언론정보학석사학위논문

Social Comparison or Emotional Contagion?

: Comparing Two Mechanisms Underlying the Association between Instagram Browsing and Subjective Well-being

(인스타그램 이용이 주관적 안녕감에 미치는 효과

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Abstract

The present study examined the relative effects of two mechanisms – social comparison and emotional contagion – underlying the association between Instagram browsing and individuals' subjective well-being. Previous studies employed a single scale of information valence when comparing these two mechanisms, yet this approach may have failed to accurately capture the effects of social comparison direction. Thus, the current study employed two disparate scales (i.e., information valence scale and comparison directionality scale) to test if two scales can be equated, and if not, which of the two scales better accounts for the effects of social media browsing on well-being. Furthermore, this study examined how differing degrees of psychological closeness between the poster and viewer (i.e., close friends, acquaintances, strangers) moderate the relationship between Instagram browsing and well-being.

Using both laboratory-based (Study 1) and diary (Study 2) methodologies, the present study lends support for emotional contagion. That is, people experience more positive affect and less negative affect when they are exposed to more positive posts, regardless of whether the posts feature

upward or downward social comparison information. In addition, exposure to positive posts enhanced life satisfaction via decreasing negative affect. Meanwhile, exposure to upward social comparison information evoked envy, yet this feeling did not affect life satisfaction. However, across two studies, exposure to upward information was negatively associated with life satisfaction. Taken together, the results of the present study suggest that browsing others' positive or upward comparison eliciting posts *per se* may not deteriorate people's affective well-being, yet the negative impact of engaging in upward social comparison may offset the positive effect of emotional contagion on people's cognitive well-being. Furthermore, there were no significant interaction effects between Instagram browsing and psychological closeness.

Key Words: Instagram, social media, social comparison, emotional contagion, psychological closeness, subjective well-being, computer-mediated communication (CMC)

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Introduction

Social media have seamlessly integrated into our everyday communication repertoire. Roughly 70 percent of U.S. adults reported that they are Facebook users, and a sizable majority of SNS users indicated that they visit the site on a daily basis, and even multiple times per day (Smith & Anderson, 2018). The practice of updating, commenting, and browsing on social media has become part of everyday life for many people. When considering the fact that social media use is increasingly playing such a big part in people's lives, it is of particular importance to question if, and if so, how social media use influences its users. Particularly, as SNSs are serving as a venue where people capture and share their life moments through a series of uploads, it seems reasonable to predict that browsing through a continuous stream of others' posts would affect how people feel and how people evaluate their own lives, namely subjective well-being. As such, empirical studies that investigate the relationship between social media use and well-being have recently flourished, especially in the realm of communication research and positive psychology.

Although the rosy aspects of social media use prevailed in early research on social media effects, studies supporting the negative impact of social media use have recently accrued. Specifically, those who claim the dark side of social media use have shown that not only the time spent on social media (e.g., Kross et al., 2013; Shakya & Christakis, 2014), but also *passive* social media use such as browsing and scrolling through others' posts is particularly detrimental to well-being (e.g., Verduyn et al., 2015). Considering the fact that social media is a venue filled with others' optimized self-presentation, it seems natural to assume that comparing oneself with others (i.e., social comparison) on SNSs while browsing others' posts would be harmful to one's well-being. For instance, imagine if you are browsing through the News Feed and realize that your Facebook friend had expensive dinner at a posh restaurant. How would you feel and how would you evaluate your life? Furthermore, the increasing popularity of image-driven social media platforms such as Instagram has exacerbated concerns about the detrimental effects of social comparison on SNSs. It has been claimed that people "get more explicit and implicit cues of people being happy, rich, and successful from a photo than from status update" (Winter, 2013) and thus Instagram is more potent in provoking immediate social comparison and even more depressing than Facebook.

However, if we accept the argument that social comparison on SNSs is detrimental to one's well-being, it becomes difficult to understand why some people do not experience negative affect or evaluate their lives negatively after browsing others' SNS posts. This may lead some to question if engaging in social comparison indeed results in negative outcomes or if there is any additional mechanism that can buffer or even outweigh the negative impact of social comparison. For instance, objective features of SNS posts such as the valence of posts may also influence users. That is, positive emotions expressed on positive SNS posts may be automatically transferred to the viewer (i.e., emotional contagion) and thus attenuate the negative affect experienced after engaging in social comparison. In order to answer these questions, the current study compares social comparison and emotional contagion mechanisms by employing two disparate scales (i.e., information valence scale and comparison directionality scale). Examining both cognitively based mechanism (i.e., social comparison) and emotion-based mechanism (i.e., emotional contagion) would no doubt be beneficial in providing a holistic explanation regarding how social media browsing influences people's well-being.

In addition, the present study examines how differing degrees of psychological closeness between the poster and viewer influence subjective

well-being, jointly with exposure to emotion-laden posts or social comparison eliciting posts. The importance of psychological closeness as a critical moderator has already been underscored in both social comparison and emotional contagion literature. When considering the *social* nature of social media which enables users to initiate and maintain a wide array of relationships (Ellison, Steinfield, & Lampe, 2007), it seems natural to question if the extent to which social comparison and emotional contagion affect well-being would be different depending on whose posts people browse through. For instance, do people feel happier when they see their friends buying expensive goods on SNSs compared to when they view similar posts from acquaintance or strangers? While previous studies are largely confined to examining the effects of close friends and acquaintances in this context (e.g., Liu et al., 2016), the present study suggests that strangers should also be taken into account. Considering the recent empirical studies addressing the importance of strangers in SNSs contexts (e.g., Chou & Edge, 2012), examining the role of strangers alongside close friends and acquaintances would help us obtain a more thorough understanding concerning how both mechanisms affect people's subjective well-being.

To further advance this line of research, the present study aims to examine the relative effects of social comparison and emotional contagion on

people's subjective well-being, and also how differing degrees of psychological closeness may intensify or attenuate this relationship. First, using the quasi-experiment (Study 1), this study examines if there are any short-term changes in affect and life satisfaction after browsing SNSs. In addition to direct effects, this study explores if social media browsing makes people *feel* happier (i.e., a state-level happiness), which subsequently leads them to evaluate their lives as *being* happier (e.g., a trait-level happiness) by conducting mediation analyses. Second, using the 7-day diary method (Study 2), the current study explores how aforementioned relationships unfold in a more naturalistic setting.

Literature Review

SNS Usage and Subjective Well-being

Defining Subjective Well-being

In the realm of positive psychology, scholars have identified two routes to happiness: eudaimonic happiness and hedonic happiness. The eudaimonic happiness perspective posits that happiness can be achieved through self-actualization or full functioning, and thus the pursuit of a meaningful life is often underscored. Although eudaimonic happiness has a long history that dates back to the Greek philosopher, Aristotle, a theoretical or methodological consensus is yet to be reached. For instance, empirical studies adopting the eudaimonic viewpoint have operationalized happiness in different ways such as self-determination theory (Ryan & Deci, 2001) and psychological well-being (Ryff, 1989).

The other route to happiness is hedonic happiness. Hedonic happiness refers to pleasure or the positive balance of emotional experiences (Kahneman, 1999), and thus pursuing pleasure is of great importance. Compared to the eudaimonic happiness literature, the empirical studies on

hedonic happiness are relatively well-established. The most popular theory that represents hedonic happiness perspective is the subjective well-being theory (Diener, 1984). According to this theory, subjective well-being is composed of two components: affective well-being and cognitive well-being. Affective well-being refers to the affective reactions to ongoing events in the person's life, and it is typically assessed with measures of positive affect and negative affect. Cognitive well-being is the global evaluation of one's life, and it is commonly assessed with measures of life satisfaction. Accordingly, high subjective well-being is achieved when people frequently experience positive affect, infrequently experience negative affect, and evaluate their lives positively.

While exploring both routes to happiness is indeed meaningful, the present study focuses on hedonic happiness. This is because its interest lies in exploring how people's experience on social media platforms may affect how people feel and evaluate their own lives, but not in investigating how well people pursue and achieve a meaningful life on social media. Thus, following Diener and colleagues (e.g., Diener, 2009; Diener, Lucas, & Oishi, 2002), the present study uses the term happiness interchangeably with subjective well-being, and views subjective well-being as an umbrella term that incorporates positive affect, negative affect, and life satisfaction.

For affective well-being, it is important to note that positive affect and negative affect should be examined separately. Although these two types of affect are not entirely independent from one another, it is deemed desirable to assess them respectively as they show some degree of autonomous variation (Diener, 2009). A bulk of empirical evidence has been provided in support for this argument, refuting the long-held belief that positive and negative affect lay in opposite directions (e.g., Bauer, McAdams, & Sakaeda, 2005). Thus, the present study separately assesses positive affect, negative affect, and life satisfaction as outcome variables.

Furthermore, in terms of time frames, affect is generally described as a transient, state level of happiness, whereas life satisfaction represents a trait level of happiness. This distinction is grounded in the assumption that compared to one' affect, which has a proclivity to fluctuate from moment to moment, life satisfaction is relatively stable because many people have a stored life satisfaction judgement. In this respect, prior studies assumed that life satisfaction would be stable unless there is a dramatic change to one's life circumstance (Diener, 2009). However, recent studies have claimed that life satisfaction is an ongoing judgement which is updated and altered depending on which memories of life domains are salient at the time (Diener, 2009). Therefore, life satisfaction is generally regarded as global appraisals of life

which shows some stability, yet this is also guided to some extent by the current mood and situational influences that make certain memories pronounced. In the context of the current study, this suggests that the way people evaluate their own lives would also be, albeit less responsive compared to affect, influenced by what experiences people have on social media.

Effects of SNS Usage on Subjective Well-being

A host of prior research has examined the effects of SNS usage on well-being, yet the findings are diverging. While some studies revealed that SNS usage is positively associated with well-being (e.g., Ellison, Steinfield, & Lampe, 2007; Kim & Lee, 2011; Valenzuela, Park, & Kee, 2009), other research demonstrated the opposite (e.g., Chou & Edge, 2012; Krasnova et al., 2013; Verduyn et al., 2015). When considering the fact that social media have become an indispensable part of everyday life for many people, a great deal of scholarly attention devoted to understanding this relationship is hardly surprising.

Previous studies have proposed various mechanisms in an attempt to provide support for either positive or negative impact of social media use on well-being, yet the precise mechanism remains elusive. For instance, a group of scholars who champion the positive sides have shown that social media use has a positive impact on well-being through increased social support (e.g., Ellison, Steinfield, & Lampe, 2007). That is, the benefits of using social media mostly comes from social interactions. This is in line with the rosy prospects which view social media as a venue for forming and maintaining social capital. Although this line of research was somewhat dominant in the early works of social media effects, the evidence appears to be increasingly accrued in support for the detrimental effects of social media use on well-being and mental health. The most commonly employed explanation for this negative impact is the act of comparing oneself to another (namely social comparison) while browsing through others' SNS posts.

While uncovering such specific mechanisms are certainly important, it would not be sufficient to obtain a more thorough, in-depth understanding of how social media use affects individuals' well-being unless one mechanism is compared with another mechanism. Considering the fact that mechanisms proposed by previous studies are distinct, yet complementary routes through which social media use affects individuals' well-being, it would no doubt be

beneficial to explore the relative strengths of these mechanisms. In this respect, a study conducted by Burke and Kraut (2016) merits note. In this study, five complementary mechanisms – belongingness, relational maintenance, signals of relational investment, social support, social comparison – through which communication types and partners on Facebook influence well-being were considered altogether. A handful of recent studies have also begun to examine two competing mechanisms to obtain a more comprehensive picture of how social media browsing influences well-being (e.g., Lin & Utz, 2015; Liu et al., 2016).

In line with these studies, the present study compares the relative strengths of two distinct, yet complementary routes – social comparison and emotional contagion – through which social media use influences people's subjective well-being. The present study focuses on these two mechanisms because of its particular interest in investigating how *passive* social media use affects well-being. Passive social media use refers to activities that do not involve direct exchanges with other users such as browsing others' posts and scrolling through the New Feed. Although passive social media use has received a great amount of scholarly attention recently, there is no consensus on the effects of passive use on individuals' well-being. Some studies provided empirical evidences in support for negative effects of passive

browsing (e.g., Krasnova et al., 2013; Verduyn et al., 2015), whereas other research supported the opposite (e.g., Liu et al., 2016). Thus, the current research focuses on mechanisms that would account for the effects of passive usage as it aims to solve the conflicting findings regarding the effects of passive browsing on well-being.

Two Mechanisms: Social Comparison and Emotional Contagion

Traditional Understandings of Social Comparison and Social Comparison on SNSs

Classic social comparison theory postulates that people are motivated to compare themselves with others in order to evaluate their opinions and abilities, especially when an objective, non-social basis for the evaluation is not available (Festinger, 1954). Initial works on social comparison have largely centered on the motives and directionality of comparison. Originally, Festinger (1954) posited that there is the unidirectional drive upward, which means that people tend to compare themselves with others who are slightly superior than themselves (namely, upward social comparison). However, the subsequent works such as Wills's (1981) study claimed that people fulfill the

desire for self-enhancement through comparison with a less fortunate other (namely, downward social comparison).

In social comparison literature, whether people engage in upward or downward social comparison is considered important as this accounts for the consequences of social comparison. Extant literature demonstrated that upward social comparison generally leads to unpleasant and negative consequences, whereas downward social comparison yields pleasant and beneficial outcomes. This was empirically supported by multiple studies. For instance, previous studies have demonstrated that upward social comparison leads people to evaluate themselves more negatively (e.g., Wheeler & Miyaka, 1992), and elicit negative emotions such as feelings of envy (e.g., Smith, Parrott, Ozer, & Moniz, 1994) and deprivation (e.g., Crosby, 1976). By contrast, it has been shown that when people engage in downward social comparison, they often feel self-enhancement (e.g., Wills, 1981) and positive emotions such as pride (e.g., Tesser, 1991).

Recently, a host of social media research has proposed that the decline in well-being may be in part attributable to engaging in *upward* social comparison while using social media (e.g., Krasnova et al., 2013; Tandoc et al., 2015; Verduyn et al., 2015). When considering the fact that SNSs are

fraught with strategically managed self-presentation that displays favorable traits (Gonzales & Hancock, 2011) which often appears in overly flattering ways (Verduyn et al., 2015), it seems natural to assume that social media provide a fertile ground for upward social comparison to transpire. Computer-mediated communication (CMC) researchers have claimed that the characteristics of CMC such as reduced cues and asynchronous communication provide message senders the opportunity for selective self-presentation and impression management (Walther, 1996). Furthermore, various filters and editing tools are available for users so that they can beautify and enrich their posts before uploading them (Lup et al., 2015). Just as exposure to television commercials that are idealized in respect to material possession, attractiveness, lifestyle, and standard of living often entails upward social comparison (Richins, 1992), exposure to the optimized self-presentation on SNSs would provoke upward social comparison.

Considering the fact that social comparison requires the presence of comparison target, it seems natural to assume that people would engage in social comparison more while they are passively browsing others' SNS posts than when they are actively uploading or commenting on SNSs. It should be noted, however, that studies which base their explanation solely on social comparison mechanism are not enough to give a balanced and thorough

explanation concerning how passive social media browsing affects well-being. That is, solely relying on social comparison perspective may neglect the effects of a more automatic, emotion-based process which simultaneously takes place while engaging in social comparison. For instance, one needs to also consider how objective features of SNS posts such as emotional valence and intensity would influence people's affect without their awareness. Therefore, to fully explicate the mechanisms underlying the association between social media browsing and well-being, especially affective well-being, the present study considers emotion-based as well as cognitively based mechanism and examine the relative effects of both routes.

Emotional Contagion in Face-to-face Interactions and CMC

Emotional contagion refers to "the tendency to mimic the verbal, physiological, and/or behavioural aspects of another person's emotional experience/expression, and thus to experience/express the same emotions oneself" (Hsee, Hatfield, Carlson, & Chemtob, 1990, p. 328). Put otherwise, emotional contagion is a process in which emotions experienced or expressed by an individual are transferred to another individual.

Scholars have proposed possible mechanisms through which emotional contagion occurs. One such mechanism is social comparison process. This line of research posits that emotions are transferred through a conscious, cognitively effortful process of social comparison. That is, people use others' emotion as a type of social information, which serves as a reference point for how they should be feeling (e.g., Schachter, 1959; Sullins, 1991). The other proposed mechanism is a more subconscious and automatic process, namely primitive emotional contagion (Hatfield, Cacioppo, & Rapson, 1993). According to this perspective, emotional contagion occurs through three stages: mimicry, feedback, and contagion. That is, people have a proclivity to automatically mimic and synchronize others' nonverbal cues such as facial expressions, vocal utterances, and postures, and thereby they receive physiological feedbacks. After receiving feedbacks, people become aware of and catch others' emotions. Although it seems that aforementioned mechanisms are two valid routes through which emotions are transferred from one individual to another, most evidence for emotional contagion has been accrued in support of primitive emotional contagion perspective (Barsade, 2002).

Regardless of whether or not emotional contagion occurs through an automatic or a more conscious process, it is important to note that emotional

contagion studies in face-to-face settings have underscored the importance of nonverbal cues emitted by others as a critical condition for emotional contagion to take place. For instance, as mentioned above, primitive emotional contagion perspective proposes the mimicry of others' nonverbal cues such as facial expressions, voice, movement as the first step of emotional contagion process (Hatfield, Rapson, & Le, 2009). However, accepting this argument, it becomes elusive if, and if so, how emotional contagion occurs in CMC contexts where nonverbal cues are largely stripped out. Considering the fact that CMC is devoid of nonverbal cues, it seems natural for early CMC scholars who adopted 'cues-filtered out' approach (Culnan & Markus, 1987) to claim that emotional communication and understanding is undermined in CMC compared to face-to-face settings.

It was only after the advent of social information processing (SIP) theory of CMC (Walther, 1992) that have communication scholars begun to view the lack of nonverbal cues as not merely an impediment in developing interpersonal impressions and affinity. This theory postulates that even if nonverbal cues are not available in CMC, people are still motivated to adapt their interpersonal communication to whatever social information such as language content and styles that remain available. A strong support for the theories of interpersonal adaptation to date implies that even if CMC is void

of nonverbal cues, people may still accomplish the similar level of communication and understanding that is expected in face-to-face interactions. By extension, it can be inferred that people may use social information available in CMC in communicating emotions, and thus the absence of nonverbal cues may not prevent people from communicating and understanding each other's emotions online. As such, some studies have demonstrated that verbal and situational information are indeed effective for emotional communication (e.g., Siemer & Reisenzein, 2007).

Considering how CMC literature developed to date, it is not altogether surprising that scholars have only recently begun to direct their attention at testing if emotional contagion occurs in CMC contexts. The recent studies have demonstrated that not only the detection of emotion (Hancock, Landrigan, & Silver, 2007), but also transference of emotion occurs in text-based CMC, both at dyadic (Hancock, Gee, Ciaccio, & Lin, 2008) and at group levels (Guillory et al., 2011). A study conducted by Hancock et al. (2008) was first to demonstrate emotional contagion in text-based communication. In this study, a partner talking to a negative emotion experiencer (confederate) via instant messaging exhibited more negative affect, sadness, compared to those in neutral condition. Furthermore, conducting a massive experiment on Facebook, Kramer et al. (2013)

demonstrated that exposure to emotional expression in News Feed is sufficient for emotional contagion to take place despite the absence of direct social interactions and nonverbal cues.

Given that emotions expressed by others on SNSs have been found to affect the viewers' emotions (Kramer et al., 2013), it seems reasonable to consider emotional contagion along with social comparison as possible mechanisms through which social media browsing influences individuals' affect. While browsing others' posts on SNS, both social comparison and emotional contagion may be simultaneously in operation, and subsequently affect how social media users feel. Specifically, when exposed to others' SNS posts, the viewer may use others' lifestyle depicted on SNS posts as a reference for comparison, and will experience concomitant emotions after engaging in either upward or downward social comparison. Along with this cognitively based process of social comparison, it can be predicted that a more automatic and unconscious process of emotional contagion would also take place while browsing through others' posts. Without much awareness, the valence of the emotion being displayed on SNS posts may be directly transferred to the viewer. As such, the relative strengths of these two mechanisms should be compared in order to fully understand how and why individuals experience certain emotions after browsing social media.

Considering these two valid routes through which exposure to SNS posts influences the viewer's affect, a handful of recent studies (e.g., de Vries, et al., 2018; Lin & Utz, 2015; Liu et al., 2016) that compared social comparison and emotional contagion in SNS contexts are noteworthy. Not only these studies corroborated that emotions are contagious on social media, but also did they mostly support emotional contagion perspective. At first glance, it seems that these empirical evidences directly refute the recent findings that show how engaging in social comparison on SNSs would be detrimental to individuals' well-being. However, a closer examination of previous works reveals that the approach taken by these studies may have failed to accurately capture or even underestimated the effects of social comparison process. In comparing two mechanisms, most of these studies presumed that the valence of posts serves as an indicator of social comparison direction, and thus employed a single scale of information valence in assessing social comparison as well as emotional contagion process. For instance, Liu et al. (2016) assumed that if participants exposed to positive SNS posts exhibit more negative affect than those who are exposed to negative posts, it could be argued that social comparison mechanism operates. By contrast, if they display more positive affect, it could be claimed that emotional contagion takes place. However, when considering that the comparison direction is

contingent upon the perceived superiority and inferiority of the comparison target compared to the self, the valence of posts may not be a determinant of comparison direction. This suggests that the recent findings that appear to lend support for emotional contagion may turn out differently if a more direct measurement of comparison direction is employed to assess social comparison process.

Differing from previous works, the present study employs two disparate scales – a scale of information valence and a scale of comparison directionality – in an attempt to overcome the aforementioned limitation. This novel approach enables us to empirically test if information valence and comparison directionality are equivalent or not. If they are different from one another, we can also test which mechanism better accounts for the effects of social media browsing on people's affect. Although two mechanisms take place simultaneously, the impact of one mechanism may outweigh that of the other. In light of this proposition, two hypotheses are proposed in a different way compared to previous studies. In addition, as emotional contagion only accounts for emotional outcomes, the following hypotheses are proposed only with regard to a state-level measure of happiness (i.e., positive and negative affect).

Hypothesis 1a: When exposed to Instagram posts featuring upward social comparison information, participants will exhibit (a) less positive affect and (b) more negative affect than when exposed to Instagram posts featuring downward social comparison information regardless of whether posts feature positive or negative information (social comparison mechanism).

Hypothesis 1b: Participants will exhibit (a) more positive affect and (b) less negative affect when exposed to positive Instagram posts than when exposed to negative posts regardless of whether posts feature upward or downward social information (emotional contagion mechanism).

With regard to life satisfaction, the current study only investigates if social comparison mechanism operates. Building on the aforementioned studies regarding the effects of social comparison on self-evaluation (e.g., Wheeler & Miyaka, 1992; Wills, 1981), it can be predicted that those who engage in upward social comparison will evaluate their lives more negatively compared to those who engage in downward social comparison. Although a trait-level of happiness (i.e., life satisfaction) may be less responsive to experimental manipulations compared to a state-level of happiness, it is still possible to assess life satisfaction in experimental setting. Recent studies have

acknowledged that life satisfaction can be formed at the moment, and is subject to "the memories and life domains which are salient at the time, as well as by what comparison standards are particularly prominent" (Diener, 2009, p.48). This led us to propose the following hypothesis:

> *Hypothesis 2*: When exposed to Instagram posts featuring upward social comparison information, participants will exhibit more negative life satisfaction than when exposed to Instagram posts featuring downward social comparison information.

Furthermore, scholars who adopt the 'mood as information' perspective have claimed that affective states function as a source of information which people base their judgements on (Schwarz, 2012). People may simply attend to their momentary feelings in forming judgments because a thorough memory search is so difficult and time-consuming (Diener, 2009). Adopting this perspective, one can expect that affect would mediate the effects of certain condition on life satisfaction. Put otherwise, people would evaluate their lives more positively when a more pleasant rather than unpleasant mood is induced. Albeit conducted in a different context, a number of experimental studies have documented this process. In Schwarz and Clore's (1983) study, the effect of salient life-events on judgements of happiness and satisfaction

was mediated by participants' affective states at the time of judgement. Furthermore, Aknin et al. (2012) demonstrated that participants who reflected on a past prosocial spending experience exhibited more positive affect, which, in turn, led them to evaluate their lives in general in a more positive way. Adopting this logic, the present research predicts that there will be an indirect effect of exposure to SNS posts on trait levels of happiness via state levels of happiness. Put differently, after being exposed to social comparison information or emotion-laden posts on Instagram, people might experience changes in their moods, which, in turn, leads to changes in the evaluation of their lives in general.

Hypothesis 3: Affect will mediate the effects of social comparison direction on participants' life satisfaction.

Hypothesis 4: Affect will mediate the effects of information valence on participants' life satisfaction.

The Moderating Role of Psychological Closeness

Social Comparison and the Role of Psychological Closeness

As noted earlier, past research has shown that upward social comparison generally leads to negative outcomes such as experiencing negative emotions and self-evaluation, whereas downward social comparison yields the opposite results. However, subsequent research claimed that whether an individual's judgements, feelings, and behaviors are displaced *toward* the comparison target (namely, assimilation) or displaced *away* from the comparison target (namely, contrast) determines the consequences of social comparison (Mussweiler, 2007). Thus, when considering both comparison direction and assimilation and contrast effects, predicting how people would feel and evaluate themselves after social comparison appears to be somewhat complicated. Previous studies have shown that upward assimilation and downward contrast increase self-evaluation/affect whereas upward contrast and downward assimilation lower self-evaluation/affect (Buunk & Gibbons, 2007). More specifically, in terms of affective consequences, Smith (2000) claimed that upward assimilation and downward contrast entail pleasant feelings such as inspiration and schadenfreude, whereas upward contrast and downward assimilation elicit unpleasant feelings such as sympathy and envy.

According to the selective accessibility model (Mussweiler et al., 2004), assimilation and contrast effects are the result of a hypothesis-testing process during social comparison, which selectively renders accessible information or knowledge indicating that the self's standing is either similar to or different from that of the comparison target. Specifically, if similar attributes or experiences become accessible, people are more likely to be assimilated towards the target, whereas if dissimilar ones are available, they may be displaced away from the target. In the context of the current study, it can be inferred that when people compare themselves to others on SNSs, information indicating either similarity or dissimilarity with the comparison target will be selectively activated, and thus they would evaluate themselves and experience certain emotions accordingly.

However, the degree to which people are assimilated towards or displaced away from the target varies depending on the relationship between the self and comparison target. For instance, whether or not two individuals are psychologically close, share common attributes or experience the salience of collectiveness could affect the extent to which assimilation and contrast effects take place (Suls, Martin, & Wheeler, 2002). For instance, when individuals engage in social comparison with a psychologically close other, shared attributes or experiences become highly accessible which lead to

assimilation. Conversely, comparing oneself with those who are psychologically distant would lead to contrast. When considering the fact that SNS is an arena where people initiate and maintain a wide array of relationships that serves as various comparison targets, it would no doubt be beneficial to examine the moderating role of relationships in assimilation and contrast effects, especially in social media contexts.

The present study defines various relationships on SNSs in terms of the extent to which the viewer feels psychological closeness towards the poster. Despite the wealth of social media research surrounding tie strengths in general, studies that examine the role of psychological closeness in social comparison on SNSs are only recently conducted (e.g., Lin & Utz, 2015; Liu et al., 2016). However, they mostly focused on examining close friends and acquaintances, ruling out strangers. This may be in part attributable to the SNS platform used for their studies, Facebook, as Facebook generally consists of known contacts (Manago, Taylor, & Greenfield, 2012), and thus scholars may have overlooked the importance of strangers as a comparison target. However, considering the fact that interacting with strangers by adding those whom they do now know personally or they simply find cool as SNS friends (Utz, 2009) is common practice on SNSs, strangers should be examined as an important comparison target alongside close friends and

acquaintances. In fact, a handful of recent studies provided empirical support concerning how strangers may influence SNS users in a different way compared to other existing relationships (e.g., Chou & Edge, 2012; Lup et al., 2015). For instance, in a study conducted by Chou and Edge (2012), those who included more strangers as their Facebook friends were more likely to believe that others are having happier and better lives and perceived that life is unfair. Although Chou and Edge (2012) did not interpret this result in light of assimilation and contrast effects, when considering that strangers are psychologically distant comparison targets, it can be inferred that contrast effects may have resulted in negative life satisfaction after upward social comparison. Keeping this in mind, the current research aims to extend this line of research by exploring how comparing oneself with close friends, acquaintances, and strangers influences a viewer's affect and life satisfaction.

Building on extant literature on assimilation and contrast effects, it seems reasonable to predict that if Instagram posts uploaded by close friends are perceived as upward social comparison information, users will experience more positive emotions and evaluate their lives more positively compared to when those posts are from acquaintance because shared experiences and attributes should be more highly accessible. Similarly, when people are exposed to upward social comparison information from strangers, they will

experience less positive or even negative life satisfaction and affect compared to when it is from acquaintance. This prediction is also in part consistent with what self-evaluation maintenance (SEM) model (Tesser, 1988) predicts. Tesser (1988) claimed that close friends' outstanding performance makes individuals "bask in the glory" of the friend which augments their self-evaluation, which accords with the prediction drawn from assimilation and contrast effects literature. However, Tesser (1988) argues that this prediction is only valid when comparison attribute is perceived to be low in relevance to the self. If perceived self-relevance is high, he argues that a close other's outstanding performance threatens one's self-evaluation (Tesser, 1988; Tesser, Millar, & Moore, 1988). Taken together, it can be inferred that in terms of upward social comparison, close friends may be a double-edged sword to individuals' self-evaluation and affect.

Along with these predictions, the present study proposes that drawing a prediction concerning the effects of strangers on SNSs may be far from straightforward. Although "stranger on the train phenomenon" (Rubin, 1975) does not dovetail perfectly as an explanation, it may give us insights into how people may show deviations when they interact with strangers. According to this phenomenon, people share intimate disclosures with complete strangers as they do with a trusted companion when no further interaction is expected

(Bazarova & Choi, 2014). Likewise, if people merely regard strangers on SNSs as temporary communication partners with whom no further interaction is expected, the aforementioned contrast effects may rarely take place and thus have a negligible influence on people's affect and life satisfaction. Therefore, with lack of consistency in previous research to draw specific hypotheses from, the following research question is proposed in this study.

> *Research Question 1*: How will the psychological closeness between the viewer and poster influence the effects of social comparison direction on participants (viewers)' subjective well-being?

Emotional Contagion and the Role of Psychological Closeness

As mentioned earlier, recent studies have noted and reaffirmed that emotion is indeed contagious in CMC contexts (e.g., Guillory et al., 2011; Hancock et al., 2008; Kramer et al, 2013). However, it still remains elusive what factors amplify or attenuate emotional contagion as well as how emotions are transferred from one to another online. This is understandable when considering the fact that emotional contagion in CMC has been investigated only recently. More broadly, this may be attributable in part to the paucity of research on emotion-based processes in media effects research,

especially in CMC literature. At the same time, however, this implies that aforementioned questions await the attention of communication scholars.

In exploring what conditions magnify or buffer emotional contagion on SNSs, the extensive research on emotional contagion in face-to-face interactions may offer a hint. Although mimicry, a prerequisite for emotional contagion to occur, has frequently been described as a purely automatic and reflex-like process, recent studies found that the extent to which mimicry occurs is in part dependent on various social contexts such as the relationship between expresser and observer (e.g., Bourgeois & Hess, 2008) and affiliation goal (e.g., Lakin & Chartrand, 2003). While examining all of these moderators on SNSs would no doubt be beneficial in understanding emotional contagion process more thoroughly, at this point, the present study focuses on the relationship as a potential moderator of the social media browsing effect on affective well-being. This is due to the fact that social media is, by its nature, relational, and thus relationships that are formed and maintained among users become the primary social context in which users are embedded.

Previous studies that examined the relationship between expresser and observer of emotions as a moderator of mimicry found that people are more likely to mimic others' nonverbal cues when the expresser of emotions are

perceived as psychologically closer (e.g., Bourgeois & Hess, 2008; McIntosh, 2006). For example, across two studies, McIntosh (2006) demonstrated that people mimic the facial expressions of likeable confederates and friends more than those of unlikable confederates and strangers. Given that mimicry causes emotional contagion, it can be predicted that emotion will be more contagious when the observer feels close to the expresser of emotions. This prediction is also in line with studies on empathy (e.g., Beeney et al., 2011; Preston & Waal, 2002) that show how familiarity and similarity facilitates empathy. As emotional contagion is one of the emotional behaviors that are included under the broad concept of empathy (Preston & Waal, 2002), these findings also suggest that emotional contagion will be more pronounced between individuals who share a greater psychological closeness than those who are psychologically distant.

Comparable studies in CMC contexts are relatively scarce, yet it appears that the results of these studies are consistent with those in face-to-face settings (e.g., Lin & Utz, 2015; Liu et al., 2016). For instance, in a study conducted by Liu et al. (2016), participants exhibited more positive emotions when they browsed through positive posts from their close friends, whereas they displayed more negative emotions when they were exposed to negative posts from their close others. Conversely, reading the posts from distant

friends did not influence participants' emotions. While these studies are meaningful as they have begun to scratch the surface of how psychological closeness moderates the effects of social media browsing on well-being, the way they simply divided the relationship into close friends (i.e., strong ties) and distant friends (i.e., weak ties) may not be sufficient to capture the effects of multifaceted layers of online relationships.

The present study aims to advance this line of research by incorporating strangers as important relationships alongside close friends and acquaintances. Building on extant literature on emotional contagion in both online and offline settings, it can be predicted that the psychological proximity between poster and viewer would positively moderate the effects of exposure to emotion-laden Instagram posts on individuals' affect. Specifically, emotions expressed in close others' posts may be transferred to viewers in a more pronounced way, such that individuals who are exposed to positive [negative] posts from close others will experience more positive [negative] affect compared to when those posts are from acquaintances. In a similar vein, individuals who browse through positive [negative] posts from acquaintances will feel higher levels of positive [negative] affect than when those posts are from strangers.

Hypothesis 5: The effects of information valence on affect *(H1b)* will be more pronounced among those who perceive the poster as psychologically closer, rather than psychologically distant.

Research Questions and Hypotheses

The present study proposes that the effects of exposure to Instagram posts may differ depending on the relative strengths of two distinct mechanisms. Considering both social comparison and emotional contagion perspectives, the following two hypotheses are drawn.

H1a: When exposed to Instagram posts featuring upward social comparison information, participants will exhibit (a) less positive affect and (b) more negative affect than when exposed to Instagram posts featuring downward social comparison information regardless of whether posts feature positive or negative information (social comparison mechanism).

H1b: Participants will exhibit (a) more positive affect and (b) less negative affect when exposed to positive Instagram posts than when exposed to negative posts regardless of whether posts feature upward or downward social information (emotional contagion mechanism).

H2: When exposed to Instagram posts featuring upward social comparison information, participants will exhibit more negative life satisfaction than when exposed to Instagram posts featuring downward social comparison information.

H3: Affect will mediate the effects of social comparison direction on participants' life satisfaction.

H4: Affect will mediate the effects of information valence on participants' life satisfaction.

Furthermore, based on the previous literature on social comparison and emotional contagion, this study suggests that the effects of social comparison and information valence might differ depending on the relationship between the poster and viewer. Strangers are included as an important comparison target along with close friends and acquaintances. The following research question and hypothesis are proposed in this study.

RQ1: How will the psychological closeness between the viewer and poster influence the effects of social comparison direction on the participants (viewers)'s subjective well-being (affect and life satisfaction)?

H5: The effects of information valence on affect *(H1b)* will be more pronounced among those who perceive the poster as psychologically closer, rather than psychologically distant.

The current research presents two studies with complementary methodologies to examine if, and if so, how passive social media browsing affects individuals' affect and life satisfaction. Specifically, the relative strength of two mechanisms were compared across two studies, yet the moderating role of psychological closeness was examined only in Study 1. Study 1 was conducted in a laboratory setting, whereas Study 2 involved a more naturalistic, daily diary method. Across both studies, participants were asked to report their experience of browsing others' posts on Instagram. Among the variants of SNSs, Instagram was chosen for the current research as its exclusively image-driven nature can very powerfully and promptly provoke immediate social comparison (Winter, 2013) and its public nature (e.g., profiles and updates are often made public) makes strangers a readily accessible communication partner.

Study1: Quasi-experiment

Study 1 sought to test the proposed hypotheses and research question in a laboratory setting. As noted earlier, the present study employed two disparate scales – a scale of information valence and a scale of comparison directionality – in order to compare two mechanisms. Thus, two sets of data, one for social comparison and the other for emotional contagion perspective, were analyzed and compared. Social comparison direction and information valence were measured (self-reported) as this study asked participants to browse through posts from their own Instagram account, whereas psychological closeness was manipulated.

Method

Participants

A total of 133 students from Seoul National University participated in this study (38 men, 95 women; age $M = 23.62$, $SD = 3.23$, range = 19-37). In terms of gender, there were more female participants (71.4 %) than male

participants (28.6%). These demographics closely reflect the actual Instagram demographics where roughly 90% of the Instagram users are under the age of 35 and 68% of them are female (Smith, 2014). To ensure familiarity with the medium, only current Instagram users were allowed to participate. Participants received a coffee gifticon (mobile voucher) equivalent to KRW 5,000 as a compensation for their participation.

Procedure

The quasi-experiment was conducted in a lab located on the campus of Seoul National University. Upon arrival, participants were informed that they are participating in a study on the effects of Instagram usage on well-being. In actuality, the study was designed to compare two mechanisms and the moderating role of psychological closeness. Participants were asked to complete a pre-experiment questionnaire which included the baseline level of happiness on both a state and trait measure, individual difference variable (i.e., self-esteem), Instagram usage, and demographic information.

Afterwards, each participant was randomly assigned to one of three experimental conditions by logging onto Instagram and selecting either a close friend, acquaintance, or stranger with same gender and similar age. The

condition of similarity in terms of gender and age was added in order to render social comparison possible. Particularly, those who were in a stranger condition were allowed to select a stranger from his or her own following/follower list or any stranger appearing on a 'Search & Explore' tab. Based on a complex algorithm, 'Search & Explore' tab allows users to find and look through contents from other users that they wouldn't otherwise see on their own feed (Mccracken, 2015). Participants were instructed to choose Instagram account having more than 10 posts so that they can thoroughly browse through the posts. Furthermore, participants were asked to choose an account with posts featuring one's lifestyle in general, and also exclude unrelated accounts such as sponsored and celebrities' account. After a target's account being chosen, participants answered questions regarding general information about a chosen target. Additionally, for manipulation check purposes, psychological closeness between the participant and the chosen target was measured.

Next, participants were asked to browse the most recent 10 posts from the chosen person's account as they would normally do. In this study, a post is operationalized as a variety of cues that appear on the screen when participants click one of the photos listed on the target's account. These cues encompass a photo, text descriptions about the photo, and other information

(e.g., the number of likes) which are juxtaposed simultaneously within the page. It should be noted that the purpose of this study is not to examine the effects of disparate cues. Rather, how participants interpret the post as upward or downward social comparison information and positive or negative information based on the overall content is the focus of the current study. While browsing 10 posts, participants were asked to rate each post in terms of information valence and social comparison direction.

Right after browsing the posts, the experimenter returned to the lab and instructed the participants to fill out the postexperiment questionnaire. This questionnaire included measures such as affect and life satisfaction. Upon completion, participants were thanked and debriefed.

Measures

The descriptive statistics and intercorrelation among key measures are summarized in Table 1 and Table 2.

Table 1. *Descriptive Statistics: Study 1*

	M	SD	α
Comparison direction	4.56	0.60	-
Information valence	5.43	0.67	-
Positive affect	4.33	0.97	.91
Negative affect	2.32	0.99	.83
Envy	4.16	1.55	-
Life Satisfaction	5.19	1.21	-

Notes: Displayed scales range from 1 to 7.

Table 2. *Intercorrelations among Key Variables: Study 1*

	1	2	3	4	5	6	7
1. Information valence							
2. Comparison direction	.31**						
3. Close friends	.01	.07					
4. Strangers	-.00	-.16	-.51**				
5. Positive affect	.22*	-.10	.13	.15			
6. Negative affect	-.24**	.06	.04	-.17	-.50**		
7. Envy	.02	.50**	.01	-.10	-.07	.16	
8. Life satisfaction	.14	-.36**	-.10	.27**	.44**	-.43**	-.31**

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

Instagram usage

Questions concerning general usage were asked in order to understand how participants use Instagram in their daily lives. Participants were asked the following questions such as “How long do you spend on Instagram per day?” (M = 4.33, SD = .97; range = 1-6: 1, less than 10 minutes; 2, 10-30 minutes; 3, 30-60 minutes; 4, 1-2 hours; 5, 2-3 hours; 6, more than 3 hours) and “How many times do you log onto Instagram per day?” (M = 4.80, SD = 4.80; range = .14-20)

Information type

While browsing 10 posts, participants rated the extent to which each post is positive or negative (information valence; from -3 to +3), and the degree to which they think each post features lifestyle that is better or worse compared to his or her lifestyle (the direction of social comparison information; from -3 to +3), respectively. After appropriate recoding, the average of 10 information valence scores (M = 5.43, SD = .67) and 10 social comparison direction scores (M = 4.55, SD = .60) were calculated separately in order to construct information valence scale and social comparison direction scale.

Psychological closeness

For manipulation check purposes, psychological closeness was assessed using a single item evaluating the degree to which participants agreed with the following statement: "I feel close to this person." This item was measured on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*; M = 3.83, SD = 2.29).

Affect

The Scale of Positive and Negative Experience (SPANE; Diener et al., 2010) was used to measure positive affect and negative affect. This study did not use the most popular current scale of emotions, the PANAS (Watson et al., 1988) because the items reflect high arousal feelings, and many of them are not considered emotions or feelings (e.g., active, strong) (Diener et al., 2010). The SPANE scale is composed of 12 affective words: 6 words for positive affect (PA; positive, good, pleasant, happy, joyful, contented) and the other 6 words for negative affect (NA; negative, bad, unpleasant, sad, afraid, angry). In addition to 6 NA words, we added the key word *envy* to capture the negative feelings aroused via social comparison. Envy is defined as "an unpleasant and often painful blend of feelings characterized by inferiority,

hostility, and resentment caused by a comparison with a person or group of persons who possess something we desire" (Smith & Kim, 2007, p.49) and thus previous studies have included envy when measuring the effects of social comparison indirectly (e.g., Krasnova et al., 2013; Tandoc et al., 2015). The SPANE scale was originally developed to measure trait-level affect, asking people to report the frequency of various feelings over the past 4 weeks. It was adapted to measure state-level affect, asking participants to indicate the degree of their current feelings right after browsing the posts on a 7-point scale (1 = *not at all*, 7 = *extremely*). An exploratory factor analysis yielded an unpredicted three-factor solution, each representing PA, NA and envy, respectively (see Table 3). Average of 6 PA words (α = .91, M = 4.33, SD = .97) and 6 NA words (α = .83, M = 2.32, SD = .99) were calculated separately in order to construct PA and NA measure, and envy index (M = 4.16, SD = 1.55) was used as an additional dependent variable in the data analysis.

Life satisfaction

Life satisfaction was measured with a single item that directly inquired, "In general, how satisfied are you with your life?" on a 7-point scale (1 = *very satisfied*, 7 = *very dissatisfied*; M = 5.19, SD = 1.21). Although such single-

item measures are normally not desirable in instrument, recent studies have shown that this single-item measure performed extremely similar to the multi-item Satisfaction With Life Scale (SWLS; Diener et al., 1985), an established and widely used measure of life satisfaction (Cheung & Lucas, 2014; Lucas & Donnellan, 2012).

Table 3. *Factor Analysis of Affect Items: Study 1*

		Factor 1 Positive Affect	Factor 2 Negative Affect	Factor3 Envy
1.	Positive	.85		
2.	Happy	.85		
3.	Joyful	.84		
4.	Good	.83		
5.	Pleasant	.79		
6.	Contented	.78		
7.	Negative		.55	
8.	Angry		.74	
9.	Sad		.73	
10.	Afraid		.72	
11.	Bad		.67	
12.	Unpleasant		.66	
13.	Envy			.96
	% of Variance Accounted For	37.26	22.26	8.73
	Eigenvalue	4.84	2.89	1.14

Note. Varimax rotation

Control variables

This study controlled for an individual difference variable (i.e., self-esteem), baseline level of happiness, and demographic variables (i.e., gender, age). First, self-esteem was assessed using he Rosenberg Self-Esteem Scale (Rosenberg, 1965). This scale consists of 10 statements, such as "I feel I do not have much to be proud of," (reversed) "I feel that I'm a person of worth" and "I take a positive attitude toward myself." Participants were asked to indicate their level of agreement with each statements on a 5-point Likert scale. After appropriate recoding, scores were averaged (α = .83, M = 3.74, SD = .49). The baseline level of happiness was measured on both a state ("I am happy right now"; 1 = *not at all*, 5 = *extremely*) and trait measure ("In general, I consider myself a happy person"; 1 = *not at all*, 5 = *extremely*) (Lyubomirsky & Lepper, 1999). Scores on these two items were highly correlated, r (131) = .77, p < .001, so participants' responses to these items were standardized and averaged as our baseline measure of happiness.

Results

Manipulation Check

To verify that the manipulation of psychological closeness was successful, a series of independent samples t-test were conducted. As expected, close friends (M = 6.27, SD = .79) were rated significantly higher than acquaintances (M = 3.53, SD = 1.45), $t(63.32) = 10.97$, $p < 001$. Participants also felt significantly stronger psychological closeness in the acquaintance condition (M = 3.53, SD = 1.45) compared to the stranger condition (M = 1.36, SD = .82), $t(66.65) = 8.53$, $p < 001$.

Hypotheses Testing

A series of hierarchical regression analyses were performed to compare the effects of social comparison direction (*H1a*) and emotional contagion (*H1b*) on participants' affective well-being, and also to examine the moderating role of psychological closeness (*RQ1, H5*). Before conducting hierarchical regression analyses, this study explored if the social comparison direction scale and information valence scale can be justified to be treated as two disparate scales. Results of Pearson's correlation indicated that there was a

significant, positive correlation between the two variables, yet the coefficient was small, $r(131) = .31$, $p < .001$. As they showed a weak correlation, this study decided to treat two scales separately (i.e., the information valence scale cannot be employed to test the social comparison mechanism), which differs from previous studies (e.g., Liu et al., 2016) that operationalized social comparison direction as the valence of information. Therefore, two separate series of hierarchical analyses (i.e., one using the social comparison direction scale as an independent variable, and the other employing the information valence scale as an independent variable) were conducted, and then the results were compared to examine whether the impact of one mechanism outweighs that of the other.

First, with regard to social comparison mechanism, hierarchical linear regression analyses were conducted separately on positive affect, negative affect, and envy. Age, gender, daily Instagram use (time, login), baseline happiness, and self-esteem were entered as covariates on Step 1. The social comparison direction variable was entered on Step 2. The dummy codes for psychological closeness (acquaintances as the reference category) were entered on Step 3, and the interactions between social comparison direction and psychological closeness were entered on Step 4. Variables were centered before creating the interaction terms. The results are shown in Table 4, 5, and

8. In each table, we present the amount of variance that was accounted for by each predictor as it was added to the model, as well as the total amount of variance predicted at each step. Second, regarding emotional contagion mechanism, hierarchical linear regression analyses were also performed separately on each of the three affect measures. In lieu of the social comparison direction variable, the information valence variable was entered on Step 2. The results are shown in Table 6, 7 and 9.

The main effects of social comparison direction on both positive affect and negative affect were not significant, β = .07, t = .88, p > .05 and β = -.08, t = -.97, p > .05, respectively (see Table 4 and 5, both Model 2). Thus, *H1a* was rejected. On the contrary, the information valence was found to have a significant main effect on the participant's positive affect, β = .18, t = 2.30, p < .05, and negative affect, β = -.18, t = -2.11, p < .05, supporting *H1b* (emotional contagion perspective; see Table 6 and 7, both Model 2). That is, participants exhibited more positive affect and less negative affect when exposed to positive Instagram posts than when exposed to negative posts regardless of whether posts feature upward or downward social comparison information. The inclusion of information valence variable on Step 2 significantly increased the variance explained by the model when it comes to positive affect and negative affect.

Table 4. *Testing the Effects of Comparison Direction and Psychological Closeness on Positive Affect: Study 1*

Predictors	Model1	Model2	Model3	Model4
Step1: Covariates				
Age	-.05	-.51	-.06	-.08
Gender (female=0, male=1)	.04	.05	.03	.02
Daily Instagram use (time)	-.01	-.01	-.02	-.01
Daily Instagram use (login)	-.07	-.08	-.07	-.08
Happiness (Baseline)	.48***	.50***	.52***	.53***
Self-esteem	-.01	.00	-.04	-.06
Incremental R^2 (%)	23.3***			
Step2: Comparison direction				
Comparison direction		.07	.08	.13
Incremental R^2 (%)		.50		
Step3: Psychological closeness				
Close friend			.31**	.31**
Stranger			.21*	.20*
Incremental R^2 (%)			7.1**	
Step4: Interaction terms				
Comparison × Close friend				.04
Comparison × Stranger				-.14
Incremental R^2 (%)				1.7
Total R^2 (%)	23.3***	23.8***	30.8***	32.5***
N	133	133	133	133

Notes: *p < .05; **p < .01; ***p < .001. Displayed values are standardized regression coefficients and explained variances.

Table 5. *Testing the Effects of Comparison Direction and Psychological Closeness on Negative Affect: Study 1*

Predictors	Model1	Model2	Model3	Model4
Step1: Covariates				
Age	.08	.08	.09	.09
Gender (female=0, male=1)	-.06	-.07	-.07	-.06
Daily Instagram use (time)	-.07	-.07	-.07	-.08
Daily Instagram use (login)	-.04	-.02	-.02	-.02
Happiness (Baseline)	-.35**	-.36**	-.36**	-.36**
Self-esteem	-.07	-.09	-.08	-.07
Incremental R^2 (%)	18.2***			
Step2: Comparison direction				
Comparison direction		-.08	-.09	.05
Incremental R^2 (%)		.60		
Step3: Psychological closeness				
Close friend			-.08	-.07
Stranger			-.11	-.10
Incremental R^2 (%)			0.9	
Step4: Interaction terms				
Comparison × Close friend				-.17
Comparison × Stranger				-.06
Incremental R^2 (%)				1.3
Total R^2 (%)	18.2***	18.9***	19.7**	21.0**
N	133	133	133	133

Notes: *p < .05; **p < .01; ***p < .001. Displayed values are standardized regression coefficients and explained variances.

Table 6. *Testing the Effects of Information Valence and Psychological Closeness on Positive Affect: Study 1*

Predictors	Model1	Model2	Model3	Model4
Step1: Covariates				
Age	-.05	-.04	-.05	-.05
Gender (female=0, male=1)	.04	.07	.05	.05
Daily Instagram use (time)	-.01	-.03	-.04	-.03
Daily Instagram use (login)	-.07	-.10	-.08	-.07
Happiness (Baseline)	.48***	.48***	.50***	.50***
Self-esteem	-.01	-.04	-.08	-.07
Incremental R^2 (%)	23.3***			
Step2: Information valence				
Information valence		.18*	.18*	.08
Incremental R^2 (%)		3.1*		
Step3: Psychological closeness				
Close friend			.30**	.30**
Stranger			.22*	.21*
Incremental R^2 (%)			0.7*	
Step4: Interaction terms				
Valence × Close friend				.12.
Valence × Stranger				.05
Incremental R^2 (%)				.07
Total R^2 (%)	23.3***	26.4***	33.4***	34.1***
N	133	133	133	133

Notes: *p < .05; **p < .01; ***p < .001. Displayed values are standardized regression coefficients and explained variances.

Table 7. *Testing the Effects of Information Valence and Psychological Closeness on Negative Affect: Study 1*

Predictors	Model1	Model2	Model3	Model4
Step1: Covariates				
Age	.08	.07	.08	.08
Gender (female=0, male=1)	-.06	-.08	-.08	-.08
Daily Instagram use (time)	-.07	-.05	-.05	-.06
Daily Instagram use (login)	-.04	-.01	-.01	-.01
Happiness (Baseline)	-.35**	-.35**	-.34**	-.34**
Self-esteem	-.07	-.05	-.03	-.03
Incremental R^2 (%)	18.2***			
Step2: Information valence				
Information valence		-.18*	-.18*	-.20
Incremental R^2 (%)		2.8*		
Step3: Psychological closeness				
Close friend			-.08*	-.08
Stranger			-.11	-.11
Incremental R^2 (%)			.90	
Step4: Interaction terms				
Valence × Close friend				-.02
Valence × Stranger				.05
Incremental R^2 (%)				.20
Total R^2 (%)	18.2***	21.1***	22.0***	22.2**
N	133	133	133	133

Notes: *p < .05; **p < .01; ***p < .001. Displayed values are standardized regression coefficients and explained variances.

Additionally, this study examined the effects of social comparison direction and information valence on participant's envious feelings as envy loaded onto a separate factor. The analysis revealed that the exposure to upward social comparison information evoked more envious feeling, $\beta = .46$, $t = 5.54$, $p < .001$ (see Table 8, Model 2). The inclusion of social comparison direction variable on Step 2 significantly increased the variance explained by the model. On the contrary, the information valence did not affect the extent to which participants' experienced envious feeling, $\beta = .05$, $t = .55$, $p > .05$ (see Table 9, Model 2).

Along with state-level happiness, this study also examined how exposure to social comparison information directly influences participant's trait-level happiness (*H2*). The results revealed that the effect of social comparison direction on life satisfaction was marginally significant $\beta = -.12$, $t = -1.2$, $p = .06$ (see Table 10, Model 2).

Table 8. *Testing the Effects of Comparison Direction and Psychological Closeness on Envy: Study 1*

Predictors	Model1	Model2	Model3	Model4
Step1: Covariates				
Age	.06	.05	.05	.04
Gender (female=0, male=1)	-.13	-.08	-.07	-.08
Daily Instagram use (time)	.02	.04	.04	.05
Daily Instagram use (login)	.03	-.03	-.03	-.04
Happiness (Baseline)	-.11	-.02	-.02	-.02
Self-esteem	-.18	-.09	-.09	-.10
Incremental R^2 (%)	8.7			
Step2: Comparison direction				
Comparison direction		.46***	.46***	.56***
Incremental R^2 (%)		18.0***		
Step3: Psychological closeness				
Close friend			-.03	-.02
Stranger			-.02	-.02
Incremental R^2 (%)			.10	
Step4: Interaction terms				
Comparison × Close friend				-.03
Comparison × Stranger				-.14
Incremental R^2 (%)				1.0
Total R^2 (%)	8.7	26.7***	26.7***	27.7***
N	133	133	133	133

Notes: *p < .05; **p < .01; ***p < .001. Displayed values are standardized regression coefficients and explained variances.

Table 9. *Testing the Effects of Information Valence and Psychological Closeness on Envy: Study 1*

Predictors	Model1	Model2	Model3	Model4
Step1: Covariates				
Age	.06	.07	.07	.07
Gender (female=0, male=1)	-.13	-.12	-.12	-.12
Daily Instagram use (time)	.02	.01	.01	.02
Daily Instagram use (login)	.03	.03	.04	.05
Happiness (Baseline)	-.11	-.11	-.10	-.10
Self-esteem	-.18	-.19	-.18	-.18
Incremental R^2 (%)	8.7			
Step2: Information valence				
Information valence		.05	.05	-.03
Incremental R^2 (%)		.20		
Step3: Psychological closeness				
Close friend			-.03	-.03
Stranger			-.06	-.06
Incremental R^2 (%)			.20	
Step4: Interaction terms				
Valence × Close friend				.10
Valence × Stranger				.03
Incremental R^2 (%)				.60
Total R^2 (%)	8.7	8.9	9.1	9.6
N	133	133	133	133

Notes: *p < .05; **p < .01; ***p < .001. Displayed values are standardized regression coefficients and explained variances.

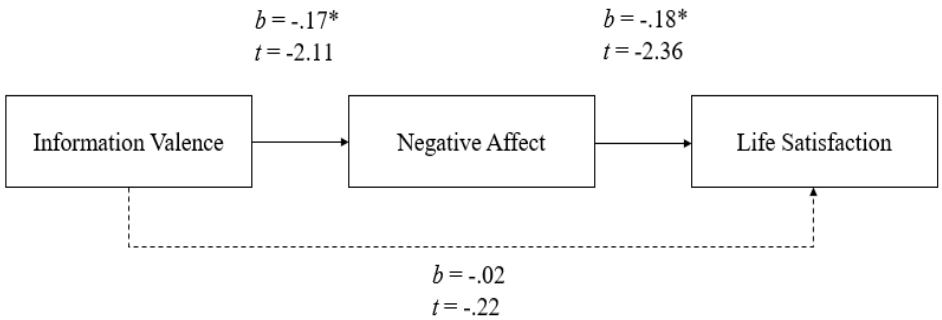
Table 10. *Testing the Effects of Comparison Direction and Psychological Closeness on Life Satisfaction: Study 1*

Predictors	Model1	Model2	Model3	Model4
Step1: Covariates				
Age	-.21***	-.20**	-.21***	-.20**
Gender (female=0, male=1)	-.02	-.04	-.04	-.03
Daily Instagram use (time)	.08	.08	.08	.08
Daily Instagram use (login)	-.11	-.09	-.10	-.10
Happiness (Baseline)	.52***	.50***	.49***	.48***
Self-esteem	.27***	.25**	.24**	.25***
Incremental R^2 (%)	60.4***			
Step2: Comparison direction				
Comparison direction		-.12	-.11	-.16
Incremental R^2 (%)		1.1		
Step3: Psychological closeness				
Close friend			.06	.06
Stranger			.12	.12
Incremental R^2 (%)			.90	
Step4: Interaction terms				
Comparison × Close friend				.03
Comparison × Stranger				.07
Incremental R^2 (%)				.20
Total R^2 (%)	60.4***	61.5***	62.5***	62.7***
N	133	133	133	133

Notes: *p < .05; **p < .01; ***p < .001. Displayed values are standardized regression coefficients and explained variances.

As trait-level measures of well-being may be less responsive to the experimental manipulations compared to transient, state-level measures, the indirect effects of information type on life satisfaction via affect (*H3, H4*) were tested using bootstrapping analyses suggested by Preacher and Hayes (2008). The result of a simple mediation showed that none of the affect measures (i.e., PA, NA, envy) mediated the relationship between social comparison direction and life satisfaction, failing to support *H3*. With respect to information valence, the indirect mediation model 95% confidence interval (CI) did not cross zero, b = .03, bias-corrected 5000 bootstrap 95% CI [.001, .092] when negative affect was entered as a mediator. That is, participants experienced less negative affect after being exposed to more positive posts, b = -.17, t = -2.11, $p < .05$, which in turn led them to evaluate their lives in general more positively b = -.18, t = -2.36, $p < .05$ (see Figure 1). However, positive affect did not mediate the relationship between the information valence and life satisfaction, b = .03, bias-corrected 5000 bootstrap 95% CI [-.001, .083]. Thus, *H4* was partially supported.

Figure 1. *Indirect Effects of Information Valence on Life Satisfaction through Affect: Study 1*



RQ1 addressed if social comparison direction and psychological closeness would jointly influence participants' subjective well-being. Results showed that there were no significant interaction effects between comparison direction and closeness for all focal DVs (see Table 4, 5, 8, 10, all Model 4). Moreover, *H5* predicted that the information valence and psychological closeness would jointly predict participants' affective well-being. However, *H5* was not supported for all focal DVs (see Table 6, 7, 9, all Model 4). As exploratory purposes, the interaction effect between information valence and psychological closeness on life satisfaction was also examined, yet it was not significant (see Table 11, Model 4).

Table 11. *Testing the Effects of Information Valence and Psychological Closeness on Life Satisfaction: Study 1*

Predictors	Model1	Model2	Model3	Model4
Step1: Covariates				
Age	-.21***	-.20**	-.21**	-.21**
Gender (female=0, male=1)	-.02	-.02	-.02	-.02
Daily Instagram use (time)	.08	.08	.08	.09
Daily Instagram use (login)	-.11	-.11	-.12	-.12
Happiness (Baseline)	.52***	.52**	.50***	.51***
Self-esteem	.27***	.27***	.26**	.26**
Incremental R^2 (%)	60.4***			
Step2: Information valence				
Information valence		.01	.02	.01
Incremental R^2 (%)		.00		
Step3: Psychological closeness				
Close friend			.06	.06
Stranger			.13	.13
Incremental R^2 (%)			1.1	
Step4: Interaction terms				
Valence × Close friend				.03
Valence × Stranger				-.02
Incremental R^2 (%)				.10
Total R^2 (%)	60.4***	60.4***	61.6***	61.7***
N	133	133	133	133

Notes: *p < .05; **p < .01; ***p < .001. Displayed values are standardized regression coefficients and explained variances.

Albeit there were no significant interaction effects, psychological closeness was found to exert a significant main effect on the participants' affect. Although it was not the focus of this study, the psychological closeness between the poster and viewer was a strong predictor for the extent to which the viewer experienced positive affect, even when controlling for the effects of information type (see Table 4 and 6, Model 3). That is, participants who browsed through acquaintances' posts exhibited less positive affect than those who viewed close friends' posts, $\beta = .31$, $t = 3.48$, $p < .01$, or strangers' posts, $\beta = .21$, $t = 2.44$, $p < .05$ (reported coefficients and values are based on Table 4).

Discussion

Consistent with previous studies that compared two mechanisms (e.g., Liu et al., 2016), the results of the present study supported emotional contagion mechanism. People exhibited more positive affect and less negative when they were exposed to positive posts compared to when they were exposed to negative posts, regardless of whether the posts feature upward or downward social comparison information. Conversely, this study found no significant effects of social comparison direction on positive and negative affect. These

findings suggest that while people may be exposed to Instagram posts that are both upward comparison eliciting and positive, the transference of emotion may exert a relatively stronger impact on people's affect.

It merits note that our findings provide more rigorous support for emotional contagion perspective compared to previous studies in many aspects. First, this study did not use information valence scale in assessing social comparison directionality, and thus eliminated the possibility of underestimating the impact of social comparison. Although social comparison directionality was measured directly, the effects of exposure to social comparison information on affect were not significant. By contrast, the effects of information valence were significant for both positive and negative affect. In addition, emotional contagion perspective was supported, even when controlling for the baseline measure of happiness.

Although exposure to social comparison information did not affect the general measure of negative affect, the additional analyses for envy showed that exposure to upward social comparison information evoked the envious feelings. This link between comparison and envy is somewhat expected when considering the concept of envy, which is defined as the unpleasant emotion that are aroused after engaging in upward social comparison (Smith & Kim,

2007). It is important to note, however, that this heightened envy did not decrease life satisfaction. That is, envy experienced after engaging in upward social comparison *per se* may not be detrimental to people's cognitive well-being. This finding seems to conflict with previous studies which demonstrated that envy mediates the relationship between intensity of passive following on Facebook and various measures of well-being (Krasnova et al., 2013; Tandoc et al., 2015). However, when considering the fact that most of these studies were correlational, it seems that the result of Study 1 is more rigorous.

Furthermore, the effect of exposure to social comparison information on life satisfaction was marginally significant. Also, there was an indirect effect of information valence on life satisfaction via affect. These two findings indicate that when it comes cognitive well-being, two mechanisms may work simultaneously, and thus the extent to which people evaluate their lives positively or negatively after browsing through others' posts would hinge on the relative strengths of these two mechanisms at the time of browsing. In addition, these findings showed that even a simple, brief exposure can alter the evaluation of people's lives. This advocates the recent claim in subjective well-being studies that life satisfaction is not entirely a stable construct, and that people may make a judgement about their lives based on what

comparison standards are salient at the moment (Diener, 2009). It should be noted, however, that life satisfaction may have been particularly responsive in this study because it explicitly asked participants to rate the extent to which others' posts feature lifestyles that are better, worse, or similar compared to his or her own lifestyle.

Finally, there were no significant interaction effects between exposure to Instagram posts and psychological closeness. This null effect seems to contradict prior studies which demonstrated the moderating role of psychological closeness on the association between exposure to emotion-laden posts and emotional outcomes (e.g., Liu et al., 2016). One possible explanation for such discrepancy may pertain to the way affect was measured. When considering the fact that Liu et al.'s (2016) study found the significant interaction effects only for implicit measure of affect, explicitly asking participants to report their affect may have prevented them from honestly reporting the negative feelings aroused after browsing friends' posts (namely, social desirability bias).

Despite its implications, the current study is not without limitations. First, as this study asked participants to browse through others' posts from their own Instagram account, it did not manipulate the types of information.

Further study should replicate this study by manipulating information type as well as psychological proximity in order to obtain a more rigorous finding. Second, this study used a college student sample, which restricts the generalizability of the findings.

Study2: Diary Study

Method

Overview

Study 2 was designed in order to complement the limitations of the first study. Although it can be inferred that the frequent changes in momentary emotions and life satisfaction may contribute to subjective well-being in the long run, the unnatural laboratory setting and short time frame used in Study 1 restrict the generalizability of the findings to affective well-being and life satisfaction typically examined in subjective well-being research. Study 2 involves a more naturalistic approach which examines within-person fluctuations over 7 days.

Hypotheses in Study 2

As Study 1 found no significant interaction effects between exposure to Instagram posts and psychological closeness, Study 2 focused mainly on comparing two mechanisms. Thus, only the aforementioned hypotheses (*H1a, H1b, H2*) regarding the relative effects of social comparison direction and

information valence on well-being were retained in Study 2. The mediation analyses (*H3, H4*) were excluded in Study 2 because independent variables and mediators were measured daily whereas life satisfaction measures were not nested within persons.

Participants

A total of 120 participants were recruited from several social media platforms (47 men, 73 women; age $M = 23.02$, $SD = 2.90$, range = 19-31). In line with Study 1, these demographics closely mirror the actual Instagram demographics. Only those who frequently use Instagram (i.e., log onto Instagram more than 3 days a week) were qualified for this study. Participants received compensation proportional to their participation: KRW 15,000 for 7 days; KRW 12,000 for 6 days; KRW 10,000 for 5 days.

Procedure

After signing up, participants were text-messaged links to the online survey, in three stages. First, they completed a battery of questionnaires concerning their demographic information (i.e., gender, age), self-esteem, and a baseline

measure of life satisfaction. Second, they filled out a daily diary form for 7 consecutive days. Participants were asked to "recall the last time they browsed through others' Instagram posts" and reported what kind of Instagram posts they browsed through in terms of information valence and social comparison direction, and the extent to which they experienced positive and negative affect after using Instagram. After the second stage, they were asked to fill out a follow-up measure of life satisfaction.

The daily survey link was sent at 9pm each day and participants were asked to submit it by the following morning at 9am. Text-messages were sent periodically throughout the study to remind them to submit survey before 9am so that the attrition could be minimized. Only the participants who completed the diary survey for at least five days were included in the analyses, leaving a total of 117 participants (45 men, 72 women; age $M = 23$, $SD = 2.91$, range = 19-31).

Measures

Daily exposure to Instagram posts

Each day, participants indicated the characteristics of the posts they most recently browsed through. Posts were operationalized as any photos, videos, and stories that are uploaded by other Instagram users. First, participants reported in percentage the proportion of posts featuring lifestyle that is better (i.e., upward social comparison), similar, and worse (i.e., downward social comparison) compared to his or her lifestyle. The sum of three categories was 100%. An upward information scale was constructed using the percentage of daily exposure to upward social comparison information (M = 33.67, SD = 1.96), and was used in the data analyses.

Second, participants also indicated in percentage how much positive, neutral, and negative posts they browsed through. The instruction specified that the valence of posts is the objective feature of posts, not the emotions or feelings aroused after they viewed those posts. The three categories added up to 100%. A positive information scale was constructed for data analyses using the percentage of daily exposure to positive information (M = 61.62, SD = 1.82).

Daily affect

Consistent with Study1, Study2 employed the Scale of Positive and Negative Experience (SPANE; Diener et al., 2010) to assess the daily positive and negative affect. Each day, participants indicated the extent to which they experienced each emotion on a 7-point scale (1 = *not at all*, 7 = *extremely*). 6 positive affect words (e.g., positive, good, pleasant, happy, joyful, contented) and 6 negative affect words (e.g., negative, bad, unpleasant, sad, afraid, angry) were averaged separately to create PA (α = .93, M = 4.73, SD = .10) and NA index (α = .86, M = 2.18, SD = .08). In addition to SPANE, the word *envy* was added and the additional analyses were performed for envy index (M = 4.29, SD = .13).

Life satisfaction

Both the baseline and follow-up measures of life satisfaction were assessed using Self-Anchoring Striving Scale (Cantril, 1965) and the Satisfaction With Life Scale (SWLS; Diener et al., 1985). Using the Self-Anchoring Striving Scale, also known as Cantril ladder, participants were asked to rate their current life on a ladder scale, with a range of 0 (*worst possible life*) to 10 (*best possible life*) (M = 6.50, SD = 1.70). The SWLS consists of 5 statements, such

as “In most ways my life is close to my ideal,” “The conditions of my life are not excellent,” (reversed) and “I am satisfied with my life.” Each item was measured on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*; α = .88, M = 4.63, SD = 1.24). Participants’ responses to these two scales were standardized and averaged as our measure of trait-level happiness.

Control variables

Consistent with Study1, items assessing participants’ self-esteem were adopted from the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Participants responded to 10 statements on a 5-point scale (1 = *not at all*, 5 = *very much*; α = .84. M = 3.84, SD = .62). Furthermore, age and gender were included as control variables.

Analysis Strategy

The data was conceptualized as a hierarchical data structure in which daily measures were nested within persons. As the units of observations (days) are not independent, hierarchical linear modeling (HLM) was used rather than ordinary least squares (OLS) regression. First, unconditional models (i.e., null

models which have no predictors at either level of analysis) were built to examine the basic multilevel descriptive statistics. Next, both day-level (i.e., level 1) and person-level (i.e., level 2) equations were constructed and were merged into a mixed model. When entering predictors, all continuous predictors at level 1 were group-mean centered (i.e., centering around each person's mean) in order to obtain unbiased estimations (Enders & Tofighi, 2007). At level 2, all continuous variables were entered grand-mean centered.

Results

Descriptive Statistics

The descriptive statistics and intercorrelation among key variables are summarized in Table 12 and 13.

Table 12. *Descriptive Statistics for Daily Measures: Study 2*

Measure	M	SD	α	Variance		Percent within
				Between	Within	
Upward information	33.67	1.96	-	.04	.02	33
Positive information	61.62	1.82	-	.04	.02	33
Positive affect	4.73	.10	.93	.99	.47	68
Negative affect	2.18	.08	.86	.61	.45	65
Envy	4.29	.13	-	1.90	1.35	58

Notes: Upward information and positive information are in percentage, which range from 0 to 100. PA, NA, and envy scales range from 1 to 7.

Table 13. *Intercorrelations among Key Variables: Study 2*

	1	2	3	4	5
1. Upward information					
2. Positive information	-.09*				
3. Positive affect	-.07	.17**			
4. Negative affect	.20**	-.14**	-.37**		
5. Envy	.45**	-.05	.12**	.07	

Notes: *p < .05; **p < .01; ***p < .001.

Before examining the same-day, within-person relationships among daily measures using a series of multilevel models, this study generated unconditional models as presented below. These unconditional models provide the mean, standard deviation, the between-person variance, and within-person variance estimates (see Table 12). In terms of nomenclature, there were *i* days nested within *j* persons, γ_{ij} refers to within-person variance and u_{0j} represents between-person variance. The result shows that for all measures, more than 30% of the total variance is within-person. Specifically, it is noteworthy that for all dependent variables, more than 50% of the variance is within-person. This suggests that analyzing within-person relationships would be informative.

Day-level (within-person):

$$y_{ij} = \beta_{0j} + \gamma_{ij}$$

Person-level (between-person):

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

Comparing Social Comparison and Emotional Contagion Perspectives

In order to compare social comparison (*H1a*) and emotional contagion mechanisms (*H1b*), this study built separate models for social comparison direction and information valence. The focal DVs were positive affect, negative affect, and envy. Gender, age, and self-esteem were included as controls in all of these models.

The first set of analyses examined the relationship between daily exposure to upward social comparison information and daily affect. These analyses are conceptually equivalent to conducting a multiple regression and estimating a regression coefficient for each person (Nezlek, 2001). The null hypothesis was that the mean coefficient representing the relationship between daily exposure to upward information and the measures of affect was 0, and this hypothesis was tested by determining whether the γ_{10} coefficient was significantly different from 0. After equations for day-level and person-level variables were built, they were merged into one (i.e., mixed model). Exposure to upward information was entered group-mean centered whereas age and self-esteem were grand-mean centered. The models were used for these analyses are presented below.

Day-level (within-person):

$y_{ij} = \beta_{0j} + \beta_{1j}$ * (Exposure to upward information) + γ_{ij}

Person-level (between-person):

$\beta_{0j} = \gamma_{00} + \gamma_{01}$ * (Gender) + γ_{02} * (Age) + γ_{03} * (Self-esteem) + u_{0j}

$\beta_{1j} = \gamma_{10} + u_{1j}$

Mixed model:

$y_{ij} = \gamma_{00} + \gamma_{01}$ * (Gender) + γ_{02} * (Age) + γ_{03} * (Self-esteem) + γ_{10} * (Exposure to upward information) + γ_{ij} + $u_{0j} + u_{1j}$ * (Exposure to upward information)

The results of these analyses are presented in Table 14. The analyses revealed that same-day, within-person relationships between exposure to upward information and affect were not significant: b = -.00, t = -.86, p > .05, for positive affect; b = .00, t = .34, p = .74, for negative affect. Therefore, *H1a* (social comparison perspective) was not supported.

The same models were built by substituting exposure to positive information variable for exposure to upward information variable. The models and results are presented below (see Table 15). As *H1b* predicted, relationship between exposure to positive information and positive affect was

positive, b = .01, t = 2.60, p < .05. That is, positive affect was higher on days when people browsed more positive information than it was on days when people browsed less positive information on Instagram. Moreover, the relationship between exposure to positive information and negative affect was negative, b = -.01, t = -2.33, p < .05, which means that negative affect was lower on days when people viewed more positive information than it was on days when people viewed less positive information on Instagram. Thus, both *H1b* (emotional contagion perspective) was supported.

Day-level (within-person):

$y_{ij} = \beta_{0j} + \beta_{1j}$ * (Exposure to positive information) + γ_{ij}

Person-level (between-person):

$\beta_{0j} = \gamma_{00} + \gamma_{01}$ * (Gender) + γ_{02} * (Age) + γ_{03} * (Self-esteem) + u_{0j}

$\beta_{1j} = \gamma_{10} + u_{1j}$

Mixed model:

$y_{ij} = \gamma_{00} + \gamma_{01}$ * (Gender) + γ_{02} * (Age) + γ_{03} * (Self-esteem) + γ_{10} * (Exposure to positive information) + $\gamma_{ij} + u_{0j} + u_{1j}$ * (Exposure to positive information)

In addition, this study examined the effects of both information types on envious feeling. The results showed that the relationship between exposure to upward information and envy was positive, $b = .02$, $t = 4.33$, $p < .001$, and also the relationship between exposure to positive information and envy was positive, $b = .01$, $t = 2.64$, $p < .01$ (see Table 14 and 15). In other words, on days when people browsed more upward information, they experienced more envious feeling than it was on days when they browsed less upward information on Instagram. Similarly, envious feeling was higher on days when people were exposed to more positive information than it was on days when people were exposed to less positive information on Instagram.

Table 14. *Within-person Relationships between Social Comparison Direction and Affect: Study 2*

	Positive Affect			Negative Affect			Envy		
	b	S.E.	*t*	*b*	S.E	*t*	*b*	S.E	*t*
Gender	.42*	.18	2.30	.00	.16	.01	.30	.28	1.07
Age	-.06*	.03	-2.09	.04	.03	1.45	.04	.05	.83
Self-esteem	.45**	.14	3.23	-.28*	.12	-2.33	-.54*	.21	-2.51
Upward information	-.00	.00	-.86	.00	.00	.34	.02***	.00	4.33

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

Table 15. *Within-person Relationships between Information Valence and Affect: Study 2*

	Positive Affect			Negative Affect			Envy		
	b	S.E.	*t*	*b*	S.E.	*t*	*b*	S.E	*t*
Gender	.42*	.18	2.32	.00	.16	.01	.28	.28	.10
Age	-.06*	.03	-2.10	.04	.03	1.42	.03	.05	.73
Self-esteem	.45**	.14	3.22	-.28*	.12	-2.28	-.51*	.22	-2.37
Positive information	.01*	.00	2.60	-.01*	.00	-2.33	.01**	.00	2.64

Notes: *p < .05; **p < .01; ***p < .001

Relationships between Exposure to Instagram Posts and Life Satisfaction

As life satisfaction measures were not nested within persons, the relationship between mean exposure to upward social comparison information and life satisfaction was assessed using OLS regressions. Demographic information (i.e., age, gender), self-esteem, and baseline life satisfaction were included as control variables. As *H2* predicted, people's average exposure to upward social comparison information over 7-day period was negatively associated with follow-up measure of life satisfaction, b = -.66, t= -2.01, p < .05 (see Table 16). By contrast, the relationship between mean exposure to positive information and life satisfaction was not significant, b = .56, t= 1.53, p > .05.

Table 16. *Relationships between Average Exposure to Instagram Posts and Life Satisfaction: Study 2*

		Life Satisfaction		
		b	S.E.	*t*
Social Comparison	Gender	.22	.14	1.56
	Age	.00	.02	.04
	Self-esteem	.17	.14	1.25
	Life satisfaction (baseline)	.62***	.10	6.00
	Upward information	-.66*	.33	-2.01
Information Valence	Gender	.23	.15	1.55
	Age	-.00	.02	-.08
	Self-esteem	.18	.14	1.28
	Life satisfaction (baseline)	.67***	.10***	6.63
	Positive information	.56	.37	1.53

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

Discussion

The findings of the diary study parallel the findings of the laboratory study. Consistent with Study 1, emotional contagion perspective was supported in Study 2. That is, participants experienced more positive affect and less negative affect on days when they were exposed to more positive Instagram posts than on days when they viewed less positive posts. In addition, the

average exposure to upward social comparison information was negatively associated with the follow-up measure life satisfaction, even when controlling for the baseline measure of happiness. These results suggest that exposure to positively skewed Instagram posts would not be detrimental to the experience of momentary emotions. However, if those positive posts are mostly composed of upward social comparison information, it may lead people to evaluate their lives negatively in the long run. However, this causal inference would be only valid when additional lagged analyses are provided in the further research.

At the same time, there was a deviation from Study 1. In Study 1, envy was only evoked after browsing upward social comparison information, but not after browsing positive information. By contrast, both exposure to positive information and upward social comparison information were positively associated with envious feeling in naturalistic setting. While only a conjecture, a high proportion of positive Instagram posts may have featured the lifestyle that people normally desire, which triggered upward social comparison and evoked envious feelings.

Previous diary studies concerning the effects of SNSs usage on well-being extensively used the time spent on SNSs as their independent variables,

and most of them did not test the underlying mechanisms. In this sense, Steer et al.'s (2014) diary study merits note as it examined the indirect effects of Facebook usage on depressive symptoms via social comparison direction. However, it was still confined to testing one specific mechanism. Differing from prior works, this study directly assessed the effects of exposure to different types of Instagram posts on people's well-being. In addition, this study was the first attempt to consider both social comparison and emotional contagion mechanisms in a single diary study, and thus further extended this line of research.

As this study only examined the same-day, within-person relationships among key variables, the results are correlational, not causal. Thus, further research needs to perform lagged analyses in order to make causal claims. In so doing, it would no doubt be beneficial to employ experience sampling method (ESM), which is collecting participants' daily experiences at random, multiple times each day.

General Discussion

The goal of the present study was to compare two mechanisms – social comparison and emotional contagion – underlying the association between Instagram browsing and subjective well-being, and also to examine the moderating role of psychological closeness. Differing from previous studies, the direct measurement of social comparison direction was employed, and the impact of strangers was explored alongside those of close friends and acquaintance. In addition, two studies were conducted in order to examine how these relationships unfold in a naturalistic setting as well as in a laboratory setting.

Across two studies, the current research lends support for emotional contagion perspective. In a laboratory setting, people experienced more positive affect and less negative affect after browsing through others' positive posts than when viewing negative posts. Mirroring the results of our experimental study, Study 2 revealed that positive affect was higher and negative affect was lower on days when people browsed more positive information than it was on days when people were exposed to less positive

information on Instagram. These findings comport well with previous research that compared two mechanisms; it seems that the transference of emotion is relatively stronger compared to the impact of engaging in social comparison. In opposition to the recent concerns over the dark sides of passive social media use, exposure to others' positive self-presentation on SNSs *per se* may not deteriorate people's affective well-being. This suggests that people should not worry too much about passive social media browsing. Furthermore, this finding corroborates the recent studies on emotional contagion in CMC contexts (e.g., Kramer et al., 2014), which revealed that emotional states expressed on social media are transferred to others through emotional contagion even when in-person interaction and nonverbal cues are absent. This is in direct opposition to early CMC researchers' assertion that emotional communication and understanding are largely restricted in CMC contexts as it is devoid of nonverbal cues.

Although exposure to upward social comparison information did not increase the general measure of negative affect, it did elicit people's envy across two studies. It merits note that envy was not subsumed under a more inclusive category of negative affect in this study because envy and other negative affect words loaded onto separate factors. Differing effects of certain conditions on envy and negative affect indicate that it would no doubt be

useful to separately analyze specific emotion. Specifically, it would be useful for communication scholars to examine discrete emotions such as envy and jealousy that are particularly relevant to interpersonal relationships. As Diener (2009) noted, “in many subjective well-being studies, scientists can also assess specific emotions such as anger, fear, joy, and sadness because global pleasant and unpleasant emotion categories may not fully capture the important differences between people in emotional experience” (p.42).

Furthermore, when considering the result that heightened envy after exposure to upward social comparison information did not decrease life satisfaction, one need to revisit the concept of envy. Although envy is often classified as negative affect and was found to have a negative influence on well-being (e.g., Krasnova et al., 2013; Verduyn et al., 2015), the result of the current research suggests that experiencing high levels of envious feeling should not be simply interpreted as negative or destructive. Envy may be even more complicated blend of feelings than one might expect, which may yield both constructive and destructive outcomes. Indeed, in many instances of everyday language, (benign) envy is used to mean an emotion closer to admiration than hostility (Smith & Kim, 2007), which can serve as an impetus for self-improvement. Therefore, experiencing envious feelings as a result of

upward social comparison on social media should be interpreted with particular caution.

For cognitive well-being, this study found that exposure to upward social comparison information on Instagram is negatively associated with life satisfaction in both studies. At the same time, the results of Study 1 showed that exposure to positive information decreases people's negative affect, which in turn, leads them to evaluate their lives in general more positively. Taking these two results into account, it seems that cognitive well-being is subject to the influence of both mechanisms. While only a conjecture, it can be inferred that exposure to a continuous stream of positive posts *per se* would not be detrimental to people's cognitive well-being as exposure to positive posts enhances life satisfaction via lowering negative affect. However, if those positive posts mostly feature the lifestyle that people desire, then the negative impact of upward social comparison would offset the positive impact of positive information on people's cognitive well-being. In addition, these results imply that two mechanisms are conceptually distinct, yet complementary routes. Thus, in lieu of simply jettisoning one and taking the other, the relative strength of each route should be understood in order to obtain a more comprehensive picture of how social media browsing affects people's well-being.

With respect to psychological closeness, the present study was the first attempt to explore the different effects of close friends, acquaintances, and strangers in comparing two mechanisms. Although there were no significant interaction effects between exposure to Instagram posts and psychological closeness, Study 1 found that psychological closeness alone exerts a significant impact on people's positive affect. Specifically, the level of positive affect was lower when participants browsed through acquaintances' posts compared to when they viewed close friends' and strangers' posts. This finding, albeit unexpected, gives us some implications. First, this finding highlights the importance of separately assessing the role of acquaintances and that of strangers in examining the effects of social media use. In previous studies (e.g., Liu et al., 2016), relationships were simply divided into close friends and distant friends, and as distant friends were not clearly operationalized, it remains uncertain if the reported effects of distant friends are the combined effects of acquaintance and strangers or the effect of acquaintances. In this respect, clearly separating the role of acquaintance and that of strangers would help scholars avoid this potential threat.

Second, the results of the current study urge further research to revisit the concept of psychological closeness, especially in CMC context. In traditional face-to-face setting, it seems warranted to assume that close friends,

acquaintances, and strangers would lay along a single psychological closeness (or intimacy) dimension. That is, people will exhibit the highest level of psychological closeness to close friends, and the lowest level of closeness to strangers. However, it may turn out differently in CMC context. Analogous to parasocial interaction (PSI; Horton & Wohl, 1956) which means that the audience can achieve an intimacy with media characters they have never met in person, social media users may also develop psychological closeness with strangers while browsing their posts or interacting with them online. For instance, as celebrities increasingly "create a profile on SNSs and exchange messages with their followers, however selectively and strategically so, in order to present themselves as an approachable, down-to-earth person" (Lee & Jang, 2013, p.28), people may feel that celebrities are psychologically closer to them compared to their acquaintances on SNSs. Therefore, this implies that scholars need to take more nuanced approached to the role of various relationships in social media use and its effect.

Finally, the present study expanded the realm of communication research by investigating emotion-based as well as cognitively based processes and effects of using social media. Although several lines of communication research highlighted the importance of affect-based constructs, there has been a relative neglect of emotional aspects in media effects research (Nabi &

Oliver, 2010). Accordingly, Nabi and Oliver (2010) once claimed that examining the role of emotion in media effects research would be one of the promising avenues for future theory development. The present study responded to this call and investigated how emotional contagion as emotion-based process as well as social comparison as cognitively based process unfold in new media contexts. This balanced approach contributed to interpreting and solving the conflicting results presented by previous studies concerning the effects of passive social media browsing on well-being. The present study also examined the emotional as well as cognitive responses of using social media in order to provide more balanced understanding of social media effects.

Limitations and Future Directions

A few limitations deserve mention. First, because both studies relied exclusively on young adults and the samples were not nationally representative, the results should be interpreted with particular caution. Although the data were reflective of the actual Instagram demographic in that the samples were skewed toward female and were mostly under the age of 35 and also the gender effects were controlled in analyses, future study should replicate the present study with a sample with a more balanced sex and age distribution to ensure generalizability.

In addition, Study 1 did not manipulate the information type. At the onset of this study, there were two options. One approach was to manipulate information type by providing a fixed set of Instagram posts that vary in terms of information valence and social comparison direction. This approach poses a problem as the manipulation of psychological closeness should be based on a hypothetical scenario (e.g., asking participants to imagine a situation in which they are browsing through close friends' posts). Thus, the present study decided to take the other approach by adopting Liu et al.'s (2016)

experimental study, which was asking participants to browse through posts from their real Instagram account. Although this approach may closely mirror the effects of various relationships in natural settings, it may be subject to the effects of potential confounding variables. Consequently, it may be worthwhile to replicate the study by taking the former approach in order to obtain even more rigorous experimental results.

With respect to Study 2, the current study only examined within-person relationships between exposure to Instagram posts and well-being, which restricts causal inference. Further study needs to perform a series of lagged analyses in order to obtain some insight into causal relationships among key variables. In so doing, it may be worthwhile to assess daily life satisfaction measure (e.g., how satisfied are you with your life today?) along with overall life satisfaction at baseline and follow-up. This is because recent daily Instagram use will exert a greater influence on measures which reflect a shorter time-frame. As Diener (2009) noted, “different time frames all fall within the boundaries of subjective well-being and can produce interesting findings” (p.50).

Across two studies, all subjective well-being measures relied on self-reports. Although self-report is the most common way to assess well-being in

extant literature, it should be noted that self-report measures have some drawbacks. For instance, the self-reports of affective well-being only uses cognitive labelling of emotions, which prevents researchers from assessing other aspects of emotions (Diener, 2009). Further study should attempt to creatively engineer alternative techniques such as assessing facial expressions and behavioral preferences (Diener, 2009) in order to capture the multifaceted aspects of emotions. Moreover, the current study only employed the explicit measure of affect. However, given that Liu et al.'s (2016) results were only significant for the implicit measure of affect and not for the explicit measure, some of the effect sizes of our findings may turn out even bigger when the implicit measure is used. Thus, it would no doubt be beneficial to replicate this study by assessing emotions both implicitly and explicitly in further studies.

Moreover, posts were operationalized broadly in both studies, which prevents us from identifying which social cues on Instagram exerted the greatest influence in the process of social comparison and emotional contagion. For instance, it is difficult to gauge if people mostly used self-generated cues (e.g., photo), friends-generated cues (e.g., friends' comments), system-generated cues (e.g., the number of likes), or the combinations of different cues as a reference in the process of interpreting the post as upward

or downward social comparison information. Previous studies on social comparison in face-to-face interactions have paid less attention to what information people employ when forming an impression of others because information about others was often given to the participants. For instance, most experimental studies manipulated the performance of others by providing a brief description about them (Mussweiler, Rüterm & Epstude, 2004) or varying the performance of a confederate (Tesser, 1988). However, as people are likely to use various types of information that are available on social media platform as a reference for social comparison, delineating the relative impact of disparate cues on people's affect would provide insights into how social comparison process unfolds in new media context. In so doing, referring to the distinction of different impression formation cues proposed by previous works (e.g., Tong et al., 2008; Utz, 2010) would be particularly useful.

Finally, as the current study mainly focused on the effects of passive browsing on people's well-being, it remains elusive how participants' well-being would change if they are given the opportunity to actively use SNSs such as interacting with other users. Particularly in Study 2, it is uncertain whether the reported well-being is solely attributable to the experience of passive browsing because it did not control for factors such as the amount of

social interactions. For instance, the positive impact of social media usage on daily affective well-being reported in Study 2 may be in part the result of social support people gained after interacting with other SNS friends, not solely the result of exposure to a specific type of information. In this respect, future research should take into account and control for these possibilities if it were to observe pure effects of passive social media use.

References

Aknin, L. B., Dunn, E. W., & Norton, M. I. (2012). Happiness runs in a circular motion: Evidence for a positive feedback loop between prosocial spending and happiness. *Journal of Happiness Studies*, *13*(2), 347-355.

Barsade, S. G. (2002). The ripple effect: Emotional contagion and its influence on group behavior. *Administrative Science Quarterly*, *47*(4), 644-675.

Bauer, J. J., McAdams, D. P., & Sakaeda, A. R. (2005). Interpreting the good life: Growth memories in the lives of mature, happy people. *Journal of Personality and Social Psychology*, *88*(1), 203-217.

Bazarova, N. N., & Choi, Y. H. (2014). Self-disclosure in social media: Extending the functional approach to disclosure motivations and characteristics on social network sites. *Journal of Communication*, *64*(4), 635-657.

Beeney, J. E., Franklin Jr, R. G., Levy, K. N., & Adams Jr, R. B. (2011). I feel your pain: Emotional closeness modulates neural responses to empathically experienced rejection. *Social Neuroscience*, *6*(4), 369-376.

Bourgeois, P., & Hess, U. (2008). The impact of social context on mimicry. *Biological Psychology*, *77*(3), 343-352.

Burke, M., & Kraut, R. E. (2016). The Relationship between Facebook use and well-being depends on communication type and tie strength. *Journal of Computer-Mediated Communication*, *21*(4), 265-281.

Buunk, A. P., Dijkstra, P., Bosch, Z. A., Dijkstra, A., & Barelds, D. P. (2012). Social comparison orientation as related to two types of closeness. *Journal of Research in Personality*, *46*(3), 279-285.

Buunk, A. P., & Gibbons, F. X. (2007). Social comparison: The end of a theory and the emergence of a field. *Organizational Behavior and Human Decision Processes*, *102*(1), 3-21.

Cantril, H. (1965). *The patterns of human concern*. New Brunswick, New Jersey: Rutgers University Press.

Cheung, F., & Lucas, R. E. (2014). Assessing the validity of single-item life satisfaction measures: Results from three large samples. *Quality of Life research*, *23*(10), 2809-2818.

Chou, H. T. G., & Edge, N. (2012). “They are happier and having better lives than I am”: The impact of using Facebook on perceptions of others' lives. *Cyberpsychology, Behavior, and Social Networking*, *15*(2), 117-121.

Crosby, F. (1976). A model of egoistical relative deprivation. *Psychological Review*, *83*(2), 85-113.

Culnan, M. J., & Markus, M. L. (1987). Information technologies. In F. M. Jablin, L. L. Putnam, K. H. Roberts, & L. W. Porter (Eds.), *Handbook of Organizational Communication: An Interdisciplinary Perspective* (pp. 420-443). Newbury Park, CA: Sage Publications.

de Vries, D. A., Möller, A. M., Wieringa, M. S., Eigenraam, A. W., & Hamelink, K. (2018). Social comparison as the thief of joy: Emotional consequences of viewing strangers' Instagram posts. *Media Psychology*, *21*(2), 1-24.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, *95*(3), 542-575.

Diener, E. (2009). Assessing subjective well-being: Progress and opportunities. In E. Diener (Eds.), *Assessing Well-Being: The Collected Works of Ed Diener* (pp. 25-65). Dordrecht: Springer.

Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*(1), 71-75.

Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology*, *54*(1), 403-425.

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. W., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research*, *97*(2), 143-156.

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends": Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, *12*(4), 1143-1168.

Ellison, N. B., & Vitak, J. (2015). Social network site affordances and their relationship to social capital processes. In S. Sundar (Ed.) *The Handbook of the Psychology of Communication Technology* (pp. 205-227). Hoboken, NK: Wiley-Blackwell.

Enders, C. K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: a new look at an old issue. *Psychological Methods*, *12*(2), 121-138.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*(2), 117-140.

Gonzales, A. L., & Hancock, J. T. (2011). Mirror, mirror on my Facebook wall: Effects of exposure to Facebook on self-esteem. *Cyberpsychology, Behavior, and Social Networking*, *14*(1-2), 79-83.

Guillory, J., Spiegel, J., Drislane, M., Weiss, B., Donner, W., & Hancock, J. (2011, May). Upset now?: Emotion contagion in distributed groups. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 745-748). New York, NY: ACM.

Hancock, J. T., Gee, K., Ciaccio, K., & Lin, J. M. H. (2008, November). I'm sad you're sad: emotional contagion in CMC. In *Proceedings of the 2008 ACM conference on Computer supported cooperative work* (pp. 295-298). New York, NY: ACM.

Hancock, J. T., Landrigan, C., & Silver, C. (2007, April). Expressing emotion in text-based communication. In *Proceedings of the SIGCHI conference on Human factors in computing systems* (pp. 929-932). New York, NY: ACM.

Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1993). Emotional contagion. *Current Directions in Psychological Science*, *2*(3), 96-100.

Hatfield, E., Rapson, R. L., & Le, Y. C. L. (2009). Emotional contagion and empathy. In J. Decety & W. Ickes (Eds.) *The Social Neuroscience of Empathy* (pp. 19-30). Cambridge, Massachusetts: The MIT Press,

Horton, D., & Richard Wohl, R. (1956). Mass communication and para-social interaction: Observations on intimacy at a distance. *Psychiatry*, *19*(3), 215-229.

Hsee, C. K., Hatfield, E., Carlson, J. G., & Chemtob, C. (1990). The effect of power on susceptibility to emotional contagion. *Cognition and Emotion*, *4*(4), 327-340.

Kahneman, D. (1999). Objective happiness. *Well-being: The Foundation of Hedonic Psychology*, 1-39.

Kim, J., & Lee, J. E. R. (2011). The Facebook paths to happiness: Effects of the number of Facebook friends and self-presentation on subjective well-being. *CyberPsychology, Behavior, and Social Networking*, *14*(6), 359-364.

Kramer, A. D., Guillory, J. E., & Hancock, J. T. (2014, June). Experimental evidence of massive-scale emotional contagion through social networks. In *Proceedings of the National Academy of Sciences* (pp. 8788-8790).

Krasnova, H., Wenninger, H., Widjaja, T., & Buxmann, P. (2013, February). Envy on Facebook: A hidden threat to users' life satisfaction?. In the *11th International Conference on Wirtschaftsinformatik* (pp.1-16), Leipzig, Germany.

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., ... & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PloS one*, *8*(8), e69841.

Lakin, J. L., & Chartrand, T. L. (2003). Using nonconscious behavioral mimicry to create affiliation and rapport. *Psychological Science*, *14*(4), 334-339.

Lee, E. J., & Jang, J. W. (2013). Not so imaginary interpersonal contact with public figures on social network sites: How affiliative tendency moderates its effects. *Communication Research*, *40*(1), 27-51.

Lim, M., & Yang, Y. (2015). Effects of users' envy and shame on social comparison that occurs on social network services. *Computers in Human Behavior*, *51*, 300-311.

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.

Liu, J., Li, C., Carcioppolo, N., & North, M. (2016). Do our Facebook friends make us feel worse? A study of social comparison and emotion. *Human Communication Research*, *42*(4), 619-640.

Lucas, R. E., & Donnellan, M. B. (2012). Estimating the reliability of single-item life satisfaction measures: Results from four national panel studies. *Social Indicators Research*, *105*(3), 323-331.

Lup, K., Trub, L., & Rosenthal, L. (2015). Instagram# Instasad?: Exploring associations among Instagram use, depressive symptoms, negative social comparison, and strangers followed. *Cyberpsychology, Behavior, and Social Networking*, *18*(5), 247-252.

Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research*, *46*(2), 137-155.

Manago, A. M., Taylor, T., & Greenfield, P. M. (2012). Me and my 400 friends: The anatomy of college students' Facebook networks, their communication patterns, and well-being. *Developmental Psychology*, *48*(2), 369-380.

Mccracken, H. (2015, June 23). Instagram's all-new search & explore features will change how you use Instagram. *Fast Company*. Retrieved from https://www.fastcompany.com/3047726/with-new-search-explore-features-instagram-is-changing-how-youll-use-instagram

McIntosh, D. N. (2006). Spontaneous facial mimicry, liking and emotional contagion. *Polish Psychological Bulletin*, *37*(1), 31-42.

Moreno, M. A., Jelenchick, L. A., Egan, K. G., Cox, E., Young, H., Gannon, K. E., & Becker, T. (2011). Feeling bad on Facebook: Depression disclosures by college students on a social networking site. *Depression and Anxiety*, *28*(6), 447-455.

Mussweiler, T. (2007). Assimilation and contrast as comparison effects: A selective accessibility model. In D. A. Stapel & J. E. Suls (Eds.) *Assimilation and Contrast in Social Psychology* (pp. 165- 185). New York, Hove, East Sussex: Psychology Press.

Mussweiler, T., Rüter, K., & Epstude, K. (2004). The ups and downs of social comparison: Mechanisms of assimilation and contrast. *Journal of Personality and Social Psychology*, *87*(6), 832-844.

Nabi, R. L., & Oliver, M. B. (2010). Mass Media Effects. In C. R. Berger, M. E. Roloff, & D. R., Roskos-Ewoldsen (Eds.) (2010). *The Handbook of Communication Science* (pp. 255-272). Los Angeles: Sage Publications.

Nezlek, J. B. (2001). Multilevel random coefficient analyses of event-and interval-contingent data in social and personality psychology research. *Personality and Social Psychology Bulletin*, *27*(7), 771-785.

Oh, S. Y. (2012). *What causes emotional arousal online? Effects of cognitive appraisal and emotional contagion in text-based communication* (Master's Thesis). Retrieved from Seoul National University Database.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879-891.

Preston, S. D., & De Waal, F. B. (2002). Empathy: Its ultimate and proximate bases. *Behavioral and Brain Sciences*, *25*(1), 1-20.

Richins, M. L. (1991). Social comparison and the idealized images of advertising. *Journal of Consumer Research*, *18*(1), 71-83.

Richins, M. L. (1992). Media images, materialism, and what ought to be: The role of social comparison. In F. W. Rudmin & M. Richins (Eds.), *SV-Meaning, Measure, and Morality of Materialism* (pp. 202-206). Provo, UT: Association for Consumer Research.

Rosenberg, M. (1965). Rosenberg self-esteem scale (RSE). *Acceptance and Commitment Therapy. Measures package*, 61-62.

Rubin, Z. (1975). Disclosing oneself to a stranger: Reciprocity and its limits. *Journal of Experimental Social Psychology*, *11*(3), 233-260.

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*(1), 141-166.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*(6), 1069-1081.

Schachter, S. (1959). *The Psychology of Affiliation*. Stanford, CA: Stanford University Press.

Schwarz, N. (2012). Feelings-as-information theory. In P. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of Theories of Social Psychology* (pp. 289-308). Thousand Oaks, CA: Sage.

Schwarz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology*, *45*(3), 513-523.

Shakya, H. B., Christakis, N. A., & Fowler, J. H. (2014). Association between social network communities and health behavior: an observational sociocentric network study of latrine ownership in rural India. *American Journal of Public Health*, *104*(5), 930-937.

Siemer, M., & Reisenzein, R. (2007). The process of emotion inference. *Emotion, 7(1)*, 1-20.

Smith, A., & Anderson, M. (2018). Social media use in 2018. *Pew Research Center Report*. Retrieved from http://www.pewinternet.org/2018/03/01/social-media-use-in-2018/

Smith, C. (2014, August 17). Here's why Instagram's demographics are so attractive to brands. *Bussiness Insider*. Retrieved from http://www.businessinsider.com/instagram-demographics-2013-12

Smith, R. H. (2000). Assimilative and contrastive emotional reactions to upward and downward social comparison. In J. Suls & L. Wheeler (Eds.), *Handbook of Social Comparison Theory and Research.* New York, N.Y.: Kluwer Academic/Plenum Publishers.

Smith, R. H., & Kim, S. H. (2007). Comprehending envy. *Psychological Bulletin*, *133*(1), 46-64.

Smith, R. H., Parrott, W. G., Ozer, D., & Moniz, A. (1994). Subjective injustice and inferiority as predictors of hostile and depressive feelings in envy. *Personality and Social Psychology Bulletin*, *20*(6), 705-711.

Stapel, D. A., & Koomen, W. (2000). Distinctiveness of others, mutability of selves: Their impact on self-evaluations. *Journal of Personality and Social Psychology*, *79*(6), 1068-1087.

Steers, M. L. N., Wickham, R. E., & Acitelli, L. K. (2014). Seeing everyone else's highlight reels: How Facebook usage is linked to depressive symptoms. *Journal of Social and Clinical Psychology*, *33*(8), 701-731.

Sullins, E. S. (1991). Emotional contagion revisited: Effects of social comparison and expressive style on mood convergence. *Personality and Social Psychology Bulletin*, *17*(2), 166-174.

Suls, J., Martin, R., & Wheeler, L. (2002). Social comparison: Why, with whom, and with what effect?. *Current Directions in Psychological Science*, *11*(5), 159-163.

Tandoc, E. C., Ferrucci, P., & Duffy, M. (2015). Facebook use, envy, and depression among college students: Is facebooking depressing?. *Computers in Human Behavior*, *43*, 139-146.

Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. *Advances in Experimental Social Psychology*, *21*, 181-227.

Tesser, A. (1991). Emotion in social comparison and reflection processes. In J. Suls & T. A. Wills (Eds). *Social Comparison: Contemporary Theory and Research* (pp. 115-125). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Tesser, A., Millar, M., & Moore, J. (1988). Some affective consequences of social comparison and reflection processes: The pain and pleasure of being close. *Journal of Personality and Social Psychology*, *54*(1), 49-61.

Tong, S. T., Van Der Heide, B., Langwell, L., & Walther, J. B. (2008). Too much of a good thing? The relationship between number of friends and interpersonal impressions on Facebook. *Journal of Computer-Mediated Communication*, *13*(3), 531-549.

Utz, S. (2009). The (potential) benefits of campaigning via social network sites. *Journal of Computer-Mediated Communication*, *14*(2), 221-243.

Utz, S. (2010). Show me your friends and I will tell you what type of person you are: How one's profile, number of friends, and type of friends influence impression formation on social network sites. *Journal of Computer-Mediated Communication*, *15*(2), 314-335.

Valenzuela, S., Park, N., & Kee, K. F. (2009). Is there social capital in a social network site?: Facebook use and college students' life satisfaction, trust, and participation1. *Journal of Computer-Mediated Communication*, *14*(4), 875-901.

Verduyn, P., Lee, D. S., Park, J., Shablack, H., Orvell, A., Bayer, J., ... & Kross, E. (2015). Passive Facebook usage undermines affective well-being:

Experimental and longitudinal evidence. *Journal of Experimental Psychology: General*, *144*(2), 480-488.

Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture*, *3*(4), 206-222.

Walther, J. B. (1996). Computer-mediated communication impersonal, interpersonal, and hyperpersonal interaction. *Communication Research*, *23*(1), 3-43.

Wheeler, L., & Miyake, K. (1992). Social comparison in everyday life. *Journal of Personality and Social Psychology*, *62*(5), 760-773.

Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, *90*(2), 245-271.

Winter, J. (2013, July 23). Selfie-Loathing: Instagram is even more depressing than Facebook. Here's why. *Slate*. Retrieved from http://www.slate.com/articles/technology/technology/2013/07/instagram_and_self_esteem_why_the_photo_sharing_network_is_even_more_depressing.html

국문초록

인스타그램 이용이 주관적 안녕감에 미치는 효과
: 사회비교와 정서전이 매커니즘 비교 연구

본 연구는 인스타그램 이용이 개인의 주관적 안녕감에 영향을 미칠 때, 사회비교와 정서전이 중 어느 매커니즘이 더 강한 설명력을 갖는지 살펴보았다. 기존의 대다수 연구들은 정보 유인가 척도를 사용하여 SNS 게시물의 유인가를 측정하고, 이 지표가 곧 게시물의 사회비교 방향성을 나타낸다고 보았다. 하지만 본 연구는 이러한 접근법이 사회비교의 효과를 제대로 검증하고 있지 못한다는 문제의식을 갖고, 보다 직접적으로 사회비교 방향성을 측정하여 두 매커니즘을 동등하게 비교하고자 하였다. 나아가 사회비교와 정서전이가 작동할 때, 게시물을 올린 사람에게 개인이 느끼는 심리적 친밀감이 어떤 조절효과를 갖는지 살펴보았다. 보다 구체적으로, 친한 사람, 지인, 모르는 사람이 올린 게시물을 볼 때 사회비교와 정서전이의 효과가 어떻게 조절되는지 알아보았다.

실험연구와 일지연구를 통해 본 연구는 사회비교보다 정서전이가 더 강한 영향력을 갖는다는 점을 밝혀냈다. 즉 게시물의 사회비교 방향성과 관계없이 긍정적인 게시물을 볼 때 사람들의 긍정 정서는 높아지고 부정 정서는 낮아졌다. 또한 긍정적인 게시물에 노출되는 것은 정서를 매개로 하여 개인의 삶에 대한 만족도에도 긍정적인 영향을

미쳤다. 한편 상향비교 게시물에 노출되는 것은 부러움의 감정을 유발했으나, 이는 삶에 대한 만족도를 낮추는 방향으로 이어지지는 않았다. 그러나 상향비교 게시물에 노출되는 것과 삶에 대한 만족도가 두 연구에서 모두 부정적 관계를 갖는 것으로 나타났다. 이를 종합했을 때, 본 연구결과는 인스타그램에서 타인의 긍정적인 또는 상향비교를 유발하는 게시물에 노출되는 것이 개인의 정서에는 부정적인 영향을 미치지 않으나, 삶에 대한 만족도에 있어서는 정서전이가 갖는 긍정적인 효과가 상향비교가 갖는 부정적인 효과에 의해 상쇄될 수 있음을 보여준다. 한편 기존 연구들과는 달리 정서전이와 사회비교가 일어나는 과정에서 심리적 친밀감의 조절효과는 나타나지 않았다.

주요어: 인스타그램, SNS, 사회비교, 정서전이, 심리적 친밀감, 주관적 안녕감, 컴퓨터 매개 커뮤니케이션

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