run based on the 7-point scale manipulation questions ranging from “1= strongly disagree” to “7 = strongly agree.” Table 1 shows the descriptive statistics of the pretest.

**Table 1.** Pretest Descriptive Statistics

|                   | <i>N</i> | <i>M</i> | <i>SD</i> |
|-------------------|----------|----------|-----------|
| No Images         | 17       | 2.29     | 1.99      |
| With Images       | 13       | 6.08     | 1.44      |
| Total             | 30       | 3.93     | 2.59      |
| Small review vote | 14       | 2.07     | 2.16      |
| Large review vote | 16       | 5.56     | 1.09      |
| Total             | 30       | 3.93     | 2.42      |

An independent samples t-test was used to analyze the manipulation of the independent variables in the pretest sample size. Table 2 shows the results of the independent samples t-tests. Again, the manipulation of images, ( $t(28) = -5.78, p < .001$ ) was successful (Table 2). Participants who were exposed to a review with images report a higher level of agreement on the presence of the images ( $M_{\text{image}} = 6.08, SD = 1.44$ ) than those who were exposed to a review without images ( $M_{\text{no-image}} = 2.29, SD = 1.99$ ). The manipulation of review votes ( $t(28) = -5.68, p < .001$ ) was also successful in the pretest, indicating that participants who were exposed to a review with a large review vote reported a higher level of the agreement on the large review votes ( $M_{\text{large review vote}} = 5.56, SD = 1.09$ ) than those who were exposed to a small review vote ( $M_{\text{small review vote}} = 2.07, SD = 2.16$ ). Stimulus and survey questions were slightly adjusted based on the pretest results in order to be a better fit for the study and understood by the participants.

**Table 2.** Pretest Independent Samples T-Test Results

| IV          | <i>t</i> | <i>df</i> | <i>Sig. (2-tailed)</i> | <i>MD</i> | <i>SE</i> |
|-------------|----------|-----------|------------------------|-----------|-----------|
| Images      | -5.78    | 28        | <.001**                | -3.78     | .65       |
| Review vote | -5.68    | 28        | <.001**                | -3.49     | .61       |

Note: Equal variance assumed, \* =  $p < 0.05$ , \*\* =  $p < 0.01$

### 3.2 Main Study Design

A 2 (image: presence vs. absence)  $\times$  2 (review vote: large vs. small) between-subjects randomized experimental design was conducted to examine the impact of images and review votes on credibility, product attitude, and purchase intention. By conducting this experiment, it is possible to isolate the independent variables and reduce extraneous factors for analysis (Charness, Gneezy, & Kuhn, 2012; Shuttleworth, 2016). Additionally, this method is often used in eWOM research, allowing researchers to develop an understanding of the systematic relationship between images, review votes, and their perceptions (i.e., credibility, attitude, purchase intention) (Cheung & Lee, 2008; Cheung et al, 2009; Chu & Kamal, 2008; Senecal & Lerman, 2007; Zhang & Watts, 2008; Huang et al, 2009; Kumar & Benbasat, 2006).

### 3.3 Participants

This study targeted participants who were above the age of 18 and were residing in the United States. Participants also need to have experience in reading and/or have basic knowledge regarding online customer reviews such as Amazon.com, Yelp, TripAdvisor, Google Reviews, etc. Mturk participants were paid \$0.40 for completing the survey. This survey took roughly 6 minutes to complete.

A total of 360 participants were recruited through Amazon Mturk service. MTurk is a crowd-sourcing platform that assists in completing Human Intelligence Tasks (HITs); for example, online survey responses. Participants have to register and input basic demographic information to be qualified as Mturk respondents. Once MTurk users have registered, they can choose which tasks they want to complete based on task title, compensation rate, estimated time of completion. During Amazon MTurk's survey recruitment, researchers can target their studies

to respondents with specific qualifications such as U.S. residency, gender, mother or non-mother, smoker or non-smoker, and so on. Research shows that Amazon MTurk is a reliable source for recruiting generalizable samples for academic studies (Behrend, Sharek, Meade, & Wiebe, 2011; Michel, O’Neill, Hartman, & Lorys, 2018). According to a recent report in 2018, there were over 100,000 respondents, with 2,000 being available at any given time (Difallah, Filatova, & Ipeirotis, 2018a). 75% of these respondents originated from the United States; 51% of them identified as female, while 49% identified as male (Difallah, Filatova, & Ipeirotis, 2018a). Here report the demographic information in the main test following the Table 3.

**Table 3.** Main Test – Demographic Information

|           |                       | <i>Frequency</i> | <i>Percent</i> |
|-----------|-----------------------|------------------|----------------|
| Age       | 18 - 25               | 49               | 19.1%          |
|           | 26 - 35               | 122              | 47.7%          |
|           | 36 – 45               | 42               | 16.4%          |
|           | 46 – 55               | 17               | 6.6%           |
|           | 56 or above           | 24               | 9.4%           |
|           | Total                 | 254              | 99.2%          |
| Education | Less than high school | 1                | 0.4%           |
|           | High school diploma   | 51               | 19.9%          |
|           | Professional degree   | 14               | 5.5%           |
|           | Bachelor’s degree     | 157              | 61.3%          |
|           | Master’s degree       | 29               | 11.3%          |
|           | Doctoral degree       | 2                | 0.8%           |
|           | Total                 | 254              | 99.2%          |
| Ethnicity | Caucasian (white)     | 159              | 62.1%          |
|           | African American      | 18               | 7.0%           |
|           | Hispanic              | 11               | 4.3%           |
|           | Asian                 | 55               | 21.5%          |
|           | Native American       | 5                | 2.0%           |
|           | More than one race    | 6                | 2.3%           |
|           | Total                 | 254              | 99.2%          |

### 3.4 Stimulus

The design of the stimulus helps control some of the potential extraneous variables that could influence the results of the study. Aside from independent variables (i.e., images and review votes), the design of other components in the review (reviewed product, reviewer profile, and review messages) are in the same conditions to control potential extraneous influences on the results.

In this study, an office copy machine product review was created based on Amazon's review features. Amazon product review features were chosen as the foundation of stimulus design because Amazon is currently one of the most popular product review sites in the U.S. Amazon hosts the most online marketplace sellers in the U.S. with 185,000 reported active marketplace sellers (Fan and Fuel, 2016). 64% of customers reported that Amazon is the best site for product reviews (Marketplacepulse, 2016). Previous studies have used common material products such as cameras or laptops to be reviewed as products in examining the impact of eWOM (Wu & Lin, 2017). Unfamiliar product types, such as an office copy machine, were chosen to reduce bias caused by pre-existing perceptions. Participants might rely on external information (i.e., reviews) to gain information and make purchase decisions about a product that they are not very familiar with. In addition, a moderate level of product involvement is also essential in this experiment. Electronic products such as an office copy machine tend to be pricier than daily supply products like paper towels or pencils, which means the purchase decision inherently involves more risk. This motivates consumers to be more cautious in their purchasing decisions.

To increase participant involvement in this experiment, a hypothetical buying scenario was implemented in which participants are asked to buy a copy machine for their office. Priming participants of their situation is important and has been used in many customer behaviors and online purchasing studies (Noort, Kerkhof, and Fennis, 2007; Pan, Kuo, Pan, and Tu, 2013; Ku, Kuo, and Kuo, 2012). The participants were told that they are buying this product for the office instead of themselves: this could reduce some personal bias toward the product as well as increase the opportunity to evaluate the reviews.

The review in this study was designed with a moderated depth and length with no star rating. Previous research has found that the star rating is an essential feature that affects reviewers' perception of the review and reviewed products (Cheung et al, 2009). Extreme star ratings are usually found to be overall less helpful in online reviews (Mudambi & Schuff, 2010; Racherla & Friske, 2012). Mudambi and Schuff (2010) found that extreme star ratings were perceived as less credible through analyzing the helpfulness of review data from Amazon.com (Mudambi & Schuff, 2010). A study conducted by Cheung et al. (2009) on online shopping also found that positive reviews increased consumer emotional trust and purchase intention toward the product. Thus, the star rating feature was removed in the stimulus design.

The image (presence vs. absence) was manipulated by including three clear images of the reviewed product (see Figure 6 and Figure 7) or without any images (see Figure 4 and 5). The images used in the stimulus were taken by the author with an actual office copy machine in real life. These three images show the overall feature of an office copy machine and its printing result. In order to manipulate review votes (large vs. small), the large condition was set with 326 review votes (see Figure 5 and 7) and the small condition was set with 0 review votes (see Figure 4 and 6). Other elements of the review (i.e., text message and the reviewer's name) were the

same. The author also chose a gender neutral name Alex to avoid any gender bias. Each participant was randomly presented in one of the following four product reviews:



**Alex**

September 17, 2019

**0** people find this review helpful

This copy machine is reliable and is fast for everyday use in the office. But the install took a while to set up. We will see the long-term performance of the copy machine.

**Figure 4.** Stimulus Condition 1: No image and Small Review Vote



**Alex**

September 17, 2019

**326** people find this review helpful

This copy machine is reliable and is fast for everyday use in the office. But the install took a while to set up. We will see the long-term performance of the copy machine.

**Figure 5.** Stimulus Condition 2: No Image and Large Review Vote



**Alex**

September 17, 2019

**0** people find this review helpful

This copy machine is reliable and is fast for everyday use in the office. But the install took a while to set up. We will see the long-term performance of the copy machine.



**Figure 6.** Stimulus Condition 3: Images and Small Review Vote



Alex

September 17, 2019

**326** people find this review helpful

This copy machine is reliable and is fast for everyday use in the office. But the install took a while to set up. We will see the long-term performance of the copy machine.



**Figure 7.** Stimulus Condition 4: Images and Large Review Vote

### 3.5 Procedure

Participants were invited to the study on Mturk. Once they chose to open the study, a consent form of the study was shown, which explains the topic of the study, goal, main content of the survey, and compensation for participating in the study. Participants were made aware that they can exit the study whenever they want to. After participants agreed with the consent form, the study began. In the first section, participants were given the definition of copy machine which stated that “Copy machine refers to a piece of office equipment designed specifically to copy, scan, print, and fax paper or create electronic documents from paper originals to distribute.” Participants’ familiarity and product involvement toward the copy machine were measured after giving the definition.

After measuring participants' familiarity and product involvement of the copy machine, participants were given a hypothetical situation, in which they were asked to look for and purchase a new office printer online. The situation is shown below:

“Imagine you’re an employee in a company. One day, your boss asks you to look for a copy machine online and purchase a new one for the office. On the following page, you will be given an online review of a copy machine. ”

After reading the hypothetical situation and before exposing to one of the four experimental conditions, a notification was placed *saying* “Please review the following message carefully” to ensure participants were focus when exposed to the message. One of the four experimental conditions then was randomly exposed to each participant. The four experimental conditions mentioned earlier were equally and randomly distributed to participants. When exposed to the message, participants need to stay on the message page for at least 30 seconds before clicking “Next” to continue the survey and answer the following questions. The reason for the 30-second duration is to ensure participants review the message carefully and thoroughly before answering the following questions.

After being exposed to the stimulus, participants were asked questions related to their perceived credibility of the review, attitude, and purchase intention toward the reviewed product. After answering all the questions related to the dependent variables, participants were asked for the manipulation check questions. Once participants answer all dependent and independent variable measurement questions as well as the manipulation check question, the participants’ demographic information was asked. These fields include age, education, race, and location (state). A full survey of the experiment can be found in Appendix A.

And Table 5 shows the cell distribution in the main test:

**Table 4.** Main Test - Cell Distributions

|             | Value Label       | <i>N</i> |
|-------------|-------------------|----------|
| No images   | Small review vote | 58       |
|             | Large review vote | 56       |
|             | Total             | 114      |
| With images | Small review vote | 55       |
|             | Large review vote | 84       |
|             | Total             | 139      |
| Total       | Small review vote | 113      |
|             | Large review vote | 140      |

### 3.6 Main Study Manipulation Check

Manipulation checks on the two independent variables (i.e., images and review votes) were performed and conducted before running other analyses.

#### 3.6.1 Images of the Product

The same two items used in pretest were used to check the image manipulation. The first question is “I’ve seen the images uploaded by the reviewer in the review.” and was evaluated by “No” or “Yes.” The second question is “There were images of the copy machine included in the review” and was evaluated on a 7-point scale from “1 = strongly disagree” to “7 = strongly agree.”

### 3.6.2 Review Votes

The same two items used in pretest were used to check the review votes manipulation. The first question is “I’ve seen the number of users who have found the review helpful.” and was evaluated by “No” or “Yes.” The second question is “A large number of people found the review helpful” and was evaluated on a 7-point scale from “1 = strongly disagree” to “7 = strongly agree.”

### 3.7 Dependent Variables Measures

The dependent variables, perceived credibility, attitude, and purchase intention were measured. All the scales chosen for this study have been previously used in other studies and reported reliable coefficient scores. A reliability coefficient of .70 or greater is considered “acceptable”, based on the majority of social science research. Table 3 shows the Cronbach’s alphas scores of the scales used in this study.

**Table 5.** Main Test – Scale Levels of Reliability

| Scale              | Cronbach’s Alpha | Mean | SD   |
|--------------------|------------------|------|------|
| Credibility        | .91              | 5.46 | 1.19 |
| Attitude           | .92              | 5.16 | 1.16 |
| Purchase Intention | .92              | 4.63 | 1.41 |

#### 3.7.1 Perceived credibility

Xu’s (2014) three items were used to measure the perceived credibility of the review on a 7-point scale, ranging from “1 = strongly disagree” to “7 = strongly agree.” The items include

“This review is credible,” “This review is believable,” and “This review is trustworthy” ( $M = 5.46$ ,  $SD = 1.19$ ,  $\alpha = .91$ ).

### **3.7.2 Attitude Towards the Reviewed Product**

Four semantic differential items, adopted from Park & Park (2013) and Lin & Wu (2017), were used to measure the participants' attitudes towards the reviewed product on a 7-point scale. The question is “On a scale of 1 to 7, what do you think of the copy machine?” The items include and range from “1= strong dislikable” to “7 = strongly likable,” “1= very bad” to “7 = very good,” “1= very unfavorable” to “7 = very favorable” and “1= very low quality” to “7 = very high quality” ( $M = 5.16$ ,  $SD = 1.16$ ,  $\alpha = .92$ ).

### **3.7.3. Purchase Intention Towards the Reviewed Product**

Three semantic differential items, adopted from Belch (1981) were used to measure the purchase intention of the product. The first item is “Given the scenario, I intend to buy this copy machine,” and was evaluated on a 7-point scale from “1= strongly disagree” to “7 = strongly agree.” The second item is “Given the scenario, I predict that I should buy this copy machine. ” and was evaluated on a 7-point scale from “1 = strongly disagree” to “7 = strongly agree.” The last item is “Given the scenario, it is likely that I will buy this copy machine in the near future.” and was evaluated on a 7-point scale from “1 = extremely unlikely” to “7 = extremely likely” ( $M = 4.63$ ,  $SD = 1.41$ ,  $\alpha = .92$ ).

## **3.8 Control Variables Measures**

Other control variables include product involvement and product familiarity were measured through the following scale:

### 3.8.1 Product Involvement

Three items concerning product involvement were adopted from Dens and De Pelsmacker (2010) and measured on a 7-point scale, ranging from “1= strongly disagree” to “7 = strongly agree.” These items include “Buying a copy machine is an important decision,” “Buying a copy machine is a decision that requires a lot of thought,” and “Buying a copy machine is a decision with high risks.” ( $M = 4.80$ ,  $SD = 1.25$ ,  $\alpha = .74$ ).

### 3.8.2 Product Familiarity

One item adopted from (Harlam, Krishna, Lehmann, and Mela, 1995) was used to measure participants’ familiarity with the reviewed product. This item is “*how familiar are you with an office printer?*” and was measured on a 7-point scale, ranging from “1 = very unfamiliar” to “7 = very familiar.” ( $M = 5.91$ ,  $SD = 1.47$ ).

In addition to the product involvement and product familiarity, general demographic information regarding the participants was also gathered to better understand the participants in this study. This included questions regarding participants’ age, education status, location (state), and ethnicity.

## CHAPTER 4. RESULT AND ANALYSIS

### 4.1 Data Overview

As mentioned before, study materials were created through Qualtrics and the data was collected through an online survey administered individually to a convenience sample of adults recruited from MTurk. The first data set was collection in March 2019, and 260 participants were recruited from MTurk. However, after filtering participants who answered the “Yes” and “No” manipulation check questions incorrectly, the final sample size was pretty low in the first data set so the author decided to recruit another data set. An additional 100 participants were recruited in the second data set from MTurk. The same experiment and procedure were implemented in both data sets’ collections. Data were stored in Qualtrics and exported in IBM SPSS 25 once the research is ready to start data analysis.

IBM SPSS 25 was used to enter, clean, and analyze the data. Two data sets were combined for the final data analysis. Using the manipulation check questions, the data was first filtered by participants who answered th “Yes” and “No” manipulation check questions correctly. Finally, 256 out of 360 (71.1%) participants answered the manipulation check questions correctly. This number was improved compared to the pretest (50%), which means the adjustments on the stimulus and survey design were effective. Overall, the final sample size in the main test was 256.

### 4.2 Analysis Overview

Using IBM SPSS 25, the author ran and conducted independent samples t-tests, Multivariate Analysis of Variance (MANOVA), and Linear Regressions to test the study hypotheses. MANOVA was used to test the impact of the images that the reviewer uploaded, review votes, and their effect on perceived credibility of the review, attitudes, and purchase

intention toward the reviewed product (H1, H2, & H3). Simple linear regressions were used to analyze the relationships between perceived credibility and attitude (H4), attitude and purchase intention (H5), and perceived credibility and purchase intention (H6). Lastly, Hayes' PROCESS was used to analyze the mediating role of attitude on the relationship between perceived credibility and purchase intention (H7).

### 4.3 Results

#### 4.3.1 Manipulation check

Independent samples t-test was used to analyze the manipulation of the independent variables (i.e., images and review vote) in the main test sample size based on the 7-point scale manipulation check questions. According to Table 6, the manipulation of images was successful in the main test ( $t(254) = -21.43, p < .001$ ). Participants who received a review with images reported a higher level of agreement on the presence of the images ( $M_{\text{image}} = 6.12, SD = 1.32$ ) than those who received a review without images ( $M_{\text{no-image}} = 2.02, SD = 1.74$ ). The manipulation of review votes was also successful ( $t(254) = -22.52, p < .001$ ), indicating that participants who received a review with a large review vote reported a higher level of the agreement on the large review vote ( $M_{\text{large review vote}} = 5.68, SD = 1.26$ ) and than those who received a review with a small review vote ( $M_{\text{small review vote}} = 1.74, SD = 1.54$ ).

**Table 6.** Main Test – Independent Samples T-Test Results

|              | <i>t</i> | <i>df</i> | <i>Sig. (2-tailed)</i> | <i>MD</i> | <i>SD</i> |
|--------------|----------|-----------|------------------------|-----------|-----------|
| Images       | -21.43   | 254       | < .001**               | -4.10     | .19       |
| Review votes | -22.53   | 254       | < .001**               | -3.94     | .17       |

*Note:* Levene's test indicated unequal variances, \* =  $p < 0.05$ , \*\* =  $p < 0.01$

**Table 7.** Main Test – Manipulation Check Descriptive Statistics

|                   | <i>N</i> | <i>M</i> | <i>SD</i> |
|-------------------|----------|----------|-----------|
| No Images         | 116      | 2.02     | 1.74      |
| With Images       | 140      | 6.12     | 1.32      |
| Total             | 256      | 4.26     | 2.55      |
| Small review vote | 114      | 1.74     | 1.54      |
| Large review vote | 142      | 5.68     | 1.26      |
| Total             | 256      | 3.93     | 2.40      |

### 4.3.2 Testing of the Hypotheses

A Multivariate Analysis of Variance (MANOVA) was used to analyze the effect of images on perceived credibility (H1a), attitude (H1b) and purchase intention (H1c), the effect of review vote on perceived credibility (H2a), attitude (H2b), and purchase intention (H2c), as well as the interaction effect of images and review votes on perceived credibility of the review (H3a), attitude (H3b), and purchase intention (H3c). Descriptive statistics (Table 8) demonstrates the overall means, group means, and standard deviations for each dependent variable. Table 9 shows the results of MANOVA, and table 10 shows the result of the two-way ANOVA.

**Table 8.** Main Test - Descriptive Statistics

| DV          | Images      | Review votes       | <i>M</i> | <i>SD</i> | <i>N</i> |
|-------------|-------------|--------------------|----------|-----------|----------|
| Credibility | No images   | Small review votes | 5.32     | 1.24      | 59       |
|             |             | Large review votes | 5.53     | 1.23      | 57       |
|             |             | Total              | 5.42     | 1.24      | 116      |
|             | With images | Small review votes | 5.27     | 1.40      | 55       |
|             |             | Large review votes | 5.59     | .96       | 85       |
|             |             | Total              | 5.46     | 1.16      | 140      |
|             | Total       | Small review votes | 5.29     | 1.32      | 114      |
|             |             | Large review votes | 5.56     | 1.08      | 142      |
|             |             | Total              | 5.44     | 1.19      | 256      |

|                    |             |                    |      |      |     |
|--------------------|-------------|--------------------|------|------|-----|
| Attitude           | No images   | Small review votes | 4.92 | 1.09 | 59  |
|                    |             | Large review votes | 5.23 | 1.29 | 57  |
|                    |             | Total              | 5.07 | 1.94 | 116 |
|                    | With images | Small review votes | 4.88 | 1.35 | 55  |
|                    |             | Large review votes | 5.47 | .93  | 85  |
|                    |             | Total              | 5.24 | 1.14 | 140 |
|                    | Total       | Small review votes | 4.90 | 1.22 | 114 |
|                    |             | Large review votes | 5.37 | 1.09 | 142 |
|                    |             | Total              | 5.16 | 1.17 | 256 |
| Purchase intention | No images   | Small review votes | 4.18 | 1.41 | 59  |
|                    |             | Large review votes | 4.82 | 1.28 | 57  |
|                    |             | Total              | 4.62 | 1.36 | 116 |
|                    | With images | Small review votes | 4.33 | 1.64 | 55  |
|                    |             | Large review votes | 4.84 | 1.31 | 85  |
|                    |             | Total              | 4.64 | 1.46 | 140 |
|                    | Total       | Small review votes | 4.37 | 1.52 | 114 |
|                    |             | Large review votes | 4.84 | 1.29 | 142 |
|                    |             | Total              | 4.63 | 1.41 | 256 |

The MANOVA test (Table 9) shows no significant main effects of images on participants' perceived credibility of the review, attitude, and purchase intention toward the reviewed product (Wilks' Lambda = .99,  $F(3, 250) = .44, p = .723$ ), indicating that there is no significant difference on the dependent variables when images were presented in the review compared to when images were absent. H1 was not supported. However, the main effects of review votes on participants' perceived credibility of the review, attitude, and purchase intention was significant (Wilks' Lambda = .96,  $F(3, 250) = 3.35, p < .05$ ), indicating that there is a significant difference in dependent variables when participants were exposed to a large review vote compared to those who exposed to a small review vote. H2 was supported. There is no

significant interaction effect between images and review votes on perceived credibility, attitude and purchase intention (Wilks' Lambda = .99,  $F(3, 250) = .41, p = .748$ ). H3 was not supported.

**Table 9.** Multivariate Analysis of Variance (MANOVA)

| <i>Effect</i>        | <i>Value</i>  | <i>F</i> | <i>Hypothesis</i> | <i>Error</i> | <i>df</i> | <i>p</i>     | <i>Partial Eta</i> |
|----------------------|---------------|----------|-------------------|--------------|-----------|--------------|--------------------|
|                      |               |          | <i>df</i>         |              |           | <i>value</i> | <i>Squared</i>     |
| Images               | Wilks' Lambda | .99      | .44               | 3.00         | 250.00    | .723         | .005               |
| Review vote          | Wilks' Lambda | .96      | 3.35              | 3.00         | 250.00    | .020*        | .039               |
| Images × Review vote | Wilks' Lambda | .99      | .41               | 3.00         | 250.00    | .748         | .005               |

Note: \* =  $p < 0.05$ , \*\* =  $p < 0.01$

Table 10 shows the results of the two-way ANOVA, which provides specific details of the effect each independent variables (images and review votes) have on each of the dependent variables (perceived credibility, attitude, and purchase intention). The two-way ANOVA shows no main effect of images on perceived credibility of the review ( $F(1, 252) = .002, p = .968$ ), indicating that there is no significant difference on perceived credibility of the review when images were presented on the review ( $M_{\text{image}} = 5.46, SD = 1.16$ ) compared to when images were absent ( $M_{\text{no-image}} = 5.42, SD = 1.24$ ). H1a is not supported. The main effect of images on attitude towards the reviewed product is not significant ( $F(1, 252) = .46, p = .498$ ), indicating that there is no significant difference in participants' attitude towards the reviewed product when images were presented ( $M_{\text{image}} = 5.24, SD = 1.14$ ) compared to when images were absent ( $M_{\text{no-image}} = 5.07, SD = 1.94$ ). H1b is not supported. The main effect of images on purchase intention towards the reviewed product is not significant, ( $F(1, 252) = .04, p = .853$ ), indicating that there is no significant difference in participants' purchase intention towards the copy machine when images were presented ( $M_{\text{image}} = 4.64, SD = 1.46$ ) compared to when images were absent ( $M_{\text{no-image}} = 4.62, SD = 1.36$ ). H1c is not supported.

The main effect of review votes on the perceived credibility of the review was not significant ( $F(1, 252) = 3.08, p = .081$ ), indicating that there is no significant difference in perceived credibility of the review with a large review vote presented in the review ( $M_{\text{large review vote}} = 5.56, SD = 1.08$ ) compared to a small review vote present in the review ( $M_{\text{small review vote}} = 5.29, SD = 1.32$ ). H2a is not supported. The main effect of review votes on attitude towards the reviewed product is significant, ( $F(1, 252) = 9.54, p < .01$ ), indicating that there is a significant difference in participants' attitude towards the reviewed product when a review was presented with a large review vote ( $M_{\text{large review vote}} = 5.37, SD = 1.09$ ) compared to a review was presented with a small review vote ( $M_{\text{small review vote}} = 4.90, SD = 1.22$ ). H2b is supported. The main effect of review votes on purchase intention towards the reviewed product is significant, ( $F(1, 252) = 6.63, p < .05$ ), indicating that there is a significant difference in participants' purchase intention towards the copy machine when the review presented with a large review vote ( $M_{\text{large review vote}} = 4.84, SD = 1.29$ ) compared to a small review vote ( $M_{\text{small review vote}} = 4.37, SD = 1.52$ ). H2c is supported.

The main interaction effect between images and review votes on the perceived credibility of the review is not significant ( $F(1, 252) = .14, p = .713$ ), indicating that there is no significant difference in perceived credibility of the review with a large review vote and images presented in the review ( $M_{\text{image and large review vote}} = 5.59, SD = .96$ ) compared to a small review vote with no images presented in the review ( $M_{\text{no-image and small review vote}} = 5.32, SD = 1.24$ ). H3a is not supported. The interaction effect between images and review votes on attitude towards the reviewed product is not significant, ( $F(1, 252) = .94, p = .334$ ), indicating that there is no significant difference in participants' attitude towards the reviewed product when a review was presented with a large review vote with images ( $M_{\text{image and large review vote}} = 5.47, SD = .93$ )

compared to a review was presented with a small review vote with no images ( $M_{\text{no-image and small review vote}} = 4.92, SD = 1.09$ ). H3b is supported. The interaction effect between images and review votes on purchase intention towards the reviewed product is not significant ( $F(1, 252) = .08, p = .772$ ), indicating that there is no significant difference in participants' purchase intention towards the copy machine when the review presented with a large review vote and images ( $M_{\text{image and large review vote}} = 4.84, SD = 1.31$ ) compared to a small review vote with no images ( $M_{\text{no-image and small review vote}} = 4.18, SD = 1.41$ ). H3c is not supported.

**Table 10.** Two-way ANOVA

| IV                  | DV                              | <i>df</i> | <i>MS</i> | <i>F</i> | <i>Sig</i> | <i>Partial Eta Squared</i> |
|---------------------|---------------------------------|-----------|-----------|----------|------------|----------------------------|
| Images              | Credibility <sup>a</sup>        | 1         | .002      | .002     | .968       | .000                       |
|                     | Attitude <sup>b</sup>           | 1         | .60       | .46      | .498       | .002                       |
|                     | Purchase intention <sup>c</sup> | 1         | .08       | .04      | .853       | .000                       |
| Review vote         | Credibility <sup>a</sup>        | 1         | 4.38      | 3.08     | .081       | .012                       |
|                     | Attitude <sup>b</sup>           | 1         | 12.54     | 9.54     | .002*      | .036                       |
|                     | Purchase intention <sup>c</sup> | 1         | 13.03     | 6.63     | .011*      | .026                       |
| Images *Review vote | Credibility <sup>a</sup>        | 1         | .19       | .14      | .713       | .001                       |
|                     | Attitude <sup>b</sup>           | 1         | 1.23      | .94      | .334       | .004                       |
|                     | Purchase intention <sup>c</sup> | 1         | .17       | .08      | .772       | .000                       |
| Error               | Credibility                     | 252       | 1.43      |          |            |                            |
|                     | Attitude                        | 252       | 1.32      |          |            |                            |
|                     | Purchase intention              | 252       | 1.97      |          |            |                            |
| Total               | Credibility                     | 256       |           |          |            |                            |
|                     | Attitude                        | 256       |           |          |            |                            |
|                     | Purchase intention              | 256       |           |          |            |                            |

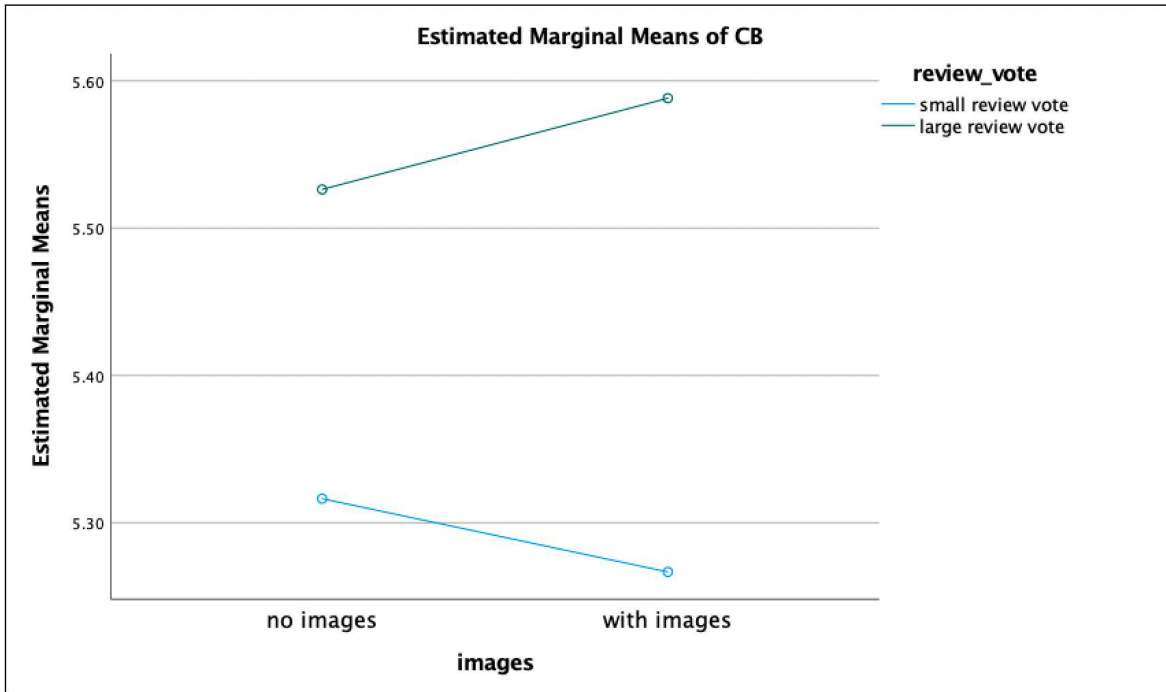
Note: \* =  $p < 0.05$ , \*\* =  $p < 0.01$

a.  $R^2 = .013, R^2_{\text{adjusted}} = .002, N = 265$

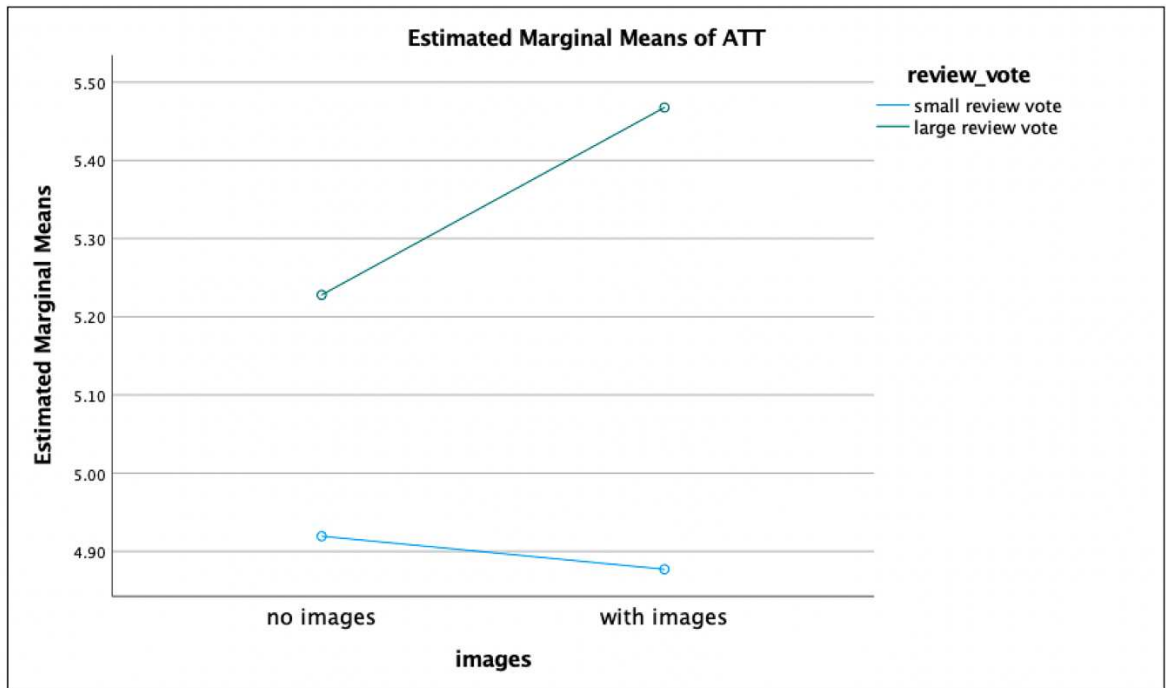
b.  $R^2 = .046, R^2_{\text{adjusted}} = .035, N = 265$

c.  $R^2 = .027, R^2_{\text{adjusted}} = .015, N = 265$

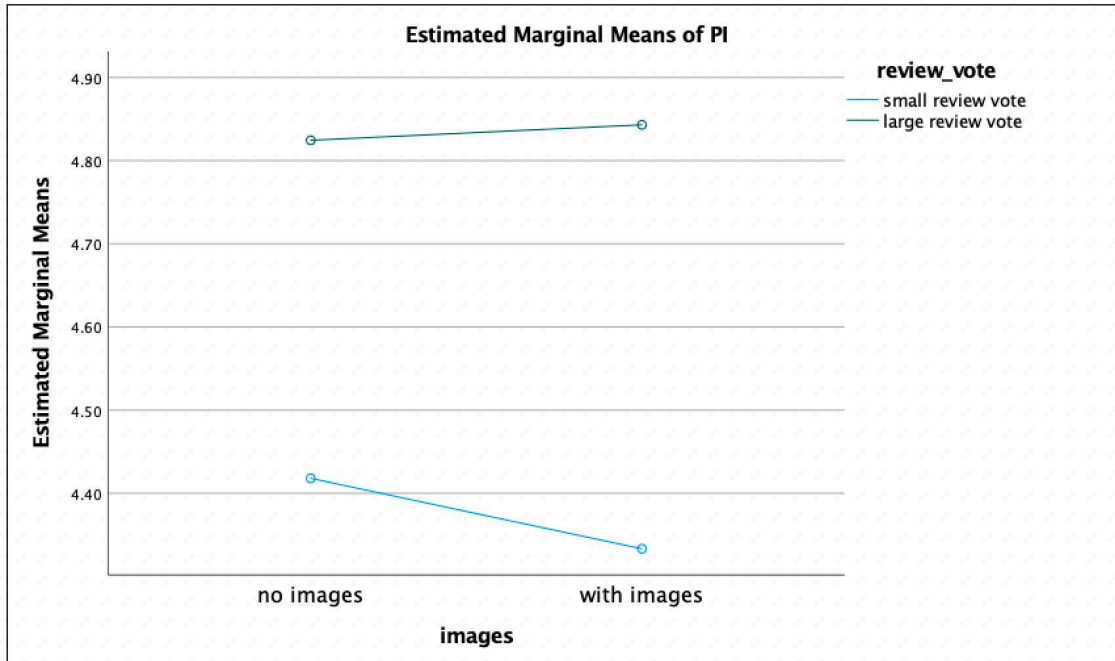
Although MANOVA shows no significant two-way interaction effect between images and review votes on the dependent variables, interaction patterns were examined to check the trends of the findings. Below are visual presentations of the interaction effect between images and review votes on the perceived credibility of the review (Figure 8), attitude (Figure 9), and purchase intention toward the reviewed product (Figure 10). As Figure 8 and Table 8 shows, when images were presented in the review, participants who were exposed to a large review vote tended to generate higher perceived credibility of the review ( $M_{\text{image and large review vote}} = 5.59, SD = .96$ ) than when images were absent in the review ( $M_{\text{no-image and large review vote}} = 5.53, SD = 1.23$ ). Figure 9 shows that when images were presented in the review, participants who exposed to a large review vote tended to generate a more positive attitude towards the reviewed product ( $M_{\text{image and large review vote}} = 5.47, SD = .93$ ) than when images were absent in the review ( $M_{\text{no-image and large review vote}} = 5.23, SD = 1.29$ ). Lastly, figure 10 shows that when images were presented in the review, participants who exposed to a large review votes tend to express a stronger purchase intention towards the reviewed product ( $M_{\text{image and large review vote}} = 4.84, SD = 1.31$ ) than when images were absent in the review ( $M_{\text{no-image and large review vote}} = 4.82, SD = 1.28$ ). These patterns are expected as the study predicted a positive interaction effect between images and review votes on perceived credibility, attitude, and purchase intention. The study previously predicted that the effect on dependent variables (credibility, attitude, and purchase intention) would be the strongest when images and large review vote both presented in the review. However, there is also an unexpected finding among the patterns. As the Figures 8, 9 and 10 show, condition where a small review vote and images presented in the review always generated the lowest mean values.



**Figure 8.** Interaction Effect of Images and Review Votes on Perceived Credibility



**Figure 9.** Interaction Effect of Images and Review Votes on Attitude



**Figure 10.** Interaction Effect of Images and Review Votes on Purchase Intention

Lastly, a Multivariate Analysis of Covariance (MANCOVA) was conducted in order to check the effect of control variables (i.e., familiarity and product involvement) on the relationship between the independent variables (i.e., images and review votes) and the dependent variables (i.e., credibility, attitude, and purchase intention). Table 11 shows the results of the MANCOVA. Consistent with the MANOVA findings, MANCOVA shows no significant main effects of images on participants’ perceived credibility of the review, attitude, and purchase intention towards the reviewed product ( $Wilks' \text{ Lambda} = .99, F(3, 247) = .42, p = .741$ ), indicating that after considering the covariates, there is still no significant difference on the dependent variables when images were presented in the review compared to when images were absent. The main effects of review votes on participants’ perceived credibility of the review, attitude, and purchase intention were significant ( $Wilks' \text{ Lambda} = .96, F(3, 247) = 3.34, p < .05$ ), indicating that after considering the covariates, there is still a significant difference on dependent variables when participants were exposed to a large review vote compared to those

who exposed to a small review vote. After considering the covariates, there is still no significant main interaction effect between images and review votes on perceived credibility, attitude, and purchase intention (Wilks' Lambda = .99,  $F(3, 247) = .61, p = .606$ ). These results indicate that familiarity and product involvement did not have a significant effect on the relationship between independent and dependent variables in this study.

**Table 11.** Multivariate Analysis of Covariance (MANCOVA)

| Effect              |               | <i>Value</i> | <i>F</i> | <i>Hypoth</i> | <i>Error</i> | <i>df</i> | <i>Sig</i> | <i>Partial Eta</i> |
|---------------------|---------------|--------------|----------|---------------|--------------|-----------|------------|--------------------|
|                     |               |              |          | <i>esis</i>   |              |           |            | <i>Squared</i>     |
|                     |               |              |          | <i>df</i>     |              |           |            |                    |
| Familiarity         | Wilks' Lambda | .98          | 1.75     | 3.00          | 247.00       | .157      | .021       |                    |
| Product Involvement | Wilks' Lambda | .86          | 13.35    | 3.00          | 247.00       | < .001**  | .139       |                    |
| Images              | Wilks' Lambda | .99          | .42      | 3.00          | 247.00       | .741      | .005       |                    |
| Review vote         | Wilks' Lambda | .96          | 3.34     | 3.00          | 247.00       | .020*     | .039       |                    |
| Images×Review vote  | Wilks' Lambda | .99          | .61      | 3.00          | 247.00       | .606      | .007       |                    |

Note: \* =  $p < 0.05$ , \*\* =  $p < 0.01$

H4 predicted that perceived credibility would be positively associated with attitudes. A simple linear regression was used to analyze this relationship. The result (Table 12) indicate that perceived credibility of the review significantly predicted participants' attitude towards the reviewed product ( $b = .624, SE = .05, p < .001$ ). Perceived credibility also explained a significant proportion of variance in attitude ( $R^2 = .408, R^2_{adjusted} = .405, F(1, 254) = 174.71, p < .001$ ). The higher perceived credibility of the review participants have, the more positive attitude participants have towards the reviewed product.

**Table 12.** The Effect of Credibility on Participants' Attitude

| IV       | <i>b</i> | <i>SE</i> | <i>t</i> | <i>Sig.</i> |
|----------|----------|-----------|----------|-------------|
| Constant | 1.77     | .26       | 6.72     | < .001**    |

|             |     |     |       |          |
|-------------|-----|-----|-------|----------|
| Credibility | .62 | .05 | 13.22 | < .001** |
|-------------|-----|-----|-------|----------|

Note:  $R^2 = .408$ ,  $R^2_{\text{adjusted}} = .405$ , \* =  $p < 0.05$ , \*\* =  $p < 0.01$

H5 predicted that attitudes would be positively associated with purchase intention. A simple linear regression was used to analyze this relationship. The result indicate that attitude significantly predicted participants' purchase intention towards the reviewed product ( $b = .83$ ,  $SE = .06$ ,  $p < .001$ ). Perceived credibility also explained a significant proportion of variance in attitude ( $F(1, 254) = 222.52$ ,  $R^2 = .467$ ,  $R^2_{\text{adjusted}} = .465$ ,  $p < .001$ ) (Table 13). The more positive attitude participants have, the stronger purchase intention they have towards the reviewed product.

**Table 13.** The Effect of Attitude on Participants' Purchase Intention

| IV       | <i>b</i> | <i>SE</i> | <i>t</i> | <i>Sig.</i> |
|----------|----------|-----------|----------|-------------|
| Constant | .36      | .29       | 1.24     | .217        |
| Attitude | .83      | .06       | 14.92    | < .001**    |

Note:  $R^2 = .467$ ,  $R^2_{\text{adjusted}} = .465$ , \* =  $p < 0.05$ , \*\* =  $p < 0.01$

H6 predicted that credibility would be positively associated with purchase intention. A simple linear regression was also used to analyze the effect. The results (Table 14) indicate that perceived credibility of the review significantly predicted participants' purchase intention towards the reviewed product ( $b = .64$ ,  $SE = .06$ ,  $p < .001$ ). Perceived credibility also explained a significant proportion of variance in purchase intention ( $F(1, 254) = 105.77$ ,  $R^2 = .294$ ,  $R^2_{\text{adjusted}} = .291$ ,  $p < .001$ ). The higher perceived credibility participants have, the stronger purchase intention they have towards the reviewed product.

**Table 14.** The Effect of Perceived credibility on Participants' Purchase Intention

| IV | <i>b</i> | <i>SE</i> | <i>t</i> | <i>Sig.</i> |
|----|----------|-----------|----------|-------------|
|----|----------|-----------|----------|-------------|

|             |      |     |       |          |
|-------------|------|-----|-------|----------|
| Constant    | 1.14 | .35 | 3.28  | .001     |
| Credibility | .64  | .06 | 10.28 | < .001** |

Note:  $R^2 = .294$ ,  $R^2_{\text{adjusted}} = .291$ , \* =  $p < 0.05$ , \*\* =  $p < 0.01$

H7 predicted that attitude toward the reviewed product would significantly mediate the relationship between perceived credibility of the review and purchase intention toward the reviewed product. According to Table 15, the result of Model 4 via the Hayes' PROCESS with 5,000 subsample bootstrapping indicated that the path from perceived credibility to attitude was positively and statistically significant ( $\beta = .6237$ ,  $SE = .0472$ , and  $p < .05$ ), indicating that participants with higher perceived credibility of the review are more likely to express an intention to purchase the reviewed product (copy machine). The path from attitude to purchase intention was positive and significant ( $\beta = .6889$ ,  $SE = .0709$ , and  $p < .05$ ), indicating that participants with higher positive attitudes are more likely to express an intention to purchase the copy machine. The direct path from perceived credibility of the review on participants' purchase intention on the reviewed product was also positive and significant ( $\beta = .2115$ ,  $SE = .0693$ , and  $p < .05$ ), indicating that participants with higher perceived credibility of the review are more likely to express an intention to purchase the copy machine. Finally, the indirect effect was tested using non-parametric bootstrapping and showed that the indirect effect of attitude on the relationship between perceived credibility and purchase intention (indirect effect =  $.4297$ ,  $SE = .0724$ ) was statistically significant: 95%CI= (.2839 and .5711). Thus, H7 was supported. Table 16 shows the overall results of the tested hypotheses.

**Table 15.** Results of Model 4 via the Hayes' PROCESS

|  | <i>Coeff.</i> | <i>SE</i> | <i>t</i> | <i>p value</i> | <i>LLCI</i> | <i>ULCI</i> |
|--|---------------|-----------|----------|----------------|-------------|-------------|
|--|---------------|-----------|----------|----------------|-------------|-------------|

|  |    |       |       |         |         |       |       |
|--|----|-------|-------|---------|---------|-------|-------|
| Intention to purchase the reviewed product (n=256) | a  | .6237 | .0472 | 13.2180 | .0000** | .5308 | .7167 |
|  | b  | .6889 | .0709 | 9.7192  | .0000** | .5493 | .8285 |
|  | c' | .2115 | .0693 | 3.0539  | .0025*  | .0751 | .3479 |
|  | c  | .6412 | .0623 | 10.2842 | .0000** | .5184 | .7640 |

IE = .4297, Boot SE.0724, and Boot CI = .2839 to .5711

Note: 5000 Bootstrapping samples; LL & UL = lower level and upper level and confidence interval at 95%, \* =  $p < 0.05$ , \*\* =  $p < 0.01$

a = the path from credibility to attitude

b = the path from attitude to purchase intention

c' = the direct path from credibility to purchase intention.

c = the total effect.

IE = the indirect effect within 95% CI.

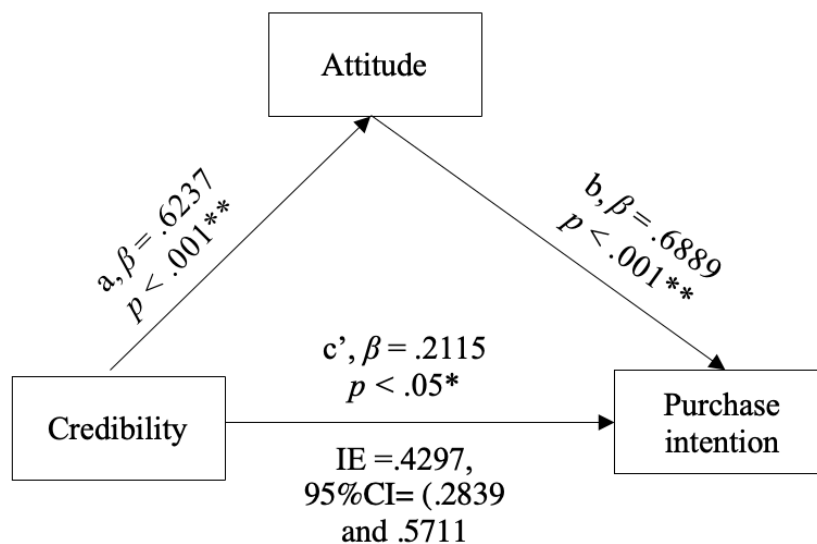


Figure 11. Visual Presentation of the Mediation Results

**Table 16.** Results of Hypotheses

| Hypotheses |  | Supported |
|------------|--|-----------|
| H1         | Participants exposed to the review with customer-uploaded images will have a) higher perceived credibility of the review, b) a more positive attitude towards the reviewed product, and c) stronger purchase intention towards the reviewed product than a review without images.  | No        |
| H2         | Participants exposed to a review with a large number of review votes will have a) higher perceived credibility of the review, b) more positive attitude towards the reviewed product and c) stronger purchase intention towards the reviewed product compared to a review with a small number of review vote.                    | Yes       |
| H3         | There is a two-way interaction between images and review votes. When images are presented in the review, the effect of review votes will be greater in terms of a) perceived credibility of the review, b) attitude towards the reviewed product, and c) purchase intention towards the reviewed product than images are absent. | No        |
| H4         | Credibility will be positively associated with attitudes.  | Yes       |
| H5         | Attitudes will be positively associated with purchase intention.   | Yes       |
| H6         | Credibility will be positively associated with purchase intention.   | Yes       |
| H7         | Attitude towards the reviewed product will have a mediated effect on the relationship between perceived review credibility of the review and purchase intention towards the reviewed product.  | Yes       |

## CHAPTER 5. DISCUSSION

This research aims at understanding how people perceive the credibility of online reviews, how the perceived credibility affects their attitude toward a given product, and if they intend to purchase the product. This is all achieved through the lens of the dual-process theory and observing the bandwagon effect. The 2 (images: with images vs. no-image)  $\times$  2 (review votes: a small review vote vs. a large review vote) between-subjects experimental design allows the study to examine the questions from an empirical perspective. The following sections discuss the results of this study.

### 5.1 Images Discussion and Theoretical Implications

H1 speculated that participants exposed to the review with customer-uploaded images would have a) a higher perceived credibility of the review, b) more positive attitude towards the reviewed product and c) stronger purchase intention towards the reviewed product than a review without images. However, results for all dependent variables examined in this study, perceived credibility of the review, attitude towards the reviewed product, and purchase intention did not show any significant effect in the responses by participants who were exposed to review with customer-uploaded images and without customers-uploaded images.

While previous research indicates that visual presence tends to generate a more positive attitude toward the message and described subjects (e.g. reviewed products), these visual aids studied in previous literature are often referred to as product images or visual element in ads, or aesthetic visual design (Clow et al., 2006; Mukherjee, 2002; Babin & Burns, 1997; Leong et al., 1996), which is different from the customer-uploaded images examined in this study. While aesthetic visual aids provided by the sellers do serve as heuristic cues during the information-processing process, viewing images uploaded by other consumers involves more complications.

There are a few factors that may contribute to this result. First of all, participants show an overall high familiarity with the office copy machine ( $M = 5.91$ ). In this case, participants might not find it necessary to obtain additional visual cues about the copy machine since they are already familiar with it. Secondly, the reviewed product type may not be the most ideal in this study. Participants may not very care much about how a copy machine looks but about its functionality, which cannot be determined through images. Products such as clothing, food, or accessories that rely more on a visual presentation may have a more significant impact from images presented in the review. Lastly, the textual information designed in the stimulus could be a compound variable that influences the impact of images on perceived credibility, attitude, and purchase intention. Zinko, Stolk, Furner, and Almond (2019) looked into how images influence information quality and information load in online reviews. The studies found that textual messages affect the effectiveness of images, and images are more effective when there is too little textual information in online reviews. Thus, the improper amount of the text designed in this study might have affected the relationship between images and credibility, attitude, as well as purchase intention. For example, the textual information used in the stimulus is enough for participants to obtain necessary information related to the product, thus they may not find the images helpful or necessary.

## **5.2 Review Vote Discussion and Theoretical Implications**

H2 speculated that participants exposed to a review with a large number of review votes would have a) higher perceived credibility of the review, b) more positive attitude towards the reviewed product and c) stronger purchase intention towards the reviewed product compared to a review with a small number of review vote. Although the results of the study did not see a significant impact of review vote on perceived credibility of the review, but the results strongly

supports the notion that the number of the review vote does influence consumers' perceptions of attitude towards the reviewed product, and purchase intention with p-values of significantly less than 0.05. When consumers see a large number of review votes, they tend to generate more positive attitudes towards the reviewed product, as well as a stronger purchase intention.

The study did not find any significant impact of heuristic cues (i.e., images and review votes) on perceived credibility of the review. This could be due to the notion that credibility often requires more thorough evaluation, which cannot be simply determined by heuristic cues like images and review votes as it entails less detail. For example, Cheung and Thadani (2012) suggested that factors associated with the content (valence and sidedness) and communicator (source credibility and attribution) have a direct effect on eWOM credibility. Verma and Dewani (2020) also provide a comprehensive framework of eWOM credibility, identifying four factors that affect eWOM credibility including content, communicator, context, and consumer. As previous literature shows, eWOM credibility is often determined by various factors and this could be the reason why this study did not see any significant effect of images and review votes on perceived credibility of the review.

The results confirm the "bandwagon effect" of online reviews on consumer online purchasing behavior (Sundar, 2007; Sundar, 2008; Xu et al., 2012; Wu & Lin, 2015; Liang et al., 2014). When consumers see a review highly endorsed by others, they tend to find it more credible and are more likely to generate a positive attitude toward the reviewed product as well as intention to purchase it. Prior to this study, the application of the bandwagon effect in eWOM literature remains limited (Liang et al., 2014). This study contributes to the literature by providing valid and significant results of the direct impact of review votes on the perceived credibility of the review, attitude, and purchase intention towards the reviewed product. These

results are in alignment with previous studies by Sundar (2008) and Wu & Lin (2017) and who found positive correlations between user-rating and perceived credibility of the review. The results also correspond to the finding in Sparks & Browning (2011) who demonstrated a positive relationship of review votes on attitude and purchase intention in the online hotel booking industry. The study expands the literature by examining the impact of heuristic-based feature review votes on a material product review (copy machine) as many previous eWOM studies use experience goods review such as hotel industry (Sparks & Browning, 2011) or only testing the effect of review votes on one dimension of the review credibility (i.e., trustworthiness) (Wu & Lin, 2017).

### **5.3 Images and Review Vote Interaction Effect Discussion and Theoretical Implications**

H3 speculated that participants exposed to the review with customer-uploaded images would have a) higher perceived credibility of the review, b) more positive attitude towards the reviewed product and c) stronger purchase intention towards the reviewed product than a review without images. However, results for all dependent variables examined in this study, perceived credibility of the review, attitude towards the reviewed product, and purchase intention –did not show any significant interaction effect between images and review vote.

One of the reasons for the insignificant results could be the effect of review votes was too strong that overtaken its interaction effect with images on the dependent variables. However, one interesting pattern, seen in Figures 8, 9, and 10, is that when 0 review vote is presented in the review, the mean values of participants' perceived credibility, attitude, and purchase intentions are slightly lower compared to image-less reviews. This could indicate that participants tend to find reviews less credible for having images. Several factors may contribute to this pattern. First of all, fake reviews are increasing in popularity among online review sites.

“Fake reviews” or “review spams” refer to an unfair review of the product by inflating or damaging the product’s reputation to affect overall consumer perception of the product (Lim et al., 2010). Researchers have also indicated some online review sites are suffering due to criticism of “fake reviews” or “review spams” (Chatterjee, 2001; Lipsman, 2010; Liu, 2012). When browsing online review sites, most of the reviews online do not include customer-uploaded images. From a user standpoint, it is easier for consumers to write a review without including any pictures while uploading images tend to be more time-consuming. Thus, participants might view reviews with images more suspicious as they might be led on the seller or just “fake review”.

Another reason that participants might find reviews with images less credible could be the images used in this study itself. The images used in the stimulus are high-quality and well-angled pictures, which could be perceived as “too intentional.” Most reviewers might not take such good quality pictures when they are writing the review. The images uploaded by the reviewers are generally more amateur and lower quality in terms of lighting, angle, and picture pixel. Figure 12 shows an example of a picture reviewer uploaded on Amazon. As the author reading through the reviews under similar products on Amazon, it is common that most of the customer-uploaded images tend to be less intentional and have average or even low quality in terms of lighting, image quality, and angle. In this study, participants might find it suspicious to see such high-quality images used in the review and thus generated lower perceived credibility towards the review that includes images. In addition, after reviewing the reviews on Amazon, the author realized that majority of the review left one image in their review and when images were presented, the author tend to also provide lengthy textural messages (see Figure 12 & 13 as examples). Customers who upload two or even more images with short

textual messages are not very common. However, this study used three high-quality, well-angled, and well-designed pictures in the stimulus (see Figure 6 & 7). Thus, the stimulus designed in this study could be inconsistent with the reality in the actual platform and therefore, raise suspicion among the participants. However, it can be also possible that images work effectively for negative reviews. The exact reason for this pattern can be investigated in a future study.

View Image Gallery



★★★★☆ **A fast printer with an easy setup but a weird amount of network usage**

By Jimster480 on Jun 28, 2020

I setup this printer to replace my 6 year old \$50 laser that has been chugging along faithfully. I've tested out a few other printers in the last months but this one is my favorite so far.

The Good:

- Has double sided printing (has to be a 2 page + document though)
- Very fast printing (wake up to print time is around 14 seconds, only around 4 seconds if its on "sleep") and definitely hits its 40ppm claim. I did print out over 20 sheets for my son (single sided) in one clip and it was done in under 1 minute (including warm up time from "sleep").
- The printer Has Ethernet and a screen where everything can be setup without a PC even if it takes a little while on the 2 line screen. I was

**Figure 12.** Example of the picture customers posted on Amazon review



Gamal Aly

★★★★★ **This printer is a BEAST!**

Reviewed in the United States on September 15, 2020

**Verified Purchase**

Great printer, fits all of my needs and isn't breaking the bank.

I downloaded the drivers from the Lexmark website and set up the web interface via a browser on my laptop

It works seamlessly, no paperjams, no toner issues, the updates are smooth as butter and it looks fantastic.

Simply put, this is the level of quality and simplicity I was looking for in a printer and with this model, I found it.



**Figure 13.** Example of the picture customers posted on Amazon review

#### **5.4 Credibility, Attitude, and Purchase Intention Discussion and Theoretical Implications**

H4 speculated that credibility would be positively associated with attitudes, H5 speculated that attitudes would be positively associated with purchase intention, and H6 speculated that credibility would be positively associated with purchase intention. Results of this study further confirmed the patterns among perceived credibility, attitude, and purchase intention in previous eWOM studies (Birjol, Petty, & Tormala, 2004; Erdem & Swait 2004; Shan, 2016; Lee, Park & Han, 2007). This study shows that the high perceived credibility of the review generally leads to a more positive attitude toward the reviewed product. Meanwhile, consumers with a more positive attitude towards the reviewed product generate a higher purchase intention, which aligns with the results of many previous eWOM and public relation studies as well (Erdem & Swait, 2004; Maathuis, Rodenburg, & Sikkel, 2004; Chang et al., 2005).

H7 speculated that attitude towards the reviewed product would have a mediated effect on the relationship between perceived review credibility and purchase intention. This study found evidence of the mediated role of attitude in the relationship between consumers' perceived

credibility of the review and purchase intention toward the reviewed product. This finding aligns with findings from Chin, Isa, and Alodin's (2019) which they found significant mediating effect of attitude towards the brand on the endorser's credibility and purchase intention towards the brand. However, limited studies have examined the exact mediating role of attitude on perceived credibility of the review and purchase intention towards the reviewed product. This study extended literature on the mediating role of attitude between perceived credibility of the review and purchase intention towards the reviewed product and examined the relationship in material goods (i.e., copy machine) context.

### **5.5 Practical Implications**

Practically, this study provides meaningful implications to public relations experts regarding how consumers view reviews online, what factors affect review credibility, and the role that online reviews play in consumer purchase decision-making. This study shows that with the same textual message, an online review with a large review vote is perceived more credible than a review with a small or 0 review vote. This study also didn't find a significant effect of customers-uploaded images on perceived review credibility, attitude, and purchase intent. One of the implications from the result is that visual cues may not be the most significant elements consumers are looking for in a review, but the endorsement by other consumers. For example, the online review platforms can design a model that ranks customer reviews based primarily on the endorsement (review vote) and promote reviews with a large review vote. In this case, consumers can read the highly-voted reviews first, which tend to have the most effect on consumers' online shopping behavior and thus, contribute to consumers' decision-making online.

Since online reviews have demonstrated a great potential value to the company, retailers

online are also encouraged to use online reviews as their marketing messages. For example, retailers highlight positive highly-voted consumer reviews on their product or description page to promote their goods and services, which tend to be more credible compared to messages from the company itself. In order to get more votes, retailers can provide incentives (e.g. cashback, coupon or discount for next purchase, etc) for users who write online reviews and vote on other consumers' reviews. Beyond the online review setting, practitioners can also use the bandwagon effect in various communication situations. For example, highlighting related statistic numbers (e.g. monthly sell number) in their marketing or product messages, and collaborating with social media influencers to promote their products, etc.

This study also indicates the significant roles of perceived credibility and attitude on purchase intention towards the reviewed product. Retailers and public relations practitioners should find ways to strengthen the credibility of the review and help consumers generate more positive attitude towards the reviewed product so that they are more likely to purchase the product. For example, Amazon has "verified purchases" in their online review section to inform review which consumers actually buy the product, other online reviewing sites or online shopping sites with reviews can add this feature in their platforms too. Retailers can improve their product description (e.g. provide more details related to the product) and product images (e.g. use more and better images) to help buyers generate more positive attitude towards the product.

## **5.6 Limitations and Future Studies**

Although this study provides new insights into understanding how customers-uploaded images and review votes affect consumers' perceived credibility of the review, attitude, and purchase intention towards the reviewed product, it nonetheless has a few limitations that should

be noted. First of all, the neutral tone of the review designed in the stimulus may not be the most ideal. Previous eWOM literature has shown that review valence (positive, negative, and neutral) has different persuasive effects on consumers' perception and behavioral intention (Wang, Cunningham & Eastin, 2015; Mudambi & Schuff, 2010; Racherla & Friske, 2012). Wang et al (2015) found that positive review has the greatest impact on consumers' perceived credibility of the review, attitudes toward the review and reviewed product, and purchase intention, followed by the neutral (negative/positive) review and negative-only review. Therefore, the neutral tone of the review in this study could have limited its effect of the independent variables. Future studies can examine the study by using a positive review instead of a review with a neutral tone. In addition, previous eWOM literature also indicates that message types such as attribute centric (focus on describing technical specifications of products) and benefit centric (focus on subjective evaluations and interpretations based on feelings and perceptions toward products) could affect consumers' product attitude and purchase intention (Park & Lee, 2008). For example, Wang et al (2015) study show that when reviews are benefit-centric and focus on reviewers' personal feeling and perceptions toward the product rather than objective information such as technical aspects of the product, it has the greatest positive effect on consumers' product attitudes and purchase intentions. Future studies can consider the message types when designing the message.

Secondly, the brand effect could also play role in the study. Previous marketing and eWOM literature have shown that brand images or brand reputation play an important role in online purchase decisions-making (Kotler & Keller, 2009; Wu et al., 2011; Elseidi & El-Baz, 2016). In this study, the brand logo is not intentionally covered but was barely recognized by viewers since it is very small, thus participants were not able to review the brand of this copy machine. However, in the reality, the brand image and brand reputation of the product are

significant factors that consumers consider when purchasing large electronic or technical products like copy machines. For example, Torlak et al. (2014) concluded that brand image has an important influence on purchase intention regarding cell phone brands through electronic word of mouth. Lien et al (2015) also indicated that brand image is a key driver that positively influences hotel booking purchase intentions. For the participants who were exposed to review with images, the fact that they were not able to see the brand of the copy machine could have prevented them to trust the review and generate a stronger attitude and purchase intention towards the reviewed product. Future studies can examine the role of brand images how it affects the consumers' perception and decision-making online.

Thirdly, participants reported an overall high familiarity towards the copy machine ( $M = 5.91$ ,  $SD = 1.47$ ) and lower product involvement in this study ( $M = 4.80$ ,  $SD = 1.25$ ), which is the opposite of what the study wanted. Previous research indicates that the level of product involvement affects consumers' attitudes and behaviors (Wu, 2002). Consumers with a high level of product involvement have a strong motivation to seek, process, and compare any relevant product information prior to purchase (Im & Ha, 2011). However, the high familiarity towards the reviewed and low product involvement could have mitigated the effect of images and review votes. Future studies can find ways to reduce participants' familiarity with the reviewed product such as choosing an unfamiliar product type for the review and increase product involvement during the study. In addition, most people are familiar with copy machines, but buying a large office copy machine online is unusual that could be one of the reasons when participants expressed a lower product involvement in this study.

Fourth, this study only examined one specific product category (office copy machine) based on the Amazon review feature. There are many different products and services reviewed

online daily. Product types play a significant role when understanding what makes a review credible and helpful to consumers (Weathers, Sharma, & Wood, 2007; Mudambi & Schuff, 2010). For example, Mudambi and Schuff (2010) found that review depth has a greater positive effect on the helpfulness of the review for search goods than for experience goods. Customer-uploaded images may not seem to play a significant role when reviewing material goods (copy machine) in this study, but the results could be different when it comes to other product types such as experience goods. Thus, the generalizability of our findings to other product categories requires further investigation.

Fifth, there are external validity issues in the study. Since the study was conducted within a specific group of the population in a specific setting, the results can not be generalized to a different setting (e.g. different stimulus designs). Although this study recruited participants from a wide range of age groups, the sample size is not representative to the overall user demographics in online review sites. Individual differences could also play a role in this study. For example, older people might not work in an office setting and do not use a technical product like an office copy machine. Lastly is the sample size in this study. The total of 256 samples is small. By increasing the sample size, the study may show some significant interactions between images and review votes.

Moving forwards, future research can also take a close look into the role of images uploaded by the reviewer and how it affects users' perception, attitude, and behavior intention: What sorts of images tend to generate high perceived credibility of online rereviews? Do customer-uploaded images tend to lower the perceived credibility of the reviews? Video is also a new feature added in many online reviews or shopping sites (e.g. Amazon). Reviewers can upload a video related to the purchased product in their reviews. Future studies can also

examine how customer-uploaded videos could affect consumers' perceptions and behaviors.

## CHAPTER 6. CONCLUSION

In conclusion, this research hopes to examine the influence of the images and review votes on consumers' perceived credibility of online reviews, attitude, and purchase intention towards the reviewed product through a 2 (images: with images vs. no images)  $\times$  2 (review votes: a large review vote vs. a small review vote) experimental design. In the past two decades, online shopping has gradually taken in-store shopping for a variety of product categories such as foods, books, home goods, electronic products, etc (Statista 2017). Online shopping sites such as Amazon have become one of the fastest-growing companies and reading reviews online before purchase any goods or services became a new normal for consumers. The impact of online shopping on the consumer economy cannot be overstated, along with the influence of online reviews on consumers' online shopping behavior. Online review sites constantly update their platform features to better help consumers review the product and make purchase decisions online. It is essential for researchers to study these novel features on online review sites and how those features affect consumers' perceptions and behavior.

The results of this study confirm the benefit of review votes on consumers' perception of the review, attitude, and purchase intention towards the reviewed product itself. This study also further confirms the positive relationships among perceived credibility, attitude, and purchase intention as well as the mediated effect of attitude on the relationship between perceived credibility and purchase intention. This study contributes to both theory and practice. By building on the foundation of dual-process theory, this study provides a theoretical framework to understand the context of online reviews. Theoretically, this study benefits researchers in the academic field by expanding the scope of eWOM credibility research into 1) visual cues directly provided by the consumers and 2) the bandwagon effect of review votes.

This study offers a conceptualization of what contributes to the perceived credibility of the review besides the textual information (customers-uploaded images and review votes), and how these heuristic cues affect consumers' attitude and purchase intention toward the reviewed product as well. Practically, this study also provides meaningful implications to public relations experts regarding how consumers view reviews online, what factors affect review credibility, and the role that online reviews play in consumer purchase decision-making.

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**APPENDIX**  
Appendix A. Survey

In the first section, you will be asked questions related to your previous attitude towards the copy office.

**Copy machine** refers to a piece of office equipment designed specifically to copy, scan, print and fax paper or create electronic documents from paper originals to distribute.

Q1. How familiar are you with copy machine?

1. Very unfamiliar
2. Unfamiliar
3. Somewhat unfamiliar
4. Neither familiar nor unfamiliar
5. Somewhat familiar
6. Familiar
7. Very familiar

On a scale of 1 to 7, please rate the following statements.

|   | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|-------------------|----------|-------------------|----------------------------|----------------|-------|----------------|
| Q2. Buying a copy machine is an important decision.                 |                   |          |                   |                            |                |       |                |
| Q3. Buying a copy machine is a decision requires a lot of thoughts. |                   |          |                   |                            |                |       |                |
| Q4. Buying a copy machine is a decision with high risks.            |                   |          |                   |                            |                |       |                |

In following, you will see a scenario provided. Please read the scenario carefully (at least 15 seconds).

“Imagine you’re an employee in a company. One day, your boss asks you to look for a copy machine online and purchase a new one for the office. On the following page, you will be given an online review of a copy machine. ”

(Place stimulus)

Please rate the following statements related to the review you saw earlier.

|                                 | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---------------------------------|-------------------|----------|-------------------|----------------------------|----------------|-------|----------------|
| Q5. This review is credible.    |                   |          |                   |                            |                |       |                |
| Q6. This review is believable.  |                   |          |                   |                            |                |       |                |
| Q7. This review is trustworthy. |                   |          |                   |                            |                |       |                |

In this section, you will be asked answer questions related to your attitude towards the reviewed copy machine. Please read the question carefully and provide your answers.

On a scale of 1 to 7, what do you think of the copy machine?

|                         | 1 | 2 | 3 | 4 | 5 | 6 | 7 |                   |
|-------------------------|---|---|---|---|---|---|---|-------------------|
| Q8. Very unfavorable    |   |   |   |   |   |   |   | Very favorable    |
| Q9. Strongly dislikable |   |   |   |   |   |   |   | Strongly likable  |
| Q10. Very bad           |   |   |   |   |   |   |   | Very good         |
| Q11. Very low-quality   |   |   |   |   |   |   |   | Very high-quality |

In this section, you will be asked to answer questions related to your behavior intention. Please read the question carefully and provide your answers.

Q12. Given the scenario, I intend to buy this copy machine.

1. Strongly disagree
2. Somewhat disagree
3. Disagree
4. Neither disagree or agree
5. Somewhat agree
6. Agree
7. Strongly agree

Q13. Given the scenario, I predict that I should buy this copy machine.

1. Strongly disagree
2. Somewhat disagree
3. Disagree
4. Neither disagree or agree
5. Somewhat agree
6. Agree
7. Strongly agree

Q14. Given the scenario, it is likely that I will buy this copy machine in the near future.

1. Very unlikely
2. Unlikely
3. Somewhat likely
4. Neither unlikely nor likely
5. Somewhat likely
6. Likely
7. Very likely

In this section, you will be asked answer questions related to the review you saw earlier. Please read the question carefully and provide your answers.

Rate how strongly you agree or disagree with the following statements:

Q15. Did you see these following pictures included in the review?

1. No, there were no images included in the review
2. Yes, these images were included in the review (place the three images used in the stimulus)

Q16. Did you see a large number of people find the review helpful?

1. No, **0** people find the review helpful
2. Yes, **326** people find the review helpful

Q17. There were images of the copy machine included in the review.

1. Strongly disagree
2. Somewhat disagree
3. Disagree
4. Neither disagree or agree
5. Somewhat agree
6. Agree
7. Strongly agree

Q18. A large number of people found the review helpful.

1. Strongly disagree
2. Somewhat disagree
3. Disagree
4. Neither disagree or agree
5. Somewhat agree
6. Agree
7. Strongly agree

This is the last section of the study, you will be asked answer some demographic questions about yourself.

Q19. How old are you?

1. 18-25
2. 26-35
3. 36-45
4. 46-55
5. 56-65
6. Above 66

Q20. In which state do you currently reside?

Choose state (50 States, D.C. and Puerto Rico).

Q21. What is the highest education you have received?

1. Less than high school
2. High school
3. Bachelor degree
4. Master degree
5. DoDoctoralegree or above

Q22. What is your ethnicity

1. Caucasiansion (White)
2. African American
3. Hispanic
4. Asian
5. Native American

6. More than one race
7. Other

We thank you for your time spent taking this survey.  
Your response has been record