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# Three Research Essays on Human Behaviors in Social Media

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THREE RESEARCH ESSAYS  
ON HUMAN BEHAVIORS IN SOCIAL MEDIA

by  
Jiao (Aimee) Wu

A Dissertation Submitted in  
Partial Fulfillment of the  
Requirements for the Degree of

Doctor of Philosophy  
in Management Science

at  
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August 2015

## ABSTRACT

## THREE ESSAYS ON HUMAN BEHAVIORS IN SOCIAL MEDIA

by

Jiao (Aimee) Wu

The University of Wisconsin-Milwaukee, 2015  
Under the supervision of Professor Mark Srite

Social Media (SM) has grown to be one of the most popular Internet technologies for individual users and has fostered a global community. For instance, recent statistics reveal that monthly active users of Facebook are almost 1.5 billion by Mar 2015. At the same time, 20% of internet users in the US are expected to have Twitter accounts. This figure has grown from 15.2% in 2012, and is expected to rise to 24.2% by 2018 (Twitter 2015).

People like spending their time on SM to track the latest news, seek knowledge, update personal status, and connect with friends. It is possible that being exposed to others' positive information on SM could generate darker emotions, such as envy. Extant literature suggests that envy significantly influences human behaviors and life satisfaction (Krasnova et al. 2013).

This dissertation, consisting of three essays, studies the effects of SM on human behaviors. Chapter 2 investigates how others' positive information arouses envy

and influences user behaviors from different angles. Chapter 3 focuses on how espoused national cultures reshape online benign envy and impact SM usage. Chapter 4 discusses the relationship between social media and envy with textual analysis techniques. Chapter 5 provides a summary and overall conclusion to this work.

## **Chapter 2- Envy and How it can Influence SM Use**

Users tend to disclose the positive side of their lives on SM. Such information can be perceived in an extremely positive light in the eyes of their connections, which could lead to envy. In the current study, we develop a theoretical framework that elaborates the mechanism through which online envy is generated and consequently influences SM usage. We specify that online users experience two types of envy: malicious and benign envy, which have distinct impacts on IS use. Specifically, malicious envy plays a mitigating role and benign envy serves as an enhancer of SM use. Our findings provide valuable implications for both academic researchers and IS practitioners.

## **Chapter 3 – Benign Envy, Social Media, and Culture**

Although envy universally exists in human society, its influence on human behaviors varies by cultural contexts. As shown in chapter 2, benign envy is a more salient factor in the social media context. In the current essay, we focus on investigating how different espoused national cultural values affect this relationship between online benign envy and consequent behaviors. We also developed a benign envy and IT usage model, which integrates four espoused

national cultural values. We conceptualized several main constructs and then theoretically justified the relationships between them. As expected, if people experience benign envy when using SM, they are more likely to continue their use. Moreover, different espoused national culture values work as independent and moderating variables along with the envy procedures. People who hold different levels of culture behave distinctly. The study found that people who espouse a greater level of collectivism were be more likely to compare with other peers in order to evaluate their self-social status; people who espouse higher levels of uncertainty avoidance were more likely to experience benign envy; and the relationship between perceived enhancement and use intention was stronger for individuals with higher levels of espoused masculinity. However, espoused power distance values were not significantly moderating the relationship between perceived enjoyment and intended behavior in the current context (general SM). This study provided some theoretical and practical implications.

#### **Chapter 4 – Tweet, Favorite, Status, and Envy**

Many social media studies have demonstrated that aggregating social information could provide valuable insight into sociological, economical, healthcare, and other critical fields. Among these studies, Twitter has been one of the most popular social platforms that researchers value. It has a greater potential for academics to observe and explore critical social behaviors, such as envy, which could lead to avoidance of using certain IT platforms, emotional depression, and even worse, suicide. With text mining techniques, massive numbers of tweets can be collected, classified, and analyzed. The envy literature

has largely theorized on the motivations of envy. However, in the IS context, envy related research is very limited, and the empirical tests are confounded by limited data. In order to address these gaps, we collected envy related tweets from Twitter and classified them into the two types (benign and malicious) of envy relying on text mining techniques with sentiment analysis (positive to negative). Based on the data set, we further analyzed the patterns of online envy. Additionally, by using logistic regression, the impacts of certain social media usage behaviors were tested on differentiating online envy. Our work included both qualitative observation and quantitative analysis, along with the evaluation of regression output.

To  
My parents, my husband  
and  
my sons.

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## Chapter 1. Introduction

Social media is becoming more and more popular. Take Twitter for example, it has a large group of users and the number has been growing exponentially. As it is reported, 23% of online adults are currently using Twitter, indicating a statistically significant increase compared with the 18% who did so in August of 2013 (Duggan et al. 2015 ).

Tons of thousands of users are using social media to update self-profiles, post pictures, interact with friends, and look for information. They generate and share a huge amount of personal information and messages on social media. Among this information, the most popular type is the positive aspects about people's life (Chou and Edge 2012). People like to show their happiness, wealth, success, and accomplishments. In a word, social media is all about perfect images. People believe that showing their positive status online would improve their identities.

However, when others view this kind of information, they might encounter envy (Krasnova et al. 2013). Envy could be a mix of emotions, feelings, and behaviors, resulting from an upward social comparison that discloses that the superior others have enjoyed some advantages that the inferior self doesn't have (Schoeck 1969; Smith and Kim 2007). It is acknowledged that social media is an online space that provide sufficient conditions to arouse envy (Krasnova et al. 2013).

According to the literature from multiple research fields, envy could influence human behaviors both positively and negatively. For example, studies found that group cohesion and overall performance were lower in organizations where

employees harbored malicious envy towards their coworkers. (Vecchio 2000). It was also found that after experiencing envy, students put more effort into learning and achieved better results in oncoming exams (Brigham et al. 1997).

It is concluded that envy can be categorized into two types, malicious envy and benign envy (Smith and Kim 2007). Malicious envy is a destructive form of envy, aiming at pulling down or derogating the others because it is featured as destructive and negative. Malicious envy is always along with depressed and frustrated emotions. Even worse, it would lead to antisocial behaviors, such as reducing group performance and becoming dissatisfied with life (Fiske 2010; Parrott 1991; van de Ven et al. 2012). For benign envy, it is a non-malicious form of envy. Benign envy is used to describe the situation that when one person finds the others are superior and enjoying some privileges that he doesn't have, but he immediately generates up-lifting motivations to improve his current positions. Benign envy is characterized as proactive and positive. It usually encourages people to improve and enhance themselves and achieve better (Ierides 2014; Wooten et al. 2011).

Is envy a positive influencer or a negative impact of information systems usage? For instance, malicious envy might be a potential factor that could limit use of the system in question by the users who experience this type of envy. When one is holding malicious envy, he might feel depressed and frustrated to see that others are better off than him. As a result, he might not consider the online activities to be enjoyable and won't continue to use the system. On the contrary, if one is a benign envier, when he notices other's positive information, he is motivated to

enhance himself and continually to interact with others to learn from them. As a result, the benign envier is more likely to use the social media application as a self-improvement method. This is a question that hasn't been answered.

Additionally, are there any other factors that exert effects on online envy?

According to the literature, envy is culturally dependent although it universally exists in the human society (DelPriore et al. 2012). However, there is very limited research on how culture influences social media usage along with online envy. Culture can be investigated from different angles, such as national, group, and organizational perspectives. When investigating individual behavior in the IT context, the individual level of national culture is considered, this is regarded as espoused national culture. It is highly possible that espoused national culture exerts influences on envy. For example, For example, envy is argued to result from inequalities (Schoeck 1969). One of the Hofstede's five dimensions of national culture values is power distance. People in high power distance cultures are more tolerant of inequity (Dorfman and Howell 1988). It is possible that envy varies among people who are different in power distance values. Another culture dimension, masculinity/femininity, might also influence envy because peoples' interested domains are distinct. According to Hofstede (1998), people who espouse higher masculine values are more achievement-oriented, and they might be more likely to envy others who have achieved accomplishments in their careers. In line with this reasoning, we argue that national culture values could exert an impact on envy.

In addition to these potential research questions, there are methodological problems in the extant envy research. The envy related studies always rely on self-report methods, which might lead to limited data with lower response rates and skewed results. People are possible reluctant to admit that they are harboring spiteful feelings and opinions, such as malicious envy. There is a need to access first-hand envy data that discloses peoples' real responses toward envy. Also, identifying the manifestations of online envy could be important for both IS researchers and IT practitioners. Envy has been extensively explored in the multiple offline contexts, such as the workplace, marketing areas, and education. However, the offline and online environments are different, since envy is contextually dependent. How can benign and malicious envy be identified and detected by a variety of features, and how are the users' usage patterns related to online envy? For IT researchers, extending envy literature to the IT context will enhance the IT literature. For IT professionals, they greatly value the users' engagement and system popularity. Getting a better understanding about enviers' related consequent emotions and behaviors could help them to improve business strategies.

By considering all the importance and gaps above, we developed this dissertation to better understand online envy in the social media context. We provided three related essays in the following chapters. Each one is detailed with introduction, literature review, research models, methodologies, limitations, future directions, and conclusions.

## **Chapter 2. Envy and How it can Influence SM Intentions to Use**

### **2.1 Introduction**

Social media (SM) has grown to be a widely acknowledged current technology, providing a series of services for their users. From being able to follow famous celebrities on Twitter, to connecting with long-lost childhood friends halfway round the world on Facebook, SM, in a manner of speaking, can knock down walls to foster a sense of a global community (Alloway 2013). For example, according to the results of Facebook reports, daily active users were 936 million on average for March 2015, an increase of 17% compare to that of the same period in 2014 (Facebook 2015) . Twitter, another powerful SM platform, to date, has 302 million monthly active users and it is estimated that there are over 500 million tweets sent per day (Twitter 2015). People like to spend their time on SM exploring a variety of information to acquire knowledge, connect with friends, track latest news, and so on.

The most popular types of information shared on SM are the positive aspects about the users' personal lives (Chou and Edge 2012). People enjoy showing their happiness online when they accomplished challenging tasks, went to interesting places, bought something luxurious, etc. They believe that by doing so they can improve other peoples' impressions of them. However, when another user learns about this kind of message, he may spontaneously compare it with his own



situation. If the reader finds himself not in as good a status as the message writer, he could become envious (CBSnews 2011).

Envy can significantly influence human behaviors. Previous studies found mixed results relating to envy. For instance, Vecchio (2000) found that envy harms the performance of employees in a workspace and as a consequence, they may quit their jobs. Nevertheless, van de Ven et al. (2009) showed that envy could stimulate students to study longer and perform better in an educational setting. Indeed, envy, has long been a subject of debate in various disciplines including philosophy, anthropology, social psychology, and business (Graf 2010). However, it has not received significant attention in the information system (IS) literature. SM is online spaces that provide sufficient conditions for people to compare themselves with their online connections, and envy can be prevalent (Krasnova et al. 2013): Will envious users be inspired to be better and catch up with others, or will they feel bad and just quit their SM usage? This question has not been explored in any extant literature.

Although envy has not received significant attention in the information system (IS) literature, researchers have explored important influences of envy on variety of topics relevant and closely related to IS research. These topics range from the work place (Schaubroeck and Lam 2004; Vecchio 1995; Vecchio 2000), consumer behavior (EMEA 2009), education (Brigham et al. 1997) and social networking sites (CBSnews 2011; Chou and Edge 2012; Krasnova et al. 2013). It seems possible that the field of IS has a very limited number of studies related to envy maybe because: 1. Envy is an implicit emotion that is difficult to be detected

in online contexts and 2. The potential effects of envy on IS is underestimated and might not exist at all. However, we believe the importance of envy cannot be over-emphasized for both information system (IS) researchers and practitioners.

According to the literature, there are three main ways to interpret envy: the dispositional, phenomenological, and situational approaches (Parrott 1991). The dispositional approach considers envy as a personal sensitivity to envy arousing situations and emphasizes people's tendency to experience envy. The phenomenological approach focuses on the specific feelings and behavioral consequences that people have when experiencing envy. The situational approach, centers on the antecedents of envy, exploring which kind of situations can arouse envy (Graf 2010).

The view of the situational approach can not only provide insight into when different emotions are likely to occur, but also help to predict people's behavior as various emotions activate different goals and action tendencies. In the current study, we want to understand the process of online envy from its natural causes, how it has evolved in the SM context, and what is more, we also hope to get some further predictions on its subsequent online behaviors. It seems that the situational approach fits our research goals well. Therefore, in this paper, we will take the situational approach to investigate different types of online envy: malicious envy and benign envy. Grounded in envy literature, we conceptualize that envy can be a factor that influences of IS intention to use. The remainder of this paper is organized as follows. The next section reviews the extant literature of envy and its extensions into other areas. The research model is then described

and justified with hypotheses and arguments. We then propose a methodology for data collection. Results follow in the analysis section. In the last section, limitations, implications, and conclusions are provided.

## **2.2 Literature Review**

A first challenge in conducting research involving envy is arriving at an understanding of what envy is, given the variety of extant definitions and conceptualizations. Envy can be a process, which occurs when a person lacks another's superior quality, achievement, or possession. The envier either desires this unattained characteristic or wishes that the others are lacking it. It occurs when this shortcoming exists in a self-relevant domain (Parrott and Smith 1993; Salovey and Rodin 1984). Envy can also be a feeling, as stated in Smith and Kim's study (2007), where they found that envy is an unpleasant and often a painful blend of feelings characterized by inferiority, hostility, and resentment caused by a comparison with others who possess something one desires (Smith and Kim 2007). In conclusion, the definitions we have so far considered are generally consistent in that envy is a social scientific term, and that it can be defined as a pattern of thoughts, emotions, and behaviors that result from the perceived loss of social standing in response to another obtaining outcomes that are personally desired (Vecchio 2005).

As mentioned in the introduction, there are three main ways to interpret envy: the dispositional, phenomenological, and situational approaches (Parrott 1991). They are different in terms of focused perspectives when comprehending envy. The dispositional approach emphasizes people's differences related to envy; the

phenomenological approach is focusing on the specific feelings and behavioral consequences that people have when experiencing envy; and the situational approach, centers on the antecedents of envy, exploring which kind of situations can arouse envy (Graf 2010).

It is important to clarify which approach we use in the current research. From a theoretical view, we want to explore how envy theory could be applied as to an IS context, specially, what type of situations are likely for envy to arouse envy. From a practical view, the most important question is to figure out what kind of online contextual features actually contribute to different types of online envy.

Therefore, the situational approach of envy seems to be best fit and most useful for this study, and will be used in this research.

### ***2.2.1 Upward Social Comparison with Envy***

Envy universally exists in society across different cultures and contexts (Schoeck 1969). Upward social comparison is a prerequisite of envy. Festinger (1954) states that in real life, present situations are a mixture of ability and opinion evaluation. There exists a natural drive within human beings to evaluate themselves using objective and non-social means. Individuals naturally compare themselves with other people (Festinger 1954; Taylor and Lobel 1989). The difference between others and themselves is a discrepancy. When a discrepancy exists, there will be a tendency to change one's own position so as to move closer to the position of the other (Festinger 1954). Social comparison can be upward or downward. An upward comparison represents a positive outcome (advantage or superiority) for the other person, whereas a downward comparison represents a

negative outcome (disadvantage or inferiority) for the other (Taylor and Lobel 1989). Some research has explored the negative affective reactions with upward comparisons and the positive reactions with downward comparisons. It concludes that envy is one of these unfavorable emotions resulting from upward comparisons (Smith 2000).

The important role of upward social comparison has been discussed in several studies. First, envy is often the resulting emotion when upward comparison initiates or highlights a person's inferiority on a desired attribute (Smith et al. 1999). Although upward social comparisons do not invariably result in a sense of inferiority, many will. Social comparison can contribute heavily to self-evaluation (Festinger 1954). For example, relatively poor performance compared to the other can affect self-esteem. In this vein, upward social comparison, because of defining the self-caused performance as poor, decreases self-esteem and leads to a sense of inferiority. Envy is aroused by this inferiority and these unpleasant feelings. Second, envy is a driver which lies at the core of mankind's life a social being. It occurs as soon as two individuals become capable of mutual comparison (Schoeck 1969). Comparing oneself with others, either intentionally or unintentionally, is a pervasive social phenomenon (Suls et al. 2002). With such comparison, envy can be aroused to have different effects on human behaviors. For example, malicious envy can turn man to destruction if the envious person is exhorted to be ashamed of himself. Benign envy also can be proactive if the envious one is motivated to work hard. Both types of envy are produced after upward social comparison when one notices others' advantages in comparison

with self disadvantages. Detailed information on malicious and benign envy will be discussed in the following section. Third, a desire for superiority on some dimensions involved in envy is based on upward social comparison (Salovey and Rodin 1984). Individuals are motivated to maintain a positive self-evaluation, however, low-esteem that diminishes information about oneself would impact self-evaluation. Envy results from the upward social comparison from which self-evaluation is threatened. In conclusion, upward social comparison is one of the most important prerequisites of envy.

### ***2.2.2 Malicious Envy, Benign Envy and Their Antecedents***

There are two distinct types of envy related terms as well as situations that can be found in the literature. These two are: malicious envy and benign envy (van de Ven et al. 2009; van de Ven et al. 2011).

Malicious envy, being referred as “envy proper” (Smith and Kim 2007), is a destructive form aimed at derogating or pulling down the envied person. It describes a situation that when a person makes an upward comparison with advantageous others, he experiences a feeling of inferiority. Then he might generate malicious thoughts to wish others to fail in something or even hurt the envied other. The other type, benign envy, is regarded as a non-malicious form aimed at improving one’s own situation (van de Ven et al. 2009). This concept refers to the situation that when a person realizes his disadvantage or inferiority as compared to another person, he develops the desire to eliminate this discrepancy by improving her or his own position (Graf 2010).

In summary, malicious envy and benign envy are different in several aspects. In terms of motivation, malicious envy aims at holding back the superior other while benign envy aims at improving one's own situation (van de Ven et al. 2012). In terms of feelings, malicious envy involves an unsavory motivation while benign envy does not (D'Arms 2009). In terms of actions, benign envy refers to the constructive reaction of a person who realizes his inferiority in comparison to another person and that person then develops the desire to eliminate this discrepancy by improving his own position (Graf 2010); In the opposite, people who encounter malicious envy might prefer not to associate with the advantaged others (Schoeck 1969).

As mentioned before, envy can be considered an emotion. The experience of emotions is closely associated with the concerned environment along with several cognitive dimensions (Tesser and Collins 1988). Being consistent with situational approach, van de Ven et al. (2012) also stated that each emotion is related to a specific pattern of cognitions, which are the perceived antecedents towards the emotional experiences. In this vein, there might exist distinct factors that produce malicious and benign envy, respectively. There is a need to understand the sorts of situations which could lead to one type of envy rather than the other.

From literature, there are two most important influencers of envy: perceived control and perceived deservingness. As stated by (Smith 2000), when one has low control over an unchangeable situation, one feels that it is unfair that the other has the superior position. As a result, envy is more likely to be experienced.

Perceived control and perceived deservingness are predictors of envy. However, this study didn't differentiate between malicious or benign envy.

Perceived control refers to the perceived ability to control or do something about an event. Tesser (1991) suggests that if one experiences a comparison in which the context conveys some information suggesting that the probability of becoming like the target person is of low probability, then there could be negative (emotional/behavioral) changes on the experienced people. It describes a situation where envy would become hostile when people have no opportunity to act constructively. Moreover, Smith (2000) stated that (malicious) envy is experienced under certain conditions and that one's response must at least be interpretable as an abortive or blocked attempt to protect himself from being disadvantageous (Silver and Sabini 1978a). To be specific, envy would be elicited for one who feels she/he cannot improve her/his current situation. In conclusion, perceived control is a prerequisite of malicious envy since it always provides some negative implications. In the current study, we specify perceived control as an antecedent of malicious envy.

If there is a fit between the situation and the outcome, it is either deserved, or, it is undeserved (Feather 1999). Perceived deservingness is to evaluate one's perception towards the fit between the situation and outcome. For example, an employee who worked hard and won a promotion is usually perceived to be of high deservingness by other employees. Deservingness of situation is important in an envy context. It provides information as to which kind of envy would be elicited. In other words, deservingness was thus clearly related to the specific type



of envy elicited (van de Ven et al. 2012). Smith and his colleagues (1994) found that a sense of injustice was a predictor of hostile feelings involved in envy experience. In van de Ven et al.'s (2012) study, researchers found that upward comparisons with people who do not deserve the advantage elicit malicious envy, while comparisons with those who deserve the advantage will elicit benign envy. In this vein, perceived deservingness serves as a common predictor of both malicious envy and benign envy. However, other studies noted that perceived deservingness could result from malicious envy. Schaubroeck and Lam (2004) stated that injustice perceptions are derived from (malicious) envy although not all perceptions of unfairness are rooted in it. Compared to the controversial role of perceived deservingness on malicious envy, its influence on benign envy is more robust and consistent. Thus, we consider perceived deservingness as an antecedent of benign envy only.

### ***2.2.3 Consequences of Envy***

In this study, we are also interested in the consequences of envy in the SM context. Although there is limited literature in the IS area, we have reviewed envy literature from related areas in order to get insightful implications. Envy is able to impact people's behaviors in multiple contexts as it is stated that envy appears to be cross-cultural and universal (Foster et al. 1972; Schoeck 1969).

Envy, especially malicious envy, has been associated with various negative outcomes, ranging from hostile and inferior feelings (Parrott and Smith 1993), depressed emotions of anxiety, anger and resentment (Salovey and Rodin 1984), to a series of antisocial behaviors, such as reducing group cohesiveness and

satisfaction (Duffy and Shaw 2000), feeling dissatisfied with life (Krasnova et al. 2013), and so on. The consequences of malicious envy can be emotional or affective responses. Schaubroeck and Lam (2004) stated that, when people experience promotion envy toward others at work, they are more likely to generate unsatisfactory feelings. More specifically, the more malicious envy one experiences after comparing with others, the more intensity he can feel inside and the more he is thrown back on himself in self-pity (Schoeck 1969). It is universally acknowledged that malicious envy would elicit unfavorable feelings of frustration, inferiority, depression, and so on. Some studies also explore the behavioral responses. (Brigham et al. 1997) found that participants' envy enhanced "schadenfreude" regardless of deservingness of the others' misfortune. Sometimes, it even reduced sympathy towards others when one was in a lower situation in social comparison. Another study stated that envy diminished the overall group effectiveness at work and it was associated with social loafing (Duffy and Shaw 2000). Moreover, online envy could mediate the relationship between of passively following others on Facebook and life satisfaction (Krasnova et al. 2013). When online users browse their News Feed, click on 'stories', follow communications of their friends, or proactively examine profiles of others, their passive following could elicit online envy. Envy negatively impacts their life satisfaction, which is an important indicator of "well-being". According to literature, malicious envy is associated with negative emotional and behavioral consequences.

Benign envy, as mentioned previously, is obviously different from malicious envy. The emotion of benign envy is more positive, motivates people to improve themselves (van de Ven et al. 2011). Benign envy leads to a moving-up motivation aimed at improving one's own position (van de Ven et al. 2009). From another viewpoint, the perception that a person is envious is moral, and the apprehension of moral quality of a context is complex (Silver and Sabini 1978a). Benign envy motivates people to do more moral behaviors (Polman and Ruttan 2012). In terms of behavioral response, benign envy, describes the reaction of a person who realizes his inferiority as compared to another person and develops the desire to reduce this discrepancy by improving his own position. Indeed, benign envy is more self-improvement focused. An example would be that a basketball player sees another team member wins an honorable individual reward and then he starts practicing to improve his own skills. There is also some empirical research supporting benign envy's positive impact on human behaviors. Researchers found that students experiencing benign envy after an upward comparison led to an intention to spend more hours studying in the upcoming semester. Participants performed better after they recalled being benignly envious than after they recalled other emotional experiences (van de Ven et al., 2011).

In conclusion, malicious envy and benign envy have an effect on the emotional goals and the actions taken but their effects are different. The literature provides support for the view of malicious envy as being aimed at degrading and hurting superior others and benign envy as a motivational driver leading to positive

improvement of oneself. We also provide a list of important literature related to current study in Appendix A3.

Extant literature also provides the theoretical and practical implications and encourages us to conduct an envy study in the IS context, especially SM. Some IS studies found that envy is prevalent in online SM (Krasnova et al. 2013) since SM is online space that could provide sufficient conditions for people to compare themselves with their online connections. We consider that envy could be potential influencing factor of IS use and in turn modify users online behaviors. In our study, we hypothesize that the two types of envy could have opposite impacts on IS use. Malicious envy could negatively impact SM use while benign envy could positively enhance it via different processes. Detailed justification will be provided through the developed hypotheses.

## 2.3 Research Model

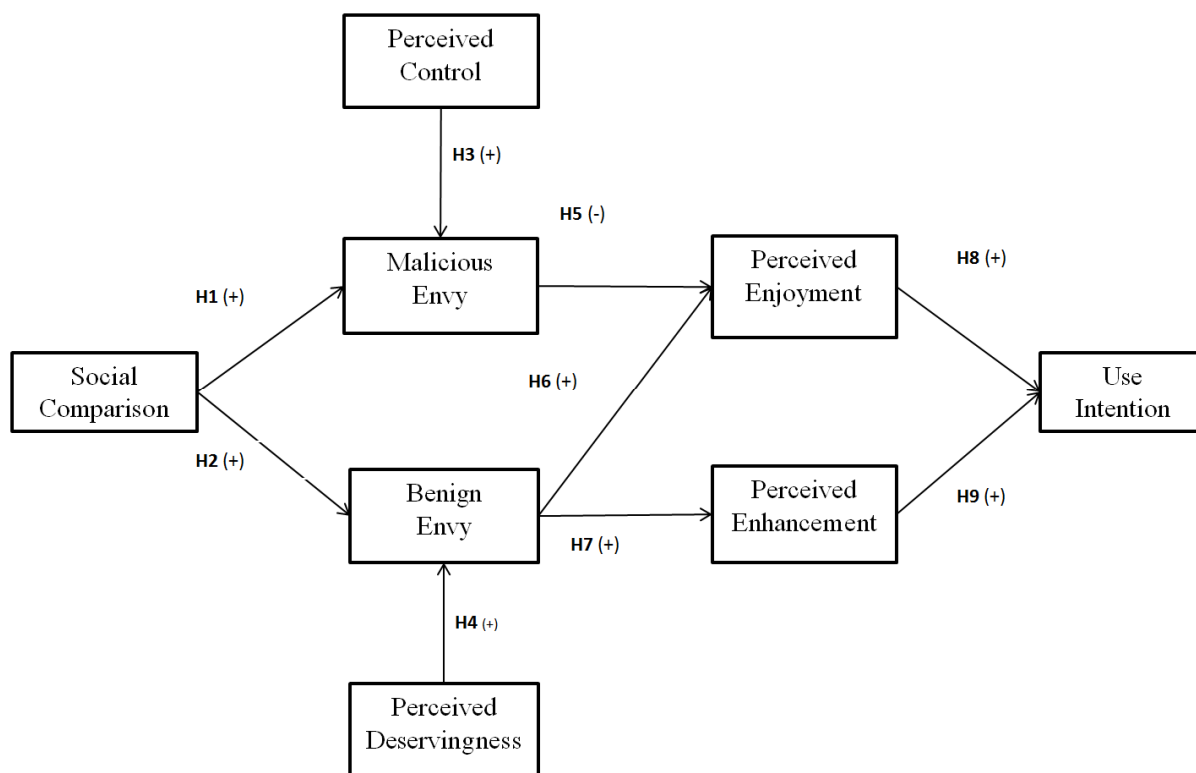


Figure 2. 1 Envy SM Usage Model

The research model is illustrated in Figure 3.1. The purpose of the proposed envy SM usage model is to explain the relationships between the two types of envy and the intention to use of SM. In this model, we differentiate two types of envy.

Malicious envy is defined as a type of envy that involves unsavory motivation and aims at holding back the superior others (van de Ven et al. 2012); benign envy is defined as a type of envy free of ill-will or hostile feelings and aims at improving one's own situation (Rawls 1999; van de Ven et al. 2012). When people access their connections on SM, they learn of others' positive information, such as travelling, dinning, shopping, and parties. They might conduct a form of social

comparison between themselves and others. If the comparison is upward, malicious envy and/or benign envy could be elicited. Then, the two types of envy could impact their perceived enjoyment and perceived enhancement, which in turn are related to intention to use. Detailed arguments for the hypotheses of the research model are provided in the following section (detailed constructs and definitions are listed in the Appendix).

## **2.4 Hypotheses**

### ***2.4.1 Upward Social Comparison, Malicious Envy, and Benign Envy***

Upward social comparison is defined as the degree to which a person believes that the others are superior and possess advantages, in an area she/he values (Smith and Kim 2007). Envy happens when a person lacks another's superior quality, achievement, or possession and it occurs when this shortcoming exists in a domain that is self-definitional (Salovey and Rodin 1984). In SM contexts, people have plenty of opportunities to access others' information. If they learn of the others' information related to positive aspects of the others' lives, especially when they are struggling with their own lives, they are more likely to make upward social comparisons. The potent consequence of these social comparisons are the changes in self-evaluation. The upward social comparison helps people to identify the discrepancy between the superior others and an inferior self. Logically, it would lead to some sort of negative feelings (Smith 2000). Thus, when people hold ill-will to the superior others, malicious envy is generated. Thus, we hypothesize:

***Hypothesis 1.*** *Upward social comparison is positively related to online malicious envy.*

Envy is generated after upward social comparison. Since upward social comparison is a general antecedent of envy as mentioned in the literature review, it also serves as an indicator of benign envy. One could just frankly acknowledge the difference from the comparison (Silver and Sabini 1978a). However, sometimes, the envying person recognizes something of value in the envied person and this recognition would seem to inspire at least a modicum of admiring goodwill. This type of envy is benign envy. It would bring about constructive, emulative actions rather than ill-will and other possible destructive consequences (Smith and Kim 2007). It is reasonable that when one's position is lowered by the success of another person, one doesn't have to be crushed or self-protective; rather, one could be motivated to work harder to be as the other. In this vein, when people are inspired to improve their self-ability and to achieve better lives, benign envy is generated. Thus, we hypothesize:

***Hypothesis 2.*** *Upward social comparison is positively related to online benign envy.*

#### **2.4.2 Perceived Control**

Perceived control is defined as the degree to which one believes that her/his ability or performance could control or impact an event (van de Ven et al. 2012). The importance of perceived control related to social comparison and malicious envy was emphasized in an empirical study on social comparisons (Smith and Kim 2007): participants were primed that they had done poorly on a task, while

they were exposed to a superior performing comparison person. Half of the participants were told that they could improve their performance (high control) while the other half were told that they could not improve (low control). As a result, participants in low-control condition showed hostile and depressed emotions, which were reported as envy. The results suggested that low perceived control was especially associated with malicious envy. It was also claimed that people who felt malicious envy must believe that the desired attribute was beyond their power to obtain (Smith et al. 1994; Vecchio 1997). Upward social comparison would elicit unfavorable emotions, including envy, depression, shame, and resentment (Smith 2000). When people notice their discrepancy with others, they evaluate their own abilities to capture this distinction. Perceived control is important for producing positive or negative emotions after social comparison (Smith 2000). Why is malicious envy associated with negative feelings? The main reason is that when people find that the discrepancy cannot be changed, they feel miserable, along with feelings of self-pity and frustration. These negative feelings lead to malicious envy and they hope the others will fail. SM users might experience a similar situation. Thus, we hypothesize:

***Hypothesis 3.*** *Perceived control is negatively related to online malicious envy.*

### **2.4.3 Perceived Deservingness**

Perceived deservingness is defined as whether the outcome for oneself or another is contingent on the situation; then the outcome is deserved if there is a fit with the situation, otherwise, it is undeserved (Feather 1999; van de Ven et al. 2012).

Envy arises when one's social standing is threatened by another person who is



better in a domain, restoring one's position after such a threat is important (Tesser and Collins 1988). According to van de Ven et al.'s. (2009) study, people are more likely to experience benign envy if the advantage of the other is deemed as deserved. For example, one might feel more comfortable when he learns that a hard-working co-worker has won a promotion. In the case that the person spent extra time and accomplished a number of difficult tasks, others might believe that the job rewards reasonably pay for his outstanding diligence and performance. The differences existing between benign and malicious envy are in the appraisals, the eliciting of positive or negative emotions. Logically, the perceived deservingness of the situation matters. Although the upward social comparison discloses the discrepancy between the inferior self and the superior other, perceived deservingness reasonably provides justifications for the other's success. It also helps one to re-justify and re-evaluate his own situation. More probably, it initiates self-focusing improvement, which is regarded as a feature of benign envy. Therefore, after learning positive personal information from online connections, if one believes that the other's good is deserved, she/he is more likely to experience benign rather than malicious envy. Thus, we hypothesize:

***Hypothesis 4.*** *Perceived deservingness is positively related to online benign envy.*

#### **2.4.4 Perceived Enjoyment**

Malicious envy, involves ill-will and possibly leads to destructive consequences (Smith and Kim 2007). This is because (malicious) envy is one of the negative emotions that are caused by affective reactions from the advantage of others

(Tesser and Collins 1988). As mentioned in the previous section, malicious envy is associated with a series of negative but complex feelings of injustice, deprivation, frustration, and depression. It is possible that in an online context, people who maliciously envy others feel ashamed of themselves. The painful feelings tend to hinder them from enjoying their online activities and lead to dissatisfaction with the online experience. In a study of exploring envy on Facebook, 29.6% of respondents mentioned that envy caused them to feel frustrated and exhausted (Krasnova et al. 2013). Moreover, Heider (1958) argued that people are usually educated to rejoice in other people's successes. In a sense, malicious envy violates this social rule that usually requires supportive rather than degrading, begrudging emotions or behavioral reactions to another person's success. In this vein, in addition to the painful feelings resulting from malicious envy itself, these embarrassed emotional struggles in one's mind could reduce the goodness of their online social lives. On SM, people learn about good news from their connections and make an upward comparison between themselves and others. This could lead to negative reactions, and they may experience resentment and low self-maintenance. Also, recognizing and acknowledging that their malicious envy could be bitter and painful; they might feel guilty and ashamed to run counter to the universal moral code but cannot stop themselves. As a result, the complex combination of negative feelings resulting from malicious envy reduces the perceived joyfulness. Thus, we hypothesize:

***Hypothesis 5.*** *Online malicious envy is negatively related to perceived enjoyment.*

Benign envy, a non-malicious form, aims at improving one's own situation. When comparing malicious and benign envy, we see that they differ in the feelings, thoughts, action tendencies, motivational goals, and motivational experiences (van de Ven et al. 2011). Benign envy fosters a motivational force for people to work harder to get what others possess (Foster et al. 1972). It is uplifting and positive—people who experience benign envy like and admire others (Polman and Ruttan 2012). How and what people do online is closely related to how they perceive these others, comprehend the events, evaluate the relationships, and construct the world online. Although the result of upward comparison seems to be unfavorable because of the disclosure of one's own inferiority and others' superiority, benign enviers could quickly focus on the positive aspects of these comparisons, such as examining the values of others, evaluating space for self-improvement, and building a bright future scenario. All of these motivating thoughts become incentives and drives to experience an online social life with pleasure and comfort. The benign enviers are more likely to digest upward comparisons with positive self-focusing ideas. For example, if one benignly envies his online friend who looks so fit and healthy, he could be highly inspired to get more exercise and eat better to achieve his own fitness goals. He would like to sincerely admit the other's achievement and feel comfortable to learn about this kind of information. In this vein, since benign enviers usually emulate others after witnessing others' good deeds, they are more likely to enjoy the online experience, and hold optimistic emotions to achieve a better life in the future. Thus, we hypothesize:

**Hypothesis 6.** *Online benign envy is positively related to perceive enjoyment.*

#### **2.4.5 Perceived enhancement**

Perceived enhancement is defined as a motive that refers to people's desire to enhance their self-positivity or decrease their self-negativity (Sedikides and Strube 1995). Given that people naturally appear to have a strong and probably adaptive desire to maintain a positive self-evaluation (Silver and Sabini 1978d), any social comparisons undermining this goal and the resulting emotional sting may prompt a willingness to change their condition. It is possible that after recognizing others' superiorities and self-inferiorities from social comparisons, people are intuitively aroused to orient themselves toward better their own condition. This enhances the likelihood of one's catching up with advantageous others and protecting their self-dignity and self-evaluation. Moreover, people are biased and they often harbor unrealistically positive views of themselves and skew information in a self-serving manner (Taylor and Brown 1988). Learning that an acquaintance won an award maybe painful, however, this might arouse self-enhancement thoughts, which in turn, foster actions so as to improve self-abilities. A recent study found that, experiencing benign envy after an upward comparison indeed led to an intention to invest more time to strengthen oneself in the immediate future. Participants performed better and worked harder after they recalled envying others in a benign manner (van de Ven et al. 2011). In the current context, people are also motivated to catch up with their online connections that they benignly envy. Thus, we hypothesize:

**Hypothesis 7.** *Online benign envy is positively related to self enhancement motivation.*

#### **2.4.6 Intention to use**

In the current context, we consider SM from both utilitarian and hedonic orientations. The original TAM, related models, and UTAUT were merely developed for, and validated, in the context of utilitarian systems in a professional environment. However, SM could be used outside a work setting and could be experienced differently beyond a professional focusing. Users might have a sense of entertainment when using SM for leisure and recreation. Perceived enjoyment is considered to be one of the most important factors of SM usage intentions (Kim 2011; Leng et al. 2011; Zhou et al. 2010). Kim (2011) demonstrated that perceived enjoyment was positively related to continued intention to use SM. In Leng et al.'s (2011) study, it was also found that compared to other constructs in the classic technology acceptance model, perceived enjoyment was a more salient factor of IS adoption in the context of SM. Zhou et al. (2010) also stated that flow, including intrinsic enjoyment, positively affected SM loyalty. Extant studies on SM confirmed the influencing role of perceived enjoyment on IS usage. It is universally acknowledged that SM provides people with a platform to have fun in various ways, such as looking for people who share a common hobby, tracking updated information on interested topics, communicating with offline friends, and updating self-profiles. People can creatively take advantage of the applications and functional features for their multiple social demands. In the current study, as mentioned previously, although

two types of envy could affect perceived enjoyment differently; perceived enjoyment itself would be positively associated with intention to use. Therefore, we include enjoyment as mediator between the two types of online envy and intention to use. Thus, we hypothesize:

***Hypothesis 8.*** *Perceived enjoyment is positively related to intention to use SM.*

In the current context, SM is the preferred media for people to interact online. Perceived benefits (usefulness and perceived enjoyment) are very influential for continued use of SM (Lin and Lu 2011; Papadimitriou 2012). The positive information of others is observed via SM, in terms of texts, pictures, videos, number of followers, etc.. If individuals are likely to engage in self-enhancing illusions, they should orient themselves to minimize negative feedback and maximize positive feedback. For instance, one's self-improvement interests may prompt one to make comparisons with others who are on occasion superior. In order to catch up with these people, they would like to continue use SM to access others' News and proactively to learn from their online connections' experiences. In this vein, if SM can further provide one the information that he needs and fulfill his self-improvement demands, one would regard it as a benefit. SM does come equipped with multiple services and functions to enhance users' engagement and satisfaction. For example, recommendation technology is one of the most popular features and it provides friend and information recommendation services (Lee 2010). These recommendations could encourage one to look for more information about their friends as well as topics to improve

her/himself. Thus, she/he would like to use SM continually. Thus, we hypothesize:

***Hypothesis 9.*** *Self enhancement motivation is positively related to intention to use SM.*

## **2.5 Research Design**

In order to test the proposed model, an envy experience presentation was produced and an online survey was conducted. The online questionnaire was designed using a web-based survey instrument (Powered by Qualtrics). This instrument allows researchers to create surveys, collect data, and produce reports. The questionnaire webpage was in HTTP protocol and data were stored on a password protected server.

The survey is comprised of two sections of questions and one multi-media presentation. In the first section, the questions were designed to gather people's general background information. The second set of questions was designed to obtain people's responses about online envy. The purpose of the presentation was to recall participants self-experience when he was using social networks.

### ***2.5.1 Survey Administration and Participants***

The participants were undergraduate students in a large mid-western University. They were asked to take the online survey as a lab activity and they received extra credit in their information technology management course. In the beginning of data collection procedure, we briefly explained the purpose of the current study and the participants' benefits. Participants were asked to take the first section of

survey. Then, they watched the multi-media envy presentation. The content in the presentation was composed of real postings from Twitter and Facebook, including pictures and texts. The postings were about online users' positive life experiences, such as obtaining luxury goods, travelling to beautiful places, achieving and accomplishing life goals, and so on. The subjects were asked to recall their personal online experiences. Then, they completed the survey with second section of questions. Some screenshots from the presentation are shown in Appendix. Participants were asked to select one type of social network (Twitter or Facebook) that they used more often.

### ***2.5.2 Structural Equation Model Analysis***

We used partial least squares structural equation modeling (PLS-SEM) to analyze the data. The main purpose of structural equation model analysis was to examine the antecedents of the two types of envy, the two types of envy themselves, users' perceptions of social networking sites, and their intention to use SM sites. We pooled the data from the online survey system that we used to gather people's responses. In total, there were 396 users' responses and 386 of them were usable. There were 160 responses for Twitter and 226 responses for Facebook. Most of the measures were adapted from previous literature. We developed the items of the upward social comparison construct according to recent published reports and articles. The items and their sources are shown in Appendix A2.

### ***2.5.3 Measurement Model Analysis***

We conducted a separate confirmatory factor analysis (CFA) for respondents of both Twitter and Facebook in order to validate the measurement prosperities and



investigate the models' convergent validity, discriminant validity, and reliability. The root mean squared error of approximations (RMSEA) are 0.0801 for Facebook and 0.0729 for Twitter. Both of them are less than or nearly equal to the cut-off level 0.08. Additionally, the confirmatory fit index (CFI) for Facebook (0.89) and Twitter (0.91) were close to or greater than the required value of 0.90. Overall, the measurement models fitted both the datasets well.

Fornell and Larcker (1981) suggested that there are three criteria for convergent validity: (1) all indicator factor loadings should be significant at  $p < 0.05$  and exceed 0.7, (2) composite reliability should exceed 0.7, and (3) the average variance extracted (AVE) for each construct should exceed the variance due to the measurement error of that construct. We tested our model separately for both Facebook and Twitter.

In the Facebook context, as shown in Table 2.1, all factor loadings exceeded 0.7. The composite reliabilities ranged between 0.8680 and 0.9587, while the AVE values were well above the cut-off level of 0.50. In the Twitter context, as shown in Table 3.2, almost all the factor loadings were exceeding 0.7, except OADVTG\_3, one item of the social comparison construct. The factor loading is 0.6919, was only slightly below the threshold and was retained for consistency across data sets. All the composite reliabilities (between 0.8443 and 0.9604) and AVEs (between 0.7070 and 0.8585) well met the criteria. Therefore, it was evident that the model in both contexts meets all the three conditions for convergent validity.

Construct	Item	Item Loadings	Average Variance Extracted	Composite Reliability	Cronbach's Alpha
Social Comparison	OADVTG_2	0.7815	0.6732	0.9426	0.9308
	OADVTG_3	0.7440			
	OADVTG_4	0.7680			
	OADVTG_5	0.8522			
	SDADVTG_2	0.8469			
	SDADVTG_3	0.8398			
	SDADVTG_4	0.8802			
	SDADVTG_5	0.8416			
Perceived Control	PCTR_1	0.8683	0.7006	0.8751	0.7903
	PCTR_2	0.7770			
	PCTR_3	0.8627			
Perceived Deservingness	PDSV_2	0.8927	0.7669	0.8680	0.6971
	PDSV_4	0.8584			
Malicious Envy	MENVY_1	0.8110	0.7445	0.9458	0.9313
	MENVY_2	0.8828			
	MENVY_3	0.8920			
	MENVY_4	0.8188			
	MENVY_5	0.8994			
	MENVY_6	0.8687			
Benign Envy	BENVY_1	0.7260	0.6687	0.9095	0.8775
	BENVY_2	0.8605			
	BENVY_3	0.8456			
	BENVY_4	0.8641			
	BENVY_5	0.7837			
Perceived Enhancement	ITENHC_2	0.9068	0.8439	0.9558	0.9383
	ITENHC_3	0.9065			
	ITENHC_4	0.9380			
	ITENHC_5	0.9229			
Perceived Enjoyment	PENJ_1	0.9321	0.8227	0.9587	0.9461
	PENJ_2	0.8793			
	PENJ_3	0.9257			
	PENJ_4	0.8847			
	PENJ_5	0.9120			
Intention to Use	IU_1	0.8329	0.8020	0.9238	0.8767
	IU_2	0.9498			
	IU_3	0.9000			

Table 2. 1 Facebook Factor Loadings

Construct	Item	Item Loadings	Average Variance Extracted	Composite Reliability	Cronbach's Alpha
Social Comparison	OADV TG_2	0.8205	0.7070	0.9505	0.9400
	OADV TG_3	0.6919			
	OADV TG_4	0.8349			
	OADV TG_5	0.9186			
	SDADV TG_2	0.8731			
	SDADV TG_3	0.8158			
	SDADV TG_4	0.8683			
	SDADV TG_5	0.8841			
Perceived Control	PCTR_1	0.9246	0.8031	0.9243	0.8777
	PCTR_2	0.9224			
	PCTR_3	0.8389			
Perceived Deservingness	PDSV_2	0.7400	0.7337	0.8443	0.6837
	PDSV_4	0.9591			
Malicious Envy	MENVY_1	0.8118	0.7903	0.9576	0.9466
	MENVY_2	0.9159			
	MENVY_3	0.9142			
	MENVY_4	0.8976			
	MENVY_5	0.8781			
	MENVY_6	0.9118			
Benign Envy	BENVY_1	0.8159	0.7130	0.9254	0.8990
	BENVY_2	0.8311			
	BENVY_3	0.8121			
	BENVY_4	0.8789			
	BENVY_5	0.8813			
Perceived Enhancement	ITENHC_2	0.9356	0.8585	0.9604	0.9446
	ITENHC_3	0.8653			
	ITENHC_4	0.9599			
	ITENHC_5	0.9426			
Perceived Enjoyment	PENJ_1	0.9429	0.8159	0.9567	0.9431
	PENJ_2	0.8477			
	PENJ_3	0.9116			
	PENJ_4	0.8711			
	PENJ_5	0.9391			
Intention to Use	IU_1	0.9173	0.8238	0.9333	0.8238
	IU_2	0.9514			
	IU_3	0.8514			

Table 2. 2 Twitter Factor Loadings

We also assessed discriminant validity. As shown in the Tables 2.3 and 2.4, all the constructs had a stronger correlation with their own measures than with those of other constructs. Finally, the Cronbach's alphas (Tables 2.1 and 2.2) of almost all the constructs were greater than the generally accepted threshold of 0.7. One exception is the construct of perceived deservingness. Its Cronbach's alphas were 0.6971 for Facebook and 0.6837 for Twitter, only slightly below 0.7. Overall, the values indicated fine reliability of the items used for each construct.

	SC	PCTR	PDSV	MENVY	BENVY	PENJ	PENHC	IU
Social Comparison	<b>0.8036</b>							
Perceived Control	-0.1507	<b>0.7842</b>						
Perceived Deservingness	0.0093	0.3864	<b>0.7350</b>					
Malicious Envy	0.6363	-0.0340	-0.1287	<b>0.8404</b>				
Benign Envy	0.0447	0.2865	0.4060	-0.0630	<b>0.7788</b>			
Perceived Enjoyment	0.0110	0.2139	0.2685	-0.1081	0.5568	<b>0.8755</b>		
Perceived Enhancement	0.1423	0.1245	0.4105	0.0450	0.5676	0.5276	<b>0.8892</b>	
Intention to Use	0.1150	0.2905	0.1781	-0.0668	0.4149	0.7146	0.4130	<b>0.9280</b>

Table 2. 3 Facebook Correlation

	SC	PCTR	PDSV	MENVY	BENVY	PENJ	PENHC	IU
Social Comparison	<b>0.8146</b>							
Perceived Control	0.0214	<b>0.8669</b>						
Perceived Deservingness	0.2369	0.2797	<b>0.8510</b>					
Malicious Envy	0.5791	0.1117	0.0931	<b>0.8556</b>				
Benign Envy	0.2567	0.1564	0.3934	0.1762	<b>0.8048</b>			
Perceived Enjoyment	0.1372	0.0376	0.2211	0.0792	0.3893	<b>0.8805</b>		
Perceived Enhancement	0.3154	0.0671	0.2596	0.3003	0.5118	0.5810	<b>0.8968</b>	
Intention to Use	0.2069	-0.0470	0.2557	0.1280	0.2613	0.7399	0.4724	<b>0.8928</b>

Table 2. 4 Twitter Correlation

### 2.5.4 Structural Model Analysis

We used PLS to test the structural model separately for both the Facebook and Twitter respondents. The standardized path coefficients are shown in Figure 2.2.

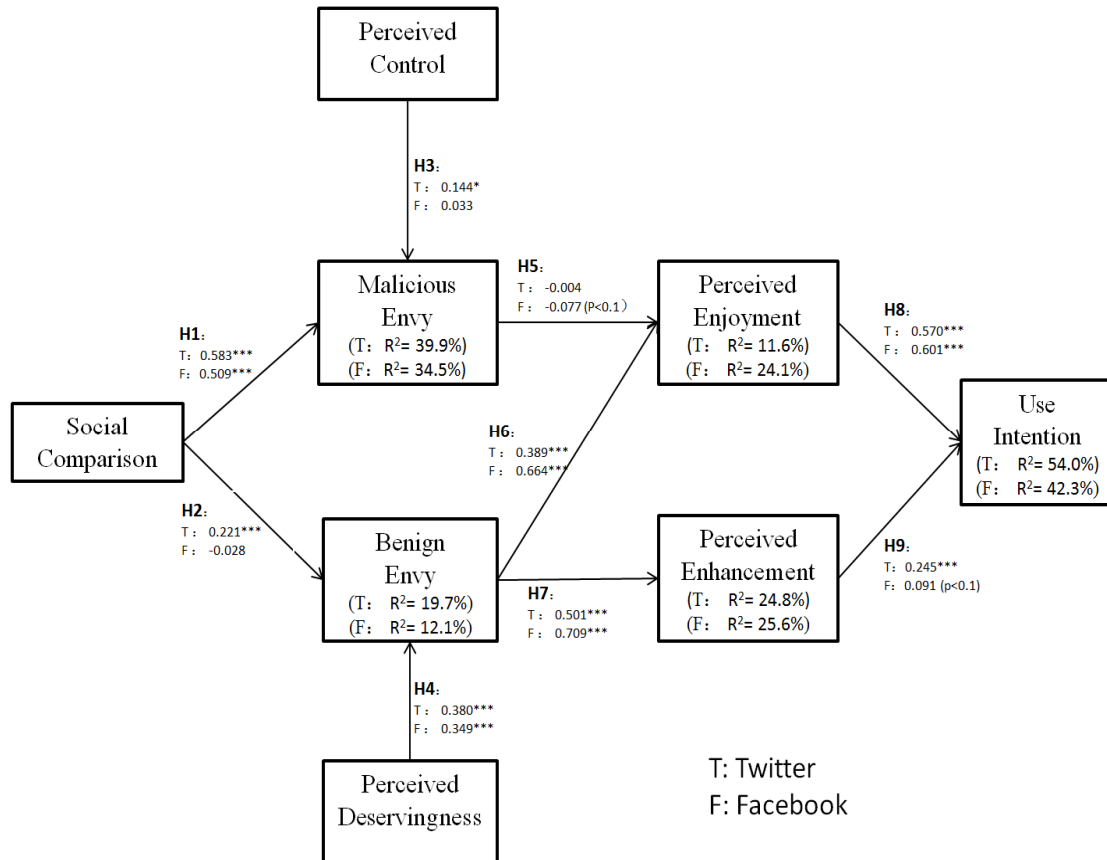


Figure 2. 2 Structural Model Analysis Results

First, as hypothesized, (upward) social comparison had a significant positive impact on (online) malicious envy for Twitter usage ( $b = 0.583$ ,  $p < 0.001$ ) and Facebook usage ( $b = 0.509$ ,  $p < 0.001$ ), validating H1. (Upward) Social comparison was significantly related to (online) benign envy for Twitter usage ( $b = 0.221$ ,  $p < 0.001$ ), however, it was not for Facebook usage. Therefore, H2 was confirmed for Twitter, but not for Facebook.

In terms of the distinct indicators of malicious envy and benign envy, the 3rd hypothesized path was significant for Twitter but not for Facebook. The 4th hypothesized path was significant in both contexts. The proposed antecedents (social comparison and perceived control) of malicious envy explained 39.9% of variance for Twitter and 34.5% of that for Facebook, while the antecedents (social comparison and perceived deservingness) of benign envy explained 19.7% for Twitter and 12.1% for Facebook. For Twitter, the paths from perceived control ( $b = 0.144, p < 0.05$ ) to malicious envy and from perceived deservingness ( $b = 0.380, p < 0.001$ ) to benign envy were both significant. For Facebook, the path from perceived control to malicious envy was not significant but the path from perceived deservingness ( $b = 0.349, b < 0.001$ ) to benign envy was significant. These results provided support for H3 for Twitter and H4 for both Twitter and Facebook.

In terms of the impacts of envy on perceived enjoyment and perceived enhancement, H6 and H7 were supported for both Twitter and Facebook, but H5 did not hold for either of them. Benign envy improved perceived enjoyment ( $b = 0.389, p < 0.001$ ) and perceived enhancement ( $b = 0.501, p < 0.001$ ) for Twitter usage. It also improved perceived enjoyment ( $b = 0.664, p < 0.001$ ) and perceived enhancement ( $b = 0.709, p < 0.001$ ) for Facebook usage. Both types of envy explained 11.6% of the variance of perceived enjoyment and 24.8% of perceived enhancement for Twitter. For Facebook, the variances explained by these two types of envy were 24.1% on perceived enjoyment and 25.6% for perceived enhancement, respectively. These findings supported H6 and H7, but

not H5 in that malicious envy was not significantly related to perceived enjoyment.

Finally, both perceived enjoyment ( $b = 0.570, p < 0.001$ ) and perceived enhancement ( $b = 0.245, p < 0.001$ ) positively influenced Twitter use intention. They explained 54.0% of the variance on Twitter use intention. For Facebook, perceived enjoyment had a significant impact on use intention ( $b = 0.601, p < 0.001$ ), however, the relationship between perceived enhancement and Facebook use intention was not significant; However, 42.3% of variance of use intention was explained by them. Therefore, these results validate H8 for Twitter and Facebook, H9 for Twitter, but not for Facebook.

Despite the differences between Twitter and Facebook the results were similar, with some notable exceptions. First, social comparison had a significant impact on benign envy for Twitter but not for Facebook. This might have been due to the fact that Twitter is more information-seeking oriented, while Facebook is more friend-socializing driven. On Twitter, one is more involved in information consumption, which would lead to benign envy. Second, perceived enhancement had a significant impact on use intention for Twitter, but not for Facebook. It might have been because Twitter can provide topic searching services and allows users to track trending topics with updated information. However, Facebook doesn't. Compared to Facebook, Twitter, is more analogous to a search engine and one can get more immediate responses, find people, and access content all over the Net. Due to this, he is more possible to take that advantage of Twitter to enhance and improve themselves. Third, the impact of benign envy on perceived

enjoyment was significantly higher ( $p < 0.05$ ) for Facebook ( $b = 0.664$ ) than for Twitter ( $b = 0.389$ ). This might be because Facebook appeals to social persons and can be very addicting to people who have a greedy appetite and enjoy keeping in touch with others. However, people like Twitter because they can post a question and get an quick response and they crave the ability to “tap into the collective consciousness” of others on the network (Thornton 2013). In this vein, Facebook is more enjoyable and Twitter is more useful after an experience of benign envy, and this might explain the differences between benign envy and perceived enjoyment on Facebook and Twitter. Fourth, benign envy is more influential relating to perceived enhancement for Facebook ( $b = 0.709$ ) than Twitter ( $b = 0.501$ ). This might because benign envy is more likely to happen between people who share similar interests. In Facebook, people look to reconnect with old friends, family members, or find new friends online with similar interests. They are more likely to share similar educational levels or other common backgrounds. Therefore, benign envy is more likely to be experienced in Facebook.

## **2.6 Discussion**

The goal of the current study was to address the following research question: Does envy influence the use intention of social networking sites, and if so, how could different types of envy generate values? By using the Envy SM Usage Model, with classic IS success literature as the theoretical foundation, we conceptualized and empirically tested the mechanism through which the two types of online envy, especially benign envy, influence the use intentions of social



networking users. Our findings provide strong support for the proposed model and explain the significant variance in the dependent and mediating variables. As expected, we found that after viewing online peers' positive information and comparing with their own lives, people may experience both malicious and benign envy. These types of envy were associated with perceived enjoyment and perceived enhancement, which in turn, were positively associated with use intention. Besides social comparison, the perceived deservingness of the situation mattered, and was clearly related to benign envy. When users were experiencing benign envy, they were more likely to enjoy their online activities and they were highly motivated to enhance their own abilities, resulting in higher use intentions.

Contrary to our prediction, the findings showed that malicious envy did not significantly affect perceived enjoyment. There were some plausible explanations for this. Malicious envy and benign envy are qualitatively differently. They might elicit distinct emotions and perceptions (van de Ven et al., 2011). In this logic, although benign envy was found to have impact on perceived enjoyment, malicious envy did not. Also, malicious envy is a painful emotion and people might be reluctant to express their malicious envy to others (Smith and Kim 2007). So, it is possible subjects disguised their true malicious envy thoughts and made different responses in the survey. Moreover, in a Facebook envy study (Krasnova et al. 2013), (malicious) envy was tested to be related to life satisfaction. However, we didn't include online satisfaction in current research. Although malicious envy doesn't affect online perceived enjoyment and use

intention in current study, there is still a possibility that malicious envy could exert influences on use intention through other routes.

What is more, according to our findings, the proposed model helps to delineate the online envy process. The envy-intriguing perceptions impact use intention. We tested our model with two specific social networking sites. Although malicious envy doesn't support the proposed hypothesis that it would reduce perceived enjoyment on the sites, benign envy was positively related to perceived enjoyment and perceived enhancement, as a result, facilitated use intentions. Benign envy had a stronger effect on perceived enjoyment and perceived enhancement on Facebook than on Twitter. This might be because these two sites are different in terms of usage orientation, communication, and social ties. People are more likely to use Facebook to strengthen their offline or online relationships while people are more likely to use Twitter to follow trending topics and look for updated information. Benign envy is more likely to happen between people who share similar backgrounds. Therefore, the impact of benign envy may be more salient for Facebook than for Twitter.

In general, the results suggest the model's generalizability to different SM. We believe that envy has potential to influence social networking use intentions. Although malicious envy did not affect perceived enjoyment, it might have an impact on other perceptions. This requires more research attention in the future. It is important to note that benign envy could also have a positive effect on users' perception and on use intentions. Moreover, upward social comparison

demonstrates how online envy is generated, suggesting that consuming others information on social networking is an important driver of online envy.

## **2.7 Limitations and Future Directions**

Prior to discussing the implications of the findings, we wish to acknowledge the limitations of this study. First, an assumption underlying our conceptualization is that users might experience different types of envy after viewing the others' positive life postings on SM, thus, use intention is affected by various perceptions resulting from envy. This assumption might not hold in all contexts since envy is personally and culturally dependent. According to our literature review, envy is related to economic and social factors (Schoeck 1969). Although envy is common for most people (Richards 2000), it changes somewhat depending on culture (Richards 2000). Therefore, in a future study, we will examine the cultural effects on the online envy processes. Second, the current study focuses on SM. We only tested the proposed model in the context of Twitter and Facebook. The findings may not be generalizable to other types of SM. Third, we only include perceived enjoyment and perceived enhancement as the subsequent perceptions of envy. They are both facilitators for use intention. There might exist other influences that we didn't take into consideration in current study. Fourth, we collected data with student participants and primed them with a video. Users might have behaved differently in a real social networking setting. In a future study, real data abstracted from social networking sites could be used to investigate the online envy process.

### ***2.7.1 Implications for Research***

As far as we know, our research was one of the first empirical studies that investigated whether and how online envy was associated with use intention of SM. Our findings have several important implications for researchers. First, there is very limited research on online envy. A Facebook envy study (Chou and Edge 2012) demonstrated that online envy had an impact on life satisfaction. However, the previous studies didn't explore the influences of envy on IS use. The proposed model delineates the process of online envy and provides a better understanding of SM usage. Our research has extended envy from a social psychology concept to the IS area. Moreover, our empirical findings show that online envy can be aroused by online experiences and ultimately influences SM usage.

Second, this study provides a rich theoretical framework to explain the mechanism through which viewing others' life postings could generate two types of envy, and their subsequent impact on IS behaviors. Although we tested the proposed model in only two social networking sites (Facebook and Twitter), the conceptual framework developed in this study could be used to understand the impact of online envy on general SM. Malicious envy might reduce perceived enjoyment, and as a result, negatively impact use intention. However, when people experience benign envy, they are more likely to enjoy their online experience and to be motivated to strengthen their own abilities and enhance SM usage. Future research can apply this framework to investigate envy impacts in other IS contexts.

Third, benign envy is especially important for social media since it could elicit positive emotions. Benign envious would like to believe that if they exert themselves, they can achieve a better life as did their online peers. Their optimistic thoughts could boost the positive qualities of their online experience and enhance their use intentions. Being consistent to our proposed hypotheses, benign envy plays a key role in IS use. Surprisingly, although malicious envy was expected to have a negative impact on personal perceptions, the empirical findings did not support previous expectations. It might be because benign envy and malicious envy are different and might not have opposite effects on a certain perceptions, one of which is perceived enjoyment.

There is another theoretical implication related to malicious envy. Although malicious envy doesn't have a significant impact on perceived enjoyment; it does marginally influence people's perception at  $p < 0.1$  level. This means that malicious envy has a higher probability to be influential for system use intentions. We can explore other emotional outcomes from malicious envy and its influences in future research.

The design of our methodology was creative. We abstracted real data from Facebook and Twitter to make the multi-media presentation and prime our participants. In this way, we were able to select envy arousing information to recall people's real experiences. Empirical research on online envy is very limited. Our study provides an innovative method for future research.

Finally, we specified two types of online envy in the proposed model. The findings of the current study suggested that different types of envy could have multiple

impacts on SM usage. Our study offers a new perspective to investigate social networking use behavior. With envy, the variance of use intention is explained at 54.0% for Twitter and at 42.3% for Facebook, suggesting that envy indeed plays an important role in use intentions.

### ***2.7.2 Implications for Practice***

From the perspective of practice, there are also several implications of our findings. First, the results indicate that online envy has the potential to influence online SM usage: the more users are exposed to other's positive life information, the higher the possibility of experiencing online envy experienced, and the more likely to facilitate or reduce IS usage depending on different envy types. Malicious envy has the potential to negatively impact perceived enjoyment, leading to lower intentions to use, while benign envy positively influences the perceived enjoyment and perceived enhancement, resulting in higher usage. People like to post their positive information relating to their personal lives on SM. When others learn about this kind of information, the others might encounter malicious envy or benign envy, and their intentions to use might be changed. Without a deep understanding of the envy generating process, it is very difficult for an IS manager to detect such emotions from users and it is very hard to tell how they could impact IS usage.

An important implication of the current study for system designers is that they might want to explore and intentionally design certain website features to mitigate malicious envy and enhance benign envy. Although online malicious envy is not significantly related to intentions to use, it is still a bitter emotion and

negatively impacts life satisfaction (CBSnews 2011; Krasnova et al. 2013). Some applications, for example, might be helpful if they can block malicious envy causing information from users to avoid the malicious envy experience. However, when people generate benign envy, they are more likely to enhance their online personal profiles. Self-enhancing applications, such as picture editing and text rephrasing widgets, which can add depth to the plain information, could facilitate the benign enviers to emphasize their online images, and enhance their usage.

Finally, our findings could also help to shape marketing persuasion strategies for advertisement producers and product retailers. Currently, it is common that online retailers encourage people to post and repost pictures and information of certain products on SM. They believe that this will boost the promotion and maximize the effects of their marketing. However, from our findings, this kind of information could be malicious envy-inducing, and lead to unfavorable results. Malicious enviers might have bad emotions after learning about others obtaining luxury goods, and they even could create and broadcast some bad reviews online to degrade the product. These kinds of emotions and behaviors resulting from malicious envy obviously negatively impact marketing efficiency.

## **2.8 Conclusion**

As mentioned before, online envy research is very limited. This study developed a theoretical framework that elaborates the mechanism through which online envy is generated and influences SM usage. We specified that online users might experience two types of envy and each one could have distinct influences towards IS use.

Empirical data analysis revealed that online envy could exert an impact on intentions to use; especially, that of benign envy which is positively associated with SM usage. The most interesting insights of the current study are that, contrary to common thinking, regarding the destructive potential of envy, it is even possible to even turn it into something good. Benign envy could be an enhancer of IS usage. Malicious envy, although it only marginally supports the proposed hypotheses, still possesses the potential power to have an impact on IS use through other ways. These insights not only provide theoretical contributions, but also help IS providers to better understand user online behaviors and adjust their online marketing strategies.



## Chapter 3. Benign Envy, Social Media, and Culture

### 3.1 Introduction

Twitter, Facebook, and other social media (SM) have become more and more popular, encouraging users to express their thoughts, opinions, and random details of their lives. Take Twitter for example, it has a large group of users and the number has been growing exponentially. As it is reported, 23% of online adults are currently using Twitter, indicating a statistically significant increase compared with the 18% who did so in August of 2013 (Duggan et al. 2015 ).

According to extant SM studies, users tend to idealize themselves by editing and posting their most attractive pictures; they exhibit themselves with more positive information compared with their “real life” (Manago et al. 2008; Qiu et al. 2012; Siibak 2009). In other words, people enjoy showing their happiness online especially when they accomplish challenging tasks, go to interesting places, buy something luxurious, etc. They believe that by doing so they can improve others’ impressions of them. Without any exaggeration, SM is largely about achieving a positive self-presentation.

As users, we are excessively and vulnerably exposed to what others present and how they idealize themselves. Unavoidably, we will instinctively compare ourselves with others, and many times, it turns out that, we are in an inferior position. As one study suggests, envy is prevalent in the SM environment since users are prone to compare themselves to others who enjoy a higher social

position (Jordan et al. 2011). Research has extensively focused on the negative effects of envy, which is known as malicious envy. It is concluded that SM malicious envy could lead to dissatisfaction with life and depression (Krasnova et al. 2013; Tandoc et al. 2015). However, the positive side of envy hasn't attracted as much attention although it could be an enhancer of IS usage (Wu and Srite 2014).

Envy, universally exists in human society and is culturally dependent (Schoeck 1969; Smith et al. 1999). However, there are no extant studies investigating the cultural effects on envy in IS. To address this gap, we consider individual-level national culture (regarded as espoused national culture), to explore the effects of envy on SM usage. The research question is:

**Does online envy influence the continuance use intention of social media, and if so, how could different espoused national cultural values affect this relationship?**

In the following sections, we first review prior work on which our theoretical foundation is grounded, including envy-related literature and culture studies. The next section details a research model with hypothesis justification. Then, a research methodology is described along with process of empirical data collection. After that, analyses of results are provided. In the last section, we conclude with limitations, future directions, implications, and contributions.

## 3.2 Literature Review – Envy and Culture

### 3.2.1 Envy

To better understand envy, we first review envy definitions from a variety of literatures. Envy can be a process, which occurs when a person lacks another's superior quality, achievement, or possession. The envier either desires this unattained characteristic or wishes that the other would lack it, especially when this shortcoming exists in a self-relevant domain (Parrott and Smith 1993; Salovey and Rodin 1984). Envy also can be a feeling, as stated in Smith and Kim's study (2007), envy is an unpleasant and painful blend of feelings characterized as inferiority, hostility, and resentment. It is caused by an upward comparison with others who possess something greater (Smith and Kim 2007). In conclusion, envy is a social scientific term, and it can be comprehended as a pattern of thoughts, emotions, and behaviors that result from comparison with superior others.

However, envy is not a simple construct. Depending on specific contexts, envy can be divided into malicious envy and benign envy (Schoeck 1969). Malicious envy involves unsavory thoughts (D'Arms 2009) and aims at holding back the superior other. When experiencing malicious envy, people are more likely to harbor depressed emotions, even worse, they might exhibit hostile behaviors. In contrast, benign envy refers to the constructive reaction of a person who realizes his inferiority in comparison to another person, and the original person develops a desire to eliminate this discrepancy by improving his own position (Graf 2010).

Upward social comparison is a prerequisite of general envy. Festinger (1954), states that in real life, temporary situations are a mixture of ability and opinion evaluation (Festinger 1954). There exists a natural driving force within human beings to evaluate themselves by comparing themselves with other people (Festinger 1954; Taylor and Lobel 1989). These social comparisons can be upward or downward. An upward comparison represents a positive outcome (advantage or superiority) for the person, while a downward comparison represents a negative outcome (disadvantage or inferiority) (Taylor and Lobel 1989).

Malicious envy and benign envy may not be equally influential for IT usage. A few studies have excessively investigated the negative impacts of malicious envy on users. They conclude that malicious envy could lead to dissatisfaction with life and depression (Krasnova et al. 2013; Tandoc et al. 2015). However, the way benign envy impacts SM usage is still an unanswered question because of the lack of work in the IT literature on benign envy. Therefore, in the current study, we focus on benign envy and believe that benign envy is more salient in the SM context: benign-envy users are often optimistic, and they are prone to speaking highly of and sincerely expressing admiration of others.

It is generally concluded that upward social comparison is a driver of envy (Festinger 1954; Salovey and Rodin 1984; Smith et al. 1999; Suls et al. 2002). Therefore, upward social comparison is conceptualized as an important antecedent of benign envy.

When talking about the consequences of benign envy, it inspires people to improve one's own position positively (van de Ven et al. 2009). From another viewpoint, since envy related perceptions are moral, benign envy encourages people to conduct more moral and proactive behaviors (Polman and Ruttan 2012). In the current study, we conceptualize that benign envious would be more likely to enjoy online activity and enhance themselves. As a result, they would be more likely to continue to use SM. Detailed justification will be provided in the subsequent sections.

Additionally, we also need to take cultural effects into consideration since envy is contextually and culturally dependent (Schoeck 1969). It is possible that envy is more likely to be initiated in a certain environment among a specific group of people. We will discuss related culture literature in the next section.

### ***3.2.2 Cultural Influences on Personal Perceptions***

Information technologies (IT) are often closely intertwined with culture (Leidner and Kayworth 2006). In the field of IS, researchers have put a great effort into studying culture from different levels (Leidner and Kayworth 2006). They often take Hofstede's five dimensions of culture (power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity, and long term/short term orientation) into consideration to determine how IS usage varies across cultural groups (Hofstede 2011; Hofstede and Hofstede 2005; Srite and Karahanna 2006).

The core assumption of culture is that it reflects cognitive structures and interpretive schemes which people use to learn from situations, make sense of

ongoing events, activities, relationships, and thereby form actions (Reichers and Schneider 1990; Sackmann 1992; Van Maanen and Stephen). In other words, culture represents humanity's value systems, and it identifies what is important for people. In summary, because there is a tight linkage between cultural values and people's subsequent actions and behaviors, cultural values can be regarded as a set of social norms that define the rules for social interactions through which people communicate and interact.

Culture, can be viewed from different levels, including national, regional, ethnic, religious, linguistic, gender, generation, social class, organizational, and work group levels (Hofstede and Hofstede 2005). It is important to select a suitable research perspective. Better prescriptive and predictive power will be achieved by recognizing and utilizing different cultural perspectives in various contexts (Karahanna et al. 2002). In the SM context, individuals are different in terms of perceptions, intentions, and behaviors.

However, when talking about individual culture, the term "individual" does not represent a cultural layer; instead, individual culture is a product of multiple cultural layers (Karahanna et al. 2002). The interaction of all layers of culture exerts a powerful influence on individuals' subsequent actions and behaviors (Hofstede 2011; Karahanna et al. 2002). That is why researchers refer individual-level culture as espoused national cultural (Karahanna et al. 2002; Srite and Karahanna 2006).

Individual-level measurement of espoused national culture values were adapted from extant research (Dorfman and Howell 1988; Karahanna et al. 2002) based

on Hofstede's five culture dimensions (Hofstede and Hofstede 2005). Srite and Karahanna (2006) have theoretically and empirically tested the moderating effects of espoused national culture values on IS usage. These studies provide us both theoretical and methodological support.

In the current study, we consider that espoused national cultural values could be closely related to online benign envy. For example, envy is argued to result from inequalities (Schoeck 1969). One of the Hofstede's five dimensions of national culture values is power distance. People in high power distance cultures are more tolerant of inequity (Dorfman and Howell 1988). It is possible that envy varies among people who are different in power distance values. Another culture dimension, masculinity/femininity, might also influence envy because peoples' interested domains are distinct. According to Hofstede (1998), people who espouse higher masculine values are more achievement-oriented, and they might be more likely to envy others who have achieved accomplishments in careers. In line with this reasoning, we argue that national culture values could exert an impact on envy. More detailed justification for each culture dimension are provided in the hypotheses section.

Being consistent with extant studies (Karahanna et al. 2002; Srite and Karahanna 2006), we propose that individual espoused national culture values serve as important antecedents (and/or moderators) of cognitive beliefs and behaviors of SM. Four of Hofstede's five espoused national culture dimensions have been taken into consideration, including individualism/collectivism, uncertainty avoidance, power distance, and masculinity/femininity. These four

are defined in the paragraphs that follow the research model. The short/long term dimension (Hofstede's fifth dimension) is excluded in the current study because it targets Asian values specifically, which is not of specific interest in the current work.

### **3.3 Research Model**

The research model which is presented in Figure 3.1, integrates espoused national cultural values into a benign envy SM use model. The logic is: when people see other's positive information on SM, they may exhibit a form of upward social comparison between others and themselves. As a result, benign envy would be the result. Benign envy positively influences people's perceptions, including perceived enjoyment and perceived enhancement, which in turn increases continuance use intention. Four espoused national culture values are incorporated into this model. Hypotheses are grouped by culture dimensions. Additionally, noting that the other relationships within Figure 1 (focusing on upward social comparison, benign envy, perceived enjoyment, perceived enhancement, and continuance use intention) were already discussed in the literature review and will be tested in the analysis section, they are not argued as formal hypotheses due to space considerations.



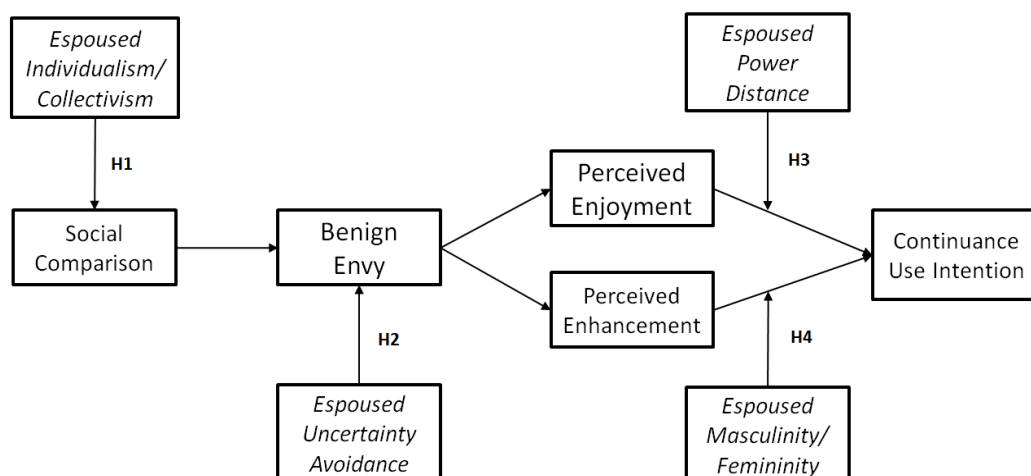


Figure 3. 1 Benign Envy and Espoused National Culture IS Use Model

### 3.3.1 Individualism/Collectivism

Individualism/collectivism was suggested as a way to differentiate people who are oriented more towards self-interest for their own goals versus those who are oriented to focus more on the social system with others (Earley 1989; Parsons and Shills 1951). An individualist would consider his personal interest to be more important than the interests of a referent group and would perceive the achievement of his personal goals to be of primary importance (Earley 1989). On the other hand, a collectivist would greatly value the interests of others and would look out for the overall well-being of the group (Wagner and Moch 1986).

In line with the previous reasoning, people high on individualism, are less influenced by a pervasive attentiveness to the relevant others in their social context (Festinger 1954). Their emotions and actions are less likely to be motivated and shaped by the consideration for others. On the contrary, the fundamental view of a collectivist (high on collectivism) involves a dependent

value on a connectedness with others. To a large extent, the behaviors of dependent people are organized by what they perceive to be the thoughts, feelings, and actions of referent others in relationships (Markus and Kitayama 1991).

Researchers suggest that a certain group of individuals may be more inclined to be engaged in comparisons with others, because for those people, comparison is a main method to evaluate themselves (Gibbons and Buunk 1999). Social comparison is a type of social behavior, which requires people to be involved in self-to-other interactions. Individuals high in social comparison orientation usually hold higher levels of accessibility and awareness related to themselves (Stapel and Tesser 2001). Collectivists are more likely to be motivated to fit in with their online context and are more likely to connect with online peers, while individualists might prefer to remain separate from others. Since individualism/collectivism is a bi-polar construct, we hypothesize:

***Hypothesis 1.*** *Individuals who espouse a higher level of collectivism will be more likely to exhibit an upward social comparison, while individuals who espouse a higher level of individualism will be less likely to exhibit an upward social comparison.*

### **3.3.2 Uncertainty Avoidance**

A higher tolerance for casualness is expected to be related to lower uncertainty avoidance cultures because these people believe that there should be as few rules as possible whereas individuals in higher uncertainty avoidance cultures favor conservatism, law, and order (Hofstede 1984). Cultural research also suggests

that traditions are important for high uncertainty avoidance people since traditional cultures are more predictable and more stable while cultures open to change are less predictable (Kilbourne et al. 2005). It was stated that people who espouse stronger uncertainty avoidance values usually possess a higher degree of stress and anxiety when facing uncertain situations; as a result, they usually try to minimize the uncertainty by enacting strict laws and rules, as well as safety and security methods (Hofstede and Hofstede 2005).

In high uncertainty avoidance cultures, people believe that conflict and competition are “dangerous” and they would exhibit a lower willingness to take risks if the situation is out of their control. In other words, individuals who espouse a higher level of uncertainty avoidance are more oriented to prevent self-harm when confronted with problems and challenges. Uncertainty avoidance values impact IT behaviors. Some findings suggest that high uncertainty avoidance orientation has a positive influence on open source software (OSS) adoption--OSS often is of a higher reliability and superior security. These advantages could reduce individuals' uncertainty concern (Bakshy et al. 2011).

In the current context, we posit that individuals who espouse higher levels of uncertainty avoidance values are more likely to benignly envy others since tradition plays an important role among these users. And, people with strong uncertainty avoidance are seeking for self-protection and are more likely to hold positive opinions, such as self-motivation and self-improvement. These uplifting perceptions are regarded as being key indicators of benign envy (van de Ven et al.

2009). They are more inclined to sincerely congratulate others on their success.

Thus, we hypothesize:

***Hypothesis 2.*** *Individuals who espouse a higher level of uncertainty avoidance values will be more likely to experience benign envy, while individuals who espouse a lower level of uncertainty avoidance values will be less likely to experience benign envy.*

### **3.3.3 Espoused Power Distance**

Power distance refers to the extent to which members of organizations expect and accept that power is distributed unequally (Hofstede and Hofstede 2005).

We posit that individuals with higher espoused power distance values would accept that superior others should enjoy more privileges while individuals with lower espoused power distance values would be more likely to doubt and question their superiors' opinions.

In the SM context, to some extent, power is presented by others' positive postings, such as obtaining luxury goods, traveling to exotic places, etc. Wu and Srite (Wu and Srite 2014) developed an online envy study and found that, in part, perceived enjoyment could be derived from benign envy and consequently improve IS usage.

This study posits that espoused power distance values would exert an influence on the relationship between perceived enjoyment and intended behaviors.

Individuals who espouse a higher power distance value would respect others and believe that the others' advantages are beyond their own grasp. As a result of

their tolerance in accepting inequalities in power, they are less likely to feel the unfairness and be miserable about the situation. Instead, they would continually keep in touch with others and use SM. Further, since people with higher power distance values regard their social code as important, the social context would regulate their behavior. As a result, they would express their sincere congratulations and best wishes to others through SM. Thus, we hypothesize:

***Hypothesis 3.*** *The relationship between perceived enjoyment and continuance use intention is moderated by the espoused national culture value of power distance such that the relationship is stronger for individuals with higher espoused power distance values and weaker for individuals with lower espoused power distance values.*

### **3.3.4 Masculinity/Femininity**

The term “masculinity/femininity” refers to the cultural tendency and categorization of groups, instead of biological sex as male or female.

Masculinity/femininity is a measure of psychological gender, describing whether a society or an individual espouses masculine values versus feminine values (Hofstede 1984; Srite and Karahanna 2006). Masculine values place an emphasis on work goals, assertiveness, and material success, while feminine values focus on quality of life goals, nurturing, and modesty (Hofstede 1998).

Much of the extant IS research has examined the role of gender, but there has been less focus on masculinity/femininity values in IT acceptance (Venkatesh and Davis 2000; Venkatesh et al. 2004; Venkatesh et al. 2000; Venkatesh et al. 2003). Gender differentiates the individual adoption and sustained usage of

technology: the perception of usefulness is more influential for males' technology decision; the perceived ease of use and subjective norm are more important for females (Venkatesh and Morris 2000). However, many arguments relating to gender were, to some extent, based on masculine and feminine values, indicating that technology acceptance intentions are not equally influenced by masculine-typed and feminine-typed individuals (Srite and Karahanna 2006; Venkatesh et al. 2004). Srite and Karahanna (2006) suggested that espoused masculinity/femininity values could moderate the relationship between perceived usefulness and IS use intentions. Specifically, they stated that the relationship would be stronger for individuals with higher espoused masculine cultural values, because perceived usefulness would improve one's job performance and reinforce one's career goals.

In the current context, we consider that perceived enhancement is closely related to achievement and assertiveness of personal goals (Hofstede 1998). In a similar vein, we posit that perceived enhancement would be more salient for individuals who espouse masculine rather than feminine values. Therefore, we hypothesize:

***Hypothesis 4.*** *The relationship between perceived enhancement and SM continuance use intention is moderated by the espoused national culture value of masculinity/femininity such that the relationship is stronger for individuals with higher espoused masculine culture values and weaker for individuals with higher espoused feminine culture values.*

### 3.4 Experiment Design

In order to test the proposed model, a multi-media presentation and online survey were designed using a web-based survey instrument (Powered by Qualtrics). This instrument allows researchers to distribute questionnaires, collect data, and produce reports. In the first part of the survey, the questions were designed to gather peoples' demographic and espoused national culture values. Then the subjects were asked to watch a multi-media presentation. We designed and created this presentation with envy-eliciting pictures and texts abstracted from Twitter and Facebook. The purpose of this administration was to recall participants' own envy experiences of SM. After that, they are asked to finish the second part of the survey in order to obtain subjects' responses regarding online benign envy.

#### 3.4.1 Structural Equation Model Analysis

A total of 428 students participated in this activity. 41 data points were discarded either due to failure to complete the full survey or because of missing data, resulting in 387 usable observations. The sample consisted of 221 males (57.1%) and 166 females (42.9%). The largest proportion (88.6%) of subjects were under 24 years old. In terms of educational background, a substantive proportion (65.5%) of them were freshman or sophomore students.

To assess reliability, composite reliabilities were calculated. Some items were excluded because acceptable thresholds were not reached. As shown in Table 3.1, all final factor loadings were above 0.7. For each construct, the factor loadings on their own items were significantly higher than to other constructs. The composite

reliabilities (ICR) ranged between 0.8343 and 0.9874, while the AVEs were well above the cut-off level of 0.50 (Between 0.7005 and 0.9632). These results suggest that the constructs exhibited adequate reliability, and convergent and discriminant validity.

### **3.4.2 Study Results**

We used PLS to test the research model. The significance of the paths was determined using the T-statistic calculated with the bootstrapping technique (Table 3.2). Being consistent with prior research (Wu and Srite 2014), benign envy was tested to be positively associated with perceived enjoyment and perceived enhancement, and ultimately improving use intention. In terms of espoused national cultural values, as hypothesized, espoused individualism/collectivism values significantly influenced the upward social comparison and espoused uncertainty avoidance values were significantly related to benign envy. This provides support for hypotheses 1 and 2. As hypothesis 4 suggested, espoused masculinity/femininity moderated the relationship between perceived enhancement and behavioral intentions. The relationship was stronger for individuals who espoused higher levels of masculine values. Contrary to our expectations, espoused power distance did not moderate the relationship between perceived enjoyment and behavioral intentions. Hypothesis 3 was not significant.



<b>Construct</b>	<b>Item</b>	<b>AVE</b>	<b>ICR</b>
Espoused Individualism/Collectivism	0.9265	0.8406	0.9134
	0.9070		
Espoused Uncertainty Avoidance	0.8080	0.7160	0.8343
	0.8828		
Espoused Power Distance	0.7131	0.7063	0.8772
	0.7344		
	0.8401		
	0.8847		
Espoused Masculinity/ Femininity	0.8042	0.7502	0.8998
	0.9029		
	0.8879		
Social Comparison	0.8558	0.7328	0.9610
	0.7894		
	0.8570		
	0.8774		
	0.8605		
	0.8210		
	0.8786		
0.8471			
Benign Envy	0.7879	0.7005	0.9211
	0.8445		
	0.8533		
	0.8820		
Perceived Enjoyment	0.8141	0.7840	0.9477
	0.9143		
	0.8862		
	0.9091		
	0.8239		
Perceived Enhancement	0.8906	0.7621	0.9410
	0.7756		
	0.8582		
	0.8998		
	0.9247		
Use Intention	0.8986	0.9632	0.9874
	0.9820		
	0.9880		
	0.9742		

Table 3. 1 Study Factor Loadings

Dependent Variable	Independent Variable(s)	R <sup>2</sup>	β	Hypothesis
Use Intention		0.468		
	Perceived Enjoyment		0.619***	
	Perceived Enhancement		-0.269	
	Power Distance* Perceived Enjoyment		0.06	H3 (not supported)
	Masculinity/Femininity* Perceived Enhancement		0.158*	H4 (marginally supported)
Perceived Enjoyment		0.199		
	Benign Envy		0.447***	
Perceived Enhancement		0.269		
	Benign Envy		0.518***	
Benign Envy		0.106		
	Social Comparison		0.255***	
	Uncertainty Avoidance		0.167***	H2 (supported)
Social Comparison		0.029		
	Individualism/ Collectivism		0.169***	H1 (supported)
Significance - ***at 0.005, ** at 0.05, * at 0.10				

Table 3. 2 Study Results

### 3.5 Discussion

In the current study, we proposed a benign envy and IT usage model, which was integrated with four espoused national cultural values. We conceptualized several main constructs and then theoretically justified the relationships between them. Finally, we collected data and examined the research model. The findings provide strong support for the proposed hypotheses and explained significant variance in the variables.

As expected, when people experience benign envy while using SM, they are more likely to continue to use them. Moreover, different espoused national cultures work as independent and moderating variables along with the envy procedures. People who hold different levels of culture behave distinctly--people who espouse a greater level of collectivism will be more likely to exhibit upward social comparisons; people who espouse higher levels of uncertainty avoidance will be more likely to experience benign envy; and the relationship between perceived enhancement and use intention is stronger for individuals with higher levels of espoused masculinity. Although espoused power distance values were not significantly moderating the relationship between perceived enjoyment and intended behavior in the current context (general SM), there is still a possibility that they could be an influencer in other specific SM environments. For example, Twitter is more information-seeking driven; Facebook is more friend-socializing driven; and LinkedIn is specifically professionalization oriented. People's opinions and behaviors might be different across various SM contexts.

To assess the explanatory power of the espoused national cultural values, we compared the explained variance of our model (model 1) to the model without 4 espoused national culture values (model 2). Model 1 had more explanatory power than model 2 (model 1: 47%; model 2: 39%). The inclusion of espoused uncertainty avoidance increased the R square of benign envy from 8 % (model 2) to 11 % (model 1). In summary, the integration of the espoused culture values significantly improves the explanatory power of envy model.

### **3.6 Limitations and Future Directions**

Prior to discussing the implications, we acknowledge the limitations of this study as well as its potential for future research. First, in the current study, we only included four of Hofstede's five cultural dimensions. We excluded the short/long term dimension because it is focused on Asian values, which are not of particular interest in the current study. However, SM are also very popular in Asia. In the future work, we would like to incorporate and test the fifth dimension and collect data from Asian users. Comparing the results with the current study could provide more depth and lead to some interesting implications.

Second, we consider only the positive impact of benign envy and include perceived enjoyment and perceived enhancement as the resulting perceptions. However, when recognizing self-inferiority, even benign envy could arouse painful feelings (van de Ven et al. 2009). The negative potential of benign envy could be taken into consideration as well in future research.

Third, we concluded an empirical study not focusing on a particular SM platform, but on the general SM environment. However, hypothesis 3 was not supported. We believe that various environments and conditions could be salient. In order to determine how the different SM contexts impact online envy, future research could examine and compare the proposed model in multiple SM contexts (such as Twitter, Facebook, LinkedIn, and so on).

### **3.7 Conclusion**

#### ***3.7.1 Implications for Research***

To date, researchers have a very limited understanding of how continuous usage intention of SM is associated with online envy, as well as individual-level cultural values. Our findings provide several valuable research implications.

First, previous literature mainly focused on the malicious aspects of envy. In a Facebook envy study (Krasnova et al. 2013), researchers concluded that online (malicious) envy has a negative impact on life satisfaction. However, fewer prior studies touch on the positive aspects. In the current work, the proposed model delineates the development of online benign envy. We posit that envy can be something beneficial for IS usage.

Second, given that envy is contextually dependent, our research provides a theoretical framework to illustrate how espoused national cultures influence SM usage through online envy. In detail, espoused individual-level culture values are incorporated into the research model. We specify that the espoused individualism/collectivism and espoused uncertainty avoidance dimensions are

salient antecedents of benign envy, while the espoused power distance and espoused masculinity/femininity dimensions are important factors that moderate the consequences of envy.

Finally, the method is innovative. We intentionally abstracted envy-intriguing information from real SM to make a multi-media presentation. By doing so, participants were primed to focus on the envy related messages and to recall their own envy experiences. In summary, our study provides a valuable support for future research.

### ***3.7.2 Implications for Practice***

The findings also provide several empirical contributions and managerial implications for IS practitioners. First, the results suggest that online benign envy has a potential to positively influence SM usage. When people learn about others' positive information on a SM site, they experience benign envy, and their intention towards continuance usage could be improved. In this way, benign envy, works as an SM enhancer, which leads to favorable consequences. Without an empirical study to examine this process, it might be very difficult for IS managers to understand or take advantage of online envy to improve IS usage.

One way to take advantage of online benign envy might be that IS designers may want to propose certain website features to enhance benign envy. In terms of arousing benign envy, some manipulations might be helpful when they encourage people to conduct upward social comparisons with others. For example, if envy-intriguing pictures on users' personal webpages were highlighted, people could be attracted to this kind of information and experience benign envy. In terms of

the consequent effects resulting from benign envy, self-enhancing applications could help users to emphasize their online images, and improve their usage. For example, picture editing and text rephrasing widgets, could add depth and richness to the plain information.

Moreover, the current study examined four espoused national culture dimensions. Our findings suggested that two of them serve as envy antecedents (espoused individualism/collectivism values and espoused uncertainty avoidance values) and one of the other two (espoused masculinity/femininity values) moderated the resulting perceptions on SM continuance use intentions. When designing or implementing a SM site, the influential power of espoused cultural values should be considered as important. For example, for individuals who are high in espoused masculinity values, improving their perceived enhancement would be more effective way to encourage SM usage. This suggests that various interventions can be undertaken to enhance usage.

The purpose of the current study was to illustrate how espoused national culture dimensions impact SM usage through online benign envy. The research model was theoretically and empirically justified. As a result, this study provides valuable theoretical contributions and practical implications.

## Chapter 4. Tweet, Favorite, Status, and Envy

### 4.1 Introduction

Twitter, Facebook and other social media have become a very popular tool among Internet users, encouraging them to express their thoughts, opinions and random details of their lives. Social media (e.g. Twitter), has a large group of users who generate a huge amount of social information and the number has been growing exponentially (Duggan et al. 2015 ). As it has been reported, 23% of online adults currently use Twitter, a statistically significant increase compared with the 18% who did so in August 2013 (Duggan et al. 2015 ). Tweets and status updating range from important events, daily life, to inane comments (Cheng et al. 2010). Users express personal feelings and emotions frequently, messages like “I see envy all in their faces” and “I envy people who can sing” are common. Knowing that one person is experiencing envy may not be interesting, but tens of thousands of such messages could be used to explore envy behavioral patterns to a larger extent. In other words, although individual messages on social media may only contain little informational value, the massive aggregation of messages could generate important and critical knowledge.

Many social media studies have demonstrated that aggregating social information would provide valuable insights into sociological, economical, healthcare, and other critical fields. Among these studies, Twitter has been one of the most popular social platforms that researchers value. For example, business



researchers investigate microbloggings as a form of electronic customer opinions concerning brands in order to reshape marketing strategies (Jansen et al. 2009). A variety of public health data can be automatically extracted from Twitter, which suggests that social media is a reliable resources for health officials and researchers to measure and track public health (Cheng et al. 2010). Moreover, messages on Twitter have been used to predict election, to be specific, the sentiment profiles of politicians and parties plausibly reflect many nuances of the election campaign (Tumasjan et al. 2010).

How could the huge amount of Twitter data can be obtained to disclose undiscovered insights? With text mining techniques, massive numbers of tweets can be collected, classified, and analyzed. Similar methods have been shown to successfully track public sentiments, predict election results, analyze purchasing behaviors, and so on. Therefore, we believe that Twitter has a greater potential for researchers to observe and explore critical social behaviors, such as envy, which could lead to avoidance of using certain IT platforms, emotional depression, and even worse, suicide. A thorough examination of envy related tweets could unveil more detailed information. The message: "I envy girls who look beautiful with little to no makeup" indicates that a user is envious of other pretty women. "I'm so jealous of my sister. She lives at home and is /always/ buying new clothes. I sat there watching her, turning green with envy" indicates sadness and frustration after comparing her situation with her sister's wealthy life. Obviously, some envy related tweets clearly demonstrate individual envy experiences, in terms of the envy objects, self-feelings, and consequent emotions.

If we could aggregate over millions of envy tweets, it could provide untapped insights for public envy research.

The envy literature largely theorizes motivations of envy. However, in the IS context, envy related research is very limited, although the impact of online envy could be compound, destructive, or constructive. Some of the previous work theorizes that online envy motivations and their offline behavioral consequences, concluding that experiencing envy on social media could lead to dissatisfaction of personal life (Krasnova et al. 2013). Some other work concludes with similar results that Facebook envy generates depression among college students (Tandoc et al. 2015). In another study, online enviers are positively motivated to strengthen their self-ability and are more likely to enjoy the online experience (Wu and Srite 2014). However, almost all of them are facing a common problem: the empirical tests are confounded by limited data. Very likely, objective envy-related records are not easy to obtain, instead, survey-based subjective responses can skew the final results. This adds difficulties for researchers to observe real opinions or behaviors among individuals in the complex dynamic online social context (Wu and Srite 2014). Moreover, there exist differences between online and offline social environments, applying a theory to an online context without capturing, considering, or analyzing the distinctions might lead to unsolid conclusions.

In order to address these gaps, there is a need to conduct online envy research by obtaining objective data, adopting suitable data analysis techniques, and addressing meaningful conclusions. Envy can be categorized into malicious envy

or benign envy depending on it is destructive or constructive (Schoeck 1969; van de Ven et al. 2009). In the current work, we collect envy related tweets from Twitter and classify them into two types of envy relying on text mining techniques with sentiment analysis (positive to negative). Based on the data set, we first analyze the patterns of online in study 1. In study 2, by using logistic regression, the impacts of certain social media usage behaviors are tested on differentiating online envy. Our work includes both qualitative observation and quantitative analysis, along with the evaluation of regression output. To the best of our knowledge, this is one of the very first envy studies to use real objective data from social media, rather than traditional survey-based subjective data.

In summary, this paper asks: **What patterns can be learned from envy tweets and how does social media usage impact online envy?**

In what follows, we first describe the current research context. Then, we conduct a literature review. After that, we develop two studies investigating the inference of both malicious and benign envy on social media. In the study 1, we collect envy related tweets, categorize them into malicious envy and benign envy based on textual analysis. By investigating the two types of envy respectively, different patterns of online malicious and benign envy are disclosed. In study 2, we further analyze the data, and demonstrate how a proactive social connection and a passive interaction differentiate the two types of envy, and how the influencing power and the impacts of being influenced could moderate the intensity of malicious envy and benign envy.

## 4.2 Research Context

For example, we see our recently promoted colleague John posting a message on Twitter: Finally, we found our dream house. We can't wait to start our new life in this perfect home. We are so blessed!"; of course, the textual posting is not enough, John also attached a photo, no surprise, the house is brilliant, as well as his lovely wife and cute children sitting on the green lawn, all smiling. Then the viewer compares with his tiny, dirty, and old apartment. Then he realizes that his life is inadequate and miserable. These emotions turn him green with envy.

The above is a common example when we are navigating on social media, such as Facebook and Twitter, sometimes, we feel envy towards our online connections. According to extant work, users on social media tend to idealize themselves by editing and posting their the most attractive pictures and exhibit themselves with more positive information compared with their "real life."(Manago et al. 2008{Siibak, 2009 #180; Qiu et al. 2012). Without exaggeration, social media is largely about achieving a positive self-presentation. As users, we are excessively and vulnerably exposed to what others present and how they idealize themselves. Unavoidably, we instinctively compare ourselves with others, and many times, it turns out that, we are in an inferior position. As one study found, envy is prevalent in the social media environment since users are prone to compare themselves with others who enjoy an apparent higher social position (Jordan et al. 2011).

Envy aroused by social media is drawing more and more attraction from both industry and academe since it could lead to multiple severe consequences, such

as discontinuance of IS usage and significant damage to user's well-being (Krasnova et al. 2013). To be specific, one work investigates that passively social media usage is positively associated with envy and leads to negative life satisfaction (Krasnova et al. 2013); a newer study found that Facebook envy is a mediating factor between social media usage and depression among college students (Tandoc et al. 2015). However, all the previous studies were survey-based, which relied heavily on self-reported answers. This method could be problematic, and weaken the robustness of the findings. As several researchers point out, envy is a timid and shameful passion that human beings are less likely to admit or acknowledge (Jordan et al. 2011; Levi 1964; Schoeck 1969). In other words, subjects might automatically fake their responses towards envy related survey questions, as a result, the finalized outcomes could be skewed.

Moreover, psychology literature offers theoretical foundations for envy, often intersecting with sociological literature, therefore envy studies in the IS context is largely based on those theories. However, the online environments and the offline circumstances are greatly different. Envy in the real world is argued to have complex antecedents and into a variety of consequences. This complexity might be reduced or exaggerated in the social media context because of the anonymous identification and various social interactions online. Therefore, these kinds of work await empirical scrutiny. One of the possible solutions is to collect objective data directly from social media which would provide more precise and accurate results and implications.

## 4.3 Literature Review

### 4.3.1 Envy

Envy is a social scientific term. It could be defined as a pattern of thoughts, emotions, feelings, behaviors, and processes that results from the perceived loss of social standing in response to another obtaining outcomes that are personally desired and valued (Parrott and Smith 1993; Salovey and Rodin 1984; Smith and Kim 2007; Vecchio 2005). In this essence, envy includes two parts: the envier and the envied. Usually, the envier would envy the envied because the envied has the possession or attainments that the envier desires but is not able to attain. Tesser and Collins (1988) suggest that three factors play an important role in developing envy--a comparison that discloses that another individual's performance is superior, the domain of the comparison is of personal relevance, and the compared other is someone who is viewed as similar. Similarly, Salovey and Rodin contend that three conditions-- negative feedback, self-relevant feedback, and a similar success rival-- are necessary for malicious envy (Salovey and Rodin 1984). In other words, envy would be aroused by an upward social comparison (negative feedback and a success rival) in a self-important domain (self-relevant feedback), such as appearance, career, family, and/or wealth. In summary, the heart of envy is based on an upward social comparison that differentiates superior others and inferior oneself in a high-relevance domain that one values (Festinger 1954). For example, when someone you know earns a promotion, moves to a nicer neighborhood, or enjoys a lovelier family time, do you automatically compare your own life with them? Are you wishing you had

what they had? In other words, as long as the superiority of one person threatens the self-esteem of another, envy may be induced.

However, envy is not a simple construct. Since envy is always accompanied by the recognition of the distance between the superior others and the inferior self, it could result in either derogating the others down or moving oneself up. This distinguishes envy into two types: malicious envy and benign envy. In terms of motivation, malicious envy aims at holding back the superior other while benign envy aims at improving one's own situation (van de Ven et al. 2012); in terms of feelings, malicious envy involves the unsavory motivation but benign envy does not (D'Arms 2009); in terms of actions, benign envy refers to the reaction of a person who realizes his inferiority comparing to another person and develops the desire to eliminate this discrepancy by improving his own position (Graf 2010); from the opposite, people who encounter malicious envy might distance themselves from others (Schoeck 1969).

Envy is categorized into somewhat two opposite, different types, yet malicious envy attracts more attention, considering its negatively and destructively emotional, psychological and behavioral consequences. Envy has an important role in all societies. There are crimes of envy and politics based on envy. Knowing the destruction power of envy, people design institutions to regulate envy and also take actions to avoiding being envied by others. Quite a few of studies have been investigating malicious envy. Many of them have emphasized the vicious role of envy played in a variety of circumstances. If the envy is manifested by individuals' disparaging of the others, it is malicious, which could further

exaggerate feelings of depression and anxiety (Salovey and Rodin 1984). Moreover, envy could damage and destroy the cohesion of teams and undermine overall performance. One study states that in organizations, envy lowers group performance, job satisfaction, and results in higher turnover (Duffy et al. 2008). In the workplace, comparisons with similar others through social interaction occur constantly. When others outperform oneself, he might be obsessed by others' success, promotion, and rewards, as a result, neglects, or sabotages his own performance, and intentionally distances himself from others, and is reluctant to learn from or collaborate with others (Menon and Thompson 2010). Besides that, people are suffering from not only harboring envious feelings, but also being envied. It is suggested that the perception of being the target of envy is negatively associated with individual performance (Robertson 2014; Vecchio 2005). Perception of being envied by basketball players is negatively associated with their individual accomplishment, which was measured by efficiency scores for each game (Manago et al. 2008). These findings suggest that because envy is a precursor to harmful acts, people fear being envied by their team members, colleagues, and even friends. However, most of the envy related work is based on offline environments, recently, IS researchers also found that envy is prevalent on social media and leads to severe negative consequences. They stress that the envy feelings on social media would lead to dissatisfaction, avoidance of IS usage (Krasnova et al. 2013), and depression (Tandoc et al. 2015). German researchers conducted a Facebook envy study. Based on responses from 584 Facebook users, they found that envy is contingently induced by the content of others' postings in terms of travel, leisure, social interaction, and happiness. They also concluded



that passive following on Facebook could lead to envy and consequently reduce individual life satisfaction (Krasnova et al. 2013). Similarly, another group of scholars determined the relationship between social media surveillance usage, social media envy, and depression among college students. They found that heavy Facebook users with a larger network of friends tend to feel higher levels of envy, which lead to depression (Tandoc et al. 2015). These two studies provided a model for conducting envy research in the social media context. That is to investigate the relationship among IS usage, online envy, and subsequent results, using traditional survey-based self-report method as offline envy studies. In summary, as listed above, malicious envy has been consistently regarded as a negative flaw in a variety of circumstances, indicating that destructive tendencies are an essential element of malicious envy.

Compared to malicious envy, benign envy has attracted less attention in the literature. Benign envy is depicted as an experience that a negative social comparison occurs but the individual is motivated to improve his own position (van de Ven et al. 2009). People are consciously or unconsciously compared with others. Rarely people would feel happy when meeting someone else who are smarter, prettier, richer, or more successful. However, it is still a possibility to develop a sense of generosity to prevent malicious envy. In other words, it can be used as an inspiration, leading a person to strive and obtain what is coveted in order to cultivate benign envy. In general, the motivational and functional goals of malicious and benign envy are different (Schoeck 1969; van de Ven et al. 2009; van de Ven et al. 2011). For example, pessimistically fearing of failure and

optimistically hoping for success could be the distinct drives of the occurrence of malicious and benign envy respectively (Atkinson 1957). The focus of benign enviers is more toward the means of improving self while that of malicious enviers mainly focus on the envied person and is directed to information on how to level them down (Crusius and Lange 2014; Johnson 2012). It has been investigated that benign enviers are encouraged to study harder and achieve better in the coming exams (van de Ven et al. 2009). In the workplace, benign enviers are more likely to generate distinct motivations on individual creative performance. Therefore, the predictive power of benign envy could be valuable for business in organizations (Crusius and Lange 2014). Besides that, Marketing researchers contend that consumption is shaped by benign envy. “Keeping up with Joneses” is widely used in advertisements that tempts consumers with images of affluent others who live a better life (Matt 2003). However, the positive power of benign envy hasn’t been fully explored in the IS field, although some IS researchers found that benign envy could enhance perceived enjoyment and perceived enhancement, which are positively associated with social media usage (Wu and Srite 2014). Wu and Srite (2014) argue that when users were experiencing benign envy on social media, they were more likely to enjoy the online activities and they were highly motivated to enhance self-abilities, resulting in higher use intention. However, since these researchers were using survey-based method to collect data, the authenticity and objectivity could be a problematic issue.

In the current study, social media is the research context. Social media is an online space that provides sufficient conditions for people to compare themselves with their online connections who regularly post better personal life information. Consequently, envy occurs. Considering the destructive effects of malicious envy and the constructive effects of benign envy, there could be influencing factors for IS use, and further modify users online and offline behaviors. It would be not only important but also an interesting topic to explore the manifestation of envy in the social media context.

#### **4.3.2 Twitter**

In the current study, we would like to explore both malicious envy and benign envy on one of the most popular social media platforms: Twitter. Twitter is a microblogging service, which enables users to create and share short 140-character information called "tweets". Although the message length is constrained, the breadth of topic is incredibly wide, moreover, additional information, such as pictures and links can be attached. Users can "follow" thousands of people and access the others' postings. These users can also be "followed" by others, called "followers." This mechanism could provide sufficient sources for users to "show off" and to be exposed to other's positive information, which might arouse envy. It is reported that currently, there are 200 million monthly active users and the average number of tweets posted per day is 500 million (Twitter 2015). Considering the large group of active users and the huge amount of social information on Twitter, we adopt it as our data source.

According to literature, previous work suggests that subjective data, usually survey-based self-reports are not able to not fully capture the real responses from people. According to the results from one of our previous studies, “benign envy” is a significant factor on IS usage while “malicious envy” is not (Wu and Srite 2014). People might disguise their true feelings since they don’t want to admit that they “maliciously envy” others. We contend and suggest that, objective data is more suitable for envy related research, and propose two studies to examine this issue.

#### **4.4 Study 1: Exploring the Patterns of Envy on Social Media**

Can the two types of envy could be detected and how? Silver and Sabini (1978) note that one person is perceived as (maliciously) envious when people see him inappropriately attempt to demean someone else in order to maintain his own self-worth. According to literature, benign envy also can be disclosed when one is observed to conduct an optimistic upward action. Here, we argue that the two types of envy could be differentiated since they have distinct manifesting patterns and features.

First, the semantic distinctions for two types of envy are common in some languages, such as in the Dutch language *benijden* is used for benign envy and *afgunst* for malicious envy. Similarly, in the Chinese language, 羡慕 is to describe the upward motivation form of envy, whereas 嫉妒 implies the hostile form.

Second, it is generally acknowledged that benign envy is more productive and malicious envy is more destructive (van de Ven et al. 2011). Third, the most

important difference between the two types of envy is on the action tendencies: while benign enviers aim at improving themselves, malicious enviers aim at degrading the others (van de Ven et al. 2009). In this vein, certain types of envy are manifested by appropriate signals, and traits, positively or negatively.

Therefore, we contend that envy can be distinguished and analyzed verbally or textually. To do so, we first collect envy related tweets, which include the “envy” keyword. In this way, we obtain explicit envy information from Twitter. Then, envy tweets are categorized into positive (benign), neutral, and negative (malicious) groups based on text sentiment analysis techniques.

We collected tweets from Twitter in December 2014 for over two weeks. We ended up with 105,194 messages in total, which were explicitly expressing envy. After cleaning out some advertisement such as including “envy collection” keywords. The finalized dataset included 104,882 tweets.

Then, we did sentiment analysis with these tweets. Sentiment analysis is one of the growing techniques to explore social media content. It can provide insightful analysis for business. For example, Twitter sentiments are widely used for understanding consumer perceptions, predicting financial performance, and determining election outcomes (Jansen et al. 2009; Tumasjan et al. 2010). The core of sentiment analysis is to classify textual input into positive, neutral, or negative polarity relating to target of the interest (Abbasi et al. 2008). Recently, many tools have been developed for analyzing social media texts, ranging from freely available systems for academic research to commercial API-based tools. However, the quality of them varies, with the best-performing tools achieving

overall accuracies of between 65% and 71%, many low-performing ones attaining accuracies below 50% (Abbasi et al. 2008). In the current study, we are using SentiStrength as the sentiment analysis tool, which is evaluated as one of the best performance tools (Abbasi et al. 2008). It is also widely used till now. It uses a sentiment lexicon for assigning scores to negative and positive phrases in text. To determine the document (tweet) level polarities, the phrase level scores are aggregated (Thelwall et al. 2010). For example, when analyze a sentence “I love sunny days dislike rainy day”, “love” and “sunny” are evaluated as 4 because they are positive, and “dislike” is scored as -4 with negative values. An overall score is  $4+(-4)=0$ . As a result, the sentence is regarded as neutral.

We first prepare our data by removing the “envy” key word from tweets to prevent the any bias effects of “envy”. Then, we use SentiStrength to analyze envy tweets as positive (benign), negative (malicious), or neutral. As a result, 25,927 of them were malicious, 34,721 of them were benign, and 44,234 of them are neutral.

Examples of benign envy tweets are: “all of you that have a sense of family and parents that love each other, I envy you. You don't even know how lucky you are,” “I envy everyone who can do winged eyeliner and it actually looks good,” and “I envy girls with perfect bodies.” Examples of malicious envy are “I don't envy people with a lot of followers, I bet you guys have people coming at you with bull\*\*\*\* all day long,” and “I know they hating, I know they jealousy they envy me!! Envy is my man crush all day every day.” Examples of neutral envy tweets

are: “I envy you”; “envy how other girls my age or younger could enjoy their lives so meaningfully :( ” and “I am envy right now.”

The research question for study 1 is: What are the different patterns between benign envy and malicious envy? In order to better understand the manifestation of different types of envy, we conducted a number analyses that were developed to examine our hypotheses.

We first would like to determine whether the length of the benign envy tweet is similar to malicious envy. Longer length indicates more content and information. According to the literature, benign enviers and malicious enviers have distinct emotional drivers and should be uniquely connected to distinct envious behaviors (Lange and Crusius 2014). It is argued that while malicious envy is only eliciting emotional frustration, benign envy includes a motivational gain for self-improvement (van de Ven et al. 2009). Therefore, there is a possibility that benign enviers create more content in their posting than malicious enviers. Thus:

**Hypothesis 1.** The length of benign envy tweets is longer than malicious envy tweets.

Second, we investigate the readability of the two types of envy tweets. From a common sense, texts should be easy to be digested by their readers. This can be defined as the reading ease of the text, which indicates how easy the message can be understood and it is also a measure of a cognitive effort required of readers. Additionally we would like to know if benign envy or malicious envy can be easier to be detected via text? We propose that benign envy tweets would be more

complex considering the different attention allocation: malicious envy is more toward the envied person whereas benign envy is directed to notice the fortune of the other and the means to improve one's own performance (Crusius and Lange 2014). In line with this reasoning, benign envy tweets might contain more content and be more difficult for readers to understand. Thus:

**Hypothesis 2.** The readability of benign envy tweets is more difficult than malicious envy tweets.

The Gunning fog index is commonly used to confirm that text can be read easily by the intended audience. Basically, it is calculated by a formula that incorporate the complexity of words in sentences (Gunning 1969). We use it measure the readability of tweets.

Finally, we would like to investigate the subjectivity of different types of envy tweets. Textual information can be generally categorized into two main types: facts and opinions. Facts are objective expressions about entities, events, and their properties while opinions are subjective expressions describing people's sentiments, appraisals, and feelings (Liu 2010). Identifying the degree of subjectivity or objectivity is useful because it tells that whether the writer is more rational or not at the moment. According to literature, benign enviers usually hold higher perception of self-control while a low state of self-control is usually linked to malicious envy (van de Ven et al. 2012). Therefore, we feel that malicious envy tweets are more likely to express subjective emotions, feelings, and opinions while benign envy tweets are more objective. Thus, we develop the third hypothesis. We are using number of subjective words/ (number of



subjective words + number of objective words) to calculate the degree of subjectivity. For example, in the sentence “I like cat,” there are two objective words (I and cat), and one subjective word (like). The degree of subjectivity for this sentence is  $1/(1+2) = 0.33$ .

**Hypothesis 3.** The subjectivity of benign envy tweets is less than malicious envy tweets.

#### 4.4.1 Results Study 1

In order to verify the three hypotheses, we first calculated the length, Fog, and subjectivity. Then conducted t-tests to compare different types of tweets among benign, malicious, and neutral messages.

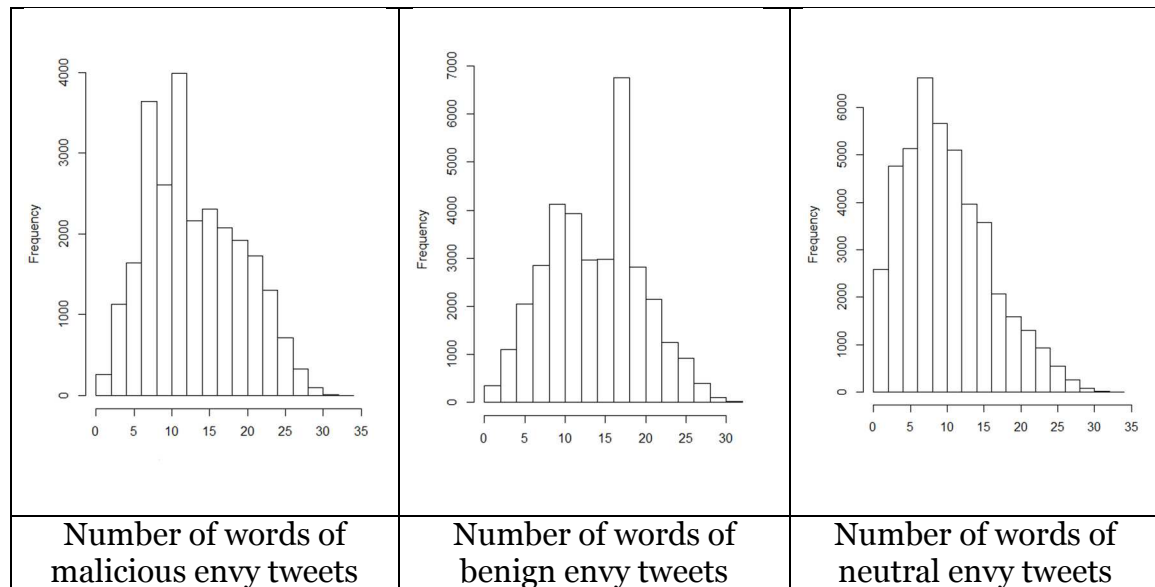


Figure 4. 1 Comparison of Number of Words among Malicious Envy, Benign Envy, and Neutral Envy Tweets

According to the results, the mean value of benign envy tweets is 14. 25149 and the mean value of the malicious envy tweets is 13.48247. p value is less than 0.0001, which indicates that the lengths between the two types of tweets are

different. We confirm that benign envy is significantly longer than malicious envy and benign envy. Hypothesis 1 is verified.

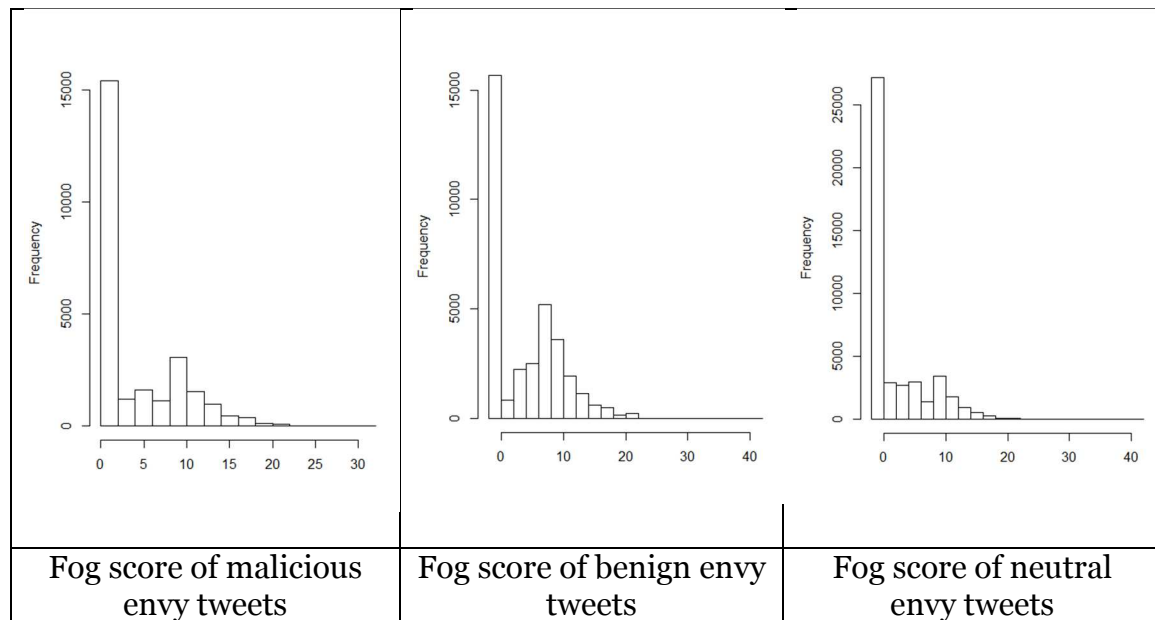


Figure 4. 2 Comparison of Readability among Malicious Envy, Benign Envy, and Neutral Envy Tweets

According to the results, the mean value of benign envy tweets is 4.442409 and the mean value of the malicious envy tweets is 3.642168. p value is less than 0.0001, which indicates that the Fog scores between the two types of tweets are different. This indicates that in general, benign envy tweets are more difficult to read than malicious envy tweets. Therefore, the hypothesis 2 is verified.

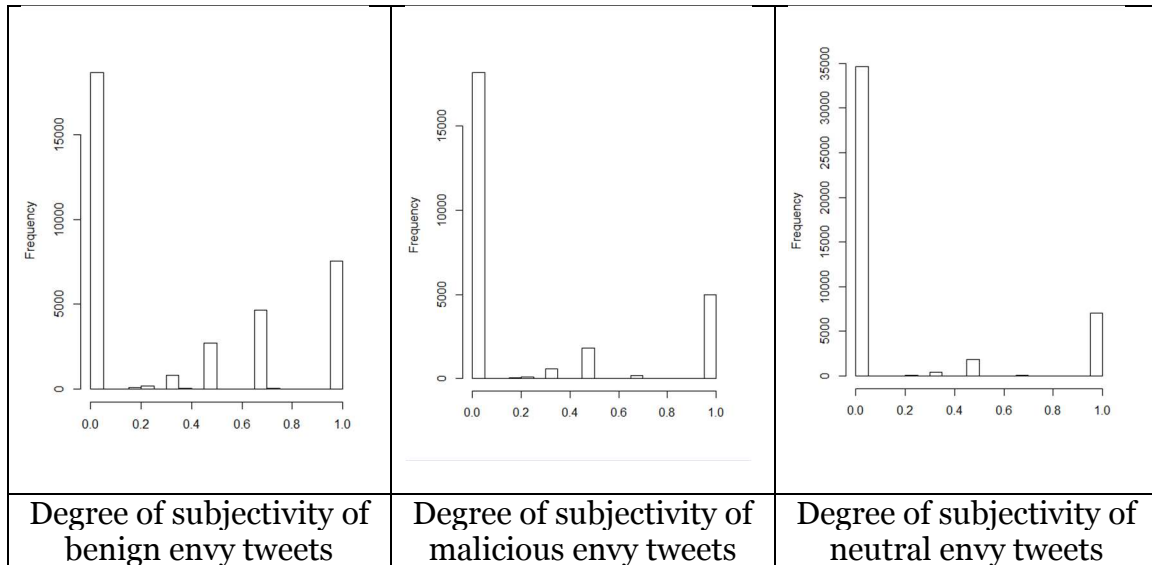


Figure 4. 3 Comparison of Subjectivity among Benign Envy, Malicious Envy, and Neutral Envy Tweets

According to the results, the mean value of benign envy tweets is 0.3561575 and the mean value of the malicious envy tweets is 0.2411003. P value is less than 0.0001, which indicates that the Fog scores between the two types of tweets are different. This indicates that in general, benign envy tweets are more subjective than malicious envy tweets. The result is opposite to hypothesis 3. Therefore, hypothesis 3 is not verified.

We then scrutinized benign tweet examples, like “I love JJ's kiss scene ... Although i soooooo envy ...btw i wanna be that girl LOL,” and “OMG!! miko... you went to see him at airport, so envy >\_<”. From these benign envy messages, we found that benign enviers are using some extremely emotional words and emoticons to express their positive feelings. It seems that these text techniques in tweets are showing their admirations and compliments towards the envied. It is interesting to find that benign envy is manifested with more emotions than malicious envy.

In conclusion, although both malicious envy tweets and benign envy tweets are expressing the emotional feelings, benign envy tweets are more objective. By deeply exploring the messages, malicious envy tweets are focusing on expressing negative emotions, a greater part of the messages are abusive language. However, benign envy tweets are describing the positive points, they are trying to describe the others good and show their admiration and good regards. Also, the length and of benign envy tweets are longer than malicious envy tweets. Readability is more difficult for benign envy than malicious envy tweets.

Another interesting finding is that based on our observation, it seems that malicious envy elicited on social media is somewhat more masculine since words as man, men, force, power, brothers, lord, king, guy, war are of the more frequently used types of words. Benign envy tweets are somewhat some feminine, such as beauty, women, grace, hair, dress, female, and skin.

From the study one, we found that 1) envy tweets can be differentiated by sentiment analysis. 2) Malicious envy and benign envy are manifested into different patterns: benign envy tweets are longer than the malicious ones; benign envy requires more efforts to understand and it describes more emotions compared to the malicious envy tweets.

#### **4.5 Study 2: What is the impact of social media usage on envy?**

According to study 1, different types of envy have distinct patterns. A much deeper question is: Does social media usage determines/impacts the types of envy that users experience online?

According to previous research, a study stated that passive usage, such as browsing or surfing on social media without actively participating, could lead to malicious envy and generate dissatisfaction with life (Krasnova et al. 2013). Another study claimed that social media envy leads to depression among college students (Tandoc et al. 2015). However, very limited work touches benign envy, although it could be a positive and salient factor for IS usage, and the practical and theoretical implications could be interesting (Wu and Srite 2014). Therefore, in study 2, we would like to explore the impacts of social media usage on both malicious envy and benign envy.

Previous studies on envy mainly relied on the survey method to investigate subjects' behavioral intentions and behaviors. There are several shortcomings. First, research based on this kind of methodology might suffer from inadequate coverage of the population and a low response rate. Second, the authenticity of the data could be threatened by the self-report mechanism since people can skew their responses intentionally or unintentionally. To solve these problematic procedures, we collected a large amount of real envy messages from Twitter, 104,882 tweets in total.

It is commonly known that there exist relationships between social media usage and envy. In previous studies, passive usage is defined as a behavior of consuming others' content, such as browsing their News, clicking on "stories", and following others communications of their friends. This passive usage could generate envy and dissatisfy life (Krasnova et al. 2013). Some other research considers that the degree of intensity of social media use would impact envy, such

as heavy users tending to feel higher levels of envy (Tandoc et al. 2015). Also, the social network size is argued to shape users' behavior and envy—a bigger network of friends could lead to higher levels of envy (Tandoc et al. 2015). Therefore, we contend that detailed usage factors and social network features should be taken into consideration. Since we are doing research based on the Twitter platform, we particularly examine Twitter usage, which can be generalized to other social media platforms. As depicted in previous parts, Twitter users could proactively follow their interested people, whom are called followings. At the same time, they are followed by followers. Therefore, the number of followings and the number of followers can be used to understand users' online social connections. For user participation, two of the main activities are to post statuses and to “favourite” others' postings. Generating self-postings is more proactive and requires more engagement while “favourite” others is less effortful. Therefore, number of favourites and number of statuses can be used to gauge a user's participation. Users' usage patterns are shaped by different combinations of number of followers, number of followings, number of statuses, and number of favorites. Separately investigating these factors is not sufficient and only provides unilateral implications. In order to get a deeper understanding, we conceptualize four usage factors that summarize different usage patterns. They are listed as following (Table 4.1).

	<b>(Be) Passively followed:</b> # of followers	<b>Passively participate:</b> # of favorites
<b>Proactively follow:</b> # of followings	<b>The degree of proactive social connection:</b> $(\# \text{ of followings}+1) / (\# \text{ of followers}+1)$	<b>The impact of being influenced:</b> $(\# \text{ of favorites}+1) / (\# \text{ of following}+1)$
<b>Proactively participate:</b> # of statuses	<b>The impact of influencing power:</b> $(\# \text{ of statuses}+1) / (\# \text{ of follower}+1)$	<b>The degree of passive engagement:</b> $(\# \text{ of favorites}+1) / (\# \text{ of statuses}+1)$

Table 4. 1 Four Usage Factors

**The degree of proactive social connection** is defined as how proactively the users connect with others. It is measured as the ratio between number of followings and number of followers. In Twitter, one user's network is consisted of number of followings and number of followers. If the ratio is larger than 1, that user has more followings than followers. Popular people usually have a lower degree of proactive social connections since their followers are much more than their own following people. For example, Tylor Swift, a famous singer, has 18,200 followers but only follows 8 people (by Apr 4, 2015). Therefore, the degree of proactive social connections for Tylor Swift is proximately  $8/18200=0.00044$ .

**The degree of passive engagement** is defined as whether the users are more participating in lower-engaged activities or higher-engaged activities. In Twitter, a user could "favorite" others' postings, update his own statuses, as well as retweet and reply to others. Because the current research is based on the individual-user and individual-tweet level, in the current study, we would like to

only consider the most self-independent activities: clicking on “favorite” and posting “status.” The original purpose of “favorite” is to show the viewer’s agreement and acknowledgement towards other’s postings. However, more than often, “favorite” is adapted to be a confirmation that the one has viewed the postings. Compared to “favorite”, self-posting status is more proactive and involves much more engagement. In the current work, the degree of passive engagement is measured as the ratio between number of favorites and number of status.

**The impact of influencing power** is defined as one’s ability to influence others on social media. In the current context, one could influence others by his postings because the message would appear on his followers’ homepage. Therefore, they are more likely to notice and read. If one rarely posts personal content, although he has a large number of followers, the impact might not be significant because he contributes little. On the contrary, even if one updates a number of messages, if the number of his followers are very small, his influencing power is limited because less people would see his information. The degree of influencing power is measured as number of status/ number of followers.

**The impact of being influenced** is defined as how vulnerable one is affected by others. Twitter users are influenced by other online connections when viewing their postings. “Favorite” is a way to see whether the user is actually noticing others’ postings. Therefore, the average influence power of one’s followings could be calculated as number of favorites/ number of followings.



Based on the above factors, we further developed four hypotheses. Social media is an environment that envy is intensively existing because it provides sufficient conditions for users to access others information and compare with themselves (Jordan et al. 2011; Krasnova et al. 2013). It is argued that since people tend to post positive information, viewers are more likely to consider others as having a better life. This comparison is envy eliciting. The more people are using social media, the more likely it is that people feel (malicious) envy (Tandoc et al. 2015). In the current Twitter context, the more followings one has, the higher the possibility he is exposed to the followings' information, which could lead to envy. However, Twitter users are also followed by followers. As mentioned previously, social media is all about perfect self-presentation, we argue that a person is reluctant to express their negative envy feelings when he knows he has a number of fans. Instead, he might express the benign envy feelings, which are more positive to maintain his image. The degree of proactive social connection is calculated as the ratio between number of followings and number of followers. When the ratio is higher, more others are followed by the target user. When the ratio is lower, the target user is followed by more people. Therefore, we expect that a user is more likely to express benign envy when the ratio is lower.

***Hypothesis 1. The degree of proactive social connections*** exerts different influences on malicious envy and benign envy. A user who proactively follows fewer people and is followed by more others is more likely to express benign envy; a user who proactively follows more people and is followed by fewer people is more likely to express malicious envy.

Besides the social connections, we also take different types of participation into consideration. It is contended by previous work that passive social media usage, such as tracking others' updates, following others communication, would promote (malicious) envy (Krasnova et al. 2013). In the current context, posting "tweet" and clicking "favourite" on others' postings are two of the main activities that one could conduct on Twitter. People tweet whatever they want and share with their followers. As concluded in a related study, projecting a positive self-presentation on social media would be linked to a higher level of happiness and self-esteem (Gonzales and Hancock 2011; Kim and Lee 2011). As benign envy would generate self-motivating emotions, which are closely related to self-esteem, there is a possibility that posting positive personal information on social media is related to benign envy. Compared to posting own statuses, clicking on "favorite" requires less engagement and effort. Sometimes, it is used as a confirmation that one has viewed others' information, therefore, we consider "favorite" as a type of passive usage of social media. The more content one views, the more one is vulnerable to compare with others. Especially, social media passive usage is correlated to malicious envy (Krasnova et al. 2013). As users' participation is made up of both passive usage and proactive usage, the degree of passive engagement is the ratio between two types of participation (number of favorites/ number of statuses). In line with the previous reasoning, we develop the second hypothesis as following.

***Hypothesis 2. The degree of passive engagement*** exerts different influences on malicious envy and benign envy. A user who "favorites" more and posts less is more likely to experience malicious envy; a user who "favorites" less and posts more is more likely to experience benign envy.

Then, we scrutinize the neutral tweets. When the summation of positive score and negative score equals to zero, the sentiment of the tweet is categorized into neutral. Here is an example: “I don’t look good with long hair 8’) I envy you omg.” This tweet expresses one’s negative feeling of personal lack of good looking hair, while a smiley emoticon (8’)) shows a positive emotion. There is a possibility that in neutral tweet, malicious envy and benign envy are coexisting but offset each other.

Therefore, it is necessary to consider the malicious and benign envy elements, simultaneously. In addition to the degree of proactive social connections and the degree of passive engagement, a user influences others and is influenced by others. Twitter, is an asymmetric microblogging service: “If you follow me, I do not have to follow you” (Gruzd et al. 2011). In this way, the influencing power and the impact of being influenced are also asymmetric. When a user posts messages, his followers are more likely to read and digest them. A user is also influenced by other online connections when he views the other’s postings. “Favorite” is a way to see whether one is involved in reading other’s postings. We use  $(\text{number of status}+1) / (\text{number of follower}+1)$  to represent the degree of influencing power, and  $(\text{number of favorite}+1) / (\text{number of following}+1)$  to represent the degree of being influenced.

Twitter is devoted to disseminating information from followers to followings. In other words, Twitter is a network of “who listens to whom.” In several previous works, influencers are defined as individuals who would impact the spread of information (Bakshy et al. 2011; Weimann 1994). In this vein, being a follower is

to be influenced and being a following is to influence others. Thus, people are both influencers and the influenced in Twitter. If the influencing power is profound, people are more likely to affect their followers. Considering one's own the influencing power, a participant might modify his behavior because the self-social identification leads to activities that are congruent with the identity (Ashforth and Mael 1989). In line with this reasoning, in social media, a person is more likely to reduce potential negative presentation and enhance his positive image in order to achieve and keep his social identification as a powerful influencer. Since a user may express both positive feelings and negative emotions related to envy within the same message, we hypothesize that the degree of influencing power would differentiate the intensity of malicious envy and benign envy.

***Hypothesis 3. The degree of influencing power*** would differentiate the degree of malicious envy and benign envy. In terms of malicious envy, a user who holds a higher degree of influencing power would be more likely to express a lower level of malicious envy; in terms of benign envy, a user who holds a higher degree of influencing power would be more likely to express a higher level of benign envy.

In addition to the degree of influencing power, people are also influenced by others. As discussed, a large study in Twitter reveals that the majority of users act as passive information consumers and do not forward the content to the network (Romero et al. 2011). In other words, many users browse others' tweets and "favourite" others' messages but do not generate their own content. The more one

is exposed to others content, especially positive information, the more probable that one gets lost in an upward comparison setting. It is concluded that passive usage is correlated to malicious envy (Krasnova et al. 2013; Tandoc et al. 2015). If one is surrounded by an intensive amount of content from superior others, he is captured by self-deficiency, frustration, and other depressed feelings, therefore, very intense malicious envy he could result. We argue that, being influenced might be unavoidable. However, if the influencing power from others is not that strong, one's own esteem can still overcome the negative influences, then, benign envy is the result. The lower the external influencing power is, the more possible that one is motivated by his own inner confidence to achieve a better performance. Therefore, we develop the fourth hypothesis as follow.

***Hypothesis 4. The degree of being influenced*** would differentiate the degree of malicious envy and benign envy. In terms of malicious envy, a user who is intensively influenced would be more likely to express a higher level of malicious envy; in terms of benign envy, a user who is intensively influenced would be more likely to express a lower level of benign envy.

#### **4.5.1 Study 2 Results**

In order to test the first two hypotheses, we used binary logistic regression to run a model.

Logistic regression is used to predict a binary response based on one or more predictor variables (features) by estimating probabilities. In other words, binary regression is to model the conditional probability  $\Pr(Y = 1|X = x)$  as a function of  $x$ .

$$F(x) = \frac{1}{1+e^{-(\beta_0+\beta_1X)}}$$

In the current situation, binary logistic regression is used to predict whether an envy tweet is malicious or benign based on the usage factors (the degree of proactive social connection and the degree of passive engagement). This estimates the probability that the envy tweet is malicious (or benign), given the linear combination of the two usage factors as predictors. Therefore, the result ranges from 0 to 1. Results are shown in Table 4.2.

	Estimate	Exp (Coef)
<b>Intercept</b>	0.23986 ***	1.2710741
<b>degree of proactive social connection</b> (# of followings+1)/ (# of followers+1)	-0.03107	0.9694093
<b>degree of passive engagement</b> (# of favorites+1) / (# of status+1)	0.38546 ***	1.4702898
Significance: p<.0001 ***; p<.001 **; p<0.01 *		

Table 4. 2 Result for H1 and H2

0.23986 is the intercept from the linear regression, -0.03107 is the regression coefficient of degree of proactive social connection, and 0.38546 is the regression coefficient of degree of passive engagement. Note that the intercept and the coefficient for degree of proactive social connection are significant. Therefore, the effects of degree of proactive connection are verified.

In order to enhance understanding, we further consider the odds ratio (OR), which evaluates whether the odds of certain event or outcome is the same for two groups. The formula of OR is as follows:

$$OR = \frac{\text{odds}(x+1)}{\text{odds}(x)} = \frac{\frac{F(x+1)}{1-F(x+1)}}{\frac{F(x)}{1-F(x)}} = e^{\beta_0 + \beta_1(x+1)} / e^{\beta_0 + \beta_1(x)} = e^{\beta_1}$$

As shown in the table, the degree of passive engagement is significant for differentiating envy. With 1 unit increase in (number of favourites+1)/ (number of statuses+1), the relative risk of posting benign envy tweets compared to malicious envy tweets is increased by 47%. In other words, holding the number of status updates constant, if the number of favourites doubles, the envy has 47% increased odds to be malicious instead of being benign.

In summary, hypothesis 1 is not supported and hypothesis 2 is supported.

In order to test the hypothesis 3 and hypothesis 4, we specify positive scores and negative scores, respectively. The positive scores range from 1 to 5. 5 indicates the strongest positive sentiment in the tweet and 1 indicates the weakest positive sentiment. Similarly, negative scores range from -1 to -5, and -5 means the most negative sentiment while -1 indicates the lowest degree of negativity. For example, while the negative score of sentence “I envy @ElliottHarris87! I am gonna live on the road with that mother\*\*\*\*\*!!!!” is the -5, that of “I envy everyone who can do winged eyeliner and it actually looks good” is -1. It is because the first sentence delivers more intense negative sentiment than the second one. All the negative sentiment scores are calculated among the collected tweets are calculated. The scores are integers of -1, -2, -3, -4, and -5.

Figure 5.4 shows the distribution of 5 negative scores among all the tweets. As shown, scores with -1 accounts of the largest portion, followed by score with -2, -3, and -4. Compared to others, the portion of score with -5, the most negative

sentiment of tweets is really small. Figure 4 also illustrates the distribution of positive scores for positive sentiment, the largest part of envy tweets containing 1 scores, followed by 2, 3 and 4. The smallest portion is tweets with 5 (the most positive sentiment). We considering all the 10 scores (from -1 to 5) are too detailed to gain a general and summarized understanding. Therefore, we subjectively divide positive scores and negative scores into two groups to represent higher and lower levels of malicious and benign envy. Since -1 and -2 account two of the largest portions in negative scores distribution, we group them together as lower negative group, the other three (-3, -4, -5) are grouped as higher negative group. Similarly, 1 and 2 are grouped as lower positive; 3, 4, and 5 are grouped as higher positive.

<b>Scores</b>	<b>Conceptualized group</b>
-1, -2, or -3	Lower level of malicious envy
-4 or -5	Higher level of malicious envy
1, 2, or 3	Lower level of benign envy
4 or 5	Higher level of benign envy

Table 4. 3 Conceptualized Group Divisions



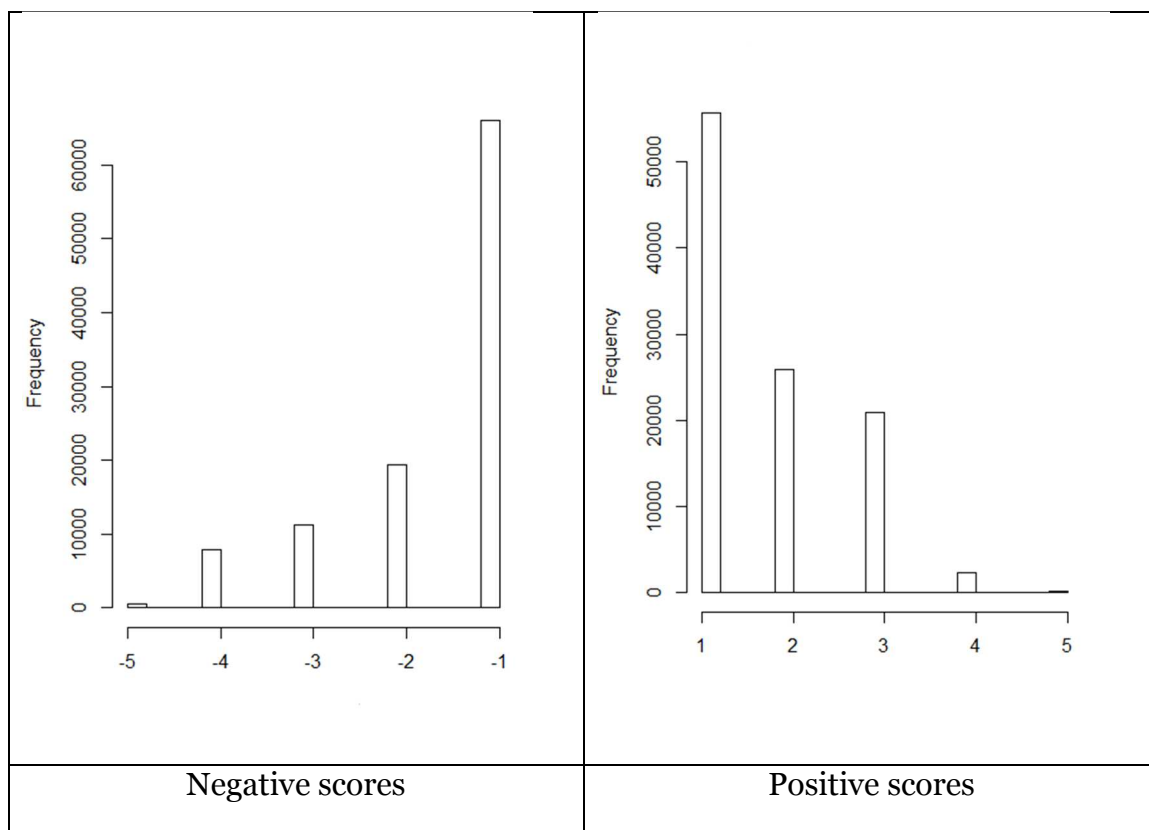


Figure 4. 4 Distribution of Negative and Positive Scores of Envy Tweets

For hypothesis 3, which is focused on malicious envy, the two groups of malicious envy are used as dependent variables. The degree of influencing power and the degree of being influenced are independent variables. By modeling with binary logistic regression, we obtain the following results:

	Estimate	Exp (Coef)
<b>Intercept</b>	1.529800 ***	4.617252
<b>The degree of influencing power</b> (# of status+1)/ (# of followers+1)	0.376613 ***	1.457340
<b>The degree of being influenced</b> (# of favorites+1)/ (# of followings+1)	0.055728	1.057310
Significance: p<.0001 ***; p<.001 **; p<0.01 *		

Table 4. 4 Results for H3

1.529800 is the intercept from the linear regression, 0.376613 is the regression coefficient of degree of influencing power, and 0.055728 is the regression coefficient of degree of being influenced. Note that the intercept and the coefficient for the degree of influencing power are significant. Therefore, the effects of degree of influencing power are verified.

In order to enhance understanding, we further consider the odds ratio (OR=1.457), which evaluates whether the odds of higher levels malicious envy or lower levels of malicious envy is the same for changes on the degree of influencing power. To be specific, with 1 unit increase in (number of statuses+1)/(number of follower+1), we expect to see about a 46% increase in the odds of being mild malicious envy rather than strong malicious envy. In other words, holding number of followers constant, if the user posts double the amount of statuses, the malicious envy expressed within the tweet has a 46% chance to be mild instead of strong.

Then, since hypothesis 4 is focused on benign envy, we use similar method to test the effects of the degree of influencing power and the degree of being influenced on benign envy. The two groups of benign envy is dependent variable. The results are shown as in the figure below (Table 4.5).

	Estimate	Exp (Coef)
<b>Intercept</b>	-3.02387 ***	0.0486129
<b>The degree of influencing power</b> (# of status+1)/ (# of followers+1)	0.39072 ***	1.4780453
<b>The degree of being influenced</b> (# of favorites+1)/ (# of followings+1)	-0.01618	0.9839505
Significance: p<.0001 ***; p<.001 **; p<0.01 *		

Table 4. 5 Results for H4

-3.02387 is the intercept from the linear regression, 0.39072 is the regression coefficient of degree of influencing power, and -0.01618 is the regression coefficient of degree of being influenced. Note that the intercept and the coefficient for the degree of influencing power are significant. Therefore, the effects of degree of influencing power are verified.

In order to enhance understanding, we further consider the odds ratio (OR=1.478), which evaluates whether the odds of higher levels malicious envy or lower levels of malicious envy is the same for changes on the degree of influencing power.

According to the result, the degree of influencing power is significant for differentiating mild benign envy and strong benign envy, while the degree of being influenced is not a significant factor, again. To be specific, with 1 unit increase in (number of statuses+1)/ (number of follower+1), we expect to see about a 48% increase in the odds of being strong benign envy rather than mild. In other words, holding number of followers constant, if the user posts double the

amount of status, the benign envy expressed within the tweet has a 48% increased chance to be strong instead of being mild.

As a result, the degree of influencing power is a significant factor for differentiating different levels of both malicious envy and benign envy.

Hypothesis 3 is verified. However, the degree of being influenced is not a significant factor, thus hypothesis 4 is not supported.

In summary, in study 2, hypothesis 1 and hypothesis 4 are not supported, but hypothesis 2 and hypothesis 3 are verified (Table 4.6).

<b>Hypotheses</b>	<b>Results</b>
<b><i>Hypothesis 1. The degree of proactive social connections</i></b> exerts different influences on malicious envy and benign envy. In detail, a user who proactively follows less people and is followed by more others is more likely to express benign envy; a user who proactively follows more people and is followed by fewer people is more likely to express malicious envy.	Not supported
<b><i>Hypothesis 2. The degree of passive engagement</i></b> exerts different influences on malicious envy and benign envy. In detail, a user who “favorites” more and posts less is more likely to experience malicious envy; a user who “favourites” less and posts more is more likely to experience benign envy.	Supported (p<.0001)
<b><i>Hypothesis 3. The degree of influencing power</i></b> would differentiate the degree of malicious envy and benign envy. In detail, in terms of malicious envy, a user who holds a higher degree of influencing power would be more likely to express a lower level of malicious envy; in terms of benign envy, a user who holds a higher degree of influencing power would be more likely to express a higher level of benign envy.	Supported (p<.0001)
<b><i>Hypothesis 4. The degree of being influenced</i></b> would differentiate the degree of malicious envy and benign envy. In detail, in terms of malicious envy, a user who is intensively influenced would be more likely to express a higher level of malicious envy; in terms of benign envy, a user who is intensively influenced would be more likely to express a lower level of benign envy.	Not supported

Table 4. 6 Hypotheses Summary

## 4.6 Discussion

Previous social psychology work provides valuable resources and insights to investigate, analyze, and conceptualize envy. However, it could be difficult to translate these ideas into an IT context, especially to the online social media environment. This current work consisted of two studies. In study 1, we examined the different patterns of the two types of envy. In study 2, we answered the question of how online social behaviors impact and generate envy, malicious and benign. In the following sections, we discuss why online social behavior is important for experiencing different types of envy online. The purpose is not only to connect the classic envy theory with the IT context but also to deepen the understanding with our current findings.

van de Ven et al. (2009) and Lange and Crusius (2014) argued that there are two types of envy. Malicious envy is the vicious form, aiming at derogating others. Another kind is benign envy, which increases the desire to enhance oneself without hostile feelings toward the envied person. However, considering the negative effects of malicious envy, the focus of previous (offline) research was on vulnerability, distress, and consequences of the experiences related to malicious envy. Recently, IT researchers also connect malicious envy with the online environment to achieve insightful implications. However, benign attracts less attention. According to the literature, we contend benign envy could also exert an impact in IT usage and it shouldn't be ignored because of its positive potential. For example, when one experiences benign envy, one would be more likely to know others' information and learn from their experience to enhance one's own

knowledge. This would lead to proactive interaction on social media, which increases the system usage (Wu and Srite 2014).

In the current work, we investigate envy in one of the most popular social media platforms: Twitter. Considering people are posting all kinds of positive information to perfect their image, when others view these messages online, they could conduct social comparisons with themselves and arouse potent envy.

We abstracted envy-related tweets from Twitter based on the premise that people disclose their envy on social media. In the first study, we scrutinized the different patterns of the two types of envy. The benign envy tweets were much longer, less understandable, and more subjective than malicious envy tweets (study 1). These observations are consistent with previous envy research. Longer tweets indicate that the messages are containing more content. It might be because benign envious are more likely to depict others' superiority and look for doable methods to improve their self-position. Also, as benign envy is characterized as being more subjective than malicious envy, we found that compared to benign tweets, dirty words, curses, and other extremely emotional sentences are more common in malicious envy tweets. It is not difficult to consider that, benign envious focus on the potential improvement to their self. They want to avoid being hostile to others, so they use positive subjective words to express their admiration and are complimentary towards others. Malicious envious are supposed to hold hostility and aggression toward whoever threatens their ego, however, when they have a chance to release these negative emotions, they narrate and justify by wording to explain why the envied person is undeserved. This might be the reason why benign envy tweets are more subjective than malicious envy tweets.

While the findings in study 1 are consistent with previous envy research that malicious envy and benign envy are characterized by somewhat opposite features, one of the more insightful implications of study 1 is to clearly indicate that different types of envy have distinct patterns when represented on social media. Moreover, to our best knowledge, it is one of the very first studies that investigated both types of envy in an online environment.

Envy on SM is associated with passive usage, and these studies were based on survey-based methodology (Krasnova et al. 2013; Shea 2013; Tandoc et al. 2015). However, there was no realistic data support for this findings. Rather, we should look to users' usage behaviors in detail to explain and justify previous notions.

Therefore, in study 2, we conceptualized four factors: the degree of proactive social connection, degree of passive engagement, the impact of being influenced, and the impact of influencing power by considering both the online connections and behaviors. Then, we develop four hypotheses to justify the relationships between the four factors and envy tweeting behaviors. For hypothesis 1, we determined that in differentiating two types of envy, the degree of passive engagement is a significant factor, in other words, the more one clicks "favourite" on others' tweets and the less self-posting one does, malicious envy is more likely to be the result. However, benign envy is elicited if the user is more proactive.

The hypothesis 1 was supported by objective data and was consistent with previous findings. However, the degree of proactive social connection was not a significant factor to orient malicious envy or benign envy; hypothesis 2 was not verified. First, we feel that it might be because envy is more likely to occur among close friends, such as people share a lot similarities. Twitter, is an open social

media that one could connect with a large amount of strangers. Especially, if one has a number of followings as well as followers, it is difficult to develop a close relationship. This means the atmosphere of prospering envy is a little weaker. Second, we use summation of positive and negative sentiment scores to categorize different types of envy. In this case, both malicious and benign envy might coexist in the same tweet. Therefore, the real relationship between social connections and benign envy and malicious envy might not be disclosed by the polarized tweets.

We further investigate the power of social influencer and being influenced on benign envy and malicious envy within a single tweet. The power of social influencer is used to measure the average impact of one's postings on one's followers. And the power of being influenced is used to measure the impact of one's followings. Hypothesis 3 is supported: The power of influencing power is a significant factor to moderate the intensity of benign envy or malicious envy. This result is also somewhat consistent with previous studies that passive usage is linked to envy, but not to proactive participation. This hypothesis is just to test "active usage" on envy and concludes that there is not a relationship between "active usages" on envy. Hypothesis 3 is supported. The power of influencing is significant to enhance benign envy and also to lessen benign envy. When one clicks "favorite" more on one's followings' postings, if one holds malicious envy, the massive others' information could even exacerbate one's sense of inferiority and produce more negative reactions of self-doubt. When he feels even more disadvantaged, more intensive malicious envy is facilitated. If he holds benign envy initially, excessive exposure to the others' superiority will eliminate one's



own confidence to achieve better performance and weaken the self-enhancing strategies. Then, benign envy is weakened.

#### ***4.6.1 Implications for Theory***

The current work carries important contributions for theory. First, our findings stress that both types of envy coexist on social. Additionally, we summarize that their manifestations are distinct in terms of length, readability, and subjectivity. We are not just simply applying outcomes of psychological envy to the IT area, but provide more deep insights to show how they are presented in a social media context. Second, we investigate both malicious envy and also benign envy in the social media context. It is one of the very first attempts to conduct benign envy research. We reinforce that higher degrees of passive engagement will elicit malicious envy while lower degrees of passive engagement will lead to benign envy. This finding is especially important for IT researchers since we built a useful frame work to conduct envy work. Third, the method is creative. We rely on text mining techniques to analyze a large amount of real data, not survey-based subjective responses. This provides a much stronger authority and reliability compared to extant work. Our method shows how IT researchers could take this opportunity to access more data and achieve insightful findings.

#### ***4.6.2 Implications for Practice***

For practical implications, our findings reflect the real phenomena on social media. IT practitioners need to understand how online envy is developed. It is not only influential for their IT usage and satisfaction, but also related to the dark side of social media. It is widely acknowledged that envy would impact human's

sense of well-being. With our findings, especially the patterns of envy messages, IT practitioners could detect, analyze, and predict different types of envy. Then, they could target several malicious enviers and benign enviers for further actions, such as filtering envy-eliciting content or providing self-enhancing learning advertisements. Second, the degree of passive engagement and the power of influencing are found to exert different impacts on both malicious envy and benign envy. IT managers might want to think about how to reduce the degree of passive engagement since it is important for generating both malicious envy and benign envy. For example, they could provide awards to encourage proactive participation. Also, the power of influencing is important to lessen malicious envy or strengthen benign envy. They might also need to figure out some way to regulate the power of influencing power. For example, they may provide noticeable figures to let the users know their influencing power. Also, they might advertise to those people who post a lot and provide opportunities and strategies to have them attract more followers. Third, our research provides an example to connect social media and academic research. The findings are beneficial for both sides. This encourages IT organizations to collaborate and support academic purpose.

#### **4.7 Limitation and Future Directions**

As with any other work, there were a few limitation in the current research, which also prints out several future directions.

First, the objective methods do have provide more strength than subjective method as discussed previously. However, envy is context dependent (Schoeck

1969; Smith and Kim 2007). In the current work, we only collected individual tweets, without considering the context. Envy might be involved in personal interactions and conversations, especially among strong-tie relationships. Future efforts should as well as capture online conversations and other interaction contexts to enhance understanding.

Second, longitudinal studies that examine how the impact of envy evolves with respect to future behaviors would provide additional insights into the phenomenon. Envy would elicit destructive or constructive emotions and behaviors, and sometimes the consequences might be time delay. Future research can engage in observation of the subsequent results. For example, although envy might not immediately change behaviors, but have a long tail effect. This kind of research would improve and develop envy understandings.

Finally, in the current work, we abstracted a large amount of tweets with envy keyword. However, envy might not be described overtly, and it might be discovered by subtle behavioral patterns, such as ironic remarks or satirical terms. These could be challenges but need to be considered. Future work could explore more specific textual patterns. This would provide more method innovations and insightful implications.

#### **4.8 Conclusions**

Although envy has been an interesting topic in the social psychological area for a long time, it is relatively new and attracting more and more attention from the IT area. Considering the difficulty of collecting objective data, IT researchers usually rely on traditional subjective survey-based methods to conduct envy research,

which might not be reliable or authentic. In the current work, we develop two studies to investigate both malicious envy and benign envy in a social media context using text mining and regression techniques. Our findings provide insightful theoretical and practical implications. On a singular conclusion: both malicious envy and benign envy coexist on social media. Different types of envy are initiated and moderated by users' usage.

## Chapter 5. Summary

This dissertation focused on the effects of social media envy on human behaviors. We developed three chapters regarding this topic. Each chapter is related to others but targets different research questions. Chapter 2 determined that viewing positive information on social media can elicit both malicious envy and benign envy, and that they have distinct effects on consequent usage intention. In chapter 3, we found that espoused national cultural values influence social media envy, especially benign envy. Finally, in chapter 4, we determined that the two types of envy manifest with specific patterns. Also, we showed that textual analysis techniques can benefit for IT behavior research. Each chapter is summarized in paragraphs that follow.

Chapter 1. Envy and how it can influence SNS intentions to use is the starting point of the current dissertation. SM has grown to be a widely acknowledged current technology, providing a series of services for their users. People like to spend their time on SM, exploring a variety of information to acquire knowledge, connect with friends, track the latest news, and so on. The most popular types of information shared on SM are the positive aspects about the users' personal lives (Chou and Edge 2012). However, viewing others' positive information can lead to envy. However, envy has not received significant attention in the information systems (IS) literature. Will envious users be inspired to be better themselves and catch up with others, or will they feel bad and just quit their SM usage? Chapter 2 is to address this research question.

We first provided an envy related literature review. It concluded that envy is a pattern of thoughts, emotions, and behaviors that result from an upward social comparison. Also, there are two types of envy: malicious and benign. Malicious envy is a destructive form that is describing a situation that a person is experiencing a feeling of inferiority emerges and the person hopes to derogate the envied person. Benign envy is regarded as a non-malicious form, aiming at improve one's own situation.

Based on the envy literature, we develop a research model to illustrate that when people access their connections on SM, they learn of others' positive information. They could then conduct a form of social comparison between themselves and the others. If the comparison is upward, malicious envy and/or benign envy could be elicited. Then, the two types of envy could impact their perceived enjoyment and perceived enhancement, which in turn are related to intention to use.

Then, a survey was designed. We also abstracted some envy-eliciting pictures and messages from Twitter and Facebook to make a multimedia presentation. The purpose was to recall subjects' real envy experiences on social media. Based on their own experiences, they took the survey with envy related items.

As a result, we collected 160 usable responses for Twitter and 226 responses for Facebook. By comparing the results between these two contexts, we found that there indeed existed malicious envy and benign envy on social media. However, malicious envy was not a significant factor. Compared with malicious envy, benign envy was a significant and positive influencer for social media usage.

As a beginning of my dissertation, in chapter 2, we developed a theoretical framework that elaborates the mechanism through which online envy is generated and influences SNS usage. Empirical data analysis revealed that online envy could exert an impact on intentions to use; especially, benign envy, which is positively associated with SM usage. The most interesting insight of the study is that, contrary to common thinking, regarding the destructive potential of envy, it is possible to turn envy into something good. The findings can help IS providers to better understand user behaviors and adjust their online marketing strategies.

However, there are several questions that haven't been solved. First, the research context in chapter 2 is Facebook and Twitter. Although the research model is verified well in the current context, whether we can draw a similar conclusions to the general social media environment is still a question. Also, since we specify that benign envy is especially interesting for social media usage, predictors of benign envy should be taken into consideration.

In order to attain a better understanding of envy on the social media environment, we further developed chapter 3: Benign Envy, Social Media, and Culture.

Envy, universally exists in human society and it is culturally dependent. Chapter 2 found that benign envy was a more salient factor for IS usage. However, there were no extant studies investigating the cultural effects on envy in IS. To address this gap, we utilized individual-level national culture (regarded as espoused national culture), to explore the effects of envy on SM usage. The research question is: Does online benign envy influence the continuance use intention of

social media, and if so, how could different espoused national cultural values affect this relationship?

In chapter 3, we first review prior work on which the theoretical foundation is grounded, including envy-related literature and culture studies. Culture represents humanity's value systems, and it identifies what is important for people. It is possible that envy is more likely to be initiated in a certain environment among a specific group of people.

Although culture can be viewed from different levels, such as national, regional, ethnic, religious, linguistic, gender, generation, social class, organizational, and work group levels, however, when talking about individual culture, the term "individual" does not represent a cultural layer; instead, it is a product of multiple cultural layers. The interaction of all layers of culture exerts a powerful influence on individuals' subsequent actions and behaviors. That is why researchers use the term "espoused national cultural values" to define culture at the individual level.

We consider that espoused national cultural values could be closely related to online benign envy. Four of Hofstede's five espoused national culture dimensions were used, including individualism/collectivism, uncertainty avoidance, power distance, and masculinity/femininity. We then developed a research model that integrates espoused national cultural values into a benign envy SM use model.

We use a similar method as in chapter 2 to collect data. This time, we rephrased the survey questions to generalize the context as general social media. Also, we



added espoused national cultural values items to investigate the subjects' culture-based background.

As a result, we collected 428 usable responses. We determined that benign envy is existing in the general SM context. Moreover, different espoused national cultures worked as independent and moderating variables along with the envy procedures. People who held different levels of culture behave distinctly--people who espoused a greater level of collectivism would be more likely to exhibit upward social comparisons; people who espoused higher levels of uncertainty avoidance cultures would be more likely to experience benign envy; and the relationship between perceived enhancement and use intention was stronger for individuals with higher levels of espoused masculinity.

Chapter 3 particularly investigated benign envy in the IS environment and provided a theoretical framework to illustrate how espoused national cultures influence SM usage through benign envy. For empirical implications, IS designers would take advantage of espoused national cultures to engage online users and enhance use intentions.

The first two essays were all based on self-report responses. However, the method might be problematic, especially for investigating malicious envy. Note that malicious envy is not verified as a significant factor on IS usage in chapter 2. However, it is probably due to the fact that subjects were reluctant to admit this painful feeling and therefore disguised their true responses. Also, although we determined that different types of envy influenced online behaviors, we were not

sure how the two types of envy manifest on social media. There is a need to obtain real data regarding this concern.

In chapter 4, we collected 104,882 envy-related tweets from Twitter and classified them into two types of envy relying on textual sentiment analysis (positive to negative). Based on the data set, we first identified different patterns of online envy in study 1. In study 2, by using logistic regression, the impacts of certain social media usage behaviors were tested on differentiating online envy.

In study 1, we found that 1) envy tweets can be differentiated by sentiment analysis. 2) Malicious envy and benign envy were manifested into different patterns: benign envy tweets were longer than the malicious ones; benign envy required more effort to understand and more emotion was described in benign envy tweets compared with the malicious tweets.

In study 2, we investigated the impact of social usage media on envy. By analyzing real data with logistic regression, we determined that the degree of passive engagement exerted different influences on malicious envy and benign envy. In detail, while a user who “favorites” more and posts less is more likely to experience malicious envy; a user who “favorites” less and posts more is more likely to experience benign envy; and the degree of influencing power would differentiate the degree of malicious envy and benign envy. In detail, in terms of malicious envy, a user who holds a higher degree of influencing power would be more likely to express a lower level of malicious envy; while in terms of benign envy, a user who holds a higher degree of influencing power would be more likely to express a higher level of benign envy.

Chapter 4 generated some important contributions for theory. First, our findings stressed that both types of envy coexist on social media. Additionally, we found that their manifestations were distinct in terms of length, readability, and subjectivity. In terms of practice, our findings reflected the real phenomena of social media. IT practitioners need to understand how online envy is developed. They could target several malicious enviers and benign enviers for further actions, such as filtering envy-eliciting content or providing self-enhancing learning advertisements. Moreover, we adopted text mining techniques to analyze a large amount of real data, not survey-based subjective responses. This provided a much stronger authority and reliability. Our method showed how IT researchers could take this opportunity to access more data and achieve insightful findings.

In conclusion, these three chapters are related to each other but provide levels of depth and specificity as in chapter progress. The two main purposes are to better understand envy in the social media context and to provide IT practitioners several implications to modify their strategies based on envy. The table below summarizes the findings of this whole dissertation.

		<b>Essay 1</b>	<b>Essay 2</b>	<b>Essay 3</b>
<b>Theory</b>		Envy literature & IT literature	Envy literature & culture	Envy literature & IT literature
<b>Methodology design</b>	<b># of Subjects</b>	386 (160 Twitter & 226 Facebook)	387	104,882 Tweets (25,927 malicious; 34,721 benign; 44,234 neutral)
	<b>Methodology</b>	Multimedia presentation & online survey	Multimedia presentation & online survey	Textual analysis
	<b>Analysis</b>	PLS-SEM	PLS-SEM	Sentiment analysis & Logistic Regression
<b>Results</b>		<b>H1.</b> (Upward) social comparison is positively related to online malicious envy. (supported)	<b>H1.</b> Individuals who espouse a higher level of collectivism will be more likely to exhibit an upward social comparison, and individuals who espouse a higher level of individualism will be less likely to exhibit an upward social comparison. (supported)	<b>H1.</b> The length of benign envy tweets is longer than malicious envy tweets. (supported)
		<b>H2.</b> (Upward) social comparison is positively related to online benign envy. (supported)	<b>H2.</b> Individuals who espouse a higher level of uncertainty avoidance values will be more likely to experience benign envy, and individuals who espouse a lower level of uncertainty avoidance values will be less likely to experience benign envy. (supported)	<b>H2.</b> The readability of benign envy tweets is more difficult than malicious envy tweets. (supported)
		<b>H3.</b> Perceived control is negatively related to online malicious envy. (supported)	<b>H3.</b> The relationship between perceived enjoyment and continuance use intention is moderated by the espoused national culture value of power distance such that the relationship is stronger for individuals with a higher espoused power distance value. (supported)	<b>H3.</b> The subjectivity of benign envy tweets is less than malicious envy tweets. (not supported)
		<b>H4.</b> Perceived deservingness is positively related to online benign envy. (supported)	<b>H4.</b> The relationship between perceived enhancement and SM continuance use intention is moderated by the espoused national culture value of masculinity/femininity such that the relationship is stronger for individuals with higher espoused	<b>H1.</b> The degree of proactive social connections exerts different influences on malicious envy and benign envy. A user who proactively follows fewer people and is followed by more others is more likely to express benign envy; a user who proactively follows more people and is followed by fewer people is more

		masculine culture values. (marginally supported)	likely to express malicious envy. (not supported)
	<b>H5.</b> Online malicious envy is negatively related to perceived enjoyment. (not supported)		<b>H2.</b> The degree of passive engagement exerts different influences on malicious envy and benign envy. A user who “favorites” more and posts less is more likely to experience malicious envy; a user who “favorites” less and posts more is more likely to experience benign envy. (supported)
	<b>H6.</b> Online benign envy is positively related to perceived enjoyment. (supported)		<b>H3.</b> The degree of influencing power would differentiate the degree of malicious envy and benign envy. In terms of malicious envy, a user who holds a higher degree of influencing power would be more likely to express a lower level of malicious envy; in terms of benign envy, a user who holds a higher degree of influencing power would be more likely to express a higher level of benign envy. (supported)
	<b>H7.</b> Online benign envy is positively related to self enhancement motivation. (supported)		<b>H4.</b> The degree of being influenced would differentiate the degree of malicious envy and benign envy. In terms of malicious envy, a user who is intensively influenced would be more likely to express a higher level of malicious envy; in terms of benign envy, a user who is intensively influenced would be more likely to express a lower level of benign envy. (not supported)
	<b>H8.</b> Perceived enjoyment is positively related to intention to use SNS. (supported)		
	<b>H9.</b> Self enhancement motivation is positively related to intention to use SNS. (supported)		
<b>Implications</b>	Identify two types of envy on social media. They have different impacts on system usage.	Confirm the effects of benign envy in the general social media context Identify that espoused national cultures play different roles during the envy development process.	Determine the different patterns of two types of envy on social media Identify the relationships between different usage and online envy

	IT practitioners need to enhance benign envy and reduce malicious envy.	IT practitioners would design different features to enhance benign envy and to value cultural potentials.	Provide a framework about how the textual analysis techniques help social behavior research Help IT managers to identify and discover envy online, which could help them to reshape business strategies.
<b>Future Direction</b>	Longitudinal research on social media envy. Identify implicit patterns of online envy. The relationship between online envy and off line behaviors.		

Table 5. 1 Dissertation Summary

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## Appendix

Constructs	Definitions (Adapted from reference)	Reference
Upward social comparison	It is defined as the degree to which a person believes that the others are superior and possess advantages, in an area she/he values.	Smith & Kim (2007)
Malicious envy	A type of envy that involves the unsavory motivation, aims at holding back the superior others.	van de Ven et al. (2012)
Benign envy	A type of envy free of ill-will or hostile feelings and aims at improving one's own situation.	Rawls (1999); van de Ven et al.(2012)
Perceived control	The degree to which one person believes that her/his ability or performance can control or impact the event.	Ajzen (1991); van de Ven et al. (2012)
Perceived deservingness	It is defined as whether the outcome for oneself or another is contingent on the situation: if there is a fit between the situation and the outcome it is deserved, else it is undeserved	Feather (1999); van de Ven et al. (2012)
Perceived enjoyment	The extent to which the activity of using a technology is perceived to be enjoyable in its own right.	Venkatesh (2000)
Perceived enhancement	It is defined as motive that refers to people's desire to enhance their self-positivity or decrease their negativity.	Sedikides & Strube (1995)
Intention to use	Intended use, it is an indication of an individual's readiness to perform a given behavior. It is assumed to be an immediate antecedent of behavior	Ajzen (2002)

Table A. 1 Constructs and Definitions

Construct	Item#	Item description	Reference
Social Comparison	OADV TG_2	They achieved more than me.	Self-developed
	OADV TG_3	They have more interesting pictures.	
	OADV TG_4	They are more popular than me.	
	OADV TG_5	They have a better life than me.	
	SDADV TG_2	I didn't achieve as much as my online connections.	
	SDADV TG_3	My pictures are not as pretty as my online connections.	
	SDADV TG_4	I am not as popular as my online connections	
	SDADV TG_5	I am not as happy as my online connections.	



Perceived Control	PCTR_1	The differences or gaps between the others and me are entirely up to me.	Ajzen (1991); 1991; van de Ven et al. (2012)
	PCTR_2	I (will) completely control the differences or gaps between others and me.	
	PCTR_3	I feel the differences or gaps between others and me in the future is under my control.	
Perceived Deservingness	PDSV_2	The others do quite deserve their wonderful life.	Feather (1999); van de Ven et al. (2012)
	PDSV_4	The differences or gaps in the outcomes are justified.	
Malicious Envy	MENVY_1	I want to pull down the online connections.	van de Ven et al. (2012)
	MENVY_2	I feel resentment towards the online connections.	
	MENVY_3	I think negatively about the online connections.	
	MENVY_4	I would like to comment negatively about the online connections.	
	MENVY_5	I would hope the online connections would fail in something.	
	MENVY_6	The experience felt frustrating.	
Benign Envy	BENVY_1	I am motivated to improve myself.	Rawls (1999); van de Ven et al. (2012)
	BENVY_2	I feel admiration for the online connections.	
	BENVY_3	I think positively about the online connections.	
	BENVY_4	I felt inspired by the online connections.	
	BENVY_5	I would try harder to achieve my goals.	
Perceived Enhancement	ITENHC_2	Using Twitter or Facebook helps me to be better.	Hepper, Sedikides, Cai, 2013 Sedikides and Strube (1995)
	ITENHC_3	Using Twitter or Facebook makes me to change, grow, and improve my self, and I will be as good as other online connections.	
	ITENHC_4	Twitter or Facebook experience motivates me to enhance myself.	
	ITENHC_5	Using Twitter or Facebook increases my motivations to work hard and reach my goal.	
Perceived Enjoyment	PENJ_1	Using Twitter or Facebook is enjoyable.	Venkatesh (2000)
	PENJ_2	Using Twitter or Facebook is exciting.	
	PENJ_3	Using Twitter or Facebook is pleasant.	
	PENJ_4	Using Twitter or Facebook is interesting.	
	PENJ_5	Using Twitter or Facebook is fun.	
Intention to Use	IU_1	I will continue to use Twitter or Facebook in the future.	Ajzen (2002)
	IU_2	I intend to use Twitter or Facebook.	
	IU_3	I intend to use Twitter or Facebook frequently in the future.	

Table A. 2 Constructs and Measurements

#	Author	Title	context	Theory	Findings	Envy type
1	Schaubroeck and Lam (2004)	Comparing Lots Before and After: Promotion Rejectees' Invidious Reactions to Promotees	work place	self-evaluation maintenance model; relative deprivation theory	Envy enhances job performance.	malicious
2	Smith, Parrott, Diener, Kim (1999)	Dispositional Envy	psychology	Social comparison. Envy involves self-inferiority and ill will	a single-factor dispositional envy scale is created to measure individual differences in tendencies to envy	malicious
3	Smith, Parrott (1993)	Distinguishing the experiences of envy and jealousy			In both experiments, envy was characterized by feelings of inferiority and longing; envy was also associated with disapproval. Jealousy, in both experiments, was characterized by anxiety, distrust, and fear of rejection or loss. In the second experiment, improved measures of hostility suggested that jealousy tends to produce justified anger, whereas envy tends to produce unsanctioned ill will.	malicious
4	Tesser and Collins (1988)	Emotion in social reflection and comparison situations: intuitive, systematic, and exploratory approaches	psychology	Self-evaluation maintenance	1, relevance (high/low) and closeness will moderate the effects of comparison (reflection) on emotions. In high relevance situation, outperformed others trigger comparison and negative emotions; low relevance situations, outperformed other triggers reflection and positive emotions	general
5	Helmut Schoeck (1969)	Envy: A theory of social behavior			The phenomenon described by the word "envy" is a fundamental psychological process which of necessity presupposes a social context: co-existence of two or more individuals.	general



6	Vecchio (1995)	Explorations in employee envy: feeling envious and feeling envied	work place	Self-evaluation maintenance	Being envied by others and feeling envy toward others are distinctly different experiences. Self-esteem was not correlated with being envied, while it was inversely correlated with feeling envy toward others. Leader-member exchange was not associated with being envied, while it was strongly associated with feeling envy toward others. In contrast, job longevity was associated with being envied, but was not correlated with feeling envy.	general
7	Niels van de Ven, Marcel Zeelenberg, and Rik Pieters (2009)	Leveling up and down, the experiences of benign and malicious envy	3 studies	Envy literature review	Experience of benign envy leads to a moving-up motivation aimed at improving one's own position, whereas the experience of malicious envy leads to a pulling-down motivation aimed at damaging the position of the superior other.	malicious and benign
8	Jerry Suls, Rene Martin, and Ladd Wheeler (2002)	Social Comparison: Why, With Whom, and With What Effect?		Theory of social comparison, attribution theory	Both upward and downward comparisons can have positive and negative effects.	
9	Peter Salovey and Judith Rodin (1984)	Some Antecedents and Consequences of Social-comparison Jealousy	undergraduate students	social-comparison jealousy; self-evaluation maintenance	consequences of comparisons: (a) a decreased closeness with others, (b) an interference with the performance of others, (c) an altering of one's self-definition (d) the degradation of the character of the rival	
10	Barry Richards (2000)	The Anatomy of Envy			literature review on daily envy, psychological envy, political envy and jealousy	general
11	Sarah E. Hill and Danielle J. DelPriore (2011)	The cognitive consequences of envy: Attention, memory, and self-regulatory depletion		Social functional framework	Envy has important consequences on cognitive process: attention and memory. Increased envy leads to increased memory of information about the targets. Women but not men envied more on the targets when the targets became more attractive. Envy eliciting-traits are somewhat sex differentiated.	
12	Maury Silver (1978)	The perception of envy		envy literature review		malicious and benign
13	Nancy L.Brigham; Kimberly A. Kelso; Mark A. Jackson and Richard H. Smith (1997)	The role of invidious comparison and deservingness in sympathy and schadenfreude	students	invidious comparison	Participants' envy enhanced schadenfreude regardless of deservingness of the misfortune. The manipulation of deservingness had no effect on schadenfreude. The effects of these variables on sympathy were different. Sympathy was greater when the student was average (vs. superior) and following an undeserved misfortune (vs. deserved), indicating that sympathy and schadenfreude are not simply opposites of each other.	

14	Michelle K. Duffy (2000)	The salieri syndrome consequences of envy in groups	work place	Envy literature review	Envy diminishes the overall group effectiveness. There is a great relationship between envy and social loafing.	malicious
15	Peter Salovey and Judith Rodin (1986)	The differentiation of social-comparison jealousy and romantic jealousy		social-comparison jealousy	Two kinds of jealousy lead to divergent emotional and cognitive experiences. Romantic jealousy is more intense than social-comparison jealousy. The differences of the two are more quantitative but not qualitative.	malicious
16	David Patient, Thomas B. Lawrence and Sally Maitlis (2003)	Understanding workplace envy through narrative fiction	workplace	social construction of emotions	Social construction of envy plays a paradoxical role in organizations, triggering individual action while at the same time reproducing the dominant organizational culture. Envy is likely to appear in organization narratives as a distinctive element in which the envious experience and express feelings of dejection and inferiority.	general
17	Hanna Krasnova, Helena Wenninger, Thomas Widjaja, and Peter Buxmann (2013)	Envy on Facebook: A hidden threat to users' life satisfaction	Facebook	SM literature review, social comparison	Envy is common in online context. It mediating the relationship between intensity of passive following and life satisfaction.	malicious
18	Niels van de Ven, Marcel Zeelenberg, and Rik Pieters (2012)	Appraisal patterns of envy and related emotions	social comparison emotions: admiration and resentment	appraisal theory	Deservingness is related to the type of envy. People in benign envy condition report more control than people in malicious condition. An upward social-comparison situation is deserved elicits benign envy, while one that is undeserved elicits malicious envy.	malicious and benign
19	Lorenz Graf (2010)	Conceptualizing envy for business research	literature review		four types of envy-related constructs are elicited: malicious envy, benign envy, spite, jealousy	malicious and benign
20	Evan Polman, Rachel L. Ruttan (2012)	Effects of anger, guilty, and envy on moral hypocrisy	moral hypocrisy		Envy (both benign and malicious) reverse moral hypocrisy.	malicious and benign
21	Omesh Johar	What makes envy hostile: perceived injustice, or a frustrated search for an explanation		Social comparison.	Fairness judgments mediated the link between procedural (un)fairness and envy (and related components).	malicious

22	Wilco W. van Dijk, Jaap W. Ouwerkerk, Sjoerd Goslinga, Myrke Nieweg, and Marcello Gallucci (2006)	When people fall from grace: Reconsidering the role of envy in schadenfreude			Envy predicts schadenfreude when people are confronted with the misfortune of a relevant social comparison other	malicious
23	Niels van de Ven, Marcel Zeelenberg, and Rik Pieters (2010)	Why envy outperforms admiration	academic study	social comparison	Experiencing benign envy after an upward comparison led to an intention to spend more hours studying in the upcoming semester, whereas admiration and malicious envy did not. Participants performed better on the RAT after they recalled being benignly envious than after they recalled admiring someone. Participants who were benignly envious worked longer on the RAT than did others, which leads to better performance.	benign
24	Niels van de Ven, Marcel Zeelenberg, and Rik Pieters (2009)	Leveling up and down, the experiences of benign and malicious envy	3 studies	Envy literature review	Experience of benign envy leads to a moving-up motivation aimed at improving one's own position, whereas the experience of malicious envy leads to a pulling-down motivation aimed at damaging the position of the superior other.	malicious and benign

Table A. 3 Literature

## Screenshots of multi-media presentation:

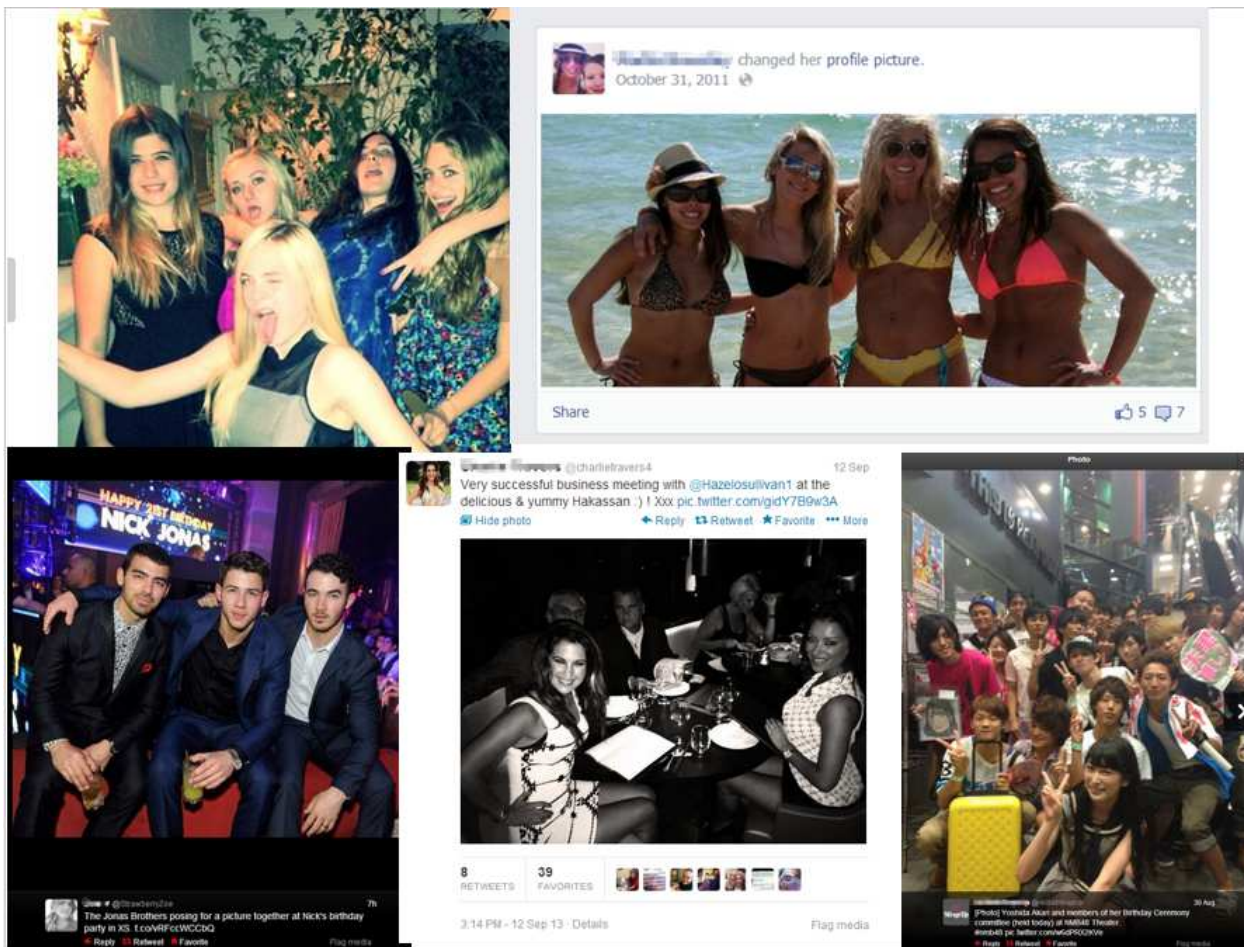


Figure A. 1 Examples of How People Share Their Happiness on SM



Figure A. 2 Postings of How People Announce Their Success and Accomplishment on SM



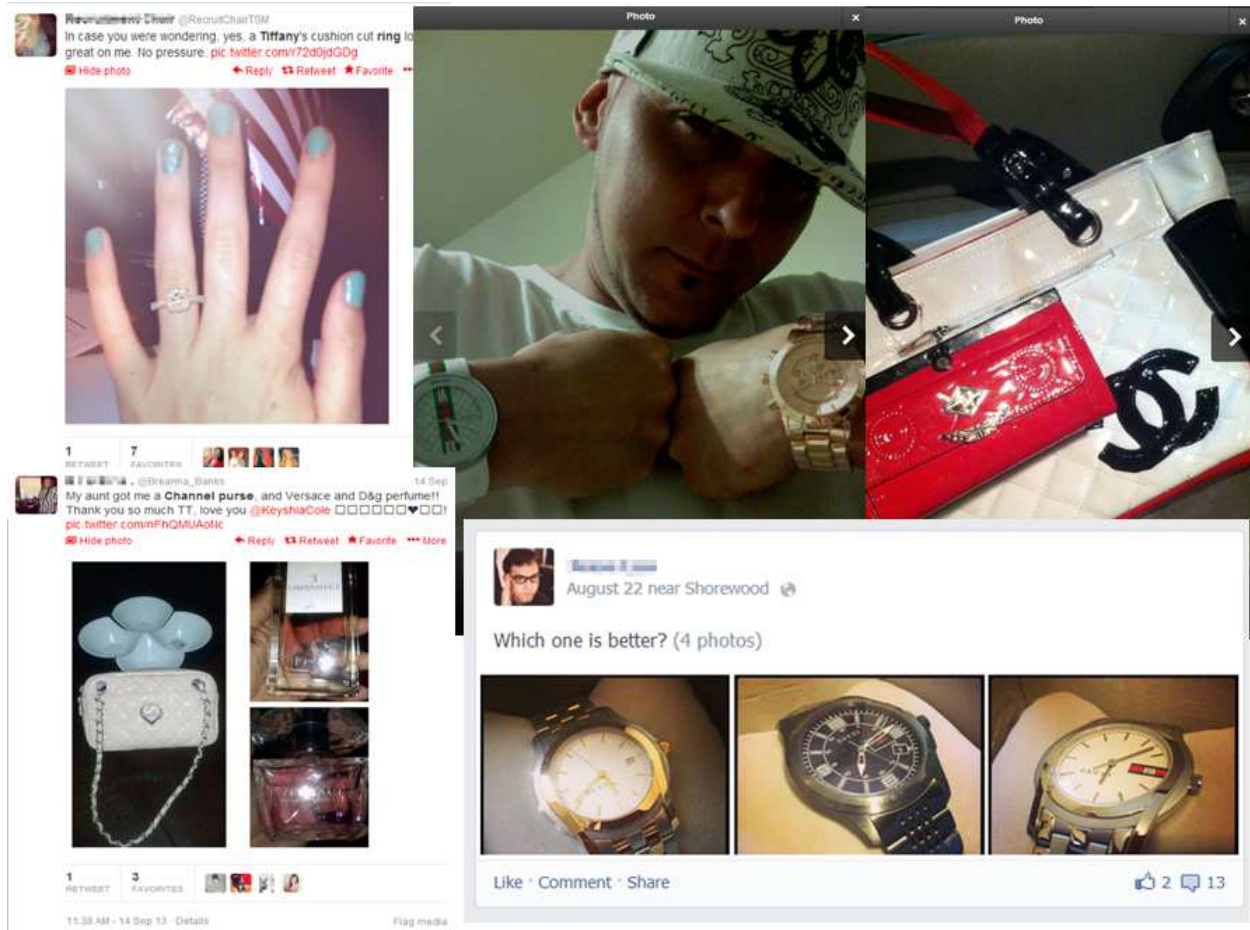


Figure A. 3 Postings of How People Show Their Luxury Products

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