



# Selfie and self: The effect of selfies on self-esteem and social sensitivity



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## ABSTRACT

The phenomenon of taking and sharing selfies has become widespread in everyday life. However, previous studies on the selfie have not dealt with the effect of the experience of a selfie. Therefore, we examined the effect of the selfie on people who took and shared their selfies. Based on the social comparison theory, we focused on two psychological factors: social sensitivity and self-esteem. In the experiment, we manipulated the context of experiencing selfies. The participants were asked to take a picture of a self-portrait or a cup, using their own smartphone. Then, they were instructed to either post it on social media or save it on their smartphone. The participants' social sensitivity was assessed by measuring their reaction time (RT) to a social probe, and self-esteem was evaluated by measuring the size of their signatures. We found that participants' RT to a social probe decreased and the size of their signature decreased, after they took and shared their selfie. These results suggest that taking and sharing selfies could result in greater social sensitivity and lower self-esteem of selfie takers.

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## 1. Introduction

### 1.1. Selfie

According to Oxford Dictionaries, the word of the year for 2013 is "Selfie." This neologism was coined to describe the act of taking a self-portrait and sharing it on social media. Taking and sharing selfies have become common with the advent of various smart devices and social media (Sung, Lee, Kim, & Choi, 2016). With the increased prevalence of the selfie phenomenon, a number of studies analyzing selfies from a socio-psychological perspective have emerged. These studies can be classified into two major categories: (1) studies that investigate how personality traits are related to selfies (Chua & Chang, 2016; Sorokowski et al., 2015; Weiser, 2015) and (2) studies that investigate how people socially perceive selfies (Lu, Wang, Wu, & Yang, 2015; Mazza, Da Silva, & Le Callet, 2014).

The perspective underlying the first category of studies emphasizes that selfies are an effective tool for self-presentation. In this regard, selfies could not only reflect individuals' personality but also help convey their ideal self-concept, given that selfies are easy to manipulate. By engaging in selective self-presentation (which can be accomplished in the case of selfies), people seek affirmation from others to strengthen their self-concept. In this self-affirmation process, social perception plays an important role, and this is the crux of the premise adopted by

the second group of studies mentioned earlier. People judge the direction of affirmation by considering others' opinion, which is generally based on social standards. Through the repetition of the entire process, from self-presentation to social comparison, people change and consolidate their self-concept. However, not many studies have empirically investigated how taking and sharing selfies influence selfie takers (Chua & Chang, 2016). For this reason, we aimed to investigate experiencing selfies can affect individuals' self-concept through social comparison.

### 1.2. Social comparison

The social comparison theory explains how people compare themselves to others in order to reduce uncertainty in specific situations, and to learn how to define self (Festinger, 1954). Especially, social media is one of the most common platforms on which social comparison takes place, because it allows people to easily showcase themselves and get feedback from as well as interactive with others.

As we summarized in Table 1, most of recent studies on social media have tried to understand users' behavior in social media as a social interactive process with others. Through the review of these related studies, we found that people are using social media platforms in order to build their own self-concepts in the form of social comparison and self-evaluation. In the process of the comparison and evaluation in social media, people are generally sensitive to others' feedback including postings and comments and they do subjectively interpret that information based on their own feelings, states of mind, and points of view. In this study, therefore, we focused on two important concepts related to social comparison: social sensitivity, which is affected in the process of social

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**Table 1**  
Recent studies on social media usage within the perspective of social comparison theory.

Authors	Key findings
Toma (2013)	An exposure to one's own profile raises state self-esteem, but that it hampers performance in a subsequent cognitive task.
Seidman (2013)	Users' motivations for Facebook use aids in understanding the relationship between personality and Facebook use.
Carpenter (2012)	Self-esteem is negatively related to self-promotion and anti-social behaviors on Facebook.
Gonzales and Hancock (2011)	Self-awareness by viewing one's own Facebook profile enhances self-esteem rather than diminishes it.
Mehdizadeh (2010)	Individuals higher in narcissism and lower in self-esteem were related to greater online activity as well as some self-promotional contents.

comparison, and self-esteem, which is affected as a result of social comparison.

Social sensitivity is defined as individuals' heightened concern for other people's judgments of and reactions to themselves (Krejci-Manwaring, Kerchner, Feldman, Rapp, & Rapp, 2006). It has been studied in the field of interpersonal communication for decades, and high social sensitivity leads to a sensitive response to social signals such as eye gaze, vocal tone, and body language (DiTommaso, Brannen-McNulty, Ross, & Burgess, 2003; Harb, Heimberg, Fresco, Schneier, & Liebowitz, 2002; Pickett, Gardner, & Knowles, 2004). In social media, other people's posts and comments have been observed to heighten social sensitivity (Chua & Chang, 2016; Weiser, 2015).

Self-esteem refers to individuals' evaluation of their self-worth or satisfaction. High self-esteem has been understood to be an influential predictor of happiness and satisfaction in relationships (Baumeister, Campbell, Krueger, & Vohs, 2003; Orth & Robins, 2014). In social media, people tend to present and interpret information based on their own feelings, states of mind, and points of view in order to enhance their self-esteem (Bareket-Bojmel, Moran, & Shahar, 2016).

### 1.3. Research questions

Based on the previous backgrounds, our research questions are as follows: First, how does taking and sharing selfies affect social sensitivity? According to the objective self-awareness (OSA) theory, proposed by Duval and Wicklund (1972), taking selfies is likely to increase social sensitivity. When participants are exposed to stimuli such as images of themselves and a mirror and camera pointed at themselves, their self-awareness increases. When self-awareness is heightened, people become more anxious about others' judgments about themselves, and they become more conscious about social standards and norms (Duval & Wicklund, 1972). Consequently, sharing selfies would also increase social sensitivity, because sharing results in direct judgment and feedback from others. Several social media studies have reported that self-presentation positively correlates with social sensitivity (Farahani, Aghamohamadi, Kazemi, Bakhtiarvand, & Ansari, 2011; Oldmeadow, Quinn, & Kowert, 2013).

Second, how do taking and sharing selfies affect self-esteem? Research about the relationship between self-awareness and self-esteem has revealed mixed findings (Sorokowska et al., 2016). Some studies based on the OSA theory explain that self-awareness negatively affects self-esteem. Since the theory points out that people often think they do not meet social standards when self-awareness is heightened (Duval & Wicklund, 1972; Gonzales & Hancock, 2011), there is the possibility that taking selfies would lower self-esteem. However, we can also assume that self-esteem will increase after selfies are shared. When people attempt to share their own selfies in social media, it is easy for them to selectively self-present themselves in the selfies (Bareket-Bojmel et al., 2016). As a result, people tend to select only the aspects they would like to emphasize when they share their selfies, and this would positively affect self-esteem.

## 2. Methods

In order to answer these two research questions, we used a  $2 \times 2$  between-subjects design (Photographed Subject [cup, selfie]  $\times$  Sharing Behavior [saving, posting]). We measured social sensitivity and self-esteem, using behavioral paradigms within the theme of social sensitivity and embodied cognition.

### 2.1. Participants

We recruited the participants via university online communities and bulletin boards on campus. The sample size was estimated using the result from a prior background study (Amir et al., 2009) and, in total, 78 students participated in the study. The advertisement called for participation in a study on user experience with camera applications of smartphones. Notably, the two dependent variables, namely, social sensitivity and self-esteem, were not mentioned during the recruiting process. The participants were randomly assigned to one of the four conditions for examining the effect of taking and sharing selfies.

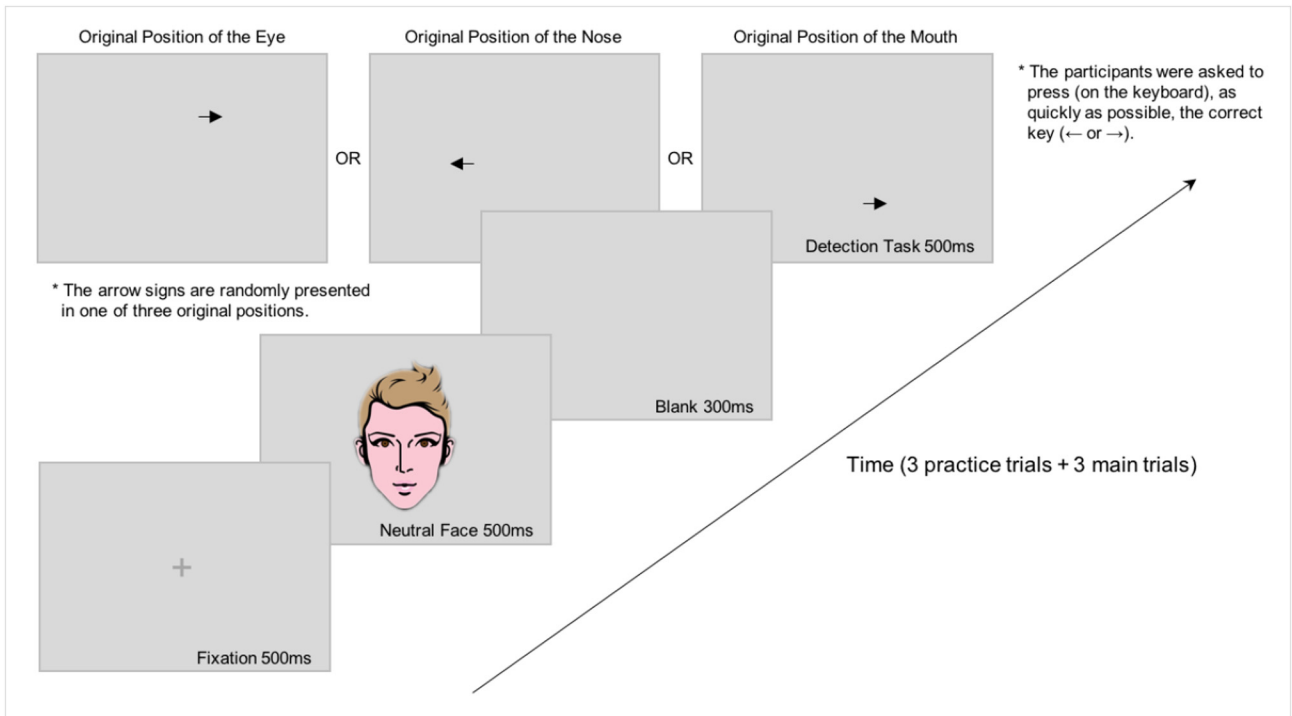
### 2.2. Measures

In this study, we used indirect methods to measure social sensitivity and self-esteem to minimize the issue of self-reported measures which has been raised by previous studies on the selfie. Most previous studies on social comparison and social media have used explicit measurements, namely self-reported measures, to measure variables (Carpenter, 2012; Seidman, 2013; Sung et al., 2016). However, such measures may lack reliability, especially when participants are required to report their own characteristics in relation to topics such as self-esteem or narcissistic tendencies (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). It is the same as in the studies on the topic of selfies (Sorokowska et al., 2016). Therefore, in order to overcome this limitation and investigate the relationships between variables through experimental methods, we designed and used indirect measurements to assess the variables. After conducting pre-test to assess the reliability and validity of those indirect measurements, we also decided not to use any explicit self-report measurements in the process of the experiment to minimize unintended consequences of the manipulation.

#### 2.2.1. Social sensitivity

To measure the participants' level of social sensitivity, we used a probe detection task, which has been used to measure individuals' level of selective attention towards social cues, which, in turn, reflects their level of interpersonal sensitivity and social sensitivity (Harb et al., 2002; Mogg, Philippot, & Bradley, 2004; Pishyar, Harris, & Menzies, 2004). Generally, people with a high level of social sensitivity tend to have a faster reaction time (RT) in the probe detection task. Likewise, in the context of taking and sharing selfies, we assumed that people who take and post selfies on social media would be more sensitive to social cue and respond more quickly to the probe. For this reason, in this study, the probe detection task was designed to measure the participants' social sensitivity level. We measured the participants' level of social sensitivity by measuring their RTs in this probe detection task after they had experienced one of our four experimental conditions.

As described in Fig. 1, a central fixation cross was first presented on the computer display for 500 ms. After this fixation cross, a female face conveying a neutral expression was shown for 500 ms. Then, the blank display was presented for 300 ms, after which one of two arrow sign targets ( $\leftarrow$  or  $\rightarrow$ ) was randomly presented for 500 ms. The signs were randomly presented in one of three positions, which matched the original position of the eye, nose, or mouth of the face image (Amir et al., 2009). For 1000 ms after the arrow sign was presented, the participants were asked to press (on the keyboard), as quickly as possible, the correct key ( $\leftarrow$  or  $\rightarrow$ ) as a valid reaction. Three practice trials were performed in order to ensure that the participants understood all the

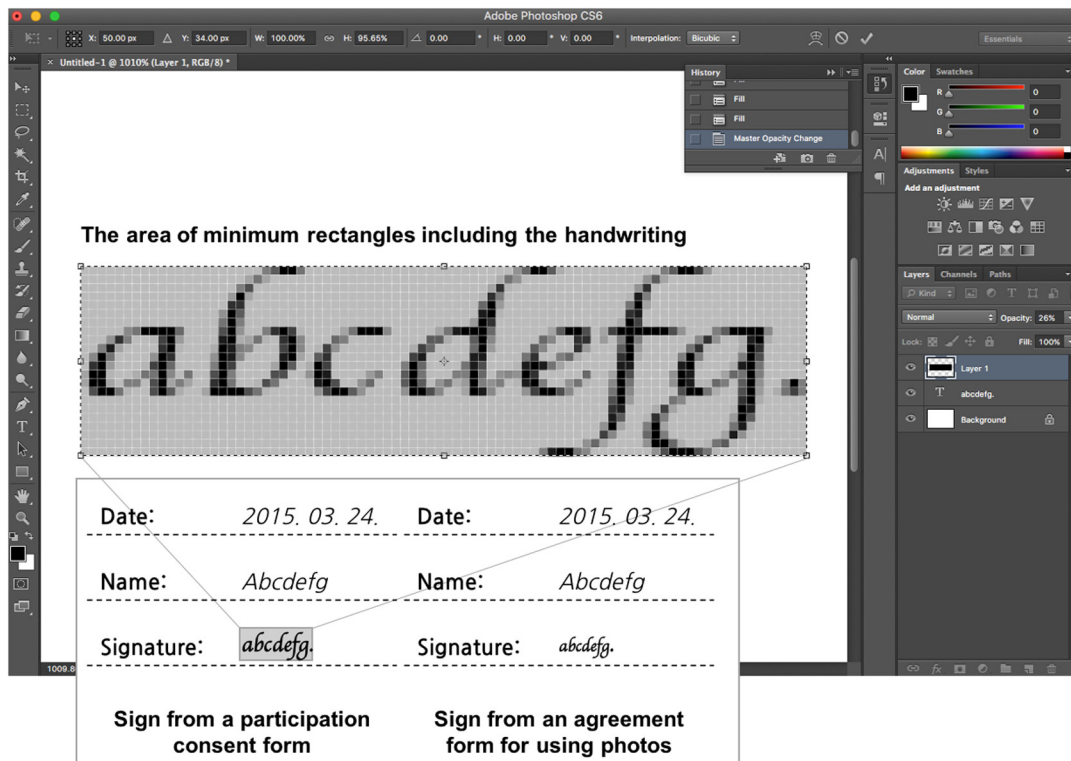


**Fig. 1.** The procedure of the probe detection task in the current study. The stimuli were created using Matlab software on a PC. To protect the portrait rights of a person who provides her face image, one of the sample illustrated images of a female face is presented here.

instructions. After the practice trials, the participants performed three main trials: in one trial, the arrow was presented in the same position as that of the eye, in another, it was presented in the same position as that of the nose, and in the other, it was presented in the same position as that of the mouth.

### 2.2.2. Self-esteem

To measure the participants' level of self-esteem, we also referred to the concepts of embodied cognition in relation to handwriting, specifically focusing on signature size (Mailhos, Buunk, & Cabana, 2016; Rudman, Dohn, & Fairchild, 2007). According to the findings in this



**Fig. 2.** The example image of measuring the size of individuals' signature before and after the whole the process of this experiment. To protect privacy of all participants, a sample name and signature is presented here.

area, in the case of people with low self-esteem, there will be a decrease in signature size before and after they are exposed to a priming stimulus (Rudman et al., 2007; Zweigenhaft & Marlowe, 1973).

Based on these findings, we predicted that in accordance with their own experience, in the case of the participants who took and shared selfies, there would be a decrease in signature size due to a decrease in self-esteem. Therefore, to measure participants' self-esteem, we scanned their written signature on papers at a resolution of 300 dpi. Next, using the Adobe Photoshop CS6 program, we measured the size of their signature, which was defined by the area of minimum rectangles including the handwriting and used it as the baseline of the participants' level of self-esteem (Fig. 2).

### 2.3. Procedure

The entire experimental procedure is shown in Fig. 3. Upon arriving at the laboratory, we informed the participants about the details of the study and asked them to sign a written consent form. At this point, we first collected a signature of the participants in order to use it as the baseline for assessing self-esteem level before they experienced the context of the selfie. Next, we encouraged the participants to take a photo of themselves (i.e., a selfie) or a cup, using their smartphone. Then, we asked some participants to post the photo on their favorite social media platform (e.g., Facebook, Twitter, and Line), and we asked the remaining participants, who were assigned to the control condition, to save the photo on their smartphone. After they had completed this task, in order to compare the size of the participants' pre-task signature to that of their post-task signature, we asked them to sign again, but this time, on an agreement form for using photos in this study. Immediately thereafter, we asked the participants to perform the probe detection task on a desktop computer. At the end of all the tasks, we conducted a post-experimental inquiry for a manipulation check and the participants were thanked and debriefed.

## 3. Results

The analyses were based on the data collected from the 78 participants (male = 27, female = 51), despite the effort to recruit the balanced number of male and female participants. We believe that this was the case because women are more likely to use social media and enjoy selfies (Oldmeadow et al., 2013). However, no significant gender effects, including simple effect and interaction effects, were observed for

social sensitivity and self-esteem. Table 2 summarizes the overall descriptive statistics in this study.

### 3.1. Social sensitivity

All the participants had correct and valid target reactions; therefore, there was no data elimination based on this issue. The results concerning social sensitivity, indicated by RTs, are shown in Fig. 4. We measured the participants' social sensitivity by their RTs, which were recorded from the onset of the probe until the time they pressed the arrow button, and these RTs were analyzed using a  $2 \times 2$  ANOVA according to each target position.

In the case of the eye target position, the main effect of photographed subject was significant,  $F(1, 74) = 26.29, p < 0.001, \eta^2 = 0.26$ ; however, the main effect of sharing behavior was not statistically significant. The participants in the selfie condition ( $M = 419.34, SD = 83.87$ ) judged the direction of the target arrow significantly faster than those who were in the cup photo condition ( $M = 516.53, SD = 89.74$ ). Additionally, an interaction effect between the photographed subject and sharing behavior conditions was statistically significant,  $F(1, 74) = 6.31, p = 0.01, \eta^2 = 0.08$ . A post-hoc simple effect test of the interaction between the photographed subject and sharing behavior showed that the simple effect of sharing behavior was only significant in the selfie condition,  $t(36) = 2.36, p = 0.02$ . To elaborate, the participants became more socially sensitive when they posted their selfie on social media ( $M = 389.00, SD = 84.68$ ) rather than when they merely saved their photo on their smartphone ( $M = 449.68, SD = 73.12$ ).

In the case of the target position of the nose, only the main effect of photographed subject was significant,  $F(1, 74) = 6.58, p = 0.01, \eta^2 = 0.08$ , with a larger difference being observed between the cup photo condition ( $M = 492.70, SD = 98.70$ ) and the selfie condition ( $M = 433.81, SD = 103.16$ ). However, there was no significant main effect of sharing behavior, nor was there an interaction between photographed subject and sharing behavior. Likewise, in the case of the target position of the mouth, only the main effect of photographed subject was significant,  $F(1, 74) = 9.69, p < 0.001, \eta^2 = 0.12$ , with a greater difference being observed between the cup photo condition ( $M = 516.55, SD = 104.29$ ) and the selfie condition ( $M = 433.92, SD = 99.44$ ). There was no significant main effect for sharing behavior, nor was there an interaction between photographed subject and sharing behavior.

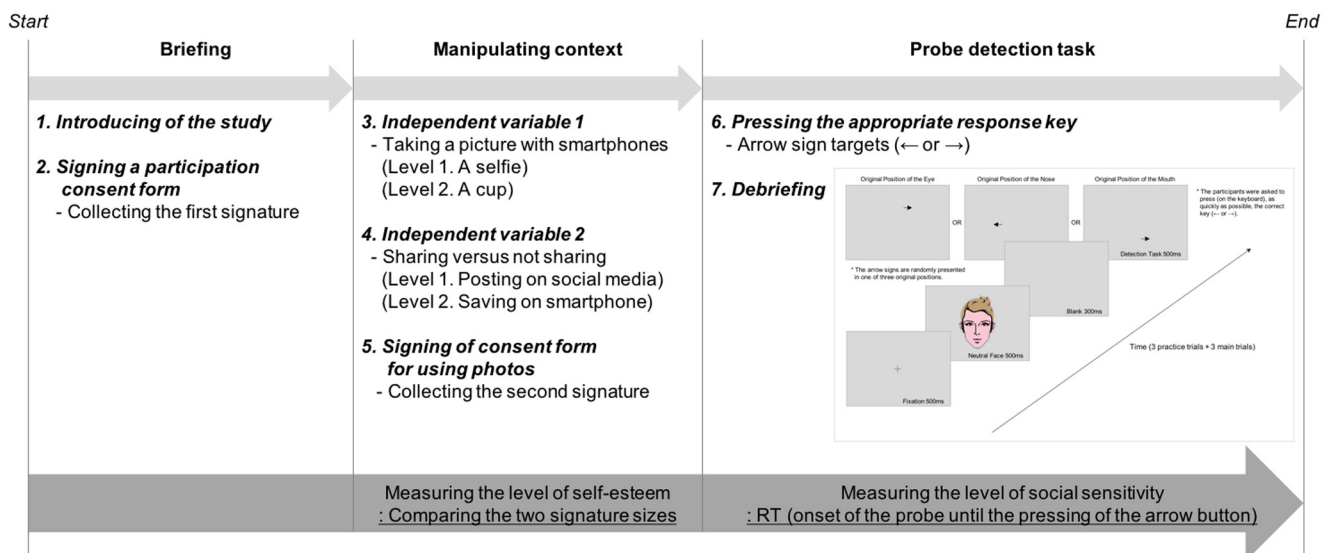


Fig. 3. The procedure of the current study. In two different phases of our study, we measured self-esteem and social sensitivity, using participants' signature size and RT, respectively.

**Table 2**  
Details of descriptive statistics for each variable.

	Taking a picture of a cup		Taking a selfie	
	Saving (N = 21)	Posting (N = 19)	Saving (N = 19)	Posting (N = 19)
Reaction time (ms)	M (SD)	M (SD)	M (SD)	M (SD)
Eye	499.71 (91.22)	535.11 (86.65)	449.68 (73.12)	389.00 (83.87)
Nose	500.95 (104.35)	483.58 (94.02)	439.21 (61.36)	428.42 (129.77)
Mouth	513.00 (94.62)	520.47 (116.56)	437.16 (100.51)	450.68 (100.64)
Signature size (cm <sup>2</sup> )	M (SD)	M (SD)	M (SD)	M (SD)
Before size	2.47 (1.91)	3.55 (3.58)	3.29 (2.95)	2.86 (1.98)
After size	2.27 (1.44)	2.99 (2.96)	2.31 (2.02)	2.59 (1.88)

3.2. Self-esteem

The results concerning self-esteem, which we assessed based on changes in the size of the participants' signature, are shown in Fig. 5. A two-way ANOVA was conducted to examine the decrease in individuals' self-esteem level. This ANOVA revealed only a significant interaction effect of decrease in signature size,  $F(1, 74) = 7.03, p = 0.01, \eta^2 = 0.09$ . There were no significant main effects for photographed subject and sharing behavior.

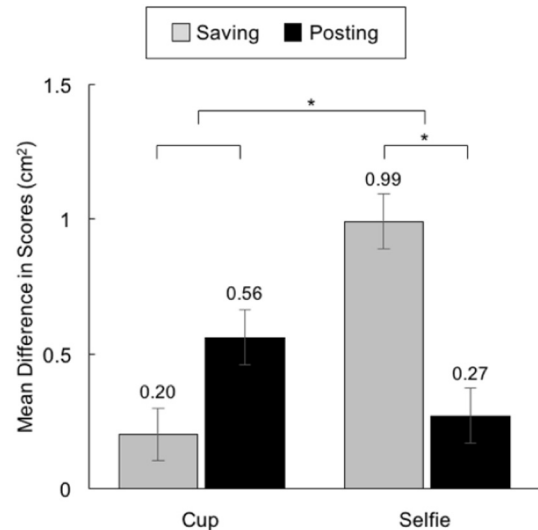
Also, a post-hoc simple effect test of the interaction between photographed subject and sharing behavior showed that the simple effect of sharing behavior was significant only in the selfie condition,  $t(36) = 2.20, p = 0.04$ . To elaborate, participants' signature size significantly decreased when they were merely saving the photo ( $M = 0.99, SD = 1.29$ ) rather than when they were posting their selfie on social media ( $M = 0.27, SD = 0.59$ ), suggesting that the participants who merely saved their selfie demonstrated a lower level of self-esteem than those who, after having taken their selfie, posted it on social media. However, this posting-related recovery of self-esteem was not observed in the cup condition.

4. Discussion

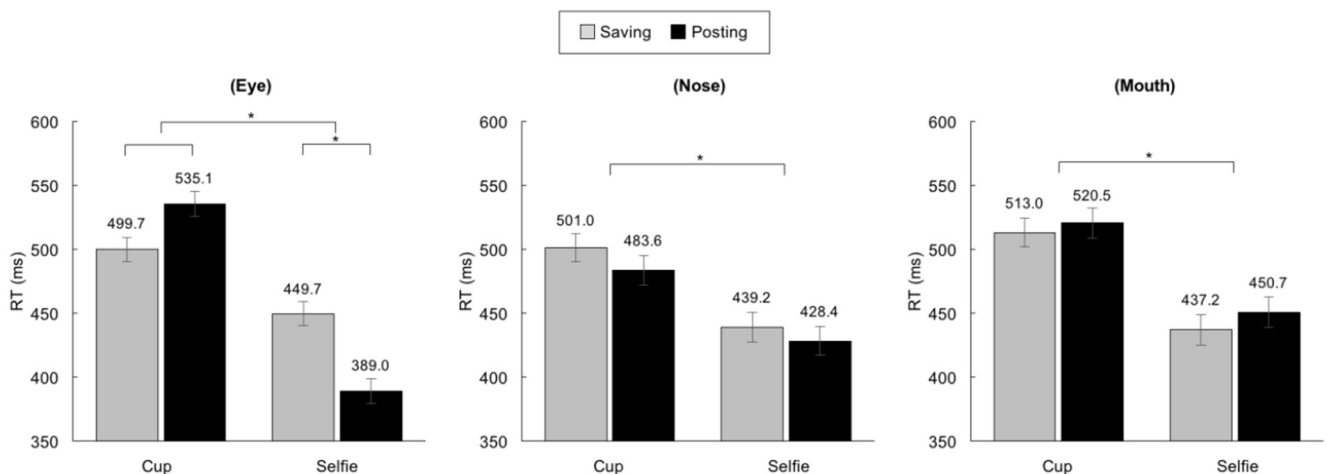
Even in the past, people took a picture and kept it for various reasons to record and remember. Today is different. This significant phenomenon of the selfie is wide-spread in everyday context. Especially, "millennials", reaching young adulthood in the early 21st century, take a lot of selfies and share them with others whenever they want (Halpern, Valenzuela, & Katz, 2016). However, most people just conclude that the main reason for the popularity of the selfie results from the advance

of technology like smart-devices and various social media platforms. Although it is true that the technology helps to create environment for people to take and share pictures as easy as clicking a mouse, we believe that this factor cannot be a sufficient condition for explaining the reason of the popularity.

To answer the question on what does say about selfies and people who take and post them actively, in this study, we attempted to



**Fig. 5.** Self-esteem results. The decrease in signature size before and after sharing behavior is plotted against the photographed subjects. The error bars indicate the standard error of the mean.



**Fig. 4.** Social sensitivity results. We plotted RTs against the photographed subjects and positions of the arrows. The error bars indicate the standard error of the mean.

examine “changes” and “effects” after taking the selfies and posting it on social media, not just to investigate a psychological breakdown of characteristics among people who enjoy posting selfies online. We found that the formation of self-concept and the life of individuals who take and share selfies could be affected by their online activities like selfies. These findings support the previous studies that the selfie is an action where various social motives (aspects of social comparison) are reflected and individuals are influenced by psychological impacts (formation of self-awareness and self-concept) as consequences of that behavior.

#### 4.1. Social sensitivity and selfie

With regard to social sensitivity, we showed that people could become more socially sensitive after taking and sharing their selfies. People present themselves on various social media platforms to strengthen their own self-concept, and they also become more sensitive to others' posts and comments (Farahani et al., 2011; Oldmeadow et al., 2013). Based on the results of the study, we proposed that taking and sharing a selfie has a positive effect on an individual's level of social sensitivity. Additionally, we showed that when a target probe was presented in the position of the eye of a face image, the participants' RTs were much faster than when the target probe was presented in the position of the nose or mouth. Given the importance of eyes in social interaction (Emery, 2000), the faster RT in the eye region than the other regions supports our claim that the probe detection task reflects social sensitivity (Langton, Watt, & Bruce, 2000).

#### 4.2. Self-esteem and selfie

Another interesting result concerns the participants' self-esteem level, which was measured on the basis of whether there was a decrease in signature size before and after they had experienced the context of the selfie. Our results suggest that merely saving selfies on a smartphone rather than posting them on social media has a more negative effect on people's self-esteem level. Walther's study (1996) and more recent research on OSA theory illustrate that selective forms of self-presentation, especially positive forms of presentation on social media, generally enhance individuals' self-esteem (Gonzales & Hancock, 2011). In our present study, however, because participants were required to take a selfie rather than a natural one that they would typically take as well as there was no self-promotional content (i.e., the photo was not taken at a famous tourist site or with famous peoples), they generally reported a decrease in self-esteem after taking a selfie.

Nevertheless, the participants who were in the condition requiring them to post their selfie on social media interestingly reported a smaller decrease in self-esteem level than participants who were in the condition requiring them to merely save their selfie. One speculation is that the participants who posted their own selfie on social media engaged in a self-promotional act, because they could have a chance to choose only the aspects they would like to emphasize and this would positively affect participants' level of self-esteem. Thus, we expect that this finding could provide new insight to explore further on how people interact, perceive, and are influenced by their selfies in the context of social computing and technology mediated environments.

#### 4.3. Limitations and future research

In this study, we have attempted to emphasize (1) a suggestion about a new way of addressing previous limitations of self-reported measurements and (2) academic implications as an alternative of absent issues from experimental studies to reveal causality – both of which were suggested by prior studies on selfies. In spite of these implications, the current study also has several limitations.

First of all, the participants were asked to take and share a selfie involuntarily not for their individual purpose in the experiment. It means that the physical forms of the behavior related to a selfie, are much the same as usual, but the meanings and intention of photo taking could be different from the real context. In fact, there are numerous variations of a selfie about why and when people take and upload a selfie in our life.

Also, it is possible that the participants could have already their own certain tendency in social style or gender differences before participating in our experiment. To address these limitations in our study, the impacts of the selfie should be investigated further not only in an actual and variety of real-life context but also over a longitudinal period. For the purpose of creating an earlier case for new fields of research on selfies, therefore, we expect that a lot of new research questions to be suggested through this study.

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