

**Envy on Social Network Sites:
How Reading Friend's Posts Leads to (Benign) Envy
and Influences Purchase Intentions**

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Abstract

Seeing other's perfect lives as presented on Social Network Sites (SNSs) sometimes triggers envy, and previous researchers were worried about the negative impact of it on users' well-being. This dissertation examines if users are suffering ill effects from the consumption of SNS services and addresses the positive effects of envy on purchase intentions and consumer behavior. Two types of envy are distinguished: one is benign envy with a motivation of moving up, and the other is malicious envy with a motivation of pulling the envied person down. This dissertation investigates the prevalence of (benign and malicious) envy on SNSs, explored the impacts of tie strength (i.e., relationship closeness) and post content (experiential vs. material purchases) on envy and the impact of envy on purchase intentions. Eight studies, including surveys and experiments, were conducted using various samples (total $N = 1816$) in Western countries. The results showed that users only experienced a limited degree of envy and it was more likely to be benign envy rather than malicious envy. Benign envy was positively predicted by the tie strength but was independent of the post content. Furthermore, benign envy was positively associated with the purchase intention of the envied object. It was also found that consumers posted their experiential purchases more frequently than material purchases on SNSs; and most SNS users perceived experiential purchases as more self-relevant than material purchases, and hence more envy was triggered after reading posts about experiential purchases. This dissertation argues that, given that experiential purchases could bring people more happiness than material purchases, experiencing benign envy about other's experiential purchases is not necessarily a bad thing—it motivates people to work harder and pursuit the experiential purchases that could bring more happiness. Marketers can also utilize this emotion for better advertising (e.g., by showing the tourism-related ads to those who are benignly envious about friends' vacation experiences). This dissertation further contributes to the literature on the SNSs and well-

being, experiential and material purchases, envy, and consumer behavior. More details and the theoretical and practical implications for SNS users, marketers, platforms, and researchers are elaborated in this dissertation.

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1. Introduction

Social Network Sites (SNSs) such as Facebook have become a more and more important arena for marketing and advertising. Advertisers worldwide have spent 17.74 billion dollars in 2014 on SNS ads, and the expenditure is expected to be 35.98 billion dollars in 2017 (eMarketer, 2015). As estimated by eMarketer (2016), Facebook will receive more than two-thirds of social media advertising revenues worldwide in 2017. This is probably due to the huge amount of active users and the innovative nature of the platform. By the end of 2016, Facebook has 1.23 billion daily active users (Statista, 2016), and it was claimed to provide companies new ways of finding target audiences, creating awareness, earning consumer loyalty, and boosting sales (Facebook, 2017). However, marketers still think it is difficult to locate the right consumers (Stelzner, 2016), and users often reported negative attitudes toward sponsored advertising (Bannister, Kiefer, & Nellums, 2013).

Compared with the firm-generated content, the user-generated content could be more influential (Park & Moon, 2016; Schivinski & Dabrowski, 2015). On the one hand, most users browse Facebook for the purpose of keeping updated with their friends' lives, but not for the purpose of watching ads and posts from companies. On the other hand, users are empowered to share consumption-related content such as traveling experiences online. Such consumption-related information shared by a Facebook friend might be much relevant to individuals. It might trigger various emotional responses (Krasnova et al., 2015) and influence future purchase intention and behavior (Forbes & Vespoli, 2013).

Many researchers have investigated social media marketing (see a review in Alves, Fernandes, & Raposo, 2016) and examined the phenomenon of eWOM (electronic word of mouth) with a focus on the roles of argument quality and source credibility (Jalilvand, Esfahani, & Samiei, 2011). Most work in this realm was about the direct impacts of eWOM metrics (i.e., volume, valence, variances, etc.) and product characteristics on sales (Rosario,

Sotgiu, De Valck, & Bijmolt, 2016; You, Vadakkepatt, & Joshi, 2015). However, when investigating the impact of user-generated posts on consumer behavior, the emotion as a result of reading the user-generated posts should also play an important role.

The use of Facebook has made other's consumptions more publicly visible. For example, without Facebook, I may not be aware of that one of my old school friends recently went on vacation (an example of experiential purchases) or bought a new expensive phone (an example of material purchases). The emotional responses of seeing a friend's post could be very mixed. On the one hand, I may feel happy for the poster as she was one of my best friends in my high school; On the other hand, I might be a bit envious, as we used to share a similar background but now she has the experiences and things that I wish I could have. As a result, I may also be more attempted to book a trip or buy a new phone due to this envious emotion. Interesting questions can be raised: To what extent do users experience envy after reading others' posts? Under which conditions it is more likely to be triggered? How is envy influenced by the content of the post and the relationship with the poster? How does envy change the purchase intention of the envied object?

Researching these questions is not only important for SNS marketers, but also relevant for the SNS users and platform providers. Envy is reported to be one of the negative emotions that Facebook users are likely to experience (Krasnova, Wenninger, Widjaja, & Buxmann, 2013), and previous researchers were concerned about the negative effects of envy on users' well-being (Krasnova et al., 2015; Tandoc, Ferrucci, & Duffy, 2015). Furthermore, Facebook aims to show users the content that they care about and want to see (Facebook, 2014a). Investigating the predictors/antecedents of envy (e.g., the content of the post, the relationship with the poster) can help SNS providers such as Facebook to further improve their newsfeed display algorithm.

In addition, this dissertation claims that it is important to distinguish two different types of envy: one is benign envy with a motivation of moving up, and the other is malicious envy with a motivation of pulling the envied person down (van de Ven, Zeelenberg, & Pieters, 2009). As a result, benign envy can increase the willingness to pay for the envied object, but malicious envy cannot—it only increases the willingness to pay for a different product than the envied object (van de Ven, Zeelenberg, & Pieters, 2011). It is also important to know the prevalence of benign envy on SNSs, which motivates people to improve and acquire the things they desire.

In a nutshell, this dissertation focuses on the emotion of envy that is caused by reading other users' posts on SNSs (mainly Facebook). As indicated in the example above, this dissertation investigates the roles of the relationship with the poster (i.e., tie strength) and the content of the post (e.g., post about experiential or material purchases) in predicting envy. It further examines how different types of envy can influence different types of purchase intentions. It aims to help not only SNS marketers to do better advertising by utilizing the emotion of envy, but also SNS platforms to better understand if their users are suffering ill effects from the consumption of their services.

This dissertation is divided into four parts, including a literature review and three papers. The literature review provides a) background information on social media marketing and the impact of social media usage on consumer behavior, b) an overview of the psychological effects of SNS usage and a discussion on the mixed results, c) a short literature review on envy, its pre-conditions, and potential consequences, d) the concept of tie strength and how it influences envy, e) the distinction between material and experiential purchase and how it influences envy, and f) the effect of envy on purchase intention. The main purpose of this chapter is to offer relevant background knowledge, explain why these research questions

were chosen, and clarify the boundary situations of my dissertation. More literature review is included in each paper.

The first paper examines to what extent Facebook users feel happy and envious after browsing others' social news, and how tie strength can moderate one's emotional responses such as happiness and (benign and malicious) envy. Two studies were conducted in the first paper: one correlational study based on a sample of 207 American participants and another experimental study based on a sample of 194 German participants. Based on a multi-method approach, the results showed that positive emotions were more prevalent than negative emotions while browsing Facebook. Moreover, after reading a (positive) post on Facebook, the feelings of happiness and benign envy were positively associated with tie strength (i.e., relationship closeness with the poster), whereas malicious envy was independent of tie strength.

The second paper includes three studies using Dutch and American samples (total N = 798). It investigates which purchase type as shared on Facebook is more likely to trigger envy and its underlying process. It mainly focuses on the comparison between the posts about experiential purchases (i.e., other's life experiences such as travel and leisure activities, etc.) and material purchases (i.e., other's material possessions such as clothes, jewelry, digital gadgets, etc.). It was consistently found that experiential purchases were more likely to trigger envy than material purchases in three studies, when people looked at instances at their own Facebook News Feeds (Study 1), in a controlled scenario experiment (Study 2), and in a general survey (Study 3). This was because experiential purchases were more self-relevant than material purchases; and consumers also shared experiential purchases more frequently than material purchases on Facebook.

The third paper further investigates how posts about experiential and material purchases on social media could trigger benign and malicious envy and further influence purchase

intentions. Based on three studies (total N = 617), with two studies asking participants to recall an envy-triggering situation on social media and one study using mocked-up stimuli, I replicated findings that benign envy drives people to buy the same envied purchase but malicious envy drives people to buy something different. Social media users were more likely to experience benign envy instead of malicious envy, and the envied object was more often about other's experiential purchases. However, purchase type was not a significant predictor of the envy type; but it was found that posts about material purchases and phrased in a material way are more likely to be perceived as showing off and therefore triggers more malicious envy (than posts about experiential purchases or phrased in an experiential way).

In sum, this dissertation investigates to what extent the consumption of SNS content triggers envy, examines the predictors of benign and malicious envy, and addresses the positive effects of envy on purchase intentions (see a summary of research models in Appendix A). The results show that 1) social network users only experience a limited degree of envy, 2) social network users are more likely to share experiential purchases than material purchases online, and hence most of the envied objects on SNSs are about experiential purchases rather than material purchases, 3) most of the envious experiences on SNSs are actually benign envy, 4) benign envy is positively predicted by tie strength, while malicious envy is predicted by dispositional envy and the perceived intention of showing off, and, more importantly, 5) benign envy is likely to increase the purchase intention of the envied object. As experiential purchases can bring people more happiness (Gilovich, Kumar, & Jampol, 2015), being benignly envious about other's vacation experience might also increase the purchase intention of such a vacation and later bring more happiness. Marketers can also utilize this negative emotion of envy to do better advertising. These are the "unexpected" benefits of envy for social media users, platform providers, and marketers.

2. Literature Review and Background

Social media and consumer behavior

The term “social media” is defined in Oxford English Dictionary as “websites and applications that enable users to create and share content or to participate in social networking”. It is an umbrella term that covers not only the Social Network Sites (e.g., Facebook) (Boyd & Ellison, 2007), but also services such as content-sharing sites (e.g., YouTube), blogs (e.g., WordPress), microblogs (e.g., Twitter), and online review sites (e.g., Yelp), etc. (Kaplan & Haenlein, 2010). However, most researchers and marketers mainly focus on Facebook when they think of social media: Over half of the social media studies (52%) conducted in the past decade was about Facebook (Stoycheff, Liu, Wibowo, & Nanni, 2017), and more than two-thirds of social media advertising revenue goes to Facebook platform (eMarketer, 2016). With regard to the term of “consumer”, it refers to individuals who are not only the social media users (Heinonen, 2011) but also the potential customers of products and services that were advertised or mentioned on social media.

Billions of consumers are using social media to check up what is going on and what is popular around them. Therefore, more and more merchants and marketers are trying to sell and advertise their products and services on social media. There were 93% of companies already use social media as a marketing tool in 2011 (Stelzner, 2011) and 38% of organizations planned to spend more than 20% of their total advertising budgets on social media channels in 2015 (Terpening, 2015). Most marketers (>75%) agreed that social media marketing helps to increase exposure and traffic; but locating and targeting ideal customers is still a big concern for marketers (86%) (Stelzner, 2016).

Consumers’ purchase intentions and their behavior can be influenced by various contents on social media (Alves et al., 2016), including firm-generated content (FGC) and user-generated content (UGC). FGC is defined as the “firm-initiated marketing

communication in its official social media pages” (Ashish Kumar, Bezawada, Rishika, Janakiraman, & Kannan, 2016). For example, on Facebook, companies can create a fan page, a profile, or a group to post information about their products and services (Ramsaran-Fowdar & Fowdar, 2013). In addition, various types of paid/sponsored ads are available on Facebook. Facebook claims that “advertising on Facebook makes it easy to find the right people, capture their attention and get results” (Facebook, 2017).

Some research showed that Facebook advertising is effective (Duffett, 2015; Yang, 2012), whereas others found that Facebook banner ads in the right column (sponsored advertising) were less eye-catching than friends’ recommendations embedded in the News Feeds (earned advertising) (Barreto, 2013), college students were likely to hold a negative or indifferent attitude toward Facebook advertising (Bannister et al., 2013), and 83% of Facebook users reported that they rarely or never click on Facebook ads (eMarketer, 2012).

Compared with FGC, brand-related UGC on social media seems to be more influential and credible (Park & Moon, 2016; Schivinski & Dabrowski, 2015). UGC refers to “media content created or produced by the general public rather than by paid professionals and primarily distributed on the Internet” (Daugherty, Eastin, & Bright, 2008). Because social media users trust their online contacts more than the sponsored ads (Nielsen, 2015), brand-related UGC is more likely to trigger emotional and cognitive responses, which further influence purchase behavior (A. J. Kim & Johnson, 2016).

Brand-related UGC can be shared in a form of electronic word of mouth (eWOM): Users can easily post positive or negative statements about a product or service to multiple others on social media (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004; Kietzmann & Canhoto, 2013). Many researchers have addressed the role of eWOM on social media in influencing consumer behavior (Erkan & Evans, 2016; Wang, Yu, & Wei, 2012; Zhang & Benyoucef, 2016), especially with a focus on argument quality and source credibility

(Jalilvand et al., 2011). However, it is also important to investigate the emotion of envy in this process: Different from e-commerce and review platforms, on social media platforms, most users just mention a product or service for the purpose of sharing their joyful life moments—without a special focus on the evaluation of the product/service. When others read such UGC, the emotion of envy could be another potential reason to explain the increased level of purchase intention.

Hence, this dissertation will examine to what extent UGC on Facebook triggers envy, whether the content of the post and the relationship with the poster can predict envy, and how it changes purchase intention of the mentioned object. It can help marketers to understand how seeing other's purchase on SNSs changes consumer's emotions and therefore changes purchase intention, which is an important part of consumer behavior (Solomon, 2004). Despite this, the current dissertation also aims to offer SNS platform providers insight into the psychological consequences of using their services. An overview of the psychological effects of SNS usage is hence provided in the following section.

The psychological effects of SNS usage

Recently, many researchers have investigated the general psychological effects of using SNSs (mainly Facebook) on individual well-being, and both positive and negative effects were found (Verduyn, Ybarra, Résibois, Jonides, & Kross, 2017). On the one hand, based on both cross-sectional and longitudinal studies, researchers asserted the use of Facebook helped to develop and maintain social connectedness (Grieve, Indian, Witteveen, Tolan, & Marrington, 2013; Sheldon, Abad, & Hinsch, 2011), and found a positive relationship between intensity of Facebook use and life satisfaction (Valenzuela, Park, & Kee, 2009). On the other hand, other researchers showed that the use of Facebook caused a decrease in mood and predicted declines in the affect and life satisfaction over time (Kross et al., 2013; Sabatini & Sarracino, 2013; Sagioglou & Greitemeyer, 2014), and recent studies argued that the

negative effects of social network usage could probably be explained by envy, as a result of upward social comparison (Krasnova et al., 2013; Tandoc et al., 2015).

There are two main explanations for the mixed results. First, it is important to distinguish the specific social network activities (active vs. passive) when analyzing the psychological effect of social network usage (Burke, Marlow, & Lento, 2010; Krasnova et al., 2015; Verduyn et al., 2017). Active usage refers to broadcasting (e.g., posting, sharing, etc.) and directed interaction with contacts (e.g., commenting, liking, etc.) on SNSs, whereas passive usage refers to the mere consumption of contents (e.g., browsing News Feeds) (Davenport, Bergman, Bergman, & Fearington, 2014). Burke et al. (2010) indicated that passive consumption of the news on Facebook was associated with a higher level of loneliness, while directed communication was associated with less loneliness. Using an experimental design, große Deters and Mehl (2013) found that posting more status updates in one week reduced loneliness. Also, PEW report (2012) revealed that those Facebook users who posted more status updates received more emotional support. In sum, most previous research agreed that using SNSs in a communicative way can increase subjective well-being.

When it comes to the effects of passive SNS usage, no agreement has been reached. In my opinion, the usage time could be another important factor that explains the mixed results. Previous research has revealed that the more time individuals spent browsing Facebook, the more negative their mood was immediately afterward, and this was mediated by a feeling of not having done anything meaningful (Sagioglou & Greitemeyer, 2014). Users might experience the feelings of exhaustion and information overload when they browse social news continuously (Maier, Laumer, Eckhardt, & Weitzel, 2012). However, when it comes to short-time usage, users often feel pleasant and positively aroused while browsing Facebook (Mauri, Ciproso, Balgera, Villamira, & Riva, 2011; Wise et al., 2010). Therefore, more

negative emotions are experienced when users overuse SNSs and think the time spent on it is meaningless.

In addition, we also need to pay attention to the short-term vs. long-term psychological effect. Short-term effect refers to the momentary feelings that are measured during or immediately after the usage; but long-term effect focuses on the feelings that are generated or still being there (long) after the usage. For example, browsing Facebook can evoke momentary high arousal and pleasant feelings (Mauri et al., 2011), but sometimes it also triggers envy (Krasnova et al., 2013), and it is possible that the feeling of envy is slightly more long-lasting than the feeling of joyfulness. From a long-term perspective, it is also possible that users may regret what they have posted on Facebook (Moore & McElroy, 2012), or gain social support after regularly using SNSs (Steinfeld, Ellison, & Lampe, 2008).

SNS usage is a double-edged sword—it can lead to both positive and negative psychological effects. As browsing social network is the most common consumer activity (Verduyn et al., 2015), this dissertation (especially the first paper) will examine the momentary emotional outcomes of browsing SNSs, given that the users do not overuse it. The next section will focus on the emotion of envy, discussing how browsing SNSs could trigger (benign and malicious) envy, as well as the antecedents and consequences of envy.

Envy: the concept, antecedents, and consequences

Envy, a painful feeling caused by a good fortune of others, is one potential emotional outcome of browsing SNSs (Krasnova et al., 2013; Tandoc et al., 2015). SNSs have made the good fortune of others more visible to users, and it even creates a (positively) biased perception of others' lives (Chou & Edge, 2012). Social comparison theory proposed that people tend to compare with others in order to get diagnostic information for self-evaluation (Festinger, 1954). When one compares oneself unfavorably with others (upward social

comparison), the unpleasant feeling of envy can arise (Mussweiler, Rüter, & Epstude, 2004; Smith & Kim, 2007).

From an evolutionary perspective, although experiencing envy is painful, envy is an adaptive emotion that motivates actions to prevent future interference (Hill & Buss, 2010). Two types of envy are differentiated recently: *malicious envy* with a hostile and ill will, and *benign envy* with a force for motivation and emulation (Miceli & Castelfranchi, 2007; Smith & Kim, 2007). Malicious envy is also called as “envy proper” or “hostile envy”, which is the focus of scholarly attention; In contrast, the benign envy is a sanitized type of envy that is free of hostile meaning (Smith & Kim, 2007). Therefore, by definition, benign envy leads to a moving-up motivation (i.e., achieving the desired attribute by improving one’s own situation), and malicious envy leads to a pulling-down motivation (i.e., an intention to damage the position of the superior other) (van de Ven et al., 2009).

When it comes to antecedents of envy, Smith (2004) identified four pre-conditions: 1) being *similar* to the compared person, 2) perceiving the situation/comparison domain as *self-relevant*, 3) the desired object is hard to achieve (or *low perceived control*), and 4) the feeling that the person does not deserve the object (or one’s own inferior situation is perceived to be *undeserved*). The latter two factors were found to be the key appraisals that distinguished benign from malicious envy (van de Ven et al., 2009; van de Ven, Zeelenberg, & Pieters, 2012): Using self-reported incidents and content analysis, van de Ven et al. (2009) found that all four pre-conditions are the characteristics of malicious envy, but only the perceived similarity and the self-relevance are strong characteristics of benign envy.

Benign and malicious envy can also have different consequences (particularly in a consumer context). Envy causes people to attend more to information about superior performing peers (Hill, DelPriore, & Vaughan, 2011). Crusius & Lange (2014) found that malicious envy biased attention more toward envied persons than their advantages, while

benign envy was associated more with an attentional focus toward means to improve oneself. Based on different motivation associated with benign and malicious envy, van de Ven et al. (2011) also found that the experience of benign envy increased the willingness to pay for the same product as the envied person had, and malicious envy increased the willingness to pay for a related but different product.

Therefore, this dissertation will not only examine how and why browsing SNSs triggers envy in general, but also investigate which type of envy it is likely to be and what are the consequences of benign and malicious envy on purchase intentions. Especially, this dissertation will focus on two predictors including the relationship with the poster (i.e., tie strength ranging from strong tie to weak tie) and the content of the post (i.e., experiential vs. material purchases), and examine the purchase intentions of the envied object and a different object as a consequence. The concepts of these predictors and why they should matter are provided in the following paragraphs. More literature review on the relevant topics will be included in the three papers.

Influence of tie strength on envy

Tie strength was defined by Granovetter (1973) as “a combination of the amount of time, the emotional intensity, the intimacy, and the reciprocal services which characterize the tie”. It is often intertwined with the concept of relationship closeness (Gilbert, 2012): A *strong tie* is usually a close friend or family member, that with whom one shares an intimate relationship; and a *weak tie* is usually an acquaintance that one does not feel emotionally close to.

Previous research has addressed the role of perceived similarity to the compared person in predicting both benign and malicious envy (van de Ven et al., 2009), but rare research has specifically addressed the role of tie strength in this process. Tesser (1988) argued in his Self-Evaluation Maintenance theory (SEM) that an upward comparison is most threatening when

the superior other is psychologically close. Hence, it is reasonable to assume that tie strength may also predict the degree of envy.

Investigating this research question is also important for the design of News Feed display algorithm. SNS usage has made the social news (especially those from weak ties) more available (Rozzell et al., 2014). The content on Facebook is booming, but user's attention is limited. A News Feed display algorithm was designed to reschedule the sequence of the posts, make News Feeds more interesting, and retain Facebook users. However, it is still unknown yet if a piece of relevant positive news from a strong tie triggers more positive or negative emotion. Knowing the role of tie strength in predicting envy is practically relevant for the design of News Feed display algorithm, as the visibility of a post is influenced not only by when it is posted, but also by who posted it (Mosseri, 2016). This issue will be mainly examined in the first paper. The next section will discuss the role of post content (e.g., experiential vs. material purchases) in predicting envy.

Influence of experiential and material purchases on envy

The distinction between experiential and material purchases was first proposed by Van Boven and Gilovich (2003). It mainly focuses on people's intentions of purchasing: to do or to have. Experiential purchases are "those made with the primary intention of acquiring a life experience: an event or series of events that one lives through", whereas material purchases are "those made with primary intention of acquiring a material good: a tangible object that is kept in one's possession" (Van Boven & Gilovich, 2003). Although there is a disputation over whether the distinction between experiential and material purchases is a clear cut or not (Gilovich et al., 2015; Schmitt, Joško Brakus, & Zarantonello, 2015), the original authors believe that this distinction can be readily understood by researchers and layman, and it is meaningful to investigate how these two purchase types influence consumer's well-being (Gilovich & Kumar, 2015; Van Boven, 2005; Van Boven & Gilovich, 2003).

Previous research on experiential and material purchases was mainly about investing in which purchase type can trigger more happiness. By reviewing previous research, Gilovich et al. (2015) summarized that experiential purchases can provide more happiness than material purchases. Three reasons were provided: 1) experiential purchases enhance social relations, 2) experiential purchases are more central and important to a person's identity than material goods, and 3) experiential purchases are more difficult to be compared and hence less likely to evoke social comparisons than material purchases.

Interestingly, the last two potential mechanisms also provided seemingly contradicting arguments for which purchase type might trigger more envy. Experiential and material purchases are often mentioned as an object that triggers envy on Facebook (Krasnova et al., 2013). On the one hand, because experiential purchases are more central to one's self than material purchases for most social network users, seeing other's experiential purchases is assumed to trigger more envy (especially benign envy). On the other hand, experiential purchases are less comparable than material purchases; therefore, seeing other's experiential purchases might not be so envy-triggering. So far, little research has addressed how these two types of purchases affect envy. The distinction between experiential and material purchases and how it influences general envy, as well as two types of envy, will be further elaborated in the second and third paper.

Influence of envy on purchase intention

For marketers, it is relevant to research if the emotion of envy on SNSs can change consumer behavior and to be utilized for better advertising. Envy is a negative and frustrating feeling that often involves longing (Smith & Kim, 2007) and potentially motivates people to "keep up with the Joneses" (Foster et al., 1972). Some work has been conducted on the role of envy in increasing consumptions and impulsive buying: Taylor and Strutton (2016) claimed that Facebook usage could lead to conspicuous consumption due to an increased

level of envy. At the same time, envy may deplete self-regulatory resources—because people’s cognitions are captured by the advantaged others—and render people less able or willing to engage in more deliberate processing (Hill et al., 2011). Therefore, impulsive buying is more likely to happen when one is of low self-control (Hoch & Loewenstein, 1991; Vohs & Faber, 2007). Nevertheless, some researchers were pretty critical about the role of envy in promoting purchase behavior (Grinblatt, Keloharju, & Ika, 2008). Researchers have found that envy can increase the willingness to pay only when one’s self-control resources are taxed (Crusius & Mussweiler, 2012) or when one has a concrete mindset (Milovic, 2014). More research is required to investigate under which conditions envy can increase purchase behavior (e.g., in the context of browsing social media).

In addition, this dissertation proposes that it is important to distinguish the type of envy: as briefly mentioned above, only benign envy is associated with a higher willingness to pay for the envied object, but malicious envy is more likely to increase the willingness to pay for a similar but different product that elicited the envy (van de Ven et al., 2011). Will this effect still be valid when using the context of social media? Also, can the content of the post predict the type of envy? The third paper in this dissertation will take one step further to answer these questions.

The following chapters contain three papers that were written independently for journal publication in the process of my Ph.D. It is suggested to read each paper as an individual one and ignore some overlaps of theory and general discussion. The first two papers are multi-authored, and the last paper is single-authored.

3. Tie Strength and Envy (Paper 1)

This chapter is a slightly modified version of our published paper:

“Lin, R., & Utz, S. (2015). The emotional responses of browsing Facebook: Happiness, envy, and the role of tie strength. Computers in Human Behavior, 52, 29–38.

<http://doi.org/10.1016/j.chb.2015.04.064>”

The first author Ruoyun Lin was responsible for designing, conducting studies, analyzing data and writing manuscript; and the second author Sonja Utz was responsible for offering supervision and feedback, and revised some parts of this manuscript.

Abstract

On Facebook, users are exposed to posts from both strong and weak ties. Even though several studies have examined the emotional consequences of using Facebook, less attention has been paid to the role of tie strength. This paper aims to explore the emotional outcomes of reading a post on Facebook and examine the role of tie strength in predicting happiness and envy. Two studies—one correlational, based on a sample of 207 American participants and the other experimental, based on a sample of 194 German participants—were conducted in 2014. In study 2, envy was further distinguished into benign and malicious envy. Based on a multi-method approach, the results showed that positive emotions are more prevalent than negative emotions while browsing Facebook. Moreover, tie strength is positively associated with the feeling of happiness and benign envy, whereas malicious envy is independent of tie strength after reading a (positive) post on Facebook.

Keywords: Facebook; emotional contagion; happiness; social comparison; envy; tie strength

Introduction and theoretical background

New communication technologies such as social media have made social news more pervasive (Bazarova, 2012). Facebook continuously keeps users updated with a variety of posts, and a majority of these posts contains positive content (Barash, Ducheneaur, Isaacs, & Bellotti, 2010; Utz, 2015). There is evidence for emotional contagion, showing happiness can spread through the positive posts on online social networks (Coviello et al., 2014; Kramer, Guillory, & Hancock, 2014). However, recent studies also indicate that exposure to positive posts on Facebook may induce envy and lead to depression (Steers, Wickham, & Acitelli, 2014; Tandoc et al., 2015) and reduced well-being over time (Kross et al., 2013; Verduyn et al., 2015). Given that Facebook has over 1.35 billion active users (Facebook, 2014b) and there are on average 1500 potential stories for users to check per visit (Facebook, 2013), we are eager to understand how Facebook affects users' emotions and identify relevant factors that will determine emotional reactions. We argue that tie strength (relationship closeness) between the user and the poster is one important factor that should affect emotional outcomes.

Psychological effects of social network usage

The use of Social Network Sites (SNSs) can cause both positive and negative feelings, and the results of prior studies on the psychological effects of social network usage are quite mixed. From a long-term perspective, using SNSs offers benefits such as the possibility of developing and maintaining social capital and social connectedness (Ellison, Steinfield, & Lampe, 2007; Grieve et al., 2013; Sheldon et al., 2011); Nevertheless, it may also lead to negative outcomes such as social overload (Maier et al., 2012), an over-optimistic perception toward others' lives (Chou & Edge, 2012), and a decrease in life satisfaction (Kross et al., 2013). From a short-term perspective, the use of Facebook can evoke a feeling of flow, which is characterized by high positive valence and high arousal (Mauri et al., 2011), and "joyful and fun" are the most common positive feelings reported by users while using Facebook

(Krasnova et al., 2013). Nonetheless, the consumption of social news on Facebook can also trigger invidious emotions such as jealousy and envy (Krasnova et al., 2013; Muise, Christofides, & Desmarais, 2009; Tandoc et al., 2015).

Faced with mixed results from prior research on the psychological effects of Facebook usage, it is important to differentiate between interactive (active) and non-interactive (passive) social network behavior (Burke et al., 2010; große Deters & Mehl, 2013; Wise et al., 2010). Previous research has shown a consistent relation between using Facebook for interpersonal interaction and positive psychological outcomes (Burke et al., 2010; K. N. Hampton et al., 2012; J. Kim & Lee, 2011). However, it remains *unclear* as to what the psychological outcomes of non-interactive Facebook behavior are.

Psychological effects of browsing Facebook

In this paper, we focus only on the psychological effects of passive consumption. Previous research has revealed that the more time individuals spent browsing Facebook, the more negative their mood was immediately afterward, and this was mediated by a feeling of not having done anything meaningful (Sagioglou & Greitemeyer, 2014). Users may experience the feelings of exhaustion and information overload when they are continuously browsing social news (Maier et al., 2012). Also, being exposed to the social news on Facebook can evoke feelings of envy (Krasnova et al., 2013). However, when it comes to momentary experiences, users often feel pleasant and positively aroused when browsing Facebook (Mauri et al., 2011; Wise et al., 2010).

In an exploratory study (Krasnova et al., 2013), participants were asked to report their *overall* feelings after their most recent Facebook usage: 43.8% of the respondents reported at least one positive emotional outcome (such as feeling joyful/fun, satisfied, informed, excited, and relaxed), and 36.8% of the respondents reported at least one negative emotional outcome (such as feeling bored, angry, frustrated, guilty, tired, sad, lonely, and envious). However, it

is unclear as to whether different feelings are triggered by different posts or whether a post can elicit several feelings. To the best of our knowledge, no research has been done that focuses on momentary feelings of browsing Facebook *on an individual message level*. To get a more comprehensive understanding of whether reading (positive) posts on Facebook leads to more positive emotions such as happiness or more negative emotions such as envy and boredom, we examine the feelings respondents report per post on their Facebook timeline. Before we turn to the underlying processes, we examine the prevalence of positive and negative emotions. Our first research question is therefore:

RQ1: What are the most prevalent *momentary* emotional outcomes of reading a post on Facebook?

Underlying mechanisms and the role of tie strength

More importantly, we are also interested in understanding the underlying mechanisms of the positive and negative emotions caused by passive consumption of social news, and aim to examine the role of relationship closeness in explaining those emotional outcomes (mainly happiness and envy). In a social network context, relationship closeness is often intertwined with the expression of “tie strength” (Gilbert, 2012): A *strong tie* is usually a close friend or family member, that with whom one shares an intimate relationship; and a *weak tie* is usually an acquaintance that one does not feel emotionally close to. As tie strength can also be measured by relationship closeness (Marsden & Campbell, 1984), in this paper, we treat “tie strength” and “relationship closeness” as interchangeable.

On Facebook, users can be exposed to posts from a variety of different people, including acquaintances, colleagues, best friends, and family members. Thus, the emotional outcomes of reading a post might not only depend on the content of the post, but may also be influenced by the relationship between the poster and the reader. For example, if your best friend posts good or bad news on Facebook, you might react differently to this compared with

seeing an acquaintance that you haven't talked to in years posting the same news. No research has been done to examine the role of tie strength in interpreting the emotional outcomes after reading a post. Our second research question is therefore:

RQ2: What is the role of tie strength in explaining emotional outcomes such as happiness and envy?

Facebook users often post about their positive life events, successes, and entertaining status updates (Utz, 2011, 2015), and sometimes even present themselves in overly flattering ways (Barash et al., 2010; Mehdizadeh, 2010; Qiu, Lin, Leung, & Tov, 2012). Especially after reading these types of posts, feelings of happiness and envy are common emotional responses. Two mechanisms can explain this phenomenon: *emotional contagion* and *upward social comparison*. The feeling of happiness can be explained by the effects of emotional contagion (Cheshin, Rafaeli, & Bos, 2011; Hatfield, Cacioppo, & Rapson, 1993), i.e., the tendency for two individuals to emotionally converge; whereas the feeling of envy can be explained as a result of upward social comparison (Festinger, 1954).

In the following parts, we provide further information on these two mechanisms and explain *why tie strength could matter* for the emotions of happiness and envy respectively.

Happiness: emotional contagion and the role of tie strength

Humans, as a species that are embedded in complex social networks, rely on the ability to share others' emotions (empathy) to engage in successful social interactions (Norscia & Palagi, 2011; Preston & de Waal, 2002). The ability to catch or experience other's feelings leads to the phenomenon of "emotional contagion", which has been described as "the tendency to automatically mimic and synchronize expressions, vocalizations, postures, and movements with those of another person's, and, consequently, to converge emotionally" (Hatfield et al., 1993). Recent studies found that emotions such as happiness can be transferred from one person to another not only in face-to-face communication (Hancock,

Gee, Ciaccio, & Lin, 2008; Hatfield et al., 1993; Neumann & Strack, 2000), but also in computer-mediated-communication (Cheshin et al., 2011; Coviello et al., 2014; Kramer, 2012). Therefore, observing others' positive news on Facebook may lead to happiness via emotional contagion.

Previous research (in offline settings) demonstrates that empathy is more pronounced when the relationship between two individuals within a dyad is closer (Beeney, Franklin, Levy, & Adams, 2011; Norscia & Palagi, 2011; Preston & de Waal, 2002). This is because kin relationships were extremely important to our ancestors' survival. And thus, the ability to empathize with close others would have facilitated social interactions (Norscia & Palagi, 2011). In addition, based on the Perception-Action Model for empathy, individuals with higher similarity and familiarity are more likely to catch emotions from each other (Preston & de Waal, 2002). Therefore, we would expect a positive moderating effect of tie strength on emotional contagion even in the computer-mediated communication context (e.g., when reading a Facebook post). More specifically, because of mood contagion, reading positive news may lead to happiness, and reading negative news may lead to sadness; the contagious effect is stronger when the news comes from a strong tie.

Envy: social comparison and the role of tie strength

Envy, a pain caused by the good fortune of others, is another potential emotional outcome of encountering positive news on Facebook (Krasnova et al., 2013), and it might be a reason why browsing Facebook can lead to depression (Tandoc et al., 2015; Verduyn et al., 2015). Hence, we are also interested in understanding the processes underlying envy.

The concept of envy is often confused with jealousy, but clear differences exist: Jealousy arises when one has something but is afraid of losing it or has lost it to another person, while envy arises when another person has something that one does not have (Parrott & Smith, 1993). Recent literature on envy further established two different types of envy:

benign envy and malicious envy (Smith & Kim, 2007; van de Ven, Zeelenberg, & Pieters, 2009). *Benign envy* leads to a moving-up motivation (i.e., achieving the desired attribute by improving one's own situation), and *malicious envy* leads to a pulling-down motivation (i.e., an intention to damage the position of the superior other).

Envy generally arises from engaging in upward comparison(s) (Nabi & Keblusek, 2014; van de Ven et al., 2012), i.e., when people compare themselves with better-off others (Mussweiler et al., 2004). Several researchers have investigated the pre-conditions and underlying mechanisms for individuals to experience envy. In Festinger's (1954) classic theory of social comparison, he claimed that people have a desire to know about their own opinions and abilities, and when the reference to the physical world is not clear, people tend to compare themselves with others. In essence, he suggested that people select comparison standards that are similar to themselves in the critical dimension, in order to get diagnostic information for self-evaluation (Festinger, 1954). Similarly, Smith (2004) proposed four pre-conditions for envy: *being similar to the compared person*, perceiving the situation as *self-relevant*, the desired object is hard to achieve (or *low perceived control*), and the feeling that the person does not deserve the object (or one's own inferior situation is perceived to be *undeserved*). The latter two factors were found to be the key appraisals that distinguished benign from malicious envy: The more a situation was perceived as fair and controllable, the more benign envy rather than malicious envy was experienced, while malicious envy was experienced when the situation was appraised as undeserved for the compared person (van de Ven et al., 2012).

Even though previous research has addressed the role of perceived similarity with the compared person, it is still unclear what role the tie strength or relationship closeness plays in predicting the feeling of envy. Tesser (1988) argued in his Self-Evaluation Maintenance theory (SEM) that an upward comparison is most threatening when the superior other is

psychologically close, and social comparisons to strong ties may be a double-edged sword. On the one hand, self-evaluation can be damaged when individuals are comparing themselves with a close friend who performs well in a domain that is also important to them, which is called “*comparison process*” in SEM. On the other hand, self-evaluation can be improved when the close others perform well in a domain that is irrelevant to one’s self-definition, which is called “*reflection process*” in SEM. Hence, based on the theories of social comparison and self-evaluation, we assume that the relationship closeness or tie strength also plays a role in predicting feelings such as envy in the online communication context; envy should be more intense in response to posts of a strong tie (but only in a domain that is important to self-definition).

To sum up, rare empirical research has so far focused on the role of tie strength/relationship closeness in interpreting or predicting the user’s emotions (mainly happiness and envy) after reading a post on Facebook. In this paper, two studies, one correlational and the other experimental, are presented, aiming to address the research questions on *momentary feelings after reading a post on Facebook* and *the role of tie strength*. The basic research model for both studies is presented in Figure 1. We expected that tie strength would positively moderate the effect of the content of Facebook posts on users’ emotions, such as strengthening the feelings of happiness or sadness; Nevertheless, the role of tie strength in predicting envy is dependent of the context and requires further investigation. More explanation on how tie strength matters in the case of envy is presented in the introduction to the second study. Finally, because emotions after reading posts can also be influenced by individual characteristics such as prevailing mood and personality traits, we also measure these factors and include them as control variables in our research.

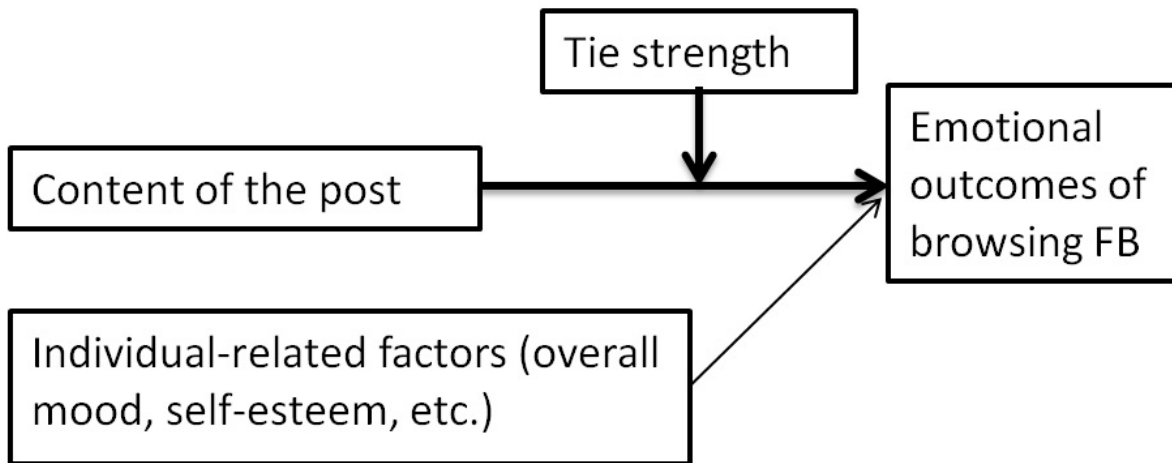


Figure 1. Research model for Paper 1.

Exploratory and correlational examination (Study 1)

Study overview and hypothesis

In Study 1, we examined the momentary emotional states of Facebook users after reading a post, and investigated the role of tie strength in predicting happiness and envy. We asked participants to report four recent posts in their News Feeds, as well as their feelings after reading each post. As it is still unclear what the most prevalent momentary feelings are, an open research question (RQ1) was posed in this study.

With regard to RQ2, we expected a positive moderating effect of tie strength on the relationship between the content of posts and the feeling of happiness based on the mechanism of emotional contagion. Therefore,

H1: Tie strength positively moderates the relationship between the content of the posts and the feeling of happiness.

The role of tie strength in predicting envy is still ambiguous in such an exploratory setting. As indicated by Tesser's (1988) theory, the effect of tie strength on the emotion of envy is further moderated by the comparison domain. But it is difficult to know about which domain the Facebook posts are involved with and whether this will be central or not to the

users' self-evaluation, therefore no predictions can be made with regard to the feeling of envy in this study.

Method

Procedure and participants

An online questionnaire for active Facebook users was launched in July 2014. Participants were asked to log into their own Facebook accounts and browse the recent updates in their News Feeds. If they had read the recent updates in their News Feeds before, they were asked to recall their feelings at the time that they first read the updates; otherwise, they were asked to report their current feelings after reading those posts. Every respondent was asked to report the *four most recent posts* from four different posters regardless of the source of the post (Facebook Friend vs. Facebook Page). We asked participants to report the posts from Facebook Pages (in addition to Facebook Friends), because that information will be used in another separate paper. However, only the posts from Facebook Friends were included in this paper. We also limited the reporting up to four updates because we were concerned that too much repetitive reporting may lead to survey fatigue.

In order to investigate the role of tie strength, we used the feelings of *happiness* and *envy* as the dependent variables; both the valence of post content (e.g., positivity and entertainment) and the perceived relationship closeness between the participant and the Facebook Friend were treated as independent variables.

A total of 207 respondents completed the questionnaire. The majority of them (92.3%) were American. Respondents were mainly recruited from a survey panel called "Tellwut"; some were recruited by a post on Reddit (<http://www.reddit.com/r/SampleSize/>). Respondents' average age was 41.7 (SD = 14.6), and 64% of them were female. Most of the respondents (81.2%) reported that they visited Facebook daily, and, on average, for 1 hour per day.

Measures

Content of the posts. Participants were asked to copy and paste the original post if they felt comfortable doing so. Then, they were asked to rate whether the content of the post was negative or positive, boring or entertaining, superficial or intimate, and factual or subjective on 7-point semantic differential scales.

Relationship closeness/Tie strength. The relationship between the reader (the participant) and the poster (a Facebook Friend) was measured by two items: “We have a close relationship/friendship” and “I would categorize him/her as one of my strong ties” (on a 7-point Likert scale, where 1 = “strongly disagree” and 7 = “strongly agree”). A numerical average was taken to present the relationship between the poster and the reader (Cronbach’s $\alpha = 0.96$).

Emotions. Participants were asked to evaluate their emotions with several items after reading each post; “I feel pleasant” and “I feel envious” were used as key dependent variables for this study. The answers were given on 7-point Likert scales (1 = “strongly disagree” and 7 = “strongly agree”), and it was also possible to select “does not apply”, which was treated as a missing value later. We also measured other momentary feelings such as jealousy, frustration, annoyance, and connectedness for exploratory purposes.

Control variables. The *mood* state of the respondents prior to the study was measured as a control variable. We also measured the respondents’ *self-esteem* with 6 items adapted from Rosenberg’s (1965) scale (Cronbach’s $\alpha = 0.96$), in addition to the *demographic* information.

Results

Among the 828 reported posts (4 cases per person), 598 posts were posted by a Facebook friend (as opposed to a Facebook page), which is the focus of this study; the rest of the reported posts (27.8%) were excluded in the following analysis. With regard to the

likelihood of experiencing positive and negative emotions, we treated an answer given between 5 and 7 (on a 7-Likert scale) as experiencing that specific feeling. The descriptive results of the emotional outcomes can be found in Table 1. Respondents felt mostly positive feelings after reading posts: in 384 cases (64.2%), the respondent felt *pleasant* after reading the post. Most respondents agreed that they felt *connected* (66.4%), *informed* (63.7%), and *entertained* (53.7%) after reading a post. The feeling of envy was found in 74 reported cases, which was 12.4% of the total cases. In this study, being envious (12.4%) was the most frequently reported negative feeling, compared with being *jealous* (11.0%), *annoyed* (10.0%) and *frustrated* (9.7%). Overall, findings from this study suggest that browsing Facebook is more likely to trigger various positive feelings as opposed to negative feelings on an individual message level. When it comes to the content of the posts, the result shows that about 72.6% of the reported posts were positive, 62.2% of them were entertaining.

Table 1. Descriptive Statistics in Paper 1 Study 1

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	Min	Max
Happiness (DV)	587	5.18	1.64	1	7
Connectedness	589	5.14	1.74	1	7
Informativeness	582	5.04	1.75	1	7
Entertainment	583	4.63	1.87	1	7
Envy (DV)	574	2.27	1.78	1	7
Jealousy	576	2.20	1.72	1	7
Annoyance	571	2.15	1.66	1	7
Frustration	577	2.14	1.64	1	7
Positive content (IV)	598	5.51	1.87	1	7
Relationship closeness (IV)	598	4.42	1.97	1	7
Mood	598	4.91	1.25	1	7
Self-esteem	598	4.76	1.54	1	7

Note. The answers of “does not apply” were recoded as missing values when measuring emotions.

In the next step of the analysis, we examined the roles of content and tie strength by running several multi-level linear models, because the posts were nested in participants. A descriptive summary of important variables can be found in Table 1 and the correlations between these variables are shown in Table 2. The feelings of happiness and envy were

treated as dependent variables respectively. We expected an interaction effect between the content of the post and relationship closeness on the feeling of happiness, but left the prediction open for envy. In addition, we added prior mood state and self-esteem as control variables. Two random-effects multi-level linear models are presented in Table 3. All variables were standardized, and therefore the effect sizes can be reflected by the unstandardized coefficients in Table 3.

Table 2. Correlational Statistics in Paper 1 Study 1

Pearson's Correlations	1	2	3	4	5
1. Happiness (DV)	1.00				
2. Envy (DV)	0.13**	1.00			
3. Positive content	0.69***	0.09*	1.00		
4. Relationship closeness	0.32***	0.00	0.22***	1.00	
5. Mood	0.26***	-0.10*	0.16**	0.20***	1.00
6. Self-esteem	0.12**	-0.25***	0.09*	0.10*	0.37***

* $p < .05$; ** $p < .01$; *** $p < .001$

The first model was constructed to predict the feeling of happiness, overall $R^2 = .54$, Wald $\chi^2(5) = 398.37$, $p < .001$. The results of Model 1 showed that both positive content, $b = 0.62$, $z = 16.30$, $p < .001$, and relationship closeness, $b = 0.09$, $z = 2.89$, $p = .004$, predicted the feeling of happiness, and there was a significant interaction effect between positive content and relationship closeness, $b = 0.08$, $z = 2.22$, $p = .027$, supporting H1. Specifically, respondents were happier after reading positive news from a closer friend, and the respondents were sadder after reading negative news from a closer friend.

With regard to the second model, overall $R^2 = .08$, Wald $\chi^2(5) = 35.32$, $p < .001$, relationship closeness did not play a role in predicting the feeling of envy: there was no main effect of relationship closeness, $b = -0.03$, $z = -0.68$, $p = .497$, nor was there an interaction between relationship closeness and content, $b = 0.02$, $z = 0.48$, $p = .628$. Positive content was a significant predictor of envy, $b = 0.16$, $z = 4.00$, $p < .001$. In addition, Facebook users who have a higher self-esteem were less likely to feel envious, $b = -0.25$, $z = -3.84$, $p < .001$.

Table 3. Results of the Random-Effects Multi-Level Linear Models in Paper 1 Study 1 (Unstandardized Coefficient Followed by z Values Based on Robust Standard Errors)

	Happiness	Envy
Positive content	0.625 (16.30)***	0.161 (4.00)***
Relationship closeness	0.095 (2.89)**	-0.031 (0.68)
Positive content X Relationship closeness	0.078 (2.22)*	0.016 (0.48)
Mood	0.178 (3.46)**	-0.028 (0.39)
Self-esteem	0.045 (1.08)	-0.258 (3.84)***
Constant	-0.018 (0.47)	0.010 (0.17)
N	587	574

* $p < .05$; ** $p < .01$; *** $p < .001$

Note. Random effects models were preferred based on the results of Hausman tests. All variables were standardized before putting into the models.

Discussion

The results of study 1 showed that most of the posts on Facebook were positive and entertaining, which is in line with previous findings (Barash et al., 2010; Utz, 2015). Positive emotions were more prevalent than negative emotions when browsing Facebook. Tie strength moderated the relationship between the content of the post and the feeling of happiness. As predicted by H1, the effect of emotional contagion was stronger when the tie strength is stronger; however, we did not find a moderating effect of tie strength on the feeling of envy.

As the positive emotions outweigh the negative emotions, browsing Facebook—at least on a message level (for a relatively short amount of time)—is not as psychologically harmful as described in previous research (e.g., Konnikova, 2013). Users are happy after reading positive posts from their Facebook friends, and they are even happier if the good news comes from a strong tie; whereas envious feelings are more likely to be predicted by individual characteristics of the user such as low self-esteem, rather than relationship closeness. It seems that tie strength does not play a role in predicting envy. For negative news, Facebook users experience more negative emotions when it comes from a strong tie than a weak tie. This

phenomenon was recently described as “cost of caring” in the context of Facebook (Hampton, Rainie, Lu, Shin & Purcell, 2015). However, one should notice that individuals have to bear the negative news from their strong ties in real life anyway, as Facebook might not be the only communicational channel for strong ties.

Here, we would also like to discuss the strengths and weaknesses of this study. A strength of the study is that we did not use a student sample, but a more heterogeneous sample. A limitation is that it was a correlational study and therefore causality cannot be assumed. For example, it is hard to say whether users feel happy is merely because the post is shared by a strong tie, or it is because positive posts are more likely to be posted by a strong tie. Also, with regard to the null effects of relationship closeness on envy, this could either be explained by a floor effect (the mean value for the degree of envy is relatively low), or that relationship closeness is not influential when predicting envy. In order to further disentangle the puzzle, an experimental study is needed. Moreover, previous research investigating the emotion of envy on SNSs has not addressed the difference between *malicious and benign envy*. In the next study, we differentiate between benign and malicious envy in the context of Facebook, and add “self-relevance” and “perceived control” as additional control variables. Several hypotheses are proposed with regard to the role of relationship closeness in predicting user’s happiness and envy after reading a post.

Experimental examination of the role of tie strength (Study 2)

Study overview and hypotheses

In order to replicate and extend the correlational findings from Study 1, we conducted an experiment with mocked-up Facebook posts, controlling for the content of the post and manipulating tie strength. We focus specifically on scenarios that are positive, such as posts about “travel and leisure” and “success in material possessions”. These types of positive posts can lead to upward comparisons and envy (Krasnova et al., 2013). In addition, most of the

posts on Facebook are quite positive and entertaining, as a result of impression management motives and privacy concerns (Barash et al., 2010; Utz, 2015).

As previously discussed, emotions such as happiness are contagious, and this effect is stronger for those who share a close relationship. Therefore, we hypothesized a positive effect of relationship closeness on the feeling of happiness, aiming to replicate the findings of Study 1.

H2: The closer the relationship, the happier a Facebook user will be after reading a positive post.

Research has shown that benign envy is an uplifting type of envy: people want to be closer to the comparison other, regardless of the feeling of frustration (van de Ven et al., 2009). In addition, Mussweiler et al. (2004) claimed that assimilation, i.e., the self is assimilated toward a given standard, is more likely if the target and standard share a close relationship. Based on the definition of benign envy and Mussweiler et al.'s (2004) concept of assimilation, we assume that a close and intimate relationship (between the poster and the reader) helps to develop a good will and triggers the motivation of levelling-up; therefore, benign envy is more likely to happen when an envy-inducing post is posted by a strong tie rather than a weak tie. Whereas for malicious envy, we would expect an opposite effect: people are less likely to experience malicious envy, a pulling down motivation, toward their strong ties/best friends compared with other less-intimate friends. We assume people are less likely to perceive the situation as undeserved for strong ties, and malicious envy is more likely to be triggered when the situation is perceived as deserved (van de Ven et al., 2012). Hence,

H3: The closer the relationship, the more a Facebook user will experience benign envy.

H4: The closer the relationship, the less a Facebook user will experience malicious envy.

Although envy is a common emotion felt by most people, there are important individual differences in the tendency to feel it (Smith, Parrott, Diener, Hoyle, & Kim, 1999). For Facebook users with higher *dispositional envy*, we would expect that they are more likely to engage in upward social comparisons and experience more (benign & malicious) envy after reading a positive post on Facebook. Also, we included *self-relevance* and *perceived control* as control variables based on previous literature. As described earlier, four preconditions are relevant: perceived similarity, self-relevance, perceived control, and perceived deservingness/unfairness (Smith, 2004). However, perceived similarity is highly correlated with the tie strength, and perceived unfairness is an item used in measuring malicious envy. Therefore, we only controlled for self-relevance and perceived control when predicting envy. For predicting the feelings of happiness, we used dispositional happiness and mood as control variables.

Method

Participants and procedure

The online experiment was launched in Germany on Sep 22nd, 2014. Participants were mainly German students who use Facebook at least once a month, and they were recruited via a local panel. The experiment took about 20 minutes to complete, and for their participation, respondents were entered into a lottery pool (with a 20% chance of winning a 10 Euro Amazon voucher). In total, 194 participants completed the questionnaire. We dropped the cases that failed the manipulation check (see details at the end of procedure session) and excluded those participants who finished the questionnaire and important questions too fast (by excluding 5% of cases with the lowest response time for specific pages). Hence, 147 cases were left for the analysis. The average age was 25 years old ($SD = 6.3$). About 84% of respondents were female. About 82% of respondents use Facebook at least once a day. The

average daily usage time is about 40 minutes, slightly less than that of the American sample in Study 1.

In the online experiment, participants were first asked to report three of their Facebook friends (a strong tie, a weak tie, and a middle tie) that they were not living with or romantically involved with. We included the third group of middle ties in order to create a continuum connecting the two ends, strong and weak ties, as proposed by Huszti, Dávid, & Vajda (2013). Since this study was launched after the summer vacation for German college students and shortly after the launch date of iPhone 6 (Sep 19th, 2014), we adopted two realistic scenarios based on the findings of Krasnova et al. (2013): one involved reading a post from a Facebook friend who posted a vacation picture, and, the other scenario involved a picture of a newly bought iPhone 6. For each scenario, we randomly assigned one of the reported Facebook friends to it. Latin square (3×2) was used to equally distribute the three types of ties into two scenarios, and each participant received only two scenarios, with each scenario assigned with one type of tie. Therefore, the scenarios are a within-subject factor and tie strength was a within- and a between-subjects factor.

For each scenario, participants were asked to report some general information about the assigned Facebook friend and then to imagine that this person just posted a certain picture on Facebook (a mocked-up post was shown to the participant). The feelings after seeing the post were recorded accordingly. After finishing two scenarios, the participants were asked to evaluate their emotional closeness to the three Facebook friends that they had reported at the beginning of the survey. We further used this question as a manipulation check, by excluding cases with a wrong order in ranking the perceived relationship closeness for strong, middle, and weak ties.

Measures

Relationship closeness/Tie strength. The tie strength between the poster and the reader (participant) was a manipulated variable, but we also measured the relationship closeness by asking “to what extent do you feel emotionally close to XX” at the end of the questionnaire. The answers were given on a scale ranging from 0 to 100. Because this item is also used as the manipulation check, the range of the scale is highly extended.

Emotions. Participants were asked to rate their feelings after reading the post in each scenario. They indicated to what extent they agree or disagree with: “I feel happy for XX” and “I feel envious”. In addition, malicious envy was measured with three items: “I felt malicious envy towards XX”, “I had negative thoughts about XX” and “It is unfair that XX can go on such a vacation/have an iPhone 6 while I cannot” (Cronbach’s $\alpha = 0.57$ for vacation scenario, and Cronbach’s $\alpha = 0.69$ for iPhone scenario). Benign envy was measured by three items: “I felt benign envy towards XX”, “I admire XX”, “I wanted to try harder to have such a vacation as well/to have a new iPhone” (Cronbach’s $\alpha = 0.74$ for vacation scenario, and Cronbach’s $\alpha = 0.45$ for iPhone scenario). These items were adapted from the scales used in Crusius & Lange’s (2014) study. Both the degrees of benign and malicious envy were calculated by taking a numerical average of the respective three items. Responses were measured on 7-point Likert scales ranging from “strongly disagree” to “strongly agree”.

Control variables. Again, we treat the *mood* of the respondents and the *demographical* information of the respondents as control variables. Furthermore, *dispositional envy* was measured with an 8-item scale (Cronbach’s $\alpha = 0.85$) developed by Smith, Parrott, Diener, Hoyle, & Kim (1999) and *dispositional happiness* was measured with a 6-item scale (Cronbach’s $\alpha = 0.88$) developed by Shiota, Keltner, & John (2006). One sample item for measuring dispositional envy is “feelings of envy constantly torment me”, and for dispositional happiness is “I often feel bursts of joy”.

We also controlled for *self-relevance* and *perceived control* in this study. In the vacation scenario, we asked the participants “In general, how much would you like to travel to places like this?” as a measure of self-relevance and “Currently, how difficult is it for you to arrange such a vacation?” (reverse coded) as a measure of perceived control. In the iPhone 6 scenario, self-relevance was measured by “In general, how much would you like to have an iPhone 6?”, and perceived control was measured by the question of “Currently, how difficult is it for you to buy an iPhone 6?” (reverse coded). These two variables were measured with a scale ranging from 0 to 10.

Table 4. Descriptive Statistics in Paper 1 Study 2

Variables	Scenario	<i>n</i>	Mean	<i>SD</i>	Min	Max
Happiness	Vacation	147	5.93	1.41	1.00	7.00
	iPhone	147	5.05	1.78	1.00	7.00
Envy	Vacation	147	3.11	1.87	1.00	7.00
	iPhone	147	1.70	1.35	1.00	7.00
Benign envy	Vacation	147	3.64	1.58	1.00	7.00
	iPhone	147	1.60	0.82	1.00	4.67
Malicious envy	Vacation	147	1.32	0.62	1.00	5.00
	iPhone	147	1.29	0.66	1.00	4.67
Relationship closeness	Vacation	147	47.90	36.41	0.00	100.00
	iPhone	147	52.23	37.14	0.00	100.00
Self-relevance	Vacation	147	5.43	2.82	0.00	10.00
	iPhone	147	0.70	1.56	0.00	8.00
Perceived control	Vacation	147	2.95	2.90	0.00	10.00
	iPhone	147	4.14	3.60	0.00	10.00
Mood		146	6.99	1.85	1.00	10.00
Dispositional envy		147	2.13	0.98	1.00	6.00
Dispositional happiness		147	4.56	1.17	1.00	7.00
Age		143	24.86	6.29	18.80	65.10
Male		147	0.15	0.36	0.00	1.00

Results

Descriptive results

The descriptive results of Study 2 are shown in Table 4. Because the nature of these two scenarios is slightly different, we analyze them separately. As can be seen in the descriptive summary, the vacation scenario triggered more happiness, $t(146) = 5.18, p < .001$, envy, $t(146) = 8.51, p < .001$, and benign envy, $t(146) = 15.22, p < .001$ than the iPhone 6

scenario, whereas malicious envy did not differ across scenarios, $t(146) = 0.38, p > .05$. Perceived self-relevance was much higher in the vacation scenario than iPhone 6 scenario, $t(146) = 17.65, p < .001$, and perceived control was slightly lower in the vacation scenario rather than the iPhone 6 scenario, $t(146) = 4.14, p < .001$. Most respondents did not show interest in buying a new iPhone, neither did they envy other iPhone 6 owners. Again, the mean values for the feeling of happiness were much higher than the mean values of envy for both scenarios. This suggests that the positive emotion of happiness is more prominent than the negative emotion of envy in both cases, even though we had chosen scenarios that were likely to trigger envy.

Table 5. Descriptive Statistics by Group (Mean Values Followed by Standard Deviation) and Results of ANOVA in Paper 1 Study 2

	Scenario	Strong tie group	Mid tie group	Weak tie group	$F(2,144)$
Happiness	Vacation	6.78 _a (0.51)	6.12 _b (1.11)	5.00 _c (1.66)	27.36***
	iPhone	5.47 (1.75)	4.84 (1.91)	4.80 (1.61)	2.25
Envy	Vacation	3.57 (1.81)	3.04 (1.84)	2.77 (1.91)	2.30
	iPhone	1.72 (1.39)	1.47 (1.14)	1.93 (1.50)	1.43
Benign envy	Vacation	4.22 _a (1.33)	3.86 _a (1.59)	2.90 _b (1.51)	10.52***
	iPhone	1.71 (0.97)	1.59 (0.73)	1.48 (0.73)	0.90
Malicious envy	Vacation	1.33 (0.62)	1.27 (0.45)	1.35 (0.75)	0.23
	iPhone	1.33 (0.66)	1.23 (0.58)	1.33 (0.74)	0.39

** $p < .01$; *** $p < .001$

Note. Means in the same row that do not share subscripts differ at $p < .05$ in Scheffe multiple-comparison test.

Hypotheses testing

Table 5 showed the mean values for emotions (happiness, envy, benign envy, and malicious envy) based on the *manipulated* conditions (strong tie, weak tie, and mid-tie group). ANOVAs were used to test the group differences. In line with H2 and H3, for the vacation scenario, there was a significant effect of tie strength on the feeling of the happiness, $F(2,144) = 27.36, MSE = 1.21, p < .001, \eta^2 = .28$, and benign envy, $F(2,144) = 10.52, MSE = 1.48, p < .001, \eta^2 = .13$. The results of Scheffe post-hoc test showed that the mean values for happiness differed for all three groups (i.e., happiness for strong ties > happiness for mid ties > happiness for weak ties). The post-hoc test for tie strength on benign envy was slightly

different (benign envy for strong ties & benign envy for mid ties > benign envy for weak ties) (see subscripts in Table 5). However, for the iPhone 6 scenario, there were no significant group difference for both happiness and benign envy. In addition, we found no group differences in both scenarios for malicious envy, thus H4 is not supported.

Table 6. Results of the Regression Models on Happiness in Paper 1 Study 2 (Unstandardized Coefficient Followed by t Values Based on Robust Standard Error)

	Happiness (vacation)	Happiness (iPhone)
Relationship	0.022	0.013
closeness	(7.52)***	(3.27)**
Mood	0.080	0.135
	(1.26)	(1.55)
Age	0.039	0.042
	(4.25)***	(2.28)*
Male	-0.208	-0.123
	(1.17)	(0.25)
Dispositional	0.058	0.150
happiness	(0.66)	(1.09)
Constant	3.126	1.735
	(6.25)***	(2.41)*
R^2	0.38	0.15
N	142	142

* $p < .05$; ** $p < .01$; *** $p < .001$

Post-hoc analysis

Furthermore, we ran linear regressions by using the continuous measurement of relationship closeness as a predictor and including the control variables. These analyses could help us better understand the relationships between the current data and hypotheses. T-values were estimated by the robust standard error in order to avoid the problem of heteroscedasticity. Table 6 presents the results of the linear regressions on the feeling of happiness for both scenarios. In both scenarios, relationship closeness was a significant predictor of the feeling of happiness, for the vacation scenario, $\beta = .55$, $t(136) = 7.52$, $p < .001$, and for the iPhone 6 scenario, $\beta = .27$, $t(136) = 3.27$, $p = .001$. These results are in line with H2. In addition, age also positively predicted the feeling of happiness.

The regression models for the feeling of envy are presented in Table 7. In line with H3, relationship closeness predicted *benign envy* in both scenarios: for the vacation scenario, β

= .30, $t(136) = 5.17$, $p < .001$ for the iPhone 6 scenario, and $\beta = .23$, $t(136) = 2.90$, $p = .004$; whereas for *malicious envy*, relationship closeness did not show any effect for the vacation scenario, $\beta = -.05$, $t(136) = -0.49$, $p = .622$ or for the iPhone scenario, $\beta = -.05$, $t(136) = -0.54$, $p = .591$, therefore there is no evidence for H4.

Table 7. Results of the Regression Models on Envy in Paper 1 Study 2 (Unstandardized Coefficient Followed by t Values Based on Robust Standard Error)

	Envy		Benign envy		Malicious envy	
	Vacation	iPhone	Vacation	iPhone	Vacation	iPhone
Relationship closeness	0.007 (1.80) [†]	0.001 (0.49)	0.013 (5.17) ^{***}	0.005 (2.90) ^{**}	-0.001 (0.49)	-0.001 (0.54)
Dispositional envy	0.633 (5.37) ^{**}	0.320 (2.68) ^{**}	0.209 (2.19) [*]	0.167 (2.76) ^{**}	0.251 (4.22) ^{***}	0.158 (2.64) ^{**}
Self-relevance	0.243 (4.78) ^{***}	0.343 (4.19) ^{***}	0.294 (7.95) ^{***}	0.187 (4.70) ^{***}	0.020 (1.26)	0.049 (0.92)
Perceived control	-0.112 (2.53) [*]	-0.059 (2.48) [*]	-0.081 (2.31) [*]	-0.010 (0.63)	-0.023 (1.78) [†]	-0.023 (1.74) [†]
Age	-0.052 (4.19) ^{***}	0.003 (0.30)	-0.004 (0.33)	0.025 (3.19) ^{**}	-0.010 (1.82) [†]	-0.005 (0.72)
Male	-0.091 (0.24)	-0.105 (0.44)	-0.256 (0.80)	0.126 (0.69)	0.297 (1.34)	0.014 (0.08)
Constant	0.615 (1.21)	0.304 (0.71)	0.559 (1.35)	0.133 (0.43)	0.761 (3.53) ^{**}	0.955 (3.73) ^{***}
R^2	0.38	0.26	0.49	0.23	0.23	0.11
N	143	143	143	143	143	143

[†] $p < .1$; ^{*} $p < .05$; ^{**} $p < .01$; ^{***} $p < .001$

Dispositional envy was positively associated with both benign and malicious envy, which is also in line with our prediction. Self-relevance was a significant predictor for benign envy but not for malicious envy. That means users are more likely to experience benign envy when it is more self-relevant. Perceived control had a slightly negative influence on the experience of malicious envy. That means users with higher perceived control are less likely to experience malicious envy. Overall, the models on malicious envy revealed that malicious envy is highly related to personal traits, regardless of tie strength or self-relevance.

Similar to the results of the correlational study, tie strength/relationship closeness did not show a role in predicting the *overall feeling of envy* after browsing Facebook. Again,

feeling envious after reading a post was more likely to be predicted by individual factors such as dispositional envy and age.

General discussion

Summary of research

In this paper, we aimed to explore the momentary emotional outcomes of browsing Facebook on an individual post level, and we were interested in whether the relationship closeness between the poster and reader can predict those emotional outcomes. In the first study, we found that, in general, positive emotions outweighed the negative ones after reading a post on Facebook. Tie strength played a role in predicting the feeling of happiness after reading a post: the closer the relationship, the happier one felt after reading a positive post; and the sadder one felt after reading a negative post.

The second study manipulated the tie strength between the poster and reader. With two mocked-up positive (envy-inducing) scenarios, we re-tested whether this type of news may trigger more happiness if it comes from a strong tie rather than a weak tie. To the best of our knowledge, this is also the first study to differentiate malicious and benign envy in the context of Facebook use. The results of the second study not only confirmed the preliminary findings of the correlational study in an experimental setting, but also revealed that tie strength predicts benign envy, but not malicious envy.

Theoretical implications

This paper provided some explanations for the mixed findings from prior research on social network usage (passive consumption), and filled the research gap in the emotional outcomes of browsing Facebook on an individual message level. Krasnova et al. (2013) inferred that the invidious feeling of envy on Facebook can lead to a decrease in users' life satisfaction. They worried that if too many negative feelings were triggered by envy-inducing posts (e.g., vacation pictures), users might quit using Facebook. However, the present study

found that positive feelings are more prevalent than negative emotions, even when Facebook users were presented with a vacation picture, which is the biggest cause of envy on Facebook based on Krasnova et al's (2013) study.

Moreover, this paper filled the research gap on the role of tie strength in predicting the emotional outcomes of browsing Facebook. We investigated the role of *tie strength* (i.e., the relationship between the poster and the Facebook user) in interpreting or predicting user's emotions of *happiness* and *envy* after reading a post. Based on a sample of 207 American respondents and a sample of 194 German students, we found that if positive news is posted by a strong tie, users are more likely to be happy for their friends and experience only benign envy, which is a positive type of envy that has a levelling-up effect (at least in short-term). The finding on happiness contributes to the theory on emotional contagion, and, consistent with previous research, suggests that emotional contagion is stronger when the relationship between individuals is closer. The finding with regard to benign envy also contributes to the literature on social comparison and tie strength, by showing that benign envy, rather than malicious envy, is more likely to be experienced when the relationship is closer.

With regard to the malicious envy, tie strength was not a significant predictor. The null finding may be explained by a floor effect, as the mean values for malicious envy were quite low in both scenarios ($M = 1.33$). It may be partly due to the scenario design. Malicious envy in real life is relatively low, and therefore more intensive manipulations are required to trigger it. Future research could specifically focus on malicious-envy-inducing scenarios in order to examine the role of tie strength in predicting malicious envy. Malicious envy is more likely to emerge when the envied object was perceived as undeserved (van de Ven et al., 2012). However, from a realistic point of view, not many Facebook users would write posts in a way suggesting that their own achievement is undeserved. The main goal of the present

study was to examine the feelings that are induced by Facebook use by using selected scenarios (vacation and iPhone) that are more representative of actual Facebook posts.

Furthermore, we would like to address the role of self-relevance (general interest) in predicting benign and malicious envy and discuss its relationship with domain relevance (the relevance of comparison domain). Self-relevance, as measured by the general interest of acquiring the envied object, in the current study, was a significant predictor of both general envy and benign envy, but not for malicious envy. Instead, dispositional envy predicted malicious envy in the models. Taken together, this seems to indicate that malicious envy is rather a personality trait that is independent of situational factors such as tie strength or self-relevance; whereas emotions such as happiness and benign envy are more situational dependent (as both tie strength and self-relevance were significant predictors, but the dispositional happiness was not).

Please note that, in the current studies, we treated self-relevance as something more general than the domain relevance (relevance of the comparison domain): domain relevance is one important component of self-relevance, but something that is self-relevant (of high general interest) might not necessarily be a highly-relevant domain that one relies on for self-estimation. For example, people may treat having a vacation as self-relevant and interesting, but it might not necessarily be a central domain for one's self-estimation. Highly relevant domains are usually related to skills and performance; however, whether a domain is relevant to self-definition is very personal and variable. Unfortunately, we did not measure the domain relevance in the current studies. Future studies can even address the component of domain relevance directly when measuring self-relevance. So far, no good measure of self-relevance is available, and researchers actually often refer to domain relevance (self-relevance of the comparison domain) as self-relevance (Smith & Kim, 2007; Tesser, 1988).

Practical implications

Psychological implications

The results from our studies have implications for teachers and parents who are worried about young adolescents' social network use. Because the positive effects of browsing Facebook outweigh the negative effects, they do not need to worry too much about the negative psychological effects as long as the users do not browse Facebook excessively (with an "appropriate" amount of usage time). Also, we found that self-esteem and dispositional envy played a significant role in predicting Facebook envy. For users who have a high dispositional envy or low self-esteem, we would suggest them do not obsessively use Facebook in a passive way.

With regard to the findings on the role of tie strength, one practical implication is that if Facebook users receive more posts from their close friends, they will experience more happiness. Further, while individuals might experience (benign) envy toward their close friend, it may be less detrimental as one expected (e.g., Krasnova et al., 2013) as benign envy generally motivates individuals to self-improve.

Applied implications

Because most Facebook users cannot read all the potential stories from their Facebook friends and pages, a News Feed ranking algorithm was created, adjusting the sequence of posts rather than using the chronological order (Facebook, 2013). However, it is still technically difficult to determine what posts are relevant to individual users and makes them happier (rather than triggering negative feelings such as envy). It is often the case that even reading the same status update can lead to different feelings for different individuals.

The research showed that the emotional outcomes of browsing Facebook were significantly influenced by three components: the content of the post, the personal traits of the Facebook reader, and the relationship with the poster. Hopefully, these findings can also offer insight into the development of Facebook News Feed algorithm. For example, the

Facebook algorithm can display more positive posts from strong ties to Facebook users who have a lower degree of dispositional envy. In addition, future research can also retest these results in other SNSs such as Twitter or LinkedIn. We hope that these studies together can contribute to the construction of a better online communication environment and eventually improve the well-being of social network users.

Limitations and future research

Several limitations need to be addressed. First, the scenario of iPhone 6 may actually not be the best scenario for triggering envy in a German sample. Most of the respondents showed a low interest in iPhone 6 and did not report any type of envious feelings afterward. This is also a potential reason for why most hypotheses were not supported by the ANOVA tests in the iPhone 6 scenarios. Second, the reliabilities of the scales for malicious and benign envy were relatively low (especially the scale of benign envy) in the iPhone scenario in Study 2. More research is required to develop a scale for measuring malicious and benign envy that is robust across various domains (e.g. money, success, beauty, relationship, etc.). Third, both studies measured emotions in a self-reporting way. There is a possibility that respondents might not be honest when reporting their negative/bad feelings (due to social desirability). This could also be another potential reason for why the hypothesis on malicious envy was not supported. Putting participants into a third-person's perspective might be helpful for measuring malicious envy. Nonetheless, our participants do honestly reveal a relatively high degree of general envy, as well as benign envy, in the vacation scenario (see Table 5). Fourth, we did not use the same item for measuring happiness across these two studies. The item of "I feel pleasant" was used in the first study as a way to measure an overall feeling, and the item of "I feel happy for the person" was used in the second study in order to be in line with the experimental context. The target of the emotions was slightly different between the two studies. Last but not least, whereas the first study is relatively high in ecological validity, it is

hard to generate any causality; while the second study isolated other factors and controlled for the tie strength, the external validity is low. We did not distinguish participants who had already seen the posts from those who saw the posts first time in Study 1. There might be some biases between recalling feelings and reporting current feelings, as recalling is not as accurate as reporting. In addition, there might have been too much priming of the tie strength in the experimental design, as we asked a few questions about the Facebook friend before each scenario. Based on these limitations, future studies should be done to adjust the experimental design (e.g., by measuring the feeling of envy in a third-person perspective, by using different items for relationship closeness and emotions, or trying to avoid the effect of priming), and by re-testing the external and internal validity of this study. Finally, this paper only focused on the momentary feelings of browsing Facebook, future research is required to investigate the implications for the long-term use of Facebook on emotional outcomes.

Conclusion

In this paper, we examined the momentary feelings after reading a post on Facebook, and the role of relationship closeness in predicting the feelings of happiness and envy. Over two studies, with different methods (correlational and experimental) and different samples (American and German), we found that positive emotions are more pronounced than negative emotions, and tie strength intensifies the feeling of happiness, as well as the feeling of benign envy, after reading a post on Facebook.

4. Material and Experiential Posts and Envy (Paper 2)

This chapter is a slightly modified version of our paper “Experiential purchases trigger more envy than material purchases on Social Network Sites”, which was accepted at ICA conference and submitted to Computers in Human Behavior (with the title of “What triggers envy on Social Network Sites? A comparison between shared experiential and material purchases”).

The first author Ruoyun Lin was responsible for designing and conducting Study 1 and Study 3, analyzing data, and writing manuscript; and the second author Niels van de Ven and the third author Sonja Utz were responsible for supervising and giving feedbacks. In addition, Niels van de Ven designed and conducted Study 2, helped with collecting data for Study 1 and 3, and revised some parts of this manuscript.

Abstract

The use of Social Network Sites has made other's consumption such as traveling experience (experiential purchase) and newly purchased gadget (material purchase) more publicly visible. Seeing such content sometimes triggers envy and may further influence the purchase intention of the shared consumption. Three studies were conducted to investigate which purchase type triggers more envy on Social Network Sites (mainly Facebook) and explored its underlying mechanism. It was consistently found that experiential purchases were more likely to trigger envy than material purchases in three studies (total N = 798), when people looked at instances at their own Facebook News Feeds (Study 1), in a controlled scenario experiment (Study 2), and in a general survey (Study 3). Study 1 and 2 confirm that this occurs because experiential purchases are more self-relevant than material purchases. In addition, it was found (in Study 1 and 3) that people shared their experiential purchases more frequently than material purchases on Social Network Sites, and posters did not expect that posting experiential purchases would trigger more envy than material purchases (found in Study 3). This paper provides insight into when and why seeing other's shared consumption leads to envy. Marketers could utilize this emotion for better social network advertising.

Keyword: Experiential purchases, material purchases, envy, social comparison, Facebook

Introduction and theoretical background

On Social Network Sites (SNSs) such as Facebook and Twitter, users often share their traveling experiences or newly purchased gadgets (Sekhon, Bickart, Trudel, & Fournier, 2014). Others, who read such content, may compare themselves unfavorably with the poster, therefore the unpleasant feeling of envy could emerge (Smith & Kim, 2007). Krasnova et al. (2015) identified several categories of the post content on Facebook that can trigger envy, including travel and leisure, money and material possessions, achievements in job and school, relationship and family, appearance, happiness, etc. The first two categories are similar to the concepts widely investigated in the consumer psychology literature: the distinction between experiential and material purchases (Van Boven & Gilovich, 2003, p.1194). The current research will investigate not only the frequency with which people share and encounter such posts on Facebook, but also the *intensity* of envy these posts about the different types of purchases tend to elicit.

Posts about *experiential* purchases mainly address an event or series of events that one lives through, such as vacations, leisure events, etc. Posts about *material* purchases mainly address a tangible object that is kept in one's possession such as clothing, devices, car, apartment, etc. Previous research mainly focuses on investigating which purchase type brings more happiness, and the results showed that spending money on experiential purchases can bring more happiness (Gilovich et al., 2015). However, there seem to be conflicting findings on whether it will be experiential or material purchases that are more likely to elicit envy (See more below; Carter & Gilovich, 2010, 2012). Furthermore, the theory behind the difference between experiential and material purchases could also predict either one to be the one that would elicit more envy. It is therefore of theoretical importance to examine which purchase type is most likely to elicit envy, and why this is the case.

It is also practically relevant to study the emotion of envy resulting from seeing other's shared consumption. Because envy can stimulate consumption (Crusius & Mussweiler, 2012; van de Ven et al., 2011), knowing which purchase type on SNSs triggers more envy and its underlying mechanisms can help marketers to utilize this emotion for better advertising. At the individual level, feeling envy on SNSs negatively affects well-being (Appel, Crusius, & Gerlach, 2015; Verduyn et al., 2015), may cause depression (Appel, Gerlach, & Crusius, 2016), and induce switch intention (i.e., stop using the current SNS platform and switch to another one) (Lim & Yang, 2015). At a social level, envy can potentially hurt interpersonal relationships (Smith & Kim, 2007). Because of these important consequences, the current research is also important for SNS users and providers to better understand the possible positive and negative psychological effects of SNS consumption.

In the following parts, we will first introduce the concept of envy and then clarify the boundaries of our research. Previous research on experiential and material purchases and happiness will be introduced, and its relationship with the emotion of envy will be discussed.

Envy

Envy is the emotion that “arises when a person lacks another's superior quality, achievement, or possession and either desires it or wishes that the other lacked it” (Parrott & Smith, 1993). The concept of envy involves two parties: the envier, who is in the inferior position, and the envied person, who possesses the envied object. The emotion envy has clear negative sides. First, envy feels negative and contains feelings of frustration and people do not like to feel it (Smith & Kim, 2007). Second, feeling envious can be detrimental for the relationship with the envied person, as envy can lead to negative behavior toward the person being envied (such as gossiping, Wert & Salovey, 2004) Finally, people also dislike being envied by others (Foster et al., 1972; Rodriguez Mosquera, Parrott, & Hurtado de Mendoza,

2010). In sum, the readers of such a message might feel negative and the posters of the message might worry about being envied.

After all, the frustration that the other is better off can be resolved by trying to pull down the other from their superior position (a motivation often associated with malicious envy) in a negative way, or by motivating oneself to improve (a motivation often associated with benign envy) in a positive way (van de Ven, Zeelenberg, & Pieters, 2009). Van de Ven et al. found that some languages (such as Dutch) have two words for envy (that refer to these subtypes: benign and malicious envy), while other languages (such as English) have one word that indicates general envy that incorporates both these subtypes. How one sees envy depends on the level at which one zooms in to the experience: a more detailed focus would suggest subtypes, and a less detailed focus defines the general envy as the frustration caused by the good fortune of others (van de Ven, 2016).

In the current manuscript, we do not make the distinction in subtypes, and focus on the overarching experience of general envy. We do so because initially we are interested in how likely posts about material or experiential purchases are to elicit envy. The reason is that (general) envy on SNSs has been a hot topic recently, and researchers were concerned about the negative effects of this general envy on life satisfaction and well-being (Appel et al., 2015; Krasnova et al., 2015; Steers et al., 2014; Tandoc et al., 2015; Verduyn et al., 2017). More intense envy is also likely to induce the SNS platform switch intention (Lim & Yang, 2015). As a result, users may stop using the current social network service when too much envy is experienced. It is important for SNS providers to know under which conditions the general negative emotion of envy is likely to be elicited.

Do experiential or material purchases elicit more envy, and why?

To explain why past research could lead to both the prediction that experiential and material purchases would trigger more envy, it helps to first look at why experiential

purchases tend to make people happier than material purchases do. Gilovich et al. (2015) provided three reasons why experiential purchases tend to make people happier. First, the sharing of experiential purchases was found to enhance social relations more than the sharing of material purchases did, thereby improving well-being (Caprariello & Reis, 2013; Amit Kumar & Gilovich, 2015). Second, experiential purchases tend to be more closely associated with one's central identity than material purchases are, acquiring them is therefore likely to have a stronger positive effect on well-being (Carter & Gilovich, 2012). Lastly, it is easier to compare someone else's material purchase (than experiential purchase) with what one owns oneself (Carter & Gilovich, 2010), which makes enjoying experiences less dependent on what other people have. We will discuss these points in more detail and how we think they relate to the experience of envy toward experiential or material purchases.

Positive effects of sharing experiences. People tend to talk more about their experiential purchases and derive more hedonic benefits from doing so (Amit Kumar & Gilovich, 2015). This is because of three reasons. First, it is more rewarding to talk about one's experiential purchases than material purchases as it helps to build social capital. Van Boven et al. (2010) showed that due to the stigmatization of materialism, others enjoy the conversation and the person more when talking over experiential purchases than material purchases. Second, by talking to others, people can re-live experiences after the experiences have happened. Third, people may even re-create the experience and add a "rosy view" by talking about them. Therefore, more satisfaction and happiness are gained by talking about experiential purchases than material purchases.

Based on these reasons, we expected social network users are more likely to post about their experiential purchases than material purchases online. Furthermore, exactly because experiential purchases are shared more frequently online, they are more likely to trigger envy than material purchases (frequency-wise). However, when it comes to which purchase type

triggers a higher degree of envy (intensity-wise), the following two mechanisms would provide contradicting arguments.

Self-relevance. When people look back on their life, they indicate that experiences were more important parts of their life than material purchases were (Amit Kumar, Mann, & Gilovich, 2017). Experiential purchases are also seen as more central to one's identity compared with material purchases (Carter & Gilovich, 2012). Self-relevance of the comparison domain is also a key antecedent of envy according to social comparison theory: things that are more important to you and are seen as a larger part of your identity are more likely to trigger envy (DeSteno & Salovey, 1996; Festinger, 1954; Salovey & Rodin, 1984). This is the main reason why it could be predicted that experiences are more likely to trigger envy than material purchases do: when others showcase their experiential purchases, and experiences tend to be more self-relevant and important to observers, more intense envy is likely.

Comparability. The second important point relates to the comparability of material and experiential purchases. Gilovich et al (2015) explained that experiential purchases are evaluated more on their own terms and that they evoke less social comparisons. A concrete product is relatively easy to compare, but an experience (e.g., a vacation) is typically unique and more difficult to compare. Carter and Gilovich (2010) found that for material purchases people are more sensitive to how aspects of one's own purchase relate to possible alternatives. As an upward social comparison is the key cause of envy (Smith & Kim, 2007), the findings that material purchases tend to trigger more comparisons suggests that they might trigger more intense envy as well.

Previous findings on envy toward material and experiential purchases

To the best of our knowledge, there are three studies that have (indirectly) compared the degrees of envy felt over seeing other's experiential and material purchases. In our point

of view, one cannot yet answer the question about which purchase type elicits more intense envy, and the other two find conflicting support. First, Krasnova et al. (2015) found that people indicated that, from all instances of envy reported, posts about travel and leisure were the dominant object of envy on Facebook (62.1%); and people were rarely envious about “material possessions” on Facebook (5.9%). Thus, if people report being envious about experiences more often, this either could be caused by encountering them more frequently, or because each instance was more likely to trigger more intense envy (or a combination of both). Due to the positive experiences of sharing experiential purchases, we expect experiential purchases were shared also more frequently than material purchases on SNSs. Besides this, the current studies will mainly test the envy intensity while controlling for the exposure frequency.

Then there appear to be two conflicting findings in the literature: Carter and Gilovich (2010, Study 5c) found that jealousy (used in their study to measure envy) was stronger when someone else had a better laptop than oneself, compared with a better vacation than one had oneself. This was thought to be due to the idea that material purchases are more comparative than experiential purchases, as the value of an experiential purchase is usually hard to estimate. This would thus lead to the prediction that sharing material purchases would be more likely to elicit envy. However, Lin and Utz (2015, Study 2) found that envy was stronger when a Facebook friend posted a picture of a vacation, than for a friend posting a picture of a newly bought iPhone. These seemingly conflicting results make it interesting to test whether it is experiential or material purchases that elicit a higher degree of envy (and why they do so).

Current research

To summarize, we aim to examine which type of post content (experiential vs. material purchases) triggers more envy on SNSs and to explore the underlying mechanism. Two

conflicting hypotheses are tested about which purchase type triggers envy more intensively, and each hypothesis was supported by one study: Lin and Utz (2015) found that experiential purchases triggered a higher degree of envy, while Carter and Gilovich (2010) found that material purchases triggered a higher degree of envy. The competing ideas are thus:

1. Experiential purchases are typically more self-relevant than material purchases are, which is likely to make people more envious for experiential purchases.
2. People make comparisons more easily for material purchases than for experiential purchases, which is likely to make people more envious for material purchases.

Furthermore, we also examine which purchase type is shared more frequently on SNSs and why. Study 1 uses more naturalistic observations in which participants report on purchases from participants' own Facebook friends. Study 2 uses a more controlled experimental study with two scenarios based on past work on experiential purchases vs. material purchases, setting the price of these two purchases to be the same. Finally, Study 3 will examine these research questions via a survey method and check whether in general an experiential or a material purchase triggers the most envy when reading such a post. Study 3 also tests if people, who take the perspective of someone who posts a message themselves, are accurate in predicting which purchase type is most likely to elicit envy in others.

Study 1

Study 1 is a lab study with a within-subject design. It examines which post category (experiential vs. material purchases) triggers more envy by asking people to look at real posts from their News Feeds. The platform of Facebook was used, as it is one of the most popular SNSs worldwide. Facebook users were asked to look at their own News Feeds to report the first instance in which a friend shared an experiential and a material purchase. They were also asked to report the frequencies of seeing posts for each category. For each reported post, we measured how important the shared topic was to them (self-relevance/domain relevance),

how easy it was to compare the shared purchase to other possible purchases (comparability), and how intense the envy is it elicited in them (envy). It was then tested whether self-relevance and comparability mediated the effect of post category on envy. In addition, this set-up allowed to test if Facebook users are more likely to be exposed to posts from friends about experiential purchases than material purchases (exposure frequency).

Method

Participants and procedure

Participants were recruited via a Dutch University local panel. This study was part of a series of independent studies, that together lasted 50–60 minutes and participants were paid 8 Euro for their participation. Participants completed an online questionnaire in Dutch. They were asked to search through their Facebook News Feeds, and, if possible, to report two posts from their Facebook Friends, including the first post they see about an experiential purchase and the first post about a material purchase. The two post categories were identified as following: 1) a post of an experiential purchase mainly addresses a (paid) experience (e.g., a dinner, party, holiday or vacation, concert, etc.) of a Facebook friend; 2) a post about a material purchase mainly addresses a purchased product (e.g., a car, telephone, television, clothes, etc.) of a Facebook friend. They were asked to continue with the survey once they found the two posts (one post for each category). If they had not found these within ten minutes, the survey gave off a signal and they were asked to continue as well. Participants were asked to first describe the post(s) that they had found, then answer several questions for each of the reported posts, and fill out demographic information (age, gender, education).

Measures

Participants indicated whether they had found a post in each category (experiential and material purchase) and briefly wrote down what the post was about.

Frequency of exposure to experiential and material purchases. Participants were asked to report how often they see posts from their Facebook Friends about experiential and material purchases respectively in the past year. Answers were rated with a 7-point ordinal scale from *never* (1), (via less than once a month, once a month, 2–3 times a month, once a week, 2–3 times a week) to *daily* (7).

Degree of envy (intensity). After each reported post, participants were asked to indicate to what extent they felt envy after reading the reported post by using the three items: “I felt a little frustrated that the other was better off than I”, “I was a bit envious”, and “I was a bit jealous”, rated continuously with a slider scale from *not at all* (0) to *very much so* (6), (Cronbach’s $\alpha = .77$ for experiential category, and Cronbach’s $\alpha = .88$ for material category). These three items were adapted from the envy scale used by van de Ven (2015).

Underlying mechanisms. Self-relevance (domain relevance) was measured by the following question: “to what extent is the thing acquired by the other person important to you (in other words, is the domain in which the other bought something also important to you)?”, using a continuous slider scale from *not at all* (0) to *very much so* (9). Comparative nature of the envied object (comparability) was measured with one item: “it was about something that is easy to compare with what someone else can buy”. Participants were asked to rate it from *strongly disagree* (1) to *strongly agree* (7).

Manipulation check (post category/purchase type). We examined whether the reported post indeed belonged to each category by asking whether the purchase was seen as something material or experiential. It was asked “to what extent do you think the purchase in the Facebook post is an experience (something you buy to do), or a material possession (a product you buy to have/use)?”. Participants rated each reported post with a scale from *definitely experience* (–4) to *definitely material possession* (4).

Please note that in addition to the degree of self-reported envy and two underlying mechanisms of self-relevance and perceived comparability, the degree of other's envy and several other potential mechanisms were also measured for each reported post for exploratory reasons (please refer to the section of "Additional Results in Paper 2, Study 1").

Results

Of the 178 participants who eventually came to the lab and completed the questionnaire, 6 did not have a Facebook account and were excluded (sample age = 21.48 years, $SD = 3.12$, 68% female). Participants in this sample visited Facebook on average one to several times a day ($M = 5.61$, $SD = 1.15$), read their News Feeds one to several times a day ($M = 5.34$, $SD = 1.24$), and posted status updates once a month ($M = 1.43$, $SD = 1.43$). They spent about 1-2 hours on Facebook in the past week ($M = 4.03$, $SD = 1.58$), and the average amount of Facebook Friends was 434, $SD = 245$, median = 400.

Frequency of exposure to posts about experiential and material purchases

Among 172 Facebook users, 131 participants found both types of posts, 39 participants found only a post of experiential purchase, and 2 participants found only a post of material purchase. This suggests that posts about both experiential and material purchases are quite common, but more so for posts about experiential purchases: 98.8% of participants encountered at least one post about an experiential purchase within ten minutes of scrolling through their News Feeds, and 77.2% encountered at least one about material purchases.

For how often people in general see posts about experiential or material purchases, we found that participants reported that they have seen more experiential posts ($M = 5.72$, $SD = 1.39$) than material posts ($M = 4.28$, $SD = 1.55$) in the past year, $t(171) = 12.97$, $p < .001$, $d = .99$. Participants in this sample saw experiential posts on average two to three times per week, whereas they saw material posts on average two to three times per month.

Post category, envy, self-relevance, and comparability

In order to compare the responses to experiential and material purchases within each person, we only included the participants who had reported both an experiential and a material post. The reason is that it does not allow us to do the within-subject comparisons for those who found only one post; and treating responses to experiential and material posts as independent would ignore their dependency that exists (which is not ideal). The sample size is thus 131 participants when looking at the effect of reading a material or experiential post on envy (as well as the possible reasons for why they envy). Table 8 contains the descriptive statistics for each post category and the statistical tests comparing the responses. We used paired *t*-tests (as indicated by a *t* value) when the data was normally distributed, and Wilcoxon signed-rank tests when the data was not (indicated by a *z* value). Furthermore, the correlational statistics are available in Table 8.

As can be seen in Table 8, the manipulation check showed that participants reported posts in the material condition as more material than those in experiential condition, $z = 8.06$, $p < .001$, $PS_{def} = .80$. With regard to envy intensity, participants reported a higher level of envy when they read the reported experiential post than the reported material post, $z = 2.75$, $p = .006$, $PS_{def} = .42$. These results suggest that it is experiential posts that triggered a higher level of envy on Facebook.

Table 8. Descriptive Statistics and Results of Between-Group Comparisons in Paper 2 Study 1

	Experiential		Material		<i>n</i>	<i>t</i>	Statistics	
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)			<i>z</i>	<i>p</i>
Experiential (-4) to material (+4) purchase	-1.95	(2.42)	1.49	(2.42)	129		8.06	< .001
Envy (0-6)	0.85	(0.98)	0.67	(1.07)	130		2.75	.006
Self-relevance (0-9)	3.90	(2.71)	2.88	(2.70)	131	3.43		< .001
Comparability (1-7)	4.82	(1.56)	5.08	(1.74)	131		-2.04	.042

As Table 8 shows, the results also confirmed that there were significant differences in the perceived self-relevance and comparability across the two post categories. Self-relevance, the perceived importance of the purchase to oneself, was higher in the experiential condition

than in the material condition, $t(130) = 3.43, p < .001, d = .30$. The comparability of experiential purchases was lower than that of material purchases, $z = -2.04, p = .042, PS_{\text{def}} = .44$.

Table 9. Pairwise Correlational Statistics for Experiential/Material Conditions Respectively in Paper 2 Study 1

Pearson's Correlations	1	2	3
1. Envy (0–6)	1		
2. Experiential (–4) to material (+4) purchase	–.01/–.04	1	
3. Self-relevance (0–9)	.40***/.39***	–.12/.04	1
4. Comparability (1–7)	.01/–.05	.15/.33***	.02/.24**

* $p < .05$; ** $p < .01$; *** $p < .001$

The correlational statistics (see Table 9) revealed that the degree of envy was highly correlated with self-relevance, but not with comparability. We had expected that the difference in envy elicited by experiential and material purchases to be mediated by the perceived self-relevance of the situation and comparability as well. As the design was within-subject, we used Judd, Kenny, & McLelland's (2001) method to examine mediation (using bootstrapping). The first step in a within-subject mediation analysis was to test whether there is a condition effect (a difference between material and experiential posts) on the dependent variable (envy) and the possible mediators (self-relevance and comparability). As Table 8 shows, all these three effects of the condition were significant. Second, the within-subject difference score for the effect of condition on the mediator should predict the condition difference score on the dependent variable (e.g., the increased self-relevance for experiential purchases over material purchases should predict the increase in envy for experiential purchases over material purchases). The result of the bootstrapping regression model showed that self-relevance played a mediating role in explaining why envy differed across two conditions: Based on 5000 bootstrap samples, the bootstrap 95% confidence interval for the indirect effect of purchase type on envy via self-relevance did not include zero (.28 to .58). However, the 95% confidence interval for the indirect effect via comparability did include

zero (-.31 to .10), indicating no mediating role of comparability (that means comparability turned out to be unrelated to envy in this study).

Discussion

This study examined whether reading posts about experiential purchases or material purchases triggers more envy. The results suggested that seeing a Facebook friend post about an experiential purchase triggers envy more intensively than seeing a Facebook friend post about a material purchase. For the potential mechanisms, we examined the role of self-relevance and the comparative nature of envied object. We replicated earlier work that material purchases were easier to be compared with each other (Carter & Gilovich, 2010), and that posts about experiential purchases were seen as more self-relevant (Gilovich et al., 2015). However, only self-relevance was related to envy in this case: the higher envy for experiential purchases existed (for a part) because these were seen as more self-relevant.

A second finding is that users encounter posts about experiential purchases much more frequently. This is also one reason to explain why Facebook users are more likely to experience envy toward other's experiential purchases rather than material purchases (Krasnova et al., 2015). It is thus not only that typical posts about experiences trigger a higher degree of envy than posts about material purchases, but also that people encounter these posts that trigger more envy more frequently.

This study had the advantage that it used people's responses to actual posts on their News Feeds. Furthermore, it used a within-subject design that allowed the comparison of responses to experiential versus material posts of the same person. One limitation of Study 1 is that the price/size of the envied object seems to be unequal across the two comparison groups (see additional results at the end of this paper). Nevertheless, the post-hoc analysis showed that, even when controlling for the size/price of the envied object, self-relevance was

still an important mediator (95% CI; .21 to .48). Study 2 was further conducted to exclude the influence of the price of the envied object on envy.

Study 2

Study 2 was an online experiment to replicate the finding that a shared experiential purchase triggers more envy than a shared material purchase does, while controlling for the price of the envied object. The study stimuli were developed based on the previous work on material and experiential purchases (see Study 2, Rosenzweig & Gilovich, 2012). Following their study, we created two hypothetical Facebook posts, one in which someone displayed a recently bought iPod and the other in which someone displayed a visit to a music venue, both labeled as having the same price (\$55). This has the advantage that both the material and experiential purchases are in the same domain (music) and have the same price.

Besides measuring how much envy the purchase elicited, we also measured self-relevance of the purchase and the comparability of the product to what one has oneself. Finally, this study also adds a third important consequence that differs between experiential and material purchases, which is whether someone likes the other more after seeing his/her post about the purchase. In their review on the differences between material and experiential purchases, Gilovich et al. (2015) concluded that experiential purchases improve social bonds. Therefore, we hypothesized that sharing posts about experiential purchases is more likely to increase liking than sharing material purchases is. This might be the reason why users are more likely to share experiential purchases than material purchases on Facebook, even if readers might become more envious when the former are being shared.

Method

A one-minute online questionnaire was conducted with a one-way (purchase type: experiential vs. material) between-subjects design. Two hundred and fifty-two Amazon mTurk workers completed the questionnaire, and each of them was paid \$0.15. Participants

were instructed to imagine that they encountered a Facebook post made by someone they know (called “Joe”). Participants were randomly assigned to the experiential condition and saw a post by Joe about having bought a concert ticket worth 55\$. The other participants were assigned to the material condition and saw a post by Joe having bought an iPod shuffle also priced at 55\$. The exact posts can be found in Figure 2.

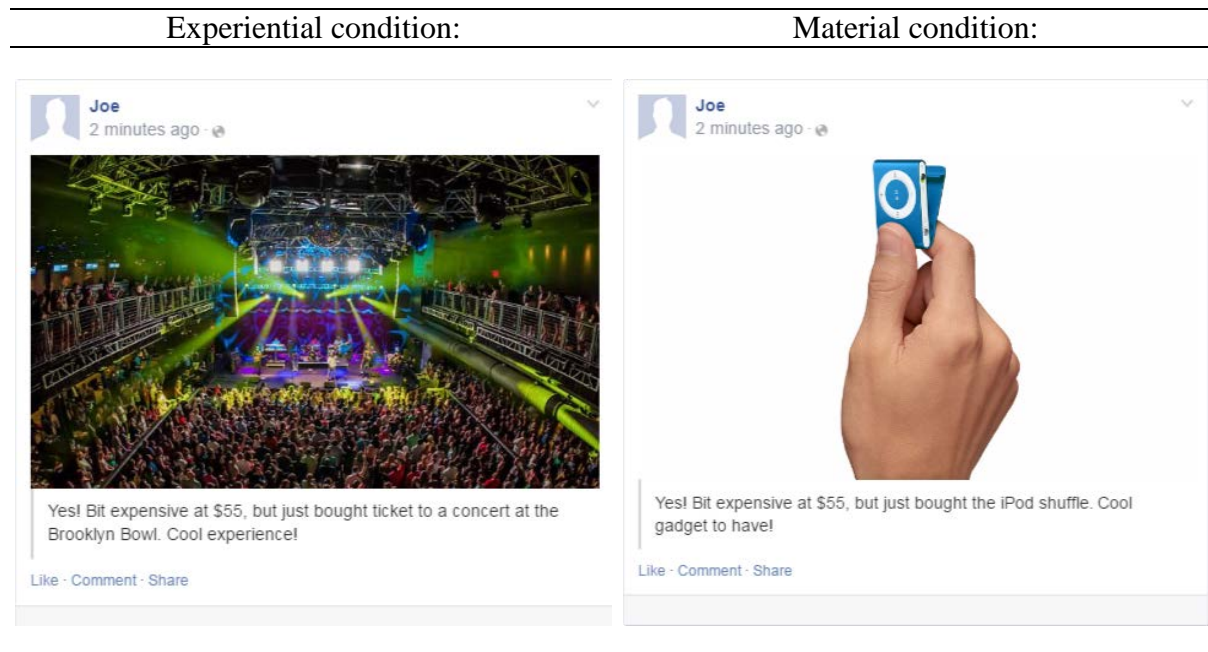


Figure 2. Stimuli used in Paper 2 Study 2.

In both conditions participants were asked to evaluate their degree of *envy* by answering “would you be a little envious of Joe?”. Self-relevance was measured with one item: “How important is it for you to have a similar thing as the one Joe posted about?”. Comparability was measured with “Did Joe’s post make you think about what you have yourself and how that relates to what Joe has?”. These questions were all answered on a scale from 0 (not at all) to 6 (very much so). Additionally, participants were asked “does Joe’s post make you like him less or more” for the changed level of liking. Participants rated this question on a slider scale from -3 (like him much less) to 3 (like him much more). The sequence of these four measurements was also randomized. At the end of the questionnaire,

demographic information (gender, age, and whether the participant is a Facebook user) was measured.

Results and Discussion

Among 252 participants, 9 did not have a Facebook account, and 2 did not complete the questionnaire properly (with missing values for all key variables). Therefore, the final analysis dataset included 241 participants ($M_{\text{age}} = 32.35$, $SD_{\text{age}} = 9.82$, 39% female). Table 10 depicts the mean values per condition for each measured variables and the results of between-group comparisons. Due to the skewed nature of the data distribution, Wilcoxon rank sum tests were used here. As can be seen in Table 10, participants reported more envy ($z = 5.64$, $p < .001$, $r = .36$) and a higher degree of self-relevance ($z = 2.37$, $p = .018$, $r = .15$) in the experiential condition than in the material condition. There was no difference in the comparability across two conditions, $z = 0.91$, $p = .366$, $r = .06$. We assume that this is due to the special experimental design in which the price of the product was mentioned explicitly. In addition, participants liked someone who posted about an experiential purchase more than someone who posted about the material purchase, $z = 4.68$, $p < .001$, $r = .30$. A closer examination shows that when someone shares an experiential purchase, participants liked that person more than they did before, $z = 3.59$, $p < .001$ (compared with the neutral point of the scale). When someone posts a material purchase, participants indicated they would like the person less than before, $z = -3.00$, $p = .002$ (compared with the neutral point).

Table 10. Descriptive Statistics and Results of Between-Group Comparisons in Paper 2 Study 2

	Experiential ($n = 124$)		Material ($n = 117$)		Rank sum tests	
	M	(SD)	M	(SD)	z	p
Envy (0–6)	2.08	(1.81)	0.86	(1.24)	5.64	<.001
Self-relevance (0–6)	1.34	(1.50)	0.82	(1.08)	2.37	.018
Comparability (0–6)	1.95	(1.64)	1.78	(1.65)	0.91	.366
Liking (–3–3)	0.24	(0.93)	–0.37	(1.02)	4.68	<.001

A mediation analysis was conducted to test the mediating role of self-relevance and comparability using ordinary least squares path analysis in PROCESS (see results in Figure 3). A bootstrap confidence interval for the indirect effect of self-relevance ($a_1b_1 = 0.33$) based on 5000 bootstrap samples was entirely above zero (.14 to .57), but the confidence interval for indirect effect of comparability ($a_2b_2 = 0.05$) included zero (-.05 to .20). In other words, the experiential purchases triggered a higher degree of envy, for a part because it was more self-relevant. The results also showed that comparability of the product increased envy (in contrast to what was found in Study 1). However, this time the manipulation of purchase type (experiential versus material) did not affect perceived comparability. Because of this, there was also no mediation of purchase type on envy via comparability.

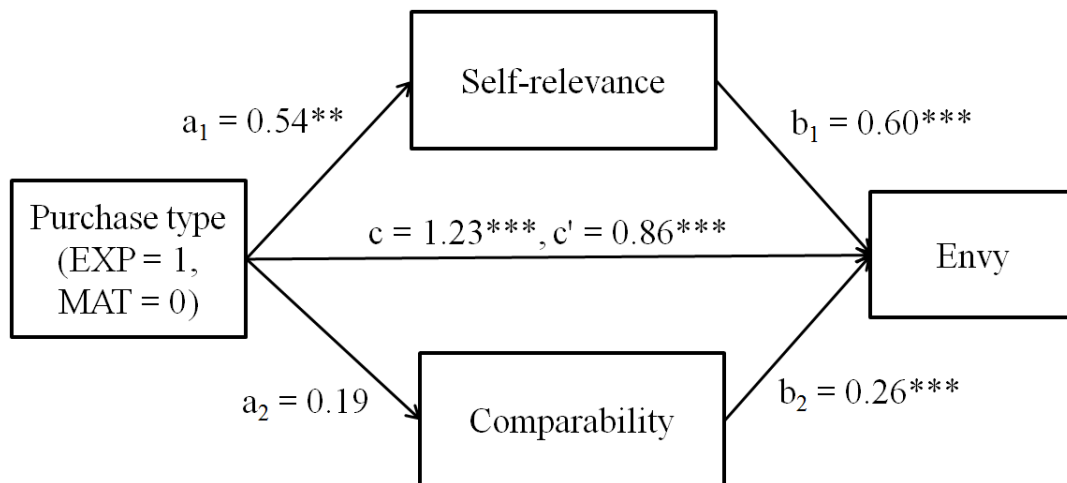


Figure 3. Mediating model in Paper 2 Study 2 (unstandardized coefficients, $**p < .01$. $***p < .001$).

To summarize, the results showed that an experiential purchase triggered more envy than a material purchase did. Consistent with Study 1, we found again that this effect arose for a part because the experiential purchase was seen as more self-relevant. Just like in Study 1, we found no mediation role of comparability; but this time there was a direct effect of comparability on envy (but the purchase type did not differ in comparability). This might be due to the slightly changed measure of comparability: in Study 1, we measured comparability

with the comparative nature of the envied object (i.e., “whether the object itself is something that everyone thinks it is easy to compare with”); but in Study 2, we measured comparability by addressing comparing one’s current situation with the poster. Interestingly, although the experiential purchases do trigger more negative feelings in the form of envy, people do actually like someone more who posts about an experiential purchase. This is also in line with van Boven et al.’s (2010) finding that others enjoy a conversation about experiential purchases more than one about material purchases. It seems that most social network users are somehow aware of the social norm that sharing experiential purchases is in a more positive light than sharing about material purchases, and therefore share experiential purchases more often on SNSs. Interestingly, this does also increase the chance of triggering the negative experience of envy in others. This issue is investigated in Study 3 both a poster’s and a reader’s perspective.

Study 3

Study 1 and 2 found that posts about experiential purchases elicit a higher degree of envy in others (compared with posts about material purchases). However, we also know that people do not like to be envied by others (Foster et al., 1972; Rodriguez Mosquera et al., 2010; van de Ven, Zeelenberg, & Pieters, 2010). Indeed, people feel discomfort when they receive preferential treatment over others (Jiang, Hoegg, & Dahl, 2013) and can feel guilty or anxious when others are thought to be envious of them (Romani, Grappi, & Bagozzi, 2016). How do we reconcile that people share these envy eliciting stories if they do not like to be envied? Study 2 already provided one answer: despite the increase in envy, people do like those who share experiential purchases more. Study 3 tested a second possible reason, namely that people wrongly predict what will elicit envy in others when they post about material or experiential purchases themselves. Do they actually realize that others will become more envious over experiential purchases than over material purchases?

In Study 3 we explored the degrees of envy triggered by five categories of posts (i.e., experiential purchases, material purchases, relationships, achievements, and appearances) and from two different perspectives: the poster’s (the person who posted the post) and the reader’s (the person who read the post). These categories were found by Krasnova et al (2013) to be the most common categories of posts that may trigger envy on Facebook. Including more post categories than only experiential and material purchases made the study a bit broader, and allowed us to explore how purchases trigger envy in relation to other possible topics people might share. In addition, we expected that there would be a prediction error: people who post a topic (posters) would think that posts about material purchases would elicit the most envy, while readers actually experience more envy when seeing posts about experiential products.

Method

Participants and procedure

Participants were recruited via Amazon MTurk for a 10-15 minute survey that paid \$1.50. They were required to be active social network users (who used Facebook at least weekly), at least 18 years old, and located in the U.S. Four hundred and five American mTurk workers completed the questionnaire.

Table 11. Descriptions for the Five Post Categories in Paper 2 Study 3

Categories	mainly reveal information about...
Experiential Purchases	...vacations, trips, visits to foreign countries, leisure events and experiences (e.g., concerts), etc. Those posts address an event or series of events that one lives through.
Material Purchases	...possessions of clothing, jewelry, devices, cool gadgets, car, apartment, etc. Those posts address a tangible object that is kept in one’s possession.
Relationship and Family	...romantic relationship, girlfriend/boyfriend, baby, pregnancy, family, love, marriage, etc.
Achievements	...job, school, and success and achievements in various areas (e.g., career, school, sports, cooking, and arts).
Appearance	...one’s appearance, beauty, nice profile picture, and being fit.

Five post categories were examined: experiential purchases, material purchases, relationships, achievements, and appearances. The description that described each post

category can be found in Table 11. Participants were randomly assigned to one of the two conditions: participants were asked to answer questions with regard to each of the five post categories from either a poster's ($n = 188$) or a reader's ($n = 197$) perspective. In other words, participants in the poster's version were asked to imagine how others would react to participants' own posts, and participants in reader's version were asked to report their reaction after reading the posts made by others.

We first asked how frequently people typically posted items from each category themselves (in the poster's version) or how much they liked to see posts from each category (in the reader's version). Then, for each post category, we measured the degree of envy that posters think would be triggered in readers (in the poster's version), and how much envy a typical post would trigger in readers themselves (in the reader's version). The comparison between readers' and the posters' reactions is therefore a between-subjects comparison, but the comparison across the five post categories is a within-subject comparison.

At the end of the questionnaire, Facebook usage behavior, an instructional manipulation check (to check whether participants actually paid attention to instructions), and demographical information were included. Same as Study 1, several additional questions had been added for exploratory purposes. Please refer to the additional results at the end of this paper.

Measures

Participants in the poster's condition were first asked to report how frequently they tend to post status updates in each post category, with a 5-point ordinal scale from *never* (1) to *very often* (5). Expected envy was measured with one item question for each post category: "when you post about [post category], do you think people who read such a post are likely to become a little envious?", with a continuous slider scale ranging from *not at all* (0) to *very much* (6).

Participants in the reader's condition were asked to report the extent to which they like to see status updates from other people in each post category, with a continuous slider scale from *not at all* (0) to *very much* (6). Envy was measured by one item: "when someone posts about [post category], does such a post make you a little envious?", with a continuous slider scale ranging from *not at all* (0) to *very much* (6).

Frequency of visiting Facebook, reading one's News Feed, and writing status updates were measured with an ordinal 7-point scale (1 = *less than once a month*, 2 = *one to three times a month*, 3 = *once a week*, 4 = *several times a week*, 5 = *once a day*, 6 = *several times a day*, 7 = *all the time*). The average time spent on Facebook daily in the past week was measured with an ordinal scale (1 = *10 minutes or less*, 2 = *10–30 minutes*, 3 = *31–60 minutes*, 4 = *1–2 hours*, 5 = *2–3 hours*, 6 = *more than 3 hours*). The number of Facebook friends was also measured. In order to check if participants were attentive, a modified version of an instructional manipulation check was included (Oppenheimer, Meyvis, & Davidenko, 2009): Participants were explicitly asked to choose a certain option as indicated in the long instruction. Those who did not read the instruction carefully were likely to click on other options, therefore can be treated as inattentive. Basic demographic information such as gender and age were collected at the end of the questionnaire.

Results

Before analyzing the data, 20 cases were dropped using the following criteria: participants who 1) did not agree with the consent form, 2) failed the instructional manipulation check, and 3) visited Facebook less than once a week. The final sample consisted of 385 participants. The mean age of the current sample was 33.78 years ($SD = 9.31$), with 49% female participants. In this sample, most participants visited Facebook one to several times a day ($M = 5.45$, $SD = 1.08$), read their News Feeds one to several times a day ($M = 5.30$, $SD = 1.14$), posted status updates one to several times a week ($M = 3.50$, $SD =$

1.58), and spent about 1 hour on Facebook daily in the past week ($M = 3.29$, $SD = 1.48$). The average amount of Facebook Friends was 282, $SD = 337$, median = 185.

Frequency of posting (poster) and willingness to see (reader)

Descriptive results are summarized in Table 12. About 94% of participants in the poster condition had posted a status update about experiential purchases (that is the % of participants that did not answer “never”), 81% had posted about material purchases, 95% had posted about a relationship, 92% had posted about achievements, and 71% had posted about appearances before. Across the five topic categories, there was a clear difference in the frequency of posting (see Table 12), $F(4,935) = 39.03$, $p < .001$, $\eta_p^2 = .14$. Posts about “relationship and family” were shared the most frequently, whereas posts about “appearance” were shared the least frequently on Facebook. Of main interest for our study is that participants indicated that they shared their experiential purchases ($M = 3.00$, $SD = 0.93$) more frequently than material purchases ($M = 2.30$, $SD = 0.93$), paired- $t(187) = 8.81$, $p < .001$, $d = .64$.

Table 12. Descriptive Results for Frequency of Posting, Willingness to See, and Degrees of Envy in Paper 2 Study 3

Post categories	Poster version ($n = 188$)			Reader version ($n = 197$)		
	Variables	M	(SD)	Variables	M	(SD)
Experiential purchases		3.00 ^d	(0.93)		3.85 ^b	(1.73)
Material purchases	Frequency of posting (1–5)	2.30 ^b	(0.93)	Willingness to see posts (0–6)	2.35 ^a	(1.74)
Relationship/family		3.20 ^c	(1.07)		4.13 ^c	(1.52)
Achievements		2.81 ^c	(1.01)		3.90 ^b	(1.48)
Appearance		2.15 ^a	(1.00)		2.50 ^a	(1.87)
Expected envy in readers (0–6)		2.72 ^c	(1.53)		2.80 ^c	(1.75)
Material purchases	Self-reported envy (0–6)	3.06 ^d	(1.65)	2.36 ^b	(1.75)	
Relationship/family		1.94 ^a	(1.64)		1.50 ^a	(1.50)
Achievements		3.03 ^d	(1.68)		2.25 ^b	(1.69)
Appearance		2.35 ^b	(1.74)		1.39 ^a	(1.64)

Note. Superscripts with different letters indicate a significant difference at $p < .05$ tested with paired- t tests for each variable.

The extent to which readers liked to read posts also differed across the categories, $F(4,980) = 50.54$, $p < .001$, $\eta_p^2 = .17$. It followed a similar pattern as the frequency at which

posters indicated to post in each category: Participants indicated to like to read others' status updates about relationships and experiential purchases the most, and least liked to see selfies (appearance posts) and posts about material purchases. Of notable interest for our current work is that people like to see posts about experiential purchases ($M = 3.85, SD = 1.73$) more than posts about material purchases ($M = 2.35, SD = 1.74$), paired- t (196) = 10.25, $p < .001, d = .73$.

Expected and reported degree of envy

As presented in the descriptive results in Table 12, Readers indicated that a typical post from certain categories (e.g., experiential purchases) triggered more envy in them than did posts from other categories, $F(4,980) = 25.07, p < .001, \eta_p^2 = .09$. Of the five categories, a post about experiential purchases was found to elicit the most envy, and posts about both “appearance” and “relationship and family” trigger the least envy. We replicated our earlier findings that readers reported a higher degree of envy when reading a typical post about an experiential purchase ($M = 2.80, SD = 1.75$) compared with reading about a typical post about a material purchase ($M = 2.35, SD = 1.75$), $p = .002$ (two-sided sign test due to skewed distribution).

Posters did expect that posts in the different categories would elicit different amounts of envy in readers, $F(4,935) = 15.85, p < .001, \eta_p^2 = .06$. We found that participants, who took the perspective of someone who posts a message, expected that others would be most envious by a typical post about a material purchase or an achievement. Especially important to our research question is that posters thought a typical post about a material purchase would trigger more envy ($M = 3.06, SD = 1.64$) than a typical post about an experiential purchase would ($M = 2.72, SD = 1.53$), $p < .001$ (two-sided sign-test due to skewed distribution). The difference remained significant when we excluded those posters who indicated to have no previous posting experience with these specific post categories, $p < .001$. In sum, posters

thought that posts about material goods would elicit more envy than posts about experiences would, while readers indicated experiencing the exact opposite.

General discussion

Three studies examined whether experiential or material purchases are more likely to trigger envy on Facebook. In Study 1, Facebook users found a post of a friend from their own Facebook News Feed about an experiential and a material purchase. The results of Study 1 showed that people experienced a higher degree of envy when reading posts about experiential purchases than about material purchases. This is due to experiential purchases being more self-relevant compared with material purchases. Study 2 created a between-subjects controlled scenario experiment that allowed us to fix the price of the purchase that was shared. Participants again felt more intense envy toward someone who posted about an experiential purchase than a material one. Self-relevance once again mediated this process. Finally, Study 3 examined the same question in a more general survey. Participants indicated that they themselves are typically more envious for a post of a friend about an experiential purchase than for a material one.

Furthermore, as indicated in Study 1 and Study 3, experiential purchases are posted more frequently than material purchases on Facebook. Still, this raised the interesting question whether people are aware that such posts about experiential purchases are also likely to trigger envy in others: people do not like others to be envious of them, so why do they post about experiential purchases so often? One reason why people probably post about experiential purchases more often is revealed in Study 2: participants indicated to like someone who posts about an experiential purchase more, than someone who posts about a material purchase. A second reason is that people do not seem to realize that experiential purchases are likely to elicit more envy in others. Study 3 revealed that participants actually

thought that others would be more envious over their material purchases than over their experiential purchases.

Theoretical implications

A long line of research has documented the positive aspects of experiential purchases: compared with material purchases, experiential purchases create greater satisfaction, people regret experiential purchases less, and in general, they create greater hedonic value (Gilovich et al., 2015). However, the current work shows that, after seeing posts about someone else's experiential purchase (compared with material purchase), people are more likely to become envious. One main advantage of experiential purchases is that they are more important to one's identity (Carter & Gilovich, 2012). But this seems to be the exact reason why they also elicit more envy. Because these experiential purchases are seen as more important, they trigger more envy. Past research found that the more important someone else's accomplishment is to one's own identity, the more likely it is to trigger envy (Salovey & Rodin, 1991). Study 1 and Study 2 indeed replicated that experiential purchases were more relevant to most Facebook users, and showed that the difference in self-relevance partially explained the extra envy that experiential purchases tend to elicit.

The current findings seem in conflict with earlier findings, which showed that material purchases triggered more envy (jealousy) because they are more comparable (Carter & Gilovich, 2010). The different results might be explained by the difference in study design. Carter and Gilovich (2010) used a scenario study in which participants were asked "to imagine that a rival had made the same material and experiential purchases that they had, but that their rival's had turned out better in each case" (p.155). First, the comparison is to a rival in this scenario, while the compared other is more likely to be a friend in the SNS setting we study. Second, Carter and Gilovich created the situation in an explicitly comparable way, by 1) focusing attention on what the participant him/herself owned and 2) by stating that what

the rival had was better. In the current studies, the comparison was always there, but more implicit (as participants were never forced to focus on what they had themselves). The current studies test people's implicit comparisons they use in daily life (where self-relevance thus has the possibility to play a much larger role). We still think comparability is an important factor in distinguishing experiential and material purchases (as found by Carter and Gilovich, 2010), and finding the boundary conditions when these effects are stronger or less strong is an important avenue for further research.

Another implication of the current research is the slightly more nuanced view of the effect that experiential purchases have in enhancing social relations. On the one hand, due to a higher story value of experiential purchases than material purchases (Amit Kumar & Gilovich, 2015), people are more likely to share their experiential purchases than material purchases online, as supported by the results of Study 1 and 3. Readers also liked the poster more when sharing experiential purchases than when sharing material purchases (as indicated by Study 2), and readers are more willing to read about other's experiential purchases than about material purchases (Study 3). Despite these many positive effects that have been identified in previous research (and we verify here), experiential purchases are also likely to elicit stronger negative feelings (envy in this case). This research provided a more comprehensive view on how sharing experiential and material purchases changes attitudes and emotions. Even though reading other's experiential purchases was found to trigger more envy than material purchases, it is also confirmed that sharing experiential purchases is better for social bonding than sharing material purchases is.

Also note that quite some research exists that shows that envy can be detrimental for social relationships and can lead to outright negative behavior toward the envied person (Duffy & Shaw, 2000; Oswald & Zizzo, 2001; Parks, Rumble, & Posey, 2002). However, only malicious envy leads to negative behavior toward the envied, and benign envy does not

(van de Ven et al., 2009). Existing research (see van de Ven, 2016 for an overview) can provide valuable insights into how one can gain the most benefit from sharing about experiential purchases without triggering the malicious form of envy. For example, the resulting envy is more likely to be of the benign form when one deserves the envied object more, when information is provided on how easy it would be to get it for a reader as well (van de Ven et al., 2012), or by focusing attention on aspects of the desired purchase (and less on oneself enjoying it; Crusius & Lange, 2014).

Practical implications

Besides the theoretical implication as mentioned above, the current work also has practical implications for social marketers, SNS users, and platform providers. As discussed before, the malicious consequences of envy might harm the relationship with the envied person, but if the envy is of the benign type it can potentially motivate people to “keep up with the Joneses” and improve their own position (van de Ven et al., 2009). Some work has been conducted on the role of envy in increasing the willingness to pay for envied products (Crusius & Mussweiler, 2012; van de Ven et al., 2011). As the posts about experiential purchases trigger the most envy on SNSs, marketers can also utilize the emotion of envy for better-targeted advertising that fits with the motivation that is likely active at that moment (e.g., by showing the tourism-related ads to those who are envious about friends’ vacation experiences). This research is also useful for those “influencers” those who make a living with their social media presence. The effect of promoting might be better (and even be more effective) when it is about promoting experiences than products. For example, an airline sponsoring a city trip might thus benefit more from marketing on SNSs than Gucci sponsoring a bag.

For SNS users who post frequently, it is interesting to know which post categories on SNSs are being liked more by others. The results of the third study showed that readers are

willing to see posts about other's relationship and family, but not too much about other's material purchases and selfies. With regard to the emotion of envy, it is also important to make posters be aware of the prediction error: it is actually experiential purchases that are likely to trigger the most envy. However, it does not necessarily mean that users should not post about their experiential purchases. There is an interesting discrepancy here: Though posts about experiential purchases trigger envy more intensively and more frequently, they were still found to be good for social relationships and well-being, and readers were willing to see such posts. The current research provides guidance to users about what to share on SNSs.

As a higher degree of envy increases user's switch intention (Lim & Yang, 2015), it is also important for SNS providers to know when and why envy is triggered. Though SNS providers are trying to provide users with news that is more relevant, the current research highlighted that such content is also more likely to trigger envy. More systematic research is needed to help SNS providers to further improve its News Feed display algorithm.

Limitations and future research

There are some limitations of the current research. First, because of the negative stereotype associated with being materialistic (Van Boven & Gilovich, 2003), readers in the current studies might be reluctant to admit that they feel envious toward material goods; therefore, it is still possible that readers might feel more envious after reading a post about material purchases but they did not report it in the questionnaire. Second, the one-item measures for comparability and self-relevance may not be reliable. Even though the concepts of self-relevance and comparative nature were often mentioned in the literature (Carter & Gilovich, 2010; Smith, 2004), no good measures of those concepts are available in the relevant research. As a result, measurements were created based on the authors' preliminary understanding of the concepts. Third, even though the current work claims that the results are

valid on SNSs, it mainly used the platform of Facebook and used samples from developed countries. Future research is encouraged to examine if experiential purchases also trigger more envy than material purchases using different samples and social networking platforms. Last but not least, although the stimuli used in Study 2 (iPod vs. concert) were based on previous research (Rosenzweig & Gilovich, 2012), the stimuli are somehow outdated. People might no longer be interested in iPod nowadays; therefore we cannot exclude the effect of such confounding factors by using the current stimuli. Multiple experiments should be conducted with different sets of stimuli. The conclusions in this paper can only be derived with the complimentary results in Study 1 and 3.

There are several potential directions for future research. As a first step, this paper only examined the general emotion of envy. Future research could also examine possible differences in the type of envy elicited by experiential or material purchases. An important distinction in envy research is that between benign and malicious envy (van de Ven et al., 2009). Benign envy, with motivations aimed at gaining the coveted object for oneself, stimulates consumption and makes one more likely to obtain it (Belk, 2011; Crusius & Mussweiler, 2012; van de Ven, Zeelenberg, & Pieters, 2011). Malicious envy likely leads to more destructive tendencies (Oswald & Zizzo, 2001; van de Ven et al., 2009). Although initial research on the antecedents of these envy types (van de Ven et al., 2012) would not predict any differences in which purchase type is more likely to trigger benign/malicious envy, the current research suggests that those who shared their experiential purchases are liked more than those who shared material purchases. If the sharing of experiences increases liking, it might become more likely that the resulting envy could be of the benign type.

It is important to understand under which conditions envy is triggered on SNSs. So far, a systematic research on this topic is not available yet. The current work only focused on the post content (mainly experiential vs. material category). However, the emotion of envy on

SNSs is not only influenced by the content of the post, but also depends on the personality trait of the reader and the relationship with the poster. For example, Appel et al. (2015) found that depressed social network users were likely to experience a higher degree of envy than non-depressed users. Lin and Utz (2015) found that the relationship closeness with the poster predicted the degree of benign envy. Furthermore, one's material value (Richins, 2004) and the perceived similarity with the compared person (Tesser, 1991) would also be potential moderators of the current research. Future research could further explore the potential moderators and the interactions between the content of the post, the relationship with the reader, and the personality trait of the poster.

Conclusion

Social network users thought that their posts about material purchases would elicit more envy in others, but it was actually the posts about experiential purchases that elicited more envy. This is due to the experiential purchases being seen as more self-relevant and important to one's identity. Also, posts about experiential purchases are more frequent than posts about material purchases, making these not only elicit a higher degree of envy but also elicit envy more frequently. Why do people post about experiential purchases so often, even though they elicit more envy? One reason is that people do like reading about experiential purchases more. A second reason is that people are not aware of this: They think others will be more envious over material purchases, which turns out to be wrong. In sum, this paper examined when and why SNS users feel more envious and which purchase type is shared more frequently on SNSs. It not only contributes to the literature on experiential vs. material purchases and the emotion of envy, but also offers practical implications for SNS marketers, users, and platform providers.

Additional results in Paper 2

Study 1

Degree of other's envy

In case participants might be reluctant to admit that they experienced envy, the degree of envy from another perspective was also measured: to what extent they thought others would be after seeing the reported post by their Facebook friend.

After each reported post, participants were asked to rate: “others will feel a little frustrated that the poster is better off than they are”, “others will be a little envious”, and “others will be a bit jealous” (Cronbach's $\alpha = .84$ for experiential category, and Cronbach's $\alpha = .91$ for material category). These three items were adapted from the envy scale (van de Ven, 2015), and were rated on a continuous slider scale from not at all (0) to very much (6).

This measure was measured before the degree of self's envy, which was the dependent variable used in the current manuscript. Even though the degrees of other's envy were higher than the degrees of self's envy, the correlation between the degree of other's envy and self's envy was very high (Person's correlation was 0.68 for experiential posts, and 0.74 for material posts). It was assumed that participant took their own perspective when rating the degree of other's envy. The main results as reported in this paper did not differ much when using the degree of other's envy as a representation of self's envy, therefore we only used the degree of self's envy for the sake of simplicity.

Other potential underlying mechanisms

In addition to self-relevance, the other three preconditions of envy (perceived similarity, perceived control, and perceived unfairness) were measured with one question for each, using a continuous slider scale from not at all (0) to very much (9). The perceived similarity was measured by the following question: “to what extent do you think the other person and yourself have a similar background (for example, nationality, age, gender, education level,

economic status, etc.)?”. Perceived difficulty/low control was measured by “how difficult is it for you to buy the thing that the other has (both with regard to the necessary money and the time required to obtain it)?”. Perceived unfairness was measured by “to what extent do you think the other person deserve the thing that they wrote in their Facebook post?”

Size of envied object was roughly estimated by asking: “To what extent do you think the poster described something small or something big in the post?”, with a continuous slider scale ranging from something small (-4) to something big (4). For the above-mentioned four variables, the results of Wilcoxon rank-sum tests showed that only the size of envied object differed significantly across the two comparison groups. Therefore, Study 2 was further conducted to examine the research question by controlling the price of the envied object.

Study 3

For exploratory reasons, we also included the motives and perceived motives of posting in the questionnaire, as well as one’s trait of social desirability.

Motives of posting & perceived motives of posting

In the poster’s version, the motivation of posting was measured in two ways: a) four items created by the researchers based on the exploratory purpose of this study and b) another eight-item scale based on a previous study (Krämer et al., 2014). The four items were “if you post a status update about experiential/material purchases, to what extent do you then typically want to be 1) admired, 2) envied, 3) perceived as competent, and 4) perceived as warm and friendly?”, which were measured with a continuous slider scale ranging from *strong disagree* (-3) to *strongly agree* (3). Another measure is based on the scale of attributed motives of self-disclosure on SNSs (Krämer et al., 2014), but we adjusted the question into “when posting about [post category], to what extent do you post such a status update due to the following motives: 1) getting attention, 2) impression management, 3) to gain fame or notoriety, 4) keeping others up-to-date, 5) keeping contact with others, 6) for fun, 7) out of

boredom, 8) seeking help or support”. These eight items were rated on a continuous slider scale ranging from *not at all* (0) to *very much* (6).

Similar to the measurement of the motives of posting, in the reader’s version, the perceived motives of posting were also measured in two ways in each post category. Identical items and scales were used as that in the poster’s version, but we rephrased the question of the four-item measure into: “if a poster posts a status update addressing experiential/material purchase, to what extent do you think the poster wants to be 1) admired, 2) envied, 3) perceived as competent, and 4) perceived as warm and friendly?” with a continuous slider scale ranging from *strong disagree* (–3) to *strongly agree* (3). The another measure was rephrased as “please estimate to what extent the following items would be the poster’s motives of posting a status update addressing experiential/material purchase?” with an identical scale and eight items as introduced in the poster’s version.

Exploratory factor analyses showed that the first three items of Krämer’s attributed motives scale were loaded together, and therefore we computed an arithmetic mean value of them and named it as the motive of impression formation. We also computed the motive of social interaction based on the average value of the fourth and fifth item, as these two items were grouped together in the exploratory factor analysis. The preliminary results of the (perceived) motives of posting are briefly reported below.

Participants in both (poster’s and reader’s) perspectives agreed that, compared with the posts about experiential purchases, the motives of impression formation were higher and motives of social interaction were lower for the posts about material purchases. Interestingly, participants reported more egocentric motives (i.e., impression formation, trigger admiration and envy, and to be perceived as competent) and less other-oriented motives (i.e., social interaction and to be perceived as friendly) when evaluating the posting motives from a reader’s perspective rather than a poster’s perspective.

Social desirability

Social desirability was assessed with a revised scale of SDS-17 (Stöber, 2001), which captures the tendency to describe oneself with socially desirable attributes in the sense of “impression management”. The current scale contained only 16 items in the scale of SDS-17. Raw scores can range from 0–16, and a higher score stands for a higher social desirability.

The results of the between-group comparisons in Study 3 did not change much after taking social desirability as a control variable; therefore, this measure was left out in the current manuscript.

5. Posts, Envy, and Purchase Intention (Paper 3)

This chapter is my single-authored work. An extended abstract “The silver lining of envy on Social Media? The relationships between post content, envy type, and purchase intention” has been accepted to ACR conference.

In addition, this full manuscript was submitted to © Emerald Publishing (Internet Research), and, if accepted, permission has been granted for this version to appear here. Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.

Abstract

Billions of users are using social media to keep updated with other's social news and marketers are struggling to attract more attentions of consumers on social media. As browsing other's social news sometimes evokes envy, researchers were concerned about the negative effects of envy on consumers. However, this paper addressed the positive sides of envy by further distinguishing two types of envy (benign vs, malicious). Three studies ($N = 622$) were conducted to explore the prevalence of benign and malicious envy, and to examine the relationships between post content (experiential vs. material purchases), envy type (benign vs. malicious), and purchase intention (same vs. similar product). The results showed that most of envious emotions were actually benign envy. More importantly, it was found that benign envy was positively associated with the purchase intention of the same envied purchase, and malicious envy was positively associated with the purchase intention of something even superior. Although no main effect of post content (experiential vs. material) on the envy type was found across three studies, there was a mediating effect of the perceived intention of showing off: experiential purchases (Study 2) and experiential phrasing of a product (Study 3) were less likely to be perceived with a higher intention of showing off, therefore less likely to triggered malicious envy. The results of Study 1 also replicated the previous finding that most envied objects on social media were about experiential purchases rather than material purchases.

Keywords: Social media, experiential purchases, material purchases, benign envy, malicious envy, purchase intention

Introduction

Social comparison theory suggested that people tend to compare themselves with others in order to evaluate themselves (Festinger, 1954). The use of social media, such as Facebook, has amplified the social news of our friends whom we rarely encounter with in real life. The carefully-crafted presentations of other's perfect life online, ironically, make Facebook a "perfect" place for upward social comparison (Taylor & Strutton, 2016). Recently, more and more researchers have found that the use of Facebook evokes envy and they were concerned about the negative effects of envy on consumers (Chou & Edge, 2012; Krasnova et al., 2015; Lim & Yang, 2015; Tromholt, 2016; Verduyn et al., 2017). However, this paper aims to address the positive sides of envy on social media by taking the type of envy into consideration.

Two types of envy are identified: one is benign envy with a motivation of working harder to obtain the envied object, and the other is malicious envy with a motivation of pulling the envied other down (van de Ven et al., 2009). Different types of envy can have different consequences on consumer behavior: benign envy can increase the purchase intention of the envied object, while malicious envy can only increase the purchase intention of a similar but slightly different object that allows differentiation (van de Ven et al., 2011). Therefore, it is very important to distinguish these two types of envy (van de Ven, 2016), as benign envy is actually a good form of envy that can be used for self-improvement (Corcoran, Crusius, & Mussweiler, 2011) and increasing purchase intention (van de Ven et al., 2011).

This paper first explores the prevalence of benign and malicious envy, as well as the antecedents of benign and malicious envy. It then examines how different types of post content on social media can influence these two types of envy, and therefore trigger a higher purchase intention of the envied object or another superior object. It mainly focuses on the comparison between two types of posts, namely posts about other's experiential purchases

(i.e., life experiences such as travel and leisure activities, etc.) and material purchases (i.e., material possessions such as clothes, jewelry, digital gadgets, etc.).

As indicated by the results of my previous work, benign envy is more likely to be experienced on Facebook (see Paper 1 Study 2); and most posts on Facebook were about experiential purchases which tend to trigger more envy (see Paper 2 Study 1 and 3). This paper additionally hypothesizes that, even though experiential purchases trigger more envy than material purchases, it is more likely to be benign envy, and benign envy can increase the purchase intention of the envied object.

Three studies were conducted to examine these hypotheses, with two studies asking participants to recall an envy-triggering situation on social media and another study using mocked-up stimuli. The following parts will first discuss the distinction between experiential and material purchases and then elaborate on the difference between benign and malicious envy and how they can influence purchase intention. Hypotheses regard to the prevalence of benign and malicious envy, as well as the relationships between post content, envy, and purchase intentions will be proposed.

Theoretical background

Experiential vs. material purchases

The distinction between experiential and material purchases—an important concept in consumer psychology—was first delineated by Van Boven and Gilovich (2003). It mainly focuses on people's intentions of purchasing: to do or to have. Experiential purchases are “those made with the primary intention of acquiring a life experience: an event or series of events that one lives through”, and material purchases are “those made with primary intention of acquiring a material good: a tangible object that is kept in one's possession” (Van Boven & Gilovich, 2003).

However, such distinction, as mentioned by previous researchers (Gilovich et al., 2015), is not always a clear cut. For example, it is easy to classify the purchase of a flight ticket or a concert ticket as experiential purchases (to do); and it is also easy to think of buying jewelry or clothing as material purchases (to have); but it is difficult to say whether the intention of buying a book, a guitar, or a game console is experiential or material (it is rather “to have in order to do”). Guevarra and Howell (2015) therefore called this product category as “experiential products”: a material good that provides experiences. Of course, the intention of purchasing an experiential product can be either material or experiential; hence it still depends on the individual case to categorize whether an experiential product belongs to an experiential or a material purchase.

Schmitt et al. (2015) even proposed another point of view: instead of treating experiential and material purchases as the two opposite ends of a continuum, it might be more useful to judge each of the purchase along the two value-creating dimensions: materialism and experientialism. They defined materialism as the value created “based on the perceived material and monetary aspects of the purchase”, and experientialism as the value created “based on the perceived experiential aspects of the purchase”. Initially, the research on experiential and material purchases was about which purchase type can trigger more happiness. Research over decades has shown that spending money on experiential purchases can provide more happiness than material purchases (Gilovich et al., 2015). As suggested by the original authors (Gilovich & Kumar, 2015; Van Boven, 2005; Van Boven & Gilovich, 2003), the distinction between experiential and material purchases is still meaningful: both researchers and layman can readily understand this distinction and it helps people to allocate their discretionary resources and maximize happiness. Therefore, the current research will also treat the distinction between experiential and material purchases as one dimension that predicts envy on social media.

Another issue is that such distinction of experiential and material purchases, which actually refer to different products, are often confounded with other factors. For example, Schmitt et al. (2015) pointed out that the material purchases are tangible consumer goods whereas experiential purchases are mainly intangible services; it is thus easier to compare tangible products than intangible services with others (Carter & Gilovich, 2010). In addition, because experiential purchases usually form a bigger part of one's identity (Carter & Gilovich, 2012), people enjoy the conversation more when others talking about experiential purchases than material purchases (Amit Kumar & Gilovich, 2015). The above-mentioned confounding factors (i.e., comparability and self-relevance) are the mechanisms that explained why experiential and material purchases can differ in certain aspects (e.g., cause different levels of envy and happiness); however, there are also some other confounding factors (e.g., price of the purchase) that might weaken the internal validity of the research.

In order to derive meaningful research results, we have to be aware of what we talk about when we talk about experiential vs. material purchases. One solution to the confounding problem is to use multiple methods. The first two studies of this paper adopt the concept of experiential and material purchases raised by van Boven and Gilovich (2013) and include various products and services. And the last experimental study utilizes an experiential purchase that can either be phrased as either a material or an experiential purchase (so that the rest confounding factors can be excluded). By using multiple ways of manipulating the experiential vs. material purchases, we can derive conclusions with higher external and internal validity.

Benign and malicious envy and its antecedents

Envy is a painful feeling caused by a good fortune of others (Smith, 2000). From an evolutionary perspective, although experiencing envy is painful, envy is an adaptive emotion that motivates actions to prevent future interference (Hill and Buss, 2010). While early

researchers often focused on the hostile and malicious components of envy (Parrott, 1991; Parrott & Smith, 1993), recent research suggests that a non-hostile and benign form of envy also exists (Smith & Kim, 2007; van de Ven et al., 2009). Both types of envy are characterized by strong feelings of inferiority and frustration, but they have different experiences and distinct motivational consequences. Malicious envy is marked by hostile and ill feelings and a behavior tendency to destroy the superior position of the envied person. Benign envy is also unpleasant, but it is often associated with a positive regard for the envied person and a desire to improve one's own inferior position. More interestingly, Crusius and Lange (2014) found that malicious envy drives attention more toward the envied persons than the envied object, while benign envy does not—it has an attentional focus toward the means to improve oneself.

There has been some work on the antecedents of (benign and malicious) envy. Previous research has proposed four pre-conditions of envy: self-relevance of the situation, perceived similarity of the compared person, perceived control over the situation, and deservingness (Smith, 2004). To be more specific, envy is more likely to be induced when the situation is perceived as self-relevant, when the compared other is similar to oneself, when it is difficult to have the envied object, and when the other does not deserve the advantage.

Based on the appraisal theory (Roseman, 1996), van de Ven and his colleagues (2012) further investigated two appraisals that can distinguish benign envy from malicious envy. They found that the perceived deservingness and perceived control are the two appraisals that can distinguish benign envy from malicious envy. The more a situation is perceived as undeserved and not controllable (hard to achieve the envied object), the more malicious envy, instead of benign envy, it is likely to be. In addition, they proposed that other factors may have an influence on the type of envy via deservingness, such as the liking toward the other person. Intuitively speaking, people are more likely to experience malicious envy toward a

disliked person. The antecedents of benign and malicious envy will also be examined in the first study of this paper.

The role of social media: purchase type and envy type

Many researchers have addressed the negative influence of browsing Facebook on users via upward social comparison (Krasnova et al., 2013). Among various social information on Facebook, others' posts of experiential purchases were mentioned the most frequently as an object that triggers envy (Krasnova et al., 2015). This is because, first, due to the high story utility of experiential purchases (Amit Kumar & Gilovich, 2015), posts about experiential purchases are also more frequently shared on SNSs than material purchases (see Paper 2); and, second, experiential purchases are more central to one's identity in general (Carter & Gilovich, 2012), therefore, experiential purchases are more likely to trigger envy than a particular material purchase (that might be only relevant to a small group of people).

However, rare research has focused on the type of the envy that is experienced by social media users. We already know that the low perceived control and undeservingness (and a disliked target) can trigger malicious envy (van de Ven et al., 2012). Even though it is difficult to estimate an average level of perceived control in our context, we know that social media users are less likely to be connected with those whom they extremely dislike (as they can unfollow or disconnect with those contacts). In addition, others, when posting on social media, would rarely address that the purchases they made are undeserved. Therefore, it is also assumed that, although a certain amount of envy might be triggered after browsing social media, it is more likely to be benign envy than malicious envy (as also indicated in the results of Paper 1 Study 2).

H1: Users are more likely to experience benign envy than malicious envy on social media.

Will the post category make a difference in predicting which type of envy it triggers? Recent research has shown that talking about experiential purchases has a greater social value: people feel more connected to the other person when they are informed of other's superior experiential purchases rather than material purchase (Amit Kumar et al., 2017). Previous literature suggested that experiential purchases are often perceived as self-relevant and can increase the perceived liking of the other person (Carter & Gilovich, 2012; Amit Kumar et al., 2017). Due to the increased level of liking and feeling of connectedness, it is assumed that posts about experiential purchases are more likely to trigger benign envy than posts about material purchases.

H2: Experiential purchases are more likely to trigger benign envy than material purchases.

It is also assumed that posts about other's material purchases have a higher chance to trigger malicious envy than posts about experiential purchases. This might be explained by several reasons, which often come along with a decreased level of liking. For example, sharing material purchases online could be a signal of being materialistic, and most people have a negative impression of materialistic others (Van Boven et al., 2010). In addition, people are more likely to think of material purchases in monetary terms than experiential purchases (Mann & Gilovich, 2016). When seeing a post about a material purchase, people may think the other person is likely to address the monetary value of one's material purchase and to show off. Therefore, seeing a post about a material purchase is more likely to decrease liking and, meanwhile, triggers malicious envy instead of benign envy.

H3: Material purchases are more likely to trigger malicious envy than experiential purchases.

Furthermore, this paper will also explore the antecedents of benign and malicious envy in the first study. In addition to the four preconditions of envy (self-relevance, perceived

similarity, perceived control, and deservingness), the roles of initial liking and the perceived intention of showing off in predicting the envy type will be examined. It is assumed that initial level of disliking should be positively associated with the perceived intention of showing off, and both of them should be important predictors of malicious envy.

Envy and purchase intention

Envy is a frustrating negative emotion that arises when others have something superior that one desires (van de Ven et al., 2009). One possible way to reduce envy is to narrow down the gap between oneself and the other (Festinger, 1954). Although experiencing envy is painful, the emotion of envy is a desirable one for marketers as it drives consumption (Cohen-Charash and Larson, 2016). Envy causes people to attend more to information about superior performing peers (Hill et al., 2011). Many scholars have argued that being aware of other's superior purchases prompts us to obtain it (Crusius & Mussweiler, 2012; Foster et al., 1972), and Facebook usage leads to conspicuous consumption due to an increased level of envy (Taylor & Strutton, 2016). The phenomenon is also called as "keeping up with the Joneses": when others have something one desires, the emotion of envy emerges, and the envious person is likely to take action to resolve this. Therefore, the purchase intention toward a desirable object is likely to be enhanced by the emotion of envy.

Furthermore, benign and malicious envy can have different consequences on consumer behavior (van de Ven et al., 2011). Based on different motivation associated with benign and malicious envy, van de Ven et al. (2011) found that the experience of benign envy increases the willingness to pay for the envied product, and malicious envy increases the willingness to pay for a related but different product. Therefore, it is expected that a superior product, which allows differentiation than the envied person and *suppresses the superior status of the other person*, should also be desired more in the case of malicious envy than benign envy. This is because it might be difficult and unrealistic to take away what the envied person has, and the

only way to “revenge” is to have something that is even superior compared to the envied person. For example, when seeing a Facebook friend posts a newly purchased MacBook, those who experience benign envy might be more willing to buy the same model as the Facebook friend has (with the positive regard toward the envied person), but those who experience malicious envy might be more willing to buy another even superior model (in order to suppress the superior status of the envied person).

Based on van de Ven et al.’s (2011) work, it is further hypothesized that, after taking the perceived difficulty of acquiring the envied object into consideration, benign envy that experienced on social media should also increase the purchase intention of the same object as shared by the other person; whereas malicious envy may increase the purchase intention of a relevant but even superior object. Therefore,

H4: Benign envy triggers higher purchase intention of the envied object.

H5: Malicious envy triggers higher purchase intention of a similar but superior object.

Study 1

The first study asked participants to recall the last time that they experienced (a little) envy on social media. The perceived purchase type and the degrees of benign and malicious envy were measured, as well as the future purchase intentions of the same and a superior object. In order to derive a hint for the follow-up research, some antecedents of benign and malicious envy were also measured.

Method

Participants and procedure

Two hundred participants (100 females, $M_{age} = 34.66$, $SD_{age} = 11.01$) were recruited via an online recruiting panel called Prolific. Each participant was paid according to a standard of £7.50/hr. Participants, who should be an active social media user and 18 years and older, were asked to complete a 15-minute online questionnaire.

After signing the consent form, participants were asked to provide information about their social media usage behavior, as well as the previous purchase behavior due to the use of social media (it is for exploratory purpose that is not essential to the current study. For the measurement and results, please read the section “Additional results in Paper 3” at the end of this paper). Then, they were introduced to the concepts about experiential and material purchases and asked to report the frequency of seeing posts about each purchase type (1 = *less than once a month*, 2 = *one to three times a month*, 3 = *once a week*, 4 = *several times a week*, 5 = *once a day*, 6 = *several times a day*, 7 = *all the time*). Most importantly, they were asked to describe in text the last time they experienced envy due to browsing social media. The envied object can be either an experiential or a material purchase. Those participants who reported such an envious event were further asked to report the post content (whether the envied object is an experiential or a material purchase), the experienced degrees of benign and malicious envy, the purchase intentions, and the antecedents of their envious emotion. If participants cannot recall such an event, these questions about the envy-triggering situation will not be shown. They continued to fill in a few additional questions such as the cost/price of the purchase and demographic information, and then were debriefed.

Measures

Post content (purchase type). The perceived purchase type was measured based on van Boven and Gilovich’s (2003) definition of experiential and material purchases. The person who made the purchase was referred to as “the (other) person” and the person’s purchase was referred to as “X”. Participants were first reminded of the envious event that they had described previously, and then rated the extent to which “the other person bought X as a material purchase (a product one buys to have/use), or as an experiential purchase (something one buys to do)?”. The rating scale ranged continuously from *definitely a material purchase*

(-3) to *definitely an experiential purchase* (3), with the middle point 0 labeled as *an equal bit of both*.

Benign and malicious envy. Benign and malicious envy was measured in a subtle way by using the scale created by van de Ven et al. (2015). Participants read that “there are actually two types of envy. Both types of envy feel frustrating, but one type focuses mainly on that you miss something that you desire (and typically activates a desire to improve oneself), the other type of envy focuses more on the other person who holds the advantage (and typically includes a wish that the other did not have this advantage). Research found that everyone experiences these emotions once in a while, and both occur equally often.” Then participants were asked to indicate how much they experienced each of the envy types respectively in the envy-triggering situation that they had recalled. Both the benign envy (Type A: focuses most on what you miss yourself) and the malicious envy (Type B: focuses most on the other person and his or her advantage) were rated with a continuous slider scale ranging from *not at all* (0) to *very much so* (6).

Purchase intention and its control variable. Purchase intentions of the same and a superior object were measured with three items for each, based on the purchase intention scale developed by Putrevu and Lord (1994): “it is very likely that I will buy the same X (or a similar but superior product/service than X)”, “I will purchase the same X (or a similar but superior product/service than X) the next time I need it”, and “I will definitely try the same X (or a similar but superior product/service than X)”. Participants rated whether they *strongly disagree* (1) or *strongly agree* (7) with each statement with a 7-point Likert scale. The Cronbach’s α for the purchase intention of the same object was 0.89, and was 0.93 for that of a superior object. In addition, the cost of the purchase (“how expensive is it to buy X in your opinion?”) was measured as an indicator of the perceived difficulty, with a continuous slider scale ranging from *not at all* (0) to *very expensive* (6).

Antecedents of benign and malicious envy. The antecedents of envy were measured with a question starting with “my emotion was caused, because...” (van de Ven et al., 2012). The four pre-conditions of envy were measured, including undeservingness (“I thought that the other person did not deserve X.”), perceived difficulty (“I thought it was difficult for me to acquire X.”), self-relevance of the situation (“I thought that having X was very important to me.”), and perceived similarity (“the other person shared a similar background as I do.”). The degrees of liking (“I liked the other person.”), disliking (“I did not like the other person.”), and perceived intention of showing off (“I thought the other person was showing off”) were also measured. Each antecedent was measured with one item with a continuous slider scale ranging from *not relevant* (0) to *very relevant* (6).

Results

Most participants were experienced social media users (who had been using social media for more than 6 years and browsed social media daily). They reported that they often saw posts about experiential purchases about several times a week ($M = 3.68, SD = 1.71$), and posts about material purchases about once to several times a week ($M = 3.32, SD = 1.66$). Among 200 participants who completed the study, 185 recalled and described an event in which they experienced (a little) envy toward others’ experiential or material purchases on social media. Therefore the following analyses were based on these 185 cases. The pairwise correlations among the major variables can be found in Table 13.

The post content was measured by asking for the perceived intention of the purchase. Most participants reported that the envied purchase was mainly experiential ($M = 1.26, SD = 2.21$), as the mean value was significantly larger than the middle point of 0, sign test: $p < .001, PS_{dep} = .71$. My research assistant and I also manually categorized the post content based on the text description of the events provided by the participants. Upon discussion, we categorized 120 cases as experiential purchases (mainly vacations and events), 48 cases as

material purchases (e.g., houses, cars, cameras, laptops, etc.), and with the rest 17 cases as hard to be categorized. These results also supported the finding in Paper 2 that most users are more envious of others' experiential than material purchases.

Hypotheses testing

Benign and malicious envy (H1). It is hypothesized that there should be more benign envy than malicious envy on social media. The result supported H1: Participants reported more benign envy ($M = 4.39, SD = 1.69$) than malicious envy ($M = 2.53, SD = 1.95$), sign test: $p < .001, PS_{dep} = .68$ (sign test was used here because the assumptions for t-tests were violated).

Table 13. Descriptive and Correlational Statistics for Major Variables in Paper 3 Study 1

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.
1. Post content (-3=MAT, 3=EXP)	1.26	2.21	1.00			
2. Benign envy (0-6)	4.39	1.69	0.13†	1.00		
3. Malicious envy (0-6)	2.53	1.95	-0.08	-0.43***	1.00	
4. Purchase intention of a same object (1-7)	3.58	1.62	0.08	0.10	-0.06	1.00
5. Purchase intention of a superior object (1-7)	3.55	1.65	0.18*	-0.02	0.14†	0.57***

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Note: MAT stands for “definitely a material purchase”, and EXP stands for “definitely an experiential purchase”.

Post content and envy type (H2&3). Also due to the violated assumptions, linear regressions with 1000 bootstrap repetitions were computed. The results showed that, although the directions of the results were in line with our hypotheses, post content was not a significant predictor of both benign ($\beta = .13, z = 1.77, 95\% CI [-0.01, 0.28]$) and malicious envy ($\beta = -.08, z = -1.00, 95\% CI [-0.23, 0.08]$). The results, although did not support H2, hinted for a very weak correlation between experiential posts and benign envy, and rejected H3.

Envy type and purchase intention (H4&5). Due to the skewed nature of the key variables, linear regressions with 1000 bootstrap repetitions were used. When taking the cost of the purchase as a control variable, the standardized coefficient of benign envy in predicting

the purchase intention of the same object was 0.11, $z = 1.59$, 95% CI [-0.03, 0.26]; the standardized coefficient of malicious envy in predicting the purchase intention of a superior object was 0.14, $z = 1.89$, 95% CI [0.00, 0.28]. Though the evidence for H4 was weak, it was in the right direction, and H5 was supported.

Exploring the antecedents of benign and malicious envy

Table 14 depicts the correlational statistics between envy and the measured antecedents. Benign envy was positively associated with perceived difficulty, and negatively associated with the level of initial disliking and the perceived intention of showing off. Malicious envy was positively associated with undeservingness, self-relevance, similarity, disliking and the perceived intention of showing off. Among all these antecedents, perceived intention of showing off seems to be the best antecedent that distinctively predicted benign and malicious envy.

Table 14. Correlational Statistics for Envy and Antecedents in Paper 3 Study 1

	1. Benign envy	2. Malicious envy	3.	4.	5.	6.	7.	8.
1. Benign envy	1.00							
2. Malicious envy	-0.43***	1.00						
3. Undeservingness	-0.11	0.31***	1.00					
4. Difficulty	0.18*	0.14†	0.07	1.00				
5. Self-relevance	0.10	0.26***	0.16*	0.23**	1.00			
6. Similarity	-0.01	0.16*	0.03	0.07	0.22**	1.00		
7. Liking	0.08	0.11	-0.14†	0.02	-0.04	0.34***	1.00	
8. Disliking	-0.14†	0.20**	0.60***	-0.06	0.18*	0.10	-0.22**	1.00
9. Showing off	-0.18*	0.37***	0.50***	-0.08	0.11	-0.01	-0.06	0.45***

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

In this study, participants were asked to recall and describe the last time they experienced (a little) envy due to seeing other's purchase on social media. Participants reported more benign envy than malicious envy (H1). They also reported more cases about experiential purchases than material purchases. These results are in line with previous research that posts about vacation and travels seem to be most frequently envied on social

media (Krasnova et al., 2013), and the emotion of envy on social media is more likely to be, in a good form, benign envy than, in a bad form, malicious envy (Lin & Utz, 2015).

A weak correlation between experiential purchases and benign envy was found, but material purchases were not necessarily associated with malicious envy. This might be explained by the self-selection effect: when participants were asked to recall an envy-triggering situation, they would mainly think of something that was highly relevant to them. For those who reported a post about a material purchase, the chance is higher that the participant is fond of material purchases rather than experiential purchases. Hence these participants might show less hostile emotion toward those who posted a material purchase on social media. This issue can probably be solved by conducting another experiment with a randomized between-subjects design (by asking half of the participants to recall an envy-triggering situation about other's experiential purchases and the rest half about material purchases). In addition, a bipolar measure of benign and malicious envy could be used to make the measurement of envy type more sensitive.

The purchase intentions of the same and a similar product were mainly in line with previous research (van de Ven et al., 2011). When controlling for the cost of the envied object, benign envy tends to drive people to acquire the same envied object (and pay less attention to other products), whereas malicious envy tends to drive people to acquire a similar but superior object instead of the envied object. But please note that, in the current study, the evidence for H4 and H5 was very weak. A hindsight explanation is offered: purchase intention should not only depend on the cost of the envied object, it is also likely to be influenced by other factors that make it difficult to acquire the envied object. The main effect of envy type on purchase intention is likely to be blurred and diluted when such important factors were not included in the model. Therefore, the next study will use the perceived difficulty of acquiring the envied object as the control variable.

For exploratory purposes, it was also examined how various antecedents predicted benign and malicious envy differently. Slightly different from previous research (van de Ven et al., 2012), perceived difficulty did not distinguish benign and malicious envy very well in the current study. Compared with the perceived undeservingness and the degree of disliking toward the poster, the perceived intention of showing off is the best predictor that distinguished benign envy from malicious envy. As proposed in the theory part, posting material purchases is also more likely to be perceived as showing off. Therefore, in Study 2, the perceived intention of showing off will be measured as one potential mechanism that explains why material purchase can trigger more malicious envy.

Study 2

Method

Participants and procedure

Two hundred and twenty-one participants (116 females, $M_{\text{age}} = 34.65$, $SD_{\text{age}} = 10.43$), again, recruited via Prolific, completed a 10-minute online questionnaire. Participants were required to be an active social media user and 18 years and older. Each participant was paid £1.

Participants were randomly allocated into two groups (experiential vs. material). In each group, participants were asked if they had ever felt a little envious after reading a post about other's experiential/material purchases. If yes, then, they were asked to describe the situation and report which type of envy it was, together with the purchase intentions of the same and a superior object. A manipulation check that was identical to the measurement of post category in Study 1 was also added in Study 2. Participants were asked to report the perceived intention of showing off of the poster, the perceived difficulty, as well as their social media usage behavior and the demographics information.

Measures

Benign and malicious envy (and instrumental manipulation check). The degrees of benign and malicious envy were measured in two ways. The first measurement was almost identical to the measurement used in Study 1, except for one modification (van de Ven et al., 2015): instead of using two unipolar scales for envy type A and B respectively, a bipolar scale was used with *envy type A* (benign envy) on the left-hand side (-3), and *envy type B* (malicious envy) on the right-hand side (3). The middle point (0) was labeled as *an equal bit of both*. This measurement should be more sensitive in detecting the type of envy.

The second measurement was a validated multi-item scale for measuring the degrees of benign and malicious envy respectively (Crusius & Lange, 2014). Five items were included for malicious envy (Cronbach's $\alpha = .93$): "I felt malicious envy toward the person about X", "I wished that the person would fail at something", "I wished that the person would no longer have X", "I would have liked to do something to hinder the person in achieving X", and "I felt coldness toward the person"; and five items for benign envy (Cronbach's $\alpha = .73$): "I felt benign envy toward the person about X", "I wished to have X too", "I admired the person", "I wanted to try harder to obtain X as well", and "I felt inspired to also attain X". Participants rated if they *strongly disagree* (1) or *strongly agree* (7) with a 7-point Likert scale. An item for instrumental manipulation check was also embedded in this ten-item matrix with a randomized order (Oppenheimer et al., 2009). Participants read: "It is important that you pay attention to this study. Please tick 'strongly agree'." Those who did not tick "strongly agree" were treated as failing the instrumental manipulation check.

Purchase intention and its control variable. Purchase intentions of the same and a superior object were measured in a similar way as Study 1. Participants were asked to recall the envy triggering event and report the extents to which they agree with the following statements: "I would purchase the same X (or a similar but superior product/service than X) the next time I need it", "It was very likely that I would buy the same X (or a similar but

superior product/service than X)", and "I would definitely try the same X (or a similar but superior product/service than X)". The Cronbach's α s for the purchase intention of the same object and a superior object were 0.91 and 0.93 respectively. The perceived difficulty was measured with one item: "to what extent was it difficult for you to have X", with a continuous slider scale ranging from *not at all* (0) to *very difficult* (6).

Perceived intention of showing off. The perceived intention of showing off was measured: "to what extent do you think the person was showing off by posting his/her experiential/material purchase (X) on social media?", also with a continuous slider scale from *not at all* (0) to *very much so* (6).

Results

After excluded 3 participants who failed the instrumental manipulation check, 110 participants were left in the experiential group, and 108 participants were left in the material group. Among them, there were 98 participants in the experiential group and 89 participants in the material group who personally had such an experience of envy. Therefore the following analyses are based on these 187 cases. The descriptive results and correlational statistics for the major variables can be found in Table 15 and 16 respectively. The result of manipulation check showed that participants in the experiential group ($M = 1.35$, $SD = 0.21$) indeed recalled a post that was more experiential than those in the material group ($M = -0.90$, $SD = 0.20$), Wilcoxon rank-sum test $z = 6.75$, $p < .001$, $r = .49$.

Hypotheses testing

Benign and malicious envy (H1). As two measurements of benign and malicious envy were included, let us first have a look at the correlational statistics between them (see Table 16). The results showed that the bipolar measure of benign and malicious envy type was negatively correlated with the scale of benign envy and positively correlated with the scale of malicious envy, as it should be.

The results also supported H1: Participants reported more benign envy ($M = 4.95$, $SD = 0.96$) than malicious envy ($M = 2.33$, $SD = 1.39$), sign test: $p < .001$, $PS_{dep} = .88$, and the value of bipolar malicious envy was significantly smaller than zero, sign test: $p < .001$, $PS_{dep} = .71$.

Table 15. Descriptive Statistics in Paper 3 Study 2

	Material Group ($n = 89$)		Experiential Group ($n = 98$)		Total ($n = 187$)		Min	Max
	M	SD	M	SD	M	SD		
Manipulation check	-0.90	1.87	1.35	2.12	0.28	2.30	-3	3
Bipolar malicious envy	-0.96	1.81	-1.20	1.85	-1.09	1.83	-3	3
Benign envy	4.96	0.92	4.93	1.00	4.95	0.96	1	7
Malicious envy	2.36	1.41	2.31	1.39	2.33	1.39	1	7
Purchase intention (same)	4.02	1.64	4.24	1.56	4.14	1.60	1	7
Purchase intention (similar)	3.70	1.52	4.16	1.60	3.94	1.57	1	7
Perceived difficulty	4.41	1.51	4.02	1.71	4.20	1.63	0	6
Showing off	4.16	1.69	3.38	1.90	3.75	1.84	0	6

Table 16. Correlational Statistics in Paper 3 Study 2

	1.	2.	3.	4.	5.	6.
1. Post category (MAT=0, EXP=1)	1.00					
2. Manipulation check	0.49***	1.00				
3. Bipolar malicious envy	-0.06	-0.05	1.00			
4. Benign envy	-0.02	-0.03	-0.23**	1.00		
5. Malicious envy	-0.02	-0.05	0.65***	-0.18*	1.00	
6. Purchase intention (same)	0.07	0.06	-0.11	0.25***	-0.08	1.00
7. Purchase intention (superior)	0.15*	0.10	0.13†	0.13†	0.22*	0.47***

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Note: MAT stands for the material category, and EXP stands for the experiential category.

Post category and envy type (H2&3). Due to the skewed nature of both benign and malicious envy in each group, Wilcoxon rank-sum tests were used for examining H2 and H3. However, as also indicated in Table 15, there were no significant group differences for both benign and malicious envy (even for the most sensitive bipolar measure, $z = 1.13$, $p = 0.26$). Therefore, both H2 and H3 were rejected.

Envy type and purchase intention (H4&5). The relationships between envy type and purchase intentions were examined by using linear regressions and taking perceived difficulty as a control variable. Bootstrapped linear regressions with 1000 repetitions were used due to the violated assumptions of linear regression.

When taking the perceived difficulty as the only control variable, the standardized coefficient of benign envy in predicting the purchase intention of the same object was 0.27, $z = 3.29$, 95% CI [0.11, 0.44]; the standardized coefficient of malicious envy in predicting the purchase intention of a superior object was 0.23, $z = 2.85$, 95% CI [0.07, 0.38]. Both H4 and H5 were supported.

Exploratory analysis

Mediation analysis. Although H2 and H3 were rejected in Study 2, it is still possible to run a mediation analysis to examine the mediation effect of the perceived intention of showing off. The bipolar malicious envy was the dependent variable and the post category was the independent variable (experiential condition coded as 1, and material condition as 0). The mediation analysis with 1000 bootstrapped repetitions showed that the perceived intention of showing off significantly mediated the process, 95% CI [-0.53, -0.08] (see the result in Figure 4).

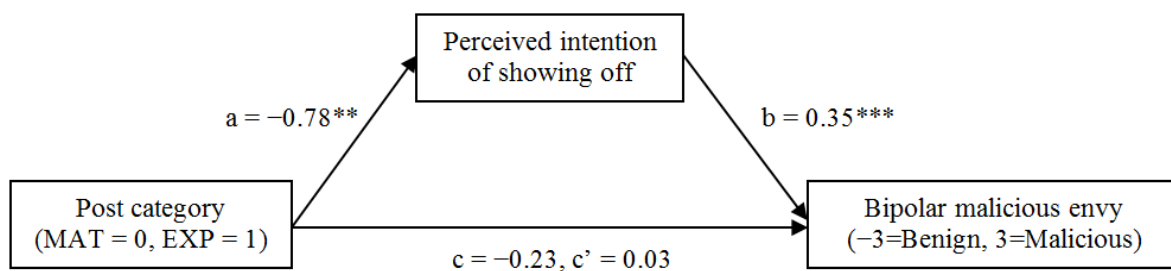


Figure 4. Result of mediation analysis in Paper 2 Study 2 (unstandardized coefficients, $**p < .01$. $***p < .001$). For the post category, material condition was coded as 0 and experiential condition was coded as 1. For the envy type, benign envy was coded as -3 and malicious envy as 3.

Discussion

In Study 2, participants reported more benign envy than malicious envy. Using a recalling method, the post category was not a significant predictor of the envy type, but there was a significant mediating effect of the perceived intention of showing off. This means that posts about material purchases are more likely to be perceived as showing off than experiential purchases, and the perceived intention of showing off can positively predict malicious envy and negatively predict benign envy. In next study, another method (by showing different posts to participants) is adopted to check if these findings can be replicated.

When it comes to the relationships between envy type and purchase intentions, the results of Study 1 were replicated. As expected, benign and malicious envy played a more significant role in predicting purchase intentions when using the control variable of the perceived difficulty of the envied object (in Study 2) than the perceived cost of the envied object (in Study 1). Of course, the control variables in both studies (the perceived cost and difficulty) were negatively associated with the two types of purchase intention.

Study 3

So far, there was no strong evidence showing that envy type depends on the post content, but there was evidence for how envy type alters different types of purchase intention. Study 3 will examine these issues from another angle, by showing different posts to our participants (a between-subjects design) and then measuring the degrees of benign and malicious envy and purchases intentions. In order to exclude other confounding variables, an experiential product was used as it can be phrased in both an experiential and a material way. Based on the previous reasoning and findings, it is hypothesized that,

H6: Posts addressing the monetary and material values (i.e., material phrasing) of a purchase are more likely to be perceived with a higher intention of showing off than posts addressing the experiential values (i.e., experiential phrasing).

H7: Experiential phrasing triggers more benign envy than material phrasing (due to a lower level of perceived intention of showing off).

H8: Material phrasing triggers more malicious envy than experiential phrasing (due to a higher level of perceived intention of showing off).

H4 and H5 would also be examined after taking the perceived difficulty into control.

Method

Two hundred and one participants (110 females, 90 males, $M_{age} = 36.27$, $SD_{age} = 12.84$) were recruited via Prolific. Participants were asked to finish a 5-minute online questionnaire and were paid £0.5. They were required to be an active social media user and 18 years and older.



Figure 5. Stimuli used in Paper 3 Study 3 (The pictures were modified from a picture by Redek Grzybowski, source: <https://unsplash.com/search/laptop?photo=eBRTYyjwpRY>).

After signing the consent form, participants were asked to imagine that they were in a situation of looking for a laptop and then encountered a post by their social media contact about a newly bought Macbook Pro. The other person either addressed the experiential or the material values of the Macbook Pro (see stimuli in Figure 5). In the experiential condition,

the other person wrote that “my new Macbook Pro makes me enjoy my work! #ExploreAndDiscover #DoMore”. Participants saw a picture of a Macbook Pro with a photo editing app opened. In the material condition, the other person wrote that “my new Macbook Pro looks just awesome! #ExpensiveBuy #MustHave”. The same Macbook Pro was shown in this stimulus, but this time the laptop screen was dark and there was no app running on that laptop. Participants were randomly assigned into one of these two conditions.

Then the participants were asked to rate to what extent they think the other person bought the laptop as a material or an experiential purchase (as a manipulation check, $-3 =$ *definitely material purchase*, $0 =$ *a bit of both*, $3 =$ *definitely experiential purchase*), to what extent they think the other person was showing off by posting the laptop on social media ($0 =$ *not at all*, $6 =$ *very much so*). The degrees of benign and malicious envy and the purchase intentions of the same (Cronbach’s $\alpha = .88$) and a similar but superior (Cronbach’s $\alpha = .92$) laptop were measured afterward using the same scales as used in Study 1. The perceived difficulty was measured by asking how difficult it was for our participants to buy such a laptop ($0 =$ *not at all*, $6 =$ *very difficult*). Measurements about one’s social media usage and demographics information were included.

Table 17. Descriptive Statistics in Paper 3 Study 3

	Material Condition ($n = 101$)		Experiential Condition ($n = 98$)		Total ($n = 199$)		Min	Max
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Manipulation check	-1.13	1.65	-0.35	1.82	-0.75	1.78	-3	3
Showing off	4.91	1.06	4.37	1.34	4.64	1.23	0	6
Benign envy	2.54	1.88	2.59	1.87	2.57	1.87	0	6
Malicious envy	2.20	1.89	2.12	1.88	2.16	1.88	0	6
Purchase intention (same)	2.50	1.29	2.56	1.39	2.53	1.34	1	7
Purchase intention (superior)	3.19	1.55	3.34	1.43	3.26	1.49	1	7
Perceived difficulty	3.41	1.75	3.08	1.91	3.25	1.83	0	6

Results

Two participants were excluded because they were not active social media users, leaving 101 participants in the material condition, and 98 participants in the experiential condition. Therefore the following analyses are based on these 199 cases. The descriptive results and correlational statistics for the key variables can be found in Table 17 and 18 respectively. The manipulation was successful, although both conditions were rated as rather material: Results showed that participants in the material phrasing condition ($M = -1.13$, $SD = 1.65$) treated the same laptop as more material than that in the experiential condition ($M = -0.35$, $SD = 1.82$), Wilcoxon rank-sum test $z = 2.99$, $p = .003$, $r = .21$.

Table 18. Correlational Statistics in Paper 3 Study 3

	1.	2.	3.	4.	5.	6.
1. Product phrasing (MAT=0, EXP=1)	1.00					
2. Manipulation check	0.22**	1.00				
3. Showing off	-0.21**	-0.12	1.00			
4. Benign envy	0.01	0.12†	-0.05	1.00		
5. Malicious envy	-0.02	0.03	0.13†	-0.13†	1.00	
6. Purchase intention (same)	0.03	0.22**	-0.16*	0.38***	0.22**	1.00
7. Purchase intention (superior)	0.05	0.06	-0.01	0.16*	0.16*	0.55***

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Note: MAT stands for the material condition, and EXP stands for the experiential condition.

Hypotheses testing

Phrasing and envy type (H6–8). Due to the skewed nature of both benign and malicious envy and perceived intention of showing off in each group, Wilcoxon rank-sum tests and bootstrapped mediation analyses were used for examining H6–8. The result supported H6 as the post in the material condition ($M = 4.91$, $SD = 1.06$) was more likely to be perceived as showing off than that in the experiential condition ($M = 4.37$, $SD = 1.34$), $z = 2.84$, $p = .005$, $r = .20$. However, the results did not support H7 and H8 as there were no significant group differences for both benign ($z = 0.18$, $p = .85$) and malicious ($z = 0.43$, $p = .67$) envy.

Though there were no main effects of phrasing on the envy type, mediation analyses with 1000 bootstrapped repetitions were conducted to examine the mediating role of perceived intention of showing off. Once again, there was a mediating effect of the perceived intention of showing off in predicting malicious envy: 95% CI [-.26, -.01] (see the result in Figure 6).

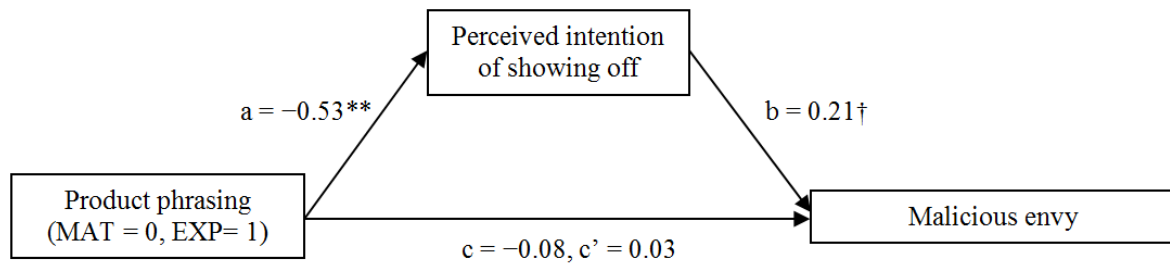


Figure 6. Result of mediation analysis in Paper 3 Study 3 (unstandardized coefficients, $**p < .01$. $†p < .10$). For the product phrasing, the material (MAT) phrasing was coded as 0 and the experiential (EXP) phrasing was coded as 1.

Envy type and purchase intention (H4&5). The relationships between envy type and purchase intentions were examined by using linear regression and taking the perceived difficulty as a control variable. Again, bootstrapped linear regressions with 1000 repetitions were used due to the violated assumptions. When taking the perceived difficulty as the only control variable, the observed coefficient of benign envy in predicting the purchase intention of the same object was 0.38, $z = 5.39$, 95% CI [0.24, 0.52]; the standardized coefficient of malicious envy in predicting the purchase intention of a superior object was 0.15, $z = 2.09$, 95% CI [0.01, 0.29]. Both H4 and H5 were supported.

Discussion

The third study was a between-subjects experiment with two conditions: material vs. experiential phrasing. It aimed to examine if the different types of phrasing can influence the degrees of benign and malicious envy and purchase intentions. The results showed that, compared with the experiential condition, participants in the material condition were more

likely to think the other person was showing off. The perceived intention of showing off was positively correlated with malicious envy and it mediated the effect of product phrasing on the envy type. In addition, the experience of benign envy predicted the purchase intention of the same laptop, and the experience of malicious envy predicted the purchase intention of a similar but superior laptop. Please note that, slightly different from the correlations between envy type and purchase intentions in Study 1 and 2, malicious envy was also highly correlated with the purchase intention of the same product in this study. This might be explained by the stimuli of Macbook Pro: maybe it was difficult for the participants by then to find another more superior laptop than the Macbook Pro.

General discussion

Three studies were conducted to examine 1) which type of envy is more prevalent on social media, 2) the antecedents of benign and malicious envy, 3) how post content influences envy type, and 4) how envy type uniquely influences purchase intentions. The first study was an online survey asked participants to recall the last time they felt envious due to browsing other's social news and describe the situation. Participants identified whether the envied object was a material or an experiential purchase and then reported the degrees of benign and malicious envy and purchase intentions. The second study was a between-subjects experiment in which participants were asked to recall an envy-triggering situation about either a material or an experiential purchase and then report the type of envy and purchase intentions. The last study examined whether different phrasings (experiential vs. material) of the same product can trigger different types of envy, and therefore influence purchase intentions.

Across three studies, significant correlations were found between the envy type and different types of purchase intentions: benign envy drives people to buy the same envied purchase but malicious envy drives people to buy something even superior. Both the results

of Study 1 and 2 revealed that social media users were more likely to experience benign envy instead of malicious envy. Across Study 2 and 3, although there was no main effect of post content on the envy type, a mediating effect of the perceived intention of showing off was found: material purchases and material phrasing of a product were more likely to be perceived with a higher intention of showing off, therefore triggered more malicious envy. In addition, the results of Study 1 showed that social media users were more likely to be envious about other's experiential purchases than material purchases, replicated the results of my second paper.

Theoretical and practical implications

There are several strengths and theoretical and practical implications of this research. First of all, this research sheds light on the emotion of envy on social media. This is the first paper that investigates the relationships between post content (purchase type), envy type and purchase intentions. Although previous researchers were worried about the negative effects of envy (Krasnova et al., 2015), this research has addressed the positive sides: It was found that most envied objects were about experiential purchases rather than material purchases, and most envious emotions on social media were actually benign envy, which comes along with a motivation of moving up. Taken together, these results novelly suggest that experiencing benign envy is not so terrible when taking the motivational factor into account: As experiential purchases bring people more happiness (Gilovich et al., 2015), being benignly envious about other's vacation experience might also increase the purchase intention of such a vacation and later bring more happiness.

Secondly, multiple methods were used to manipulate the post content (purchase type), and this contributes to the literature on experiential and material purchases. Previous researchers disagreed on whether to treat experiential and material purchases as the two opposite ends of a continuum (Van Boven & Gilovich, 2003) or two value-creating

dimensions (Schmitt et al., 2015). This research proposes that it is still meaningful to treat experiential and material purchases as the two opposite ends of a continuum, but researchers have to pay attention to all types of confounding variables for the distinction of experiential and material purchases. For manipulating the purchase type, multiple methods are suggested to increase the internal and external validity of the research design.

Thirdly, the current research has identified and empirically tested some antecedents of envy. Rare studies have examined the antecedents of envy (type) in the context of social media. This research not only investigates the role of post content, but also highlights several antecedents such as self-relevance based on previous research (van de Ven et al., 2012). Additionally, the perceived intention of showing off was identified as an important antecedent when distinguishing the envy type.

Last but not least, the current research transfers insights from the offline consumer research to the social media context. This research not only conceptually replicated that benign envy increases the purchase intention of the envied object (van de Ven et al., 2011), but also showed that malicious envy increases the purchase intention of a similar but superior object than the envied object. Previous research only claimed that envy increases conspicuous online consumption (Taylor & Strutton, 2016), but the current work shows that it is also important to distinguish the envy type.

Practical implications can be derived based on the current findings: as social media users are likely to experience benign envy, it would make sense for social marketers to add more ads about the same purchase as shown in one's News Feed. Showing such ads (better with a link for the online purchase) is likely to shorten the consumer decision journey and increase the chance of impulsive buying (Court, Elzinga, Mulder, Vetvik, & Others, 2009). For example, travel agencies can show ads of the same place after detecting a location sharing post of one's Facebook friend. In addition, according to the findings on the

antecedents of envy, social media users are suggested to avoid posting contents that are likely to be perceived as showing off.

Limitations and future research

There are some limitations as well. First of all, no causality can be inferred in cross-sectional studies. The perceived intention of showing off was measured as an antecedent/cause of envy only in Study 1 but not in Study 2 and 3. Though mediation analyses were conducted in Study 2 and 3, it is hard to exclude the impact of malicious envy on the perceived intention of showing off. Nevertheless, the results of Study 1 suggest that the appraisal of other's intention of showing off is still one important reason that causes malicious envy. Similarly, as the envy type was not manipulated, only the correlations between the envy type and purchase intention were interpreted (even though participants were asked to report their future purchase intention after the measurement of their current envious emotion). Furthermore, the current research treated the perceived difficulty as an important control variable when examining the effect of envy on purchase intention. More research is needed to examine the causal effect of envy in increasing the purchase intention and check the effect size of the direct effect.

Another limitation is about the stimulus (a Macbook Pro) used in the last study. It is pretty much one of the best laptops available on the market. Hence, different from the results of the first and second study, there was no weaker effect of malicious envy in predicting the purchase intention of the same product (than that of a similar product) in the last study. Future research could use another stimulus (for example Macbook Air) so that such ceiling effect can be avoided. It would also be good to replicate our third study with a variety of experiential and material purchases, including vacations and luxury goods.

There is plenty room for future research. The current research found that whether the post is about an experiential or a material purchase is not a key predictor of the envy type.

Maybe only seeing other's conspicuous consumption (Veblen, 1899) and materialistic purchases (i.e., purchases for showing-off, see Carter & Gilovich, 2012), instead of material purchases, leads to more malicious envy. Also, the envy type is likely to be influenced by the perceived liking toward the compared person, which is likely to influence the perception of deservingness (van de Ven, 2015). Researchers are encouraged to explore other important antecedents of benign and malicious envy (e.g., the degree of liking toward the poster and whether the purchase belongs to conspicuous consumption), and disentangle their relationships with the perceived deservingness and perceived control (van de Ven et al., 2012). With regard to the purchase intentions of a same and similar product, researchers can also investigate how they are influenced by consumer's personality traits such as consumer susceptibility to interpersonal influence (Bearden, Netemeyer, & Teel, 1989) and the need for uniqueness (Tian, Bearden, & Hunter, 2001). Furthermore, besides investigating the purchase intentions as the outcome variables, more research is required to investigate the effects of benign and malicious envy on online ads click-through rates and actual impulsive buying behavior, etc.

Conclusion

The current research indicated that there is a silver lining to the emotion of envy on social media. Billions of consumers are using social media to keep updated with other's social news, and reading such information sometimes triggers envy. Experiencing the negative emotion of envy might threaten consumers' well-being. This paper addressed the positive sides of envy: Luckily, most envious experience on social media was likely to be benign envy, which comes along with a motivation of moving up. The current research also showed that benign envy drives people to buy the same product as owned by others, whereas malicious envy is likely to increase the purchase intention of a similar but superior product. As marketers are struggling to attract more attentions of consumers on social media, such

emotions could be used for better advertising. More research is required to investigate the antecedents of benign and malicious envy so that marketers could further customize the ads on social media.

Additional results in Paper 3: Previous Purchase Behavior due to Social Media Usage

Participants read “social media can provide a great wealth of information about a certain product or service. For example, on Facebook or Instagram, you may see an ad or a post containing information about others' newly bought clothes, gadgets, concert or movie tickets, restaurant visits, etc. Have you ever bought or booked anything after browsing social media? Please estimate how many times you have bought or booked something (partially) due to being on social media?”

Out from 200 participants, 136 participants reported that they have purchased something due to browsing social media. A majority of them have done it multiple times (with 70 participants reported that they have purchased 2-4 times). The 136 participants who had such a purchase experience were further asked to describe their recent purchase experience, including what (on social media) triggered the purchase behavior, what did they bought or booked, and why.

Among the 136 cases, there are 58 cases in which the purchase behavior was triggered by UGC (i.e., posts from a friend or online contact) and 31 cases were triggered by FGC (i.e., an ad or posts from the company’s fan pages); it was difficult to identify the triggers in the rest cases. For the purchased object, 55 cases were about an experiential purchase, and 45 cases were about a material purchase, 23 cases were a bit of both, and the rest cases were difficult to categorize. When it comes to why they made the purchase, people often mentioned the reasons like “it looks nice and fits my need”. When the purchase is triggered by a post of a friend, participants were more likely to mention the reasons such as “the person speaks high of it” (and they trust the recommendation from a friend) and “fear of missing out” (they want to have it because their friend has it). Interestingly, when the purchase is triggered by a sponsored advertisement, participants often mentioned reasons concerning discounts and cheap prices, such as “it was a good offer/very affordable”.

6. General Discussion and Conclusion

Summary of empirical findings

The present thesis mainly examined the emotion of envy on SNSs and addressed the positive effects of it in the context of consumer behavior. It explored how tie strength and post content can influence the emotion of envy on SNSs and examined the different roles of benign and malicious envy in predicting purchase intentions of a same and superior object. Across three papers, it was found that 1) compared with the emotion of happiness, social network users only experienced a limited degree of envy (Paper 1 Study 1), 2) tie strength only predicted benign envy, but not malicious envy and general envy (Paper 1 Study 2), 3) users were more likely to be envious about other's experiential purchases rather than material purchases (Paper 2 and 3), 4) the content of the post (experiential vs. material purchases) did not predict the type of envy, but malicious envy was likely to be triggered when the posting behavior was perceived as showing off (Paper 3), 5) most of the envious experiences were actually benign envy (Paper 3), and, more importantly, 6) benign envy was likely to increase the purchase intention of the envied object, whereas malicious envy was likely to increase the purchase intention of a similar but superior object (Paper 3). The results of the current dissertation not only helps social network platforms and users to understand the prevalence of benign and malicious envy as a result of browsing, but also helps social marketers to understand which purchase type is shared and envied more frequently on SNSs, as well as when and where to put their advertisements. Due to the huge amount of information and slightly different foci in each study, a detailed summary of the three papers is provided below, together with the explanation of how each study is linked to one another. A summary in table format is also available in Appendix B.

A summary of Paper 1

The first paper explored the emotional outcomes of browsing SNS posts. It also examined the roles of tie strength in predicting happiness (based on the theory of emotional contagion, Hatfield et al., 1993) and envy (based on the theory of social comparison, Festinger, 1954; and SEM, Tesser, 1988). In Study 1, participants were asked to report their momentary emotions after reading each post on their Facebook News Feed. More positive emotions were reported than negative emotions (such as envy). Tie strength was found to be a significant moderator for happiness: the pleasant feeling after reading a positive post was intensified if the post was posted by a strong tie (e.g., a good friend) rather than a weak tie. But tie strength was not a significant moderator for the emotion of general envy.

In Study 2, benign and malicious envy was further distinguished. Participants were asked to imagine reading one post about a vacation and another post about a newly bought iPhone from a strong, a middle, or a weak tie (tie strength was manipulated). The results showed that tie strength only predicted happiness and benign envy, but did not predict general envy and malicious envy. The general envy and malicious envy were more likely to be predicted by personality traits. An interesting phenomenon was observed in the second study: the vacation post in general triggers more envy than the iPhone post. This result gave a first hint on the role of post content (experiential vs. material purchases) on the emotion of envy.

A summary of Paper 2

The second paper therefore examined whether experiential or material purchase-related posts trigger more envy on SNSs and why this is the case. Two opposing arguments were offered: first, experiential purchases are typically more self-relevant to most Western consumers (Carter & Gilovich, 2012), and therefore experiential purchases are more likely to trigger envy than material purchases; second, people make comparisons more easily for

material purchases than for experiential purchases (Carter & Gilovich, 2010), and therefore material purchases are more likely to trigger envy than experiential purchases.

In the first study of this paper, participants, who were Facebook users, were asked to find two posts on their News Feeds (within-subject design): one about experiential purchases and the other about material purchases. The degrees of envy after seeing each post were measured, together with the perceived self-relevance and comparability of the post. The results showed experiential posts triggered a higher degree of envy than material posts. Even though material purchases were much easier to be compared with others than experiential purchases, experiential purchase were treated as more self-relevant than material purchases; and only the self-relevance mediated the effect of post category on the degree of envy. However, it was also found that the paid prices for experiential purchases seemed to be higher than that for material purchases in the reported envy-triggering cases.

Therefore, the second study used a between-subjects experimental design: Participants were asked to imagine seeing a post either about a 55\$ concert experience (experiential condition) or about a 55\$ iPod (material condition). In addition to the degree of envy, self-relevance, and comparability, the changed level of liking toward the poster was measured. The result of the second study replicated the results of the first study: The experiential condition triggered more envy than the material condition, and this was because the self-relevance was higher in the experiential condition. In addition, participants liked the poster more in the experiential condition.

So far, all studies adopted the perspective of a reader (who read other's posts). The third study also adopted the perspective of a poster. Two versions of the online survey were created to measure the expected and reported degrees of envy after seeing posts in five categories (including experiential and material purchases). In the poster's version, the frequency of posting posts in each category and the expected level of envy for each post

category were measured. In the reader's version, the willingness to see posts from each category and the experienced envy were measured. The results revealed that, even though readers reported that more envy was triggered by experiential posts, posters thought material purchases should trigger more envy than experiential purchases. In addition, experiential purchases were posted much more frequently than material purchases on SNSs, and readers preferred to see experiential posts rather than material posts.

In sum, the results of three studies in the second paper indicated that experiential purchases, as they were more important and self-relevant to most SNS users, triggered more envy than material purchases. Interestingly, readers also preferred to see experiential posts more than material posts and tended to like the poster more if the post was about experiential purchases (rather than material purchases). Then, why are people willing to see those posts that make them feel envious? This might be explained by one important finding in the third paper: when people experience envy on social media, it is more likely to be benign envy rather than malicious envy.

A summary of Paper 3

Most studies in the first and second paper were conducted using the platform of Facebook; the third paper further examined the prevalence of benign and malicious envy using a broader context of social media. Furthermore, it examined the relationships between post content, envy type, and purchase intentions. In the first and second study of this paper, participants were asked to recall an envy-triggering situation. The only difference is that the first study was rather a survey that asked people to recall the last time they experienced envy (due to either an experiential or a material purchase); while the second study was an experiment, and participants were randomly assigned to two groups (between-subjects design: one group to recall an experiential-related situation that triggers envy and another to recall a material-related situation). In addition, some antecedents of benign and malicious envy

(including the perceived intention of showing off) were also examined in the first study. The results of both studies showed that there was more benign envy than malicious envy on social media, and the envy type was not associated with the post category (although there was a mediating effect of the perceived intention of showing off). More importantly, when controlling for the perceived cost/difficulty, benign envy was associated with the purchase intention of the same envied object, but malicious envy was associated with the purchase intention of a similar and even superior object.

In the last study, a between-subjects online experiment was conducted for the replication purposes. Participants were asked to see a post about a newly purchase Macbook Pro with either a material phrasing or an experiential phrasing. The degrees of benign and malicious envy and purchase intentions were measured, as well as the perceived intention of showing off (as a mediator) and the perceived difficulty (as a control variable for purchase intention). The results once again showed that the envy type was not predicted by the product phrasing, but there was a mediating effect of the perceived intention of showing off. Different types of envy were also positively associated with purchase intentions.

Theoretical implications and relation to previous research

Concerning the mixed findings on the general psychological effects

This dissertation offers explanations (e.g., the length of usage) for the previous mixed findings on the psychological effects of the passive SNS usage. Both positive (e.g., happiness) and negative (e.g., envy) emotions could be elicited by browsing SNSs: Mauri et al. (2011) found that browsing Facebook evokes a flow state (which is characterized by high positive valence and high arousal); However, Verduyn et al. (2017) recently did a review and concluded that passive SNS usage decreases well-being due to the increased level of upward social comparison. This dissertation does agree that browsing SNSs may cause envy and is hence detrimental to user's well-being (Krasnova et al., 2013, 2015; Tandoc et al., 2015;

Verduyn et al., 2015). However, this dissertation also suggests that it is important to pay attention to the length of usage. Contrary to Verduyn et al.'s (2017) finding and in line with Mauri et al.'s (2011) finding, the current dissertation showed that more positive emotions were experienced by the users than negative emotions as a result of short-term SNS browsing. This contributes to the research on the psychological effects of passive SNS usage. Therefore, people should not worry too much about the negative effects of SNS browsing as long as the total usage time is under control and when the SNS usage does not disturb one's normal life. In addition, when researching the emotion of envy as a result of other's positive self-presentations on SNSs, researchers should be aware that positive emotions can also be elicited by those entertaining and informative content on SNSs.

Concerning the research on envy on SNSs and its antecedents

Although the first paper indicated that envy was not the most dominant emotion as a result of browsing SNS, envy was still found to be one of the negative emotions that could be frequently experienced by users. As indicated by Appel et al. (2016), besides investigating the global affective changes as a result of general SNS usage, it is also important to investigate "which processes cause which effects in which populations". Concerning the potential negative effects of envy on billions of SNS users, the present dissertation further focused on the social comparison process (Festinger, 1954) and the negative emotion of envy on SNSs.

The current dissertation largely extends current knowledge on the emotion of envy: it not only examined two types of envy, but also investigated the antecedents of benign and malicious envy on SNSs. Previous research on the emotion of envy on SNSs usually examines the emotion of general envy without taking the type of envy into consideration (e.g., Krasnova et al., 2015). The current research showed the first time that the emotion of envy on SNSs is more likely to be the benign type, and benign envy is likely to be intensified by the

tie strength. The unique role of the perceived intention of showing off in predicting envy type is also addressed in the current work. This is useful for future research that aims to identify different types of envy.

Concerning the experiential and material purchases and envy

Furthermore, this dissertation contributes to the research on experiential and material purchases. The distinction between experiential and material purchase is an important one in consumer psychology literature (Van Boven & Gilovich, 2003). Previous research has mainly justified the advantages of experiential purchases over material purchases, such as investing in experiential purchases brings more happiness (Gilovich et al., 2015), and sending experiential purchase as gifts fosters stronger social relationship (Chan & Mogilner, 2017). However, it is also important to have a look at this issue from another perspective: experiential purchases can also trigger more envy than material purchases on SNSs, and this is exactly because experiential purchases are more self-relevant to most SNS users than material purchases. Although material purchases are much likely to trigger social comparisons in the offline context (Carter & Gilovich, 2010), the current research reconciles the two potential mechanisms (self-relevance and comparability) in the context of social media and suggests a mediating role of self-relevance in predicting reader's envy.

In addition, it was found that experiential purchases are less likely to be perceived as showing off than material purchases, therefore less malicious envy is triggered. This finding corresponds to the results that a) posters were more likely to share experiential purchases rather than material purchases on SNSs, b) readers were more willing to see posts about experiential purchases rather than material purchases (see Paper 2 Study 3; Amit Kumar & Gilovich, 2015), c) readers felt happier after seeing other's experiential purchases rather than material purchases (see Paper 1 Study 2), and d) readers liked the poster more after seeing the post about experiential purchases rather than material purchases (see Paper 2 Study 2). This

also confirms the positive role of sharing experiential purchase in fostering social relationships (Gilovich et al., 2015).

Concerning the perspective taking

Another theoretical implication is concerning the theory of mind (Frith & Frith, 2003) and the different perspectives that participants take (Epley & Caruso, 2008). This dissertation examined the envious emotion mainly from a reader's perspective, except for the last study in the second paper. That study showed that posters and readers hold different opinions toward which purchase type triggers more envy: readers reported that experiential purchases triggered more envy than material purchases; while posters thought that others would be more envious toward their posts of material purchases rather than experiential purchase. And these differences still exist when taking the factor of social desirability into the control. This means that posters do hold a biased perspective when assuming how readers would react to their own posts. When posters were asked to estimate which purchase type triggers more envy, posters might mainly think of the comparability nature of material purchases and be less concerned about the self-relevance factor. However, more research is required to confirm this process. Future researchers should also bear this perspective taking bias in mind.

Concerning the research on consumer behavior

Concerning the peer-to-peer influence among consumers, previous research on social media marketing mainly focused on the cognitive process of eWOM (Alves et al., 2016; Jalilvand et al., 2011). The current dissertation addressed an emotional process—the role of benign and malicious envy in increasing purchase intentions of the same or a superior product. The current research conceptually replicates the results of previous offline consumer research (van de Ven et al., 2011), and claims that it is also important to distinguish different types of envy in the context of social media. Researchers should note that although van de Ven et al. (2011) examined the willingness to pay for a product that allows differentiation, the current

research took one step further and measured the purchase intention in future for an even superior product. The current findings also shared some similarity with the cognitive dissonance theory (Festinger, 1957). Cognitive dissonance theory suggests that people have an inner drive to avoid inconsistent attitudes and beliefs. Therefore, when people experience malicious envy and dislike the poster, they are also less likely to buy the exactly same (envied) object. Following this promising research line, future studies could examine the different effects of benign and malicious envy on consumer's actual purchase behavior.

Practical implications

For SNS marketers

The advent of social media brings new chances and challenges for advertising and marketing. Billions of users are actively using SNSs to check up what is popular around them. As indicated in the additional results of Paper 3, consumers do buy/book various experiential and material purchases after browsing social media, and they are likely to be influenced by the purchase behavior of their online contacts. Although the advertising on Facebook is often perceived as annoying and retains less attention (Barreto, 2013), it is still an important venue for promoting sales.

One existing challenge is about how to improve the personal involvement (Zaichkowsky, 1986) toward the Facebook ads. This dissertation suggests that showing a relevant ad as shared in one's friend post could be one option to increase the Facebook ads involvement. An important result of the current research is that benign envy increases the likelihood to purchase the envied object, whereas malicious envy increases the likelihood to purchase a different (and even superior) product/service than the envied object. It would make sense for SNS marketers to advertise the same product when benign envy occurs, and advertise another superior object when malicious envy occurs. In case that the type of envy is hard to be distinguished, it would be wise to offer a variety of choices to users.

Traditional research about the mere exposure effect (Zajonc, 1968) would indicate that familiarity breeds liking: if the Facebook ad contains the same object as posted by a Facebook Friend, users may like it more. However, it is also important to know that familiarity can also breed contempt (Norton, Frost, & Ariely, 2011) and an avoidance strategy would be adopted when malicious envy is experienced. By recognizing the predictors and antecedents of benign and malicious envy (e.g., tie strength, post content, perceived intention of showing off) as identified in the current dissertation, SNS marketer can better predict when the various emotions are likely to happen and therefore locate the “right” advertising to the “right” customers.

In addition, marketers could encourage consumers to share their experiences while using the product/services. By addressing the positive experiential value of the purchase in a shared post, it is less likely to be perceived as showing off. Others, who see the purchase-related post, might experience benign envy and hence are more likely to buy the same thing as their online contact did.

For SNS providers

For Facebook Company, it is good to know that their users are likely to experience more positive emotions than negative emotions after browsing Facebook. However, it is still important to prevent negative emotions such as (malicious) envy. The results of the current dissertation indicated that, on the one hand, Facebook users are willing to see other’s experiential purchases; but on the other hand, more envy is elicited after seeing other’s experiential purchases. In addition, based on the Tesser’s SEM theory, showing a similar other’s achievement in a highly relevant domain could be threatening to the users. Therefore, SNS providers should bear in mind that displaying relevant news from strong ties is not always good for their customers’ well-being.

There is already some third-party software such as “F.B. Purity” which enables Facebook users to filter out content that they do not like to see. SNS providers could actively consult opinions from those users who are not satisfied with the current Facebook content (e.g., have installed such plug-ins to change the SNS layout), and work further on the display algorithm to prevent the negative user experiences. For those users who are dispositionally more likely to experience the negative emotion of envy, SNS providers could consider providing services to filter out those posts that might trigger envy.

For SNS users

The current results can also give practical and meaningful suggestions to SNS users about what to post online. Addressing the monetary value in a Facebook post is not likely to be favored by other users. Most Facebook users would love to see posts about relationships and family, achievements, and experiences, but less interested in knowing about other’s material purchases and seeing other’s selfies. Therefore, users could minimize negative consequences of posting by taking the perspective as a reader (i.e., bear readers in mind) and avoiding posting things which are likely to be perceived as showing off.

Limitations and future research

Inevitably, there were some limitations in this dissertation as already listed in each paper. First of all, the generalizability (external validity) of the current results is always an issue. Social norm plays an important role with regard to some of my findings (e.g., which purchase type triggers more envy), and the core values held by various social network platform should matter. However, except for the third paper, the platform of Facebook was mainly investigated in this dissertation. In addition, most of my studies used the samples from Western, educated, industrialized, rich, and democratic (“WEIRD”) countries (Henrich, Heine, & Norenzayan, 2010). It is important to see if the current findings can be replicated in some non-WEIRD societies (Dunn & Weidman, 2015). There are certain societies and sub-

groups where people prioritize the pursuit of material goods. For example, envicase.com is a social network platform where users can post about the items they own and “envying” one another. It is actually built for showing off material purchases. Future research could use other samples to examine the emotion of envy on various social network platforms.

In addition, this dissertation only investigates the momentary emotions as a result of short-term usage. Blease (2015) highlighted the social comparison process as one important reason to explain why Facebook usage may lead to depression. Maybe, in long term, the accumulation of the negative emotion (e.g., envy as a result of the upward social comparison) is detrimental to certain users. Therefore, it is suggested to address the momentary emotional responses and the long-term psychological effects of social network usage separately in the future review.

Second, the emotions were mainly self-reported in the current studies, which may put some conclusions of this dissertation into doubt. Due to the social desirability issue, participants might less likely to admit those negative emotions than positive emotions. A meta-analysis is needed and the measurement method should be taken into control.

Another important limitation is about the reversed causality. Only the correlations were examined due to the cross-sectional nature of most studies. For example, due to the multiple research questions that were investigated in the third paper, benign and malicious envy was not manipulated. The results can also be interpreted in a way that the purchase intention of the same object in future triggers more benign envy. However, logically speaking, it is less likely to be the case that the purchase intention of a superior product in future triggers more malicious envy. The current results are still meaningful. Future research could try to manipulate the envy type and then measure the purchase intentions (and even the purchase behavior).

Last but not least, although the concept of self-relevance has been mentioned throughout three papers, the measurement used in each study was not consistent. In the first paper, the measurement was about the general interests toward a vacation trip vs. an iPhone. This is actually quite similar to the concept of product involvement, which was defined as “the ‘relevance’ of the product to the needs and values of the consumer and hence interest for product information” (Zaichkowsky, 1994). In the second and third paper, the measurement of self-relevance was mainly about the importance of the compared domain to one’s identity. Slightly different measurement items were used in each study due to the changed context. This is because researchers in different disciplines actually referred to different facets of self-relevance and have not developed a concrete multi-facet scale for measuring it: In the literature about envy and social comparison, self-relevance mainly referred to the importance and the relevance of the comparison domain for self-estimation (Smith & Kim, 2007); whereas in the literature about experiential vs. material purchases, Carter and Gilovich (2012) were mainly talking about the centrality and relevance of different types of purchase in presenting one’s self. Interestingly, these two facets are somehow similar to the two facets of the product involvement: the product perceived importance (i.e., the intrinsic importance of the comparison object/domain to consumers) and the perceived sign value of the product class (i.e., having the product says something about this person) (Laurent & Kapferer, 1985). Laurent and Kapferer (1985) found that these two facets are often positively correlated, and both facets are important and meaningful components of the involvement concept. Future research is suggested to clarify the concept of self-relevance first and then develop a meaningful (multi-item) measurement based on the scale of Revised Personal Involvement Inventory (McQuarrie & Munson, 1987).

More directions for future research are proposed as following. The current dissertation only examined the direct impacts of tie strength and purchase type respectively in predicting

envy, however, there might be an interaction effect between tie strength and purchase type on the emotion of envy and purchase intention. Future research could investigate this interaction effect between tie strength and purchase type, as well as the direct impact of tie strength on purchase intentions. In addition, future research can also explore if the emotion of envy directly changes the attention toward a Facebook ad on the right-hand side, and increases the click through rate. Nevertheless, the emotion of envy is only one potential path that might change consumer behavior. More research is required to explore how SNS usage changes consumer behavior.

Conclusion

This dissertation investigated the negative emotion of envy (after seeing other's purchases on SNSs) in the context of consumer behavior. It was found that consumers only experienced a limited degree of envy, and it is more likely to be benign envy. In addition, consumers are more likely to be envious of other's experiential rather than material purchase on SNSs. This is because 1) experiential purchases are more relevant to most social network users and 2) people are more likely to share their experiential purchases than material purchases on SNSs. This dissertation also argues that, being benignly envious about other's experiential purchases is not necessarily a bad thing—it motivates consumers to work harder and increases the purchase intention of experiential purchases, which, in turn, can bring them more happiness (compared with spending more money on material purchases). There is definitely a silver lining to the negative emotion of envy on SNSs. This dissertation not only helps social network platform providers to better evaluate the negative psychological effects of consuming their services, but also helps marketers to gain a better knowledge of when and where to put advertising on SNSs (and hopefully eventually improves conversion rates and sales).

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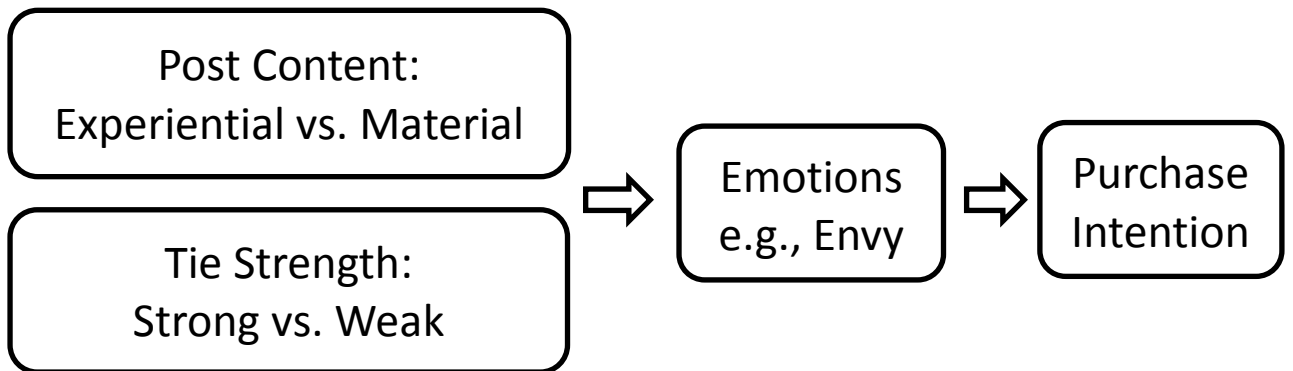
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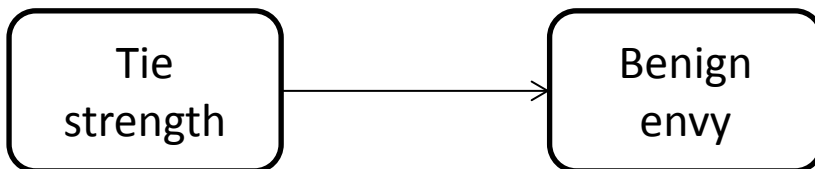
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Appendix A

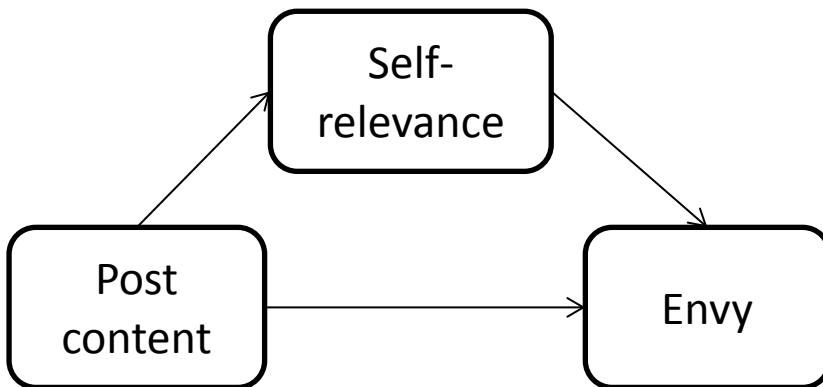
Research models in a nutshell



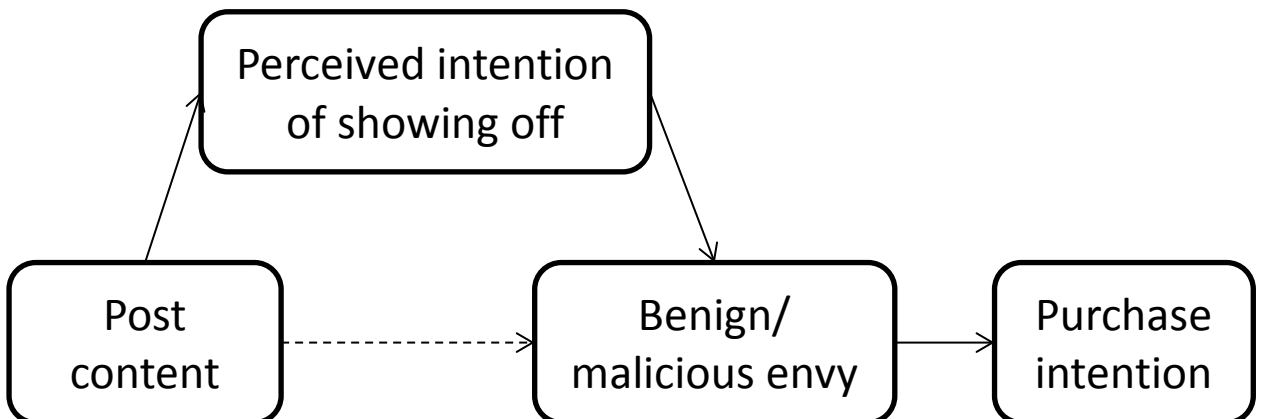
Results of Paper 1



Results of Paper 2



Results of Paper 3



Appendix B

Paper 1: Tie strength → Envy

Paper 1	Purposes	Method	Key Findings
Study 1	<p>RQ1: What are the most prevalent momentary emotional outcomes of reading a post on Facebook?</p> <p>RQ2: What is the role of tie strength in explaining emotional outcomes such as happiness and envy?</p>	<p>Sample: 207 American Participants;</p> <p>Each participant reported the <i>four most recent posts</i> from four different posters.</p> <ul style="list-style-type: none"> • For each post: <ul style="list-style-type: none"> – Content of post – Tie strength – Emotions • Control variables: mood, self-esteem, demographics 	<ul style="list-style-type: none"> • Positive emotions > negative emotions • Tie strength predicted happiness but not envy • Positive content was positively associated with both happiness and envy
Study2	<p>H1: Stronger tie → more happiness;</p> <p>H2: Stronger tie → more benign envy;</p> <p>H3: Stronger tie → less malicious envy</p>	<p>Sample: 194 German Participants;</p> <p>A lab experiment with a mixed design (3 ties × 2 scenarios), focused only on positive posts.</p> <ul style="list-style-type: none"> • Report three FB friends (strong, mid, weak ties) • Each participant saw two scenarios (vacation and iPhone) from a tie assigned by Latin square • Report tie strength and emotions after seeing the post • Manipulation check of the tie strength • Demographics 	<ul style="list-style-type: none"> • Stronger tie → more happiness • Stronger tie → more benign envy • No relationships between tie strength and malicious envy

Paper 2: Posts about experiential (EXP) vs. material (MAT) purchases → Envy

Paper 2	Purposes	Method	Key Findings
Study 1	<p>RQ1: Which purchase type (EXP vs. MAT) triggers more envy?</p> <p>RQ2: What is the underlying mechanism?</p> <ul style="list-style-type: none"> – Self-relevance – Comparability – Posting frequency 	<p>Sample: 178 Dutch Participants;</p> <p>A lab study with a within-subject design: Each participant reported one experiential and one material post.</p> <ul style="list-style-type: none"> • Frequency of exposure to experiential and material purchases • For each post: <ul style="list-style-type: none"> – Degree of envy – Self-relevance – Comparability – Manipulation check • FB usage and demographics 	<ul style="list-style-type: none"> • Posting frequency: EXP > MAT • Degree of envy: EXP > MAT • Self-relevance: EXP > MAT • Comparability: MAT > EXP • The mediating role of self-relevance
Study 2	<p>H1: EXP triggers a higher degree of envy than MAT;</p> <p>H2: Self-relevance mediates the process;</p> <p>H3: EXP triggers more liking</p>	<p>Sample: 252 American MTurkers;</p> <p>An online experiment with a between-subjects design: Each participant saw a post either about a concert (experiential purchase) or about an iPod (material purchase).</p> <ul style="list-style-type: none"> • Degree of envy • Self-relevance • Comparability • Liking • Demographics 	<ul style="list-style-type: none"> • Degree of envy: EXP > MAT • Self-relevance: EXP > MAT • Comparability: MAT > EXP • Liking: EXP > MAT
Study 3	<p>Examine the degree of envy from both a reader's and a poster's perspective; Including five post categories</p>	<p>Sample: 405 American MTurkers;</p> <p>An online survey with mixed design: between-subjects (poster vs. reader); within-subject (5 post categories including experiential purchases, material purchases, relationships, achievements, and appearances).</p> <ul style="list-style-type: none"> • Poster version: <ul style="list-style-type: none"> – Frequency of posting – Expected degree of envy (for each post category) • Reader version <ul style="list-style-type: none"> – Willingness to see – Self-reported degree of envy (for each post category) • FB usage, social desirability, demographics 	<ul style="list-style-type: none"> • Poster's version: <ul style="list-style-type: none"> – Posting frequency: EXP > MAT – Expected degree of envy: MAT > EXP • Reader's version: <ul style="list-style-type: none"> – Willingness to see: EXP > MAT – Experienced degree of envy: EXP > MAT

Paper 3: Post content, envy type, and purchase intentions

Paper 3	Purposes	Method	Key Findings
Study 1	<p>H1: Social media users are more likely to experience benign than malicious envy.</p> <p>RQ1: Relationships between post content, envy type, and purchase intentions?</p> <p>RQ2: Antecedents of benign and malicious envy?</p>	<p>Sample: 200 Prolific Participants; An online survey asked participants to report the last time they felt envious due to seeing other's EXP or MAT purchases on social media.</p> <ul style="list-style-type: none"> Recall last time experiencing envy on FB (could be either EXP or MAT) Perceived post category (whether the envied object is an experiential or a material purchase) Benign and malicious envy Purchase intentions (same vs. superior) Antecedents of the envious emotion (perceived difficulty, self-relevance, perceived intention of showing off, etc.) Perceived cost of the purchase Demographics 	<ul style="list-style-type: none"> Benign envy > Malicious envy A weak correlation between post category and envy type (marginal effect) Benign envy → Purchase intention (same) (marginal effect) Malicious envy → Purchase intention (superior) Unique role of show-off in predicting benign and malicious envy Post hoc: Recalled posts were more often about EXP instead of MAT
Study2	<p>H2: Benign envy: EXP > MAT; H3: Malicious envy: MAT > EXP; H4: Benign envy → Purchase intention of the envied object; H5: Malicious envy → Purchase intention of another superior object; RQ3: Mediating role of perceived intention of showing off?</p>	<p>Sample: 221 Prolific Participants; An online experiment with a between-subjects design: Each participant reported either an EXP- or a MAT-related envy-triggering situation.</p> <ul style="list-style-type: none"> Describe the envy-triggering situation Manipulation check Benign and malicious envy Purchase intention (same vs. superior) Perceived difficulty Perceived intention of showing off Demographics 	<ul style="list-style-type: none"> Benign envy > Malicious envy No main effect of post category on envy type Benign envy → Purchase intention (same) Malicious envy → Purchase Intention (superior) Perceived intention of showing off was a mediator for post category and envy type
Study 3	<p>H4 and 5 as above; H6: Showing off: EXP > MAT; H7: Benign envy: EXP > MAT; H8: Malicious envy: EXP < MAT</p>	<p>Sample: 201 Prolific Participants; An online experiment with a between-subjects design: Each participant read a post about a newly purchased MacBook Pro with either an EXP- or a MAT-phrasing.</p> <ul style="list-style-type: none"> Manipulation check Perceived intention of showing off Benign and malicious envy Purchase intention (same vs. superior) Perceived difficulty Demographics 	<ul style="list-style-type: none"> No main effect of phrasing on envy type Perceived intention of showing off was a mediator, which predicted malicious envy Benign envy → Purchase intention (same) Malicious envy → Purchase Intention (superior)