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IMPACT OF SOCIAL INFLUENCE AND USERS' PERCEPTION OF COOLNESS ON SMARTWATCH BEHAVIOR

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We explored the motives behind switching one's smartwatch, focusing on 2 divergent motivations that relate to social influence and the mobile and visible nature of these watches. Our findings and a review of related work indicated that the social motive for switching a smartwatch was coolness, that is, distinguishing oneself from others, because owning the latest model of smartwatch is a way to demonstrate having ample financial resources. The perceived benefit of switching one's smartwatch was associated more with coolness and the identity formation process, and less with actual utility or social influence. Further, the effects of similarity avoidance based on smartwatch purchasing intention were mediated by the effect of identity formation. Our findings may shed light on the nature of smartwatch uses and the motives that drive smartwatch users' choice to upgrade their devices.

Keywords: smartwatch, coolness, social influence, user behavior, purchasing motivation, switching behavior.

Despite the huge growth in sales of smartwatches (Shin & Biocca, 2017b), consumers' upgrading behavior in relation to these devices has not yet received much attention in the literature. People tend to replace their existing smartwatch with a new one even when the watch they own is in good working condition

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(Shin, An, & Kim, 2016), which cannot be called a rational act (Park, Kim, Shon, & Shim, 2013). Irrationality in upgrading one's smartwatch is not necessarily surprising given that humans are so irrational that their irrational behavior can be reliably predicted (Shin, 2014). The predictability of human irrationality can be explained by the social functions of irrational behaviors, mainly through accounts that explain why a certain behavior exists. Humans' seemingly irrational behavior involves the use of specific functions to solve recurrent problems of survival and reproduction, especially in social environments (Calvo-Porral & Levy-Mangin, 2015).

To explore the unique behavior of upgrading a smartwatch, we discuss the phenomenon of and present logical explanations for why perceived usefulness (PU) grounded in rational decision making may not be a predictor of behavior in the case of upgrading a smartwatch, although social influence (SI) can be a predictor. We formed the following research questions to guide this study:

Research Question 1: What are the motivations of users who switch their smartwatch?

Research Question 2: How do social motives (e.g., social influence) influence the motivation to switch?

Research Question 3: How are the perceived benefits of switching one's smartwatch related to identity formation and perception of coolness?

We distinguish between SI and similarity avoidance, with the aim of explaining why the latter can be used to predict smartwatch upgrading. In examining predictors of this behavior, we sought to reveal the associations between upgrade intention and perceived similarity avoidance in smartwatch use. We also examined the dissociation between smartwatch upgrade intention and the original watch's PU, along with perceived SI in relation to the upgraded device.

Literature Review

Purchasing a smartwatch every 2 to 3 years is an unnecessary cost. In costly signaling theory (Miller, 2000), it is suggested that individuals often waste their resources to impress others. The latest models of smartwatch are expensive and can serve as signals of having material resources because they generally embody improved functions, increased device properties, and advanced fashionable style, which can help owners signal their intellectual superiority. Furthermore, the distinctiveness of a smartwatch is related to mobility and visibility of use (Rahim, Safin, Kheng, Abas, & Ali, 2016); users of smartwatches nearly always take their devices with them wherever they go, so that others can easily observe their possession of this device. This contrasts with the use of notebook computers, which are not always carried or used in a way that is visible to others. The visibility of the smartwatch provides individuals with a means of signaling

their resources. Costly signaling behaviors are generated within the domain of competition, when individuals are faced with limited resources or the need to compete for potential mates, and when this domain is activated, individuals are typically motivated to distinguish themselves from others. If upgrading a smartwatch is a costly signaling behavior, it can be inferred that the motive for upgrading one of these watches is to distinguish oneself from others (Tseng & Lo, 2011). To be distinct, individuals need to avoid similarity with others, and because being distinct involves being visible to others, individuals must necessarily show themselves off to others.

As smartwatch users frequently switch and upgrade their devices, and because we believed that this behavioral tendency could hardly be explained as rational decision making grounded in PU, our first hypothesis was as follows:

Hypothesis 1: Smartwatch upgrade intention will not be associated with individuals' perception of usefulness.

Kim, Shin, and Park (2015) examined how users perceive *coolness*, and defined this as being autonomous in an appropriate way. Users feel cool when given innovative technological products with new features, such as curved displays, wearables, and smart glasses (Kim et al., 2015). These cool devices invoke conscious acknowledgment by observers of the technology's "hipness" by triggering the coolness heuristic with its novelty and innovativeness, which ultimately produces positive user perceptions and experiences (Shin & Chung, 2017). Sundar, Tamul, and Wu (2014) theorized a socially constructed multi-dimensional user-based judgment consisting of four factors: *attractiveness*, defined as providing pleasure or delight, especially in appearance or manner; *originality*, which is the quality of being novel or unusual; *subcultural appeal*, defined as a cultural group within a larger culture that has beliefs or interests that vary from those of the larger culture; and *utility*, which is the state of being useful, profitable, or beneficial.

SI motivates smartwatch users to replace their device even when the device that they own is still usable, and involves two aspects: distinctness from others and assimilation with others. For the owner to connect with others, his or her smartwatch does not necessarily have to be up-to-date, but up-to-date models can help their owners to signal that they have ample resources. This means that the social motive for upgrading one's smartwatch will be so as to not assimilate with others. The SI of smartwatch use will not be associated with users' smartwatch upgrade intention; rather, the social motive for upgrading a smartwatch will be distinctness. Thus, we formed the following hypothesis:

Hypothesis 2: Smartwatch upgrade intention will be associated with the use of the product for similarity avoidance, which, in turn, will be associated with using the product to express the user's uniqueness.

Method

Participants

For this study, we recruited 336 participants (167 men and 169 women) from a survey pool managed by a Korean research firm. The age of the participants ranged from 26 to 36 years ($M = 31.12$, $SD = 1.93$); 34% were students and 66% were nonstudents; 186 were married and 150 were not married; and 61% had a university-level qualification, whereas 39% had a lower level of education. In terms of annual income, six earned over US$140,000, 10 earned US$130,000–139,999, 20 earned US$120,000–129,999, 38 earned US$110,000–119,999, 32 earned US$100,000–109,999, 10 earned US$90,000–99,999, 22 earned US$80,000–89,999, 18 earned US$70,000–79,999, 19 earned US$60,000–69,999, 11 earned US$50,000–59,999, 20 earned US$40,000–49,999, and 130 earned under US$40,000. All participants were of Korean ethnicity, and the survey was administered in the Korean language.

Procedure and Data Analysis

A link to the survey website was sent via email, and the participants completed the survey either online or via their smartwatch, depending on their preference, between January and May 2016. They were given US$5 as compensation.

We used the services of a professional marketing firm that specializes in survey development, data collection, analysis, and reporting; this is because the specific topic of smartwatch purchase and use made it necessary to use such a firm to ensure the quality of the data. Over the 5-month period that the survey was conducted, 798 smartwatch users viewed the website, and 356 survey forms were submitted. Of these, 20 were excluded because of incomplete answers, leaving 336 usable responses (valid response rate = 42%). In addition, the researchers placed mobile calls to 200 smartwatch users and collected a further 88 usable responses. Although this could have presented an issue of data aggregation because of the different collection methods that were used, we determined that it was necessary to interview users by telephone given that the nature of the study was to investigate smartwatch users' experiences. To control for country-specific effects, only residents of Korea were surveyed. Surveying this sample population yielded statistical results that are generalizable to the entire Korean user population because all respondents had used a smartwatch for at least 3 months, which is a sufficient period of time to establish reliable perceptions and opinions regarding the service. In addition, this sample is an actual representation of the entire Korean user population based on comparisons of the demographic data. A chi-square test for goodness of fit revealed that there was no significant difference in market shares in this sample and in the Korean market ($\chi^2 = 9.73$, $df = 3$, $p < .005$). For the data analysis, PASW Statistics 18 was used.

Measures

All the items were measured using a 7-point Likert-type scale (1 = *strongly disagree* to 7 = *strongly agree*).

Switching intention. Switching intention was measured with four statements from Shin and Biocca (2017a; Cronbach's alpha = .79): "I will keep using my smartwatch until it stops working," (reverse coded) "Because I have become accustomed to my current smartwatch, I don't want to replace it with a newer model," (reverse coded) "I plan to replace my smartwatch when a new, better model is introduced," and "Whenever a new model is introduced, I will replace my smartwatch with the latest model."

Perceived usefulness. PU was measured with the following three statements (Cronbach's alpha = .81): "Using a smartwatch is useful," "Using a smartwatch helps me to save time and effort," and "Using a smartwatch enhances my efficiency at work." These statements were selected from items the authors had used in a previous study (Shin, Biocca, & Choo, 2013).

Social influence. SI was measured with four statements from Shin and Kim (2015; Cronbach's alpha = .78): "The people I like use a smartwatch," "Friends or colleagues around me use a smartwatch," "Most people in the group that I belong to (school, company, or community) use a smartwatch," and "Most people around the world use a smartwatch." We avoided words such as "should" that might have implied injunctive norms that tell individuals what is approved or disapproved of, because the goal was to identify descriptive norms that inform people of what is typically done. Following this method produces consistent results relating to SI on individual behavior (Shin & Kim, 2015).

Coolness. Coolness was measured with four statements (Cronbach's alpha = .91) selected from the coolness subscale of a consumer uniqueness scale developed by the first author and colleagues (Kim et al., 2015), with the statements modified to fit the context of switching a smartwatch: "This smartwatch is stylish. This device is hot," "This smartwatch is sexy and hip. People who use this device are unique," "This smartwatch makes people who use it different from other people," and "This smartwatch is original and cool."

Identity formation. Identity formation was measured with three statements (Cronbach's alpha = .91) selected from the creative choice counter conformity subscale of a consumer uniqueness scale developed by Tian, Bearden, and Hunter (2001): "An important reason for using a smartwatch is to express my individuality," "I use my smartwatch as a way to create a more distinctive personal image," and "I use my smartwatch to create a style that is all my own."

Confounders. To control for the effects of possible confounders, information pertaining to gender, age, income, and marital status was captured at the end of the survey; annual income was broken down into 12 levels. We included marital status as a possible confounder because individuals who are not married may

have stronger motives for signaling prestige than do those who are married (Shin, Lee, & Hwang, 2017). Data on level of education were collected for reference purposes but not analyzed in the study model.

Results

Descriptive Summary and Preliminary Analyses

All variables were normally distributed, and the absolute values for skewness and kurtosis were less than 1.00. Gender had no effect on smartwatch upgrade intention, SI, or identity formation, although it did affect similarity avoidance: men (M = 3.31, SD = 1.35) expressed a significantly stronger desire to avoid similarity than women did (M = 2.93, SD = 1.26), t = 2.64, $p < .008$. Marital status did not affect any of the variables. There was a significant correlation of smartwatch upgrade intention with similarity avoidance (r = .19, $p < .001$) and with identity formation (r = .24, $p < .001$), but not with PU (r = .06, $p < .31$) or with SI (r = .01, $p < .80$). There was a significantly positive correlation between PU and SI (r = .36, $p < .001$) but a significantly negative correlation between PU and similarity avoidance (r = -.12, $p < .02$). Details relating to these results are summarized in Table 1.

Main Analyses

We conducted a multiple linear regression to examine the associations between smartwatch upgrade intention and four predictors, controlling for gender, marital status, income, and age. Income was collected as ordinal values but treated as intervals, and we dummy-coded the discrete variables of gender (male/female = 0/1) and marital status (not married/married = 0/1). The continuous measures were mean-centered. Multicollinearity was not identified; the variance inflation factor for all variables was less than 1.32. The residuals around the regression line were constant, which indicates the absence of heteroscedasticity, that is, a collection of random variables.

We had predicted that smartwatch upgrade intention would not be associated with PU or SI but would, instead, be associated with similarity avoidance and identity formation. As expected, smartwatch upgrade intention was not significantly associated with either PU (β = .04, p = .48) or SI (β = .01, p = .82), and nonsignificant associations were found when smartwatch upgrade intention was regressed with either similarity avoidance alone (β = .05, p = .39) or identity formation alone (β = .02, p = .67). Because SI and PU were significantly correlated (r = .36, $p < .001$) with upgrade intention, we tested for a possible significant interaction between the two, but none was identified (β = .05, p = .21).

Table 1. *Summary of Study Results*

Hypothesis	Result
Smartwatch upgrade intention will not be associated with perceived usefulness (PU) and social influence (SI) but will be associated with similarity avoidance and identity formation.	Smartwatch upgrade intention was not significantly associated with either PU or SI.
Identity formation will be related to a motivation to upgrade smartwatches.	Identity formation was positively and significantly associated with smartwatch upgrade intention ($\beta = .16$, $p < .01$).
Identity formation will be related to similarity avoidance in predicting smartwatch upgrade intention.	The association between similarity avoidance and smartwatch upgrade intention was mediated by identity formation. The role of identity formation shows that there is an interaction between predictor and mediator.
There will be possible interaction effects of similarity avoidance and identity formation on smartwatch upgrade intention.	We clustered homogeneous subgroups among the observed units using k-means clustering, a partitioning method in which all clusters are found simultaneously. First, the similarity avoidance and identity formation scores were standardized (t score, $M = 50$, $SD = 10$). To determine the number of clusters, iteration was performed by calculating the sum of squared errors for the distances between each point of a cluster and its cluster centroid (i.e., the mean of the cluster), varying the number of clusters from 2 to 15. The iteration results indicated that a four-cluster solution was optimal.

Discussion

Consumers often replace their smartwatch even when the device that they already own is still usable, and this frequent upgrading is not a rational action. To explore irrationality, in this study we focused on social motives and the visible nature of the smartwatch. Human beings are extremely social by nature, which leads them to be heavily influenced in their behavior by their social environment (Shin & Kim, 2015). SI often makes individuals disregard rationality when making decisions; depending on the social situation, behavior is either assimilated with or distinguished from others (Tseng & Lo, 2011).

We have presented empirical evidence that smartwatch upgrade intention is not associated with a rational predictor (i.e., PU) but rather with a social predictor. We found that a stronger tendency to avoid similarity with others in the various

uses of smartwatches is associated with a stronger tendency to upgrade the device. A similar pattern was observed with regard to identity formation and smartwatch upgrade intention. Individuals who generally used their smartwatch as a means of identity formation had a stronger tendency to upgrade their device to an up-to-date model. This finding is inconsistent with those reported in previous studies on technology adoption, in which PU and SI were found to be predictors of smartwatch adoption (e.g., Chun, Lee, & Kim, 2012).

This inconsistency can be explained in relation to the difference between *adoption*, which refers to acquiring something that an individual does not currently have, and *upgrading*, which refers to replacing something that an individual already possesses with a cooler version. This difference seems trivial, but the underlying motives behind adoption and upgrading are significantly different. Adoption motives may include both assimilation and the desire to distinguish oneself from others, and can differ depending on the stage at which adoption is performed. The motive for adopting innovations at an early stage may be to distinguish oneself from others, whereas the motive for later adoption may be to assimilate into a group; in either case, individuals may decide to adopt an innovation when they perceive it to be useful. With specific regard to SI, because the majority of people in South Korea already use a smartwatch (Shin, 2015), the motive behind adopting this device could be to assimilate with others, which is consistent with our finding that SI is associated with smartwatch adoption intention.

In contrast, however, the motive for upgrading, especially smartwatch upgrading, could be limited solely to distinguishing oneself from others. Even when the device is still usable, smartwatches are typically upgraded every 2 to 3 years, which is nearly twice as often as similar computing devices, such as notebook computers (Kim & Shin, 2015). This can be considered wasting resources, which is obviously irrational in terms of a proximate account, but upgrading can provide new smartwatch functions that help individuals in a positive way. As suggested by costly signaling theory (Miller, 2000), wasting resources can be a signal to others of possessing ample resources, which is consistent with the findings we obtained in this study. Specifically, we found that the degree of similarity avoidance was positively associated with smartwatch upgrade intention, and this association was mediated by identity formation; however, PU and SI were not associated with upgrade intention.

This study is one of only a few in which the motives behind upgrading a smartwatch have been explored. Most prior researchers examined the various uses of the smartwatch from the perspective of technology adoption (e.g., Kim et al., 2015; Shin, 2015), but the motives underlying the decision to upgrade and to adopt can be fundamentally different. Distinguishing between the social motives of assimilation and distinction has significant implications for studies

on technology use; thus, researchers on technology use should consider both the nature of users and the type of technology. As we found in this study, humans have divergent social motives, including assimilating themselves with or distinguishing themselves from others. The motive of technology adoption and upgrading is similar: connecting with or showing off to others. Thus, the diverse uses of technology can activate different social motives.

This study has significant theoretical implications for research on uses of new technology, especially regarding technology adoption. Previously, scholars in this field tended to modify or extend existing models by incorporating additional variables (see, e.g., Chun et al., 2012; Park et al., 2013). However, we found that PU, which is one key variable affecting technology acceptance, may not always be a predictor of the individual's use of the technology. The various psychological processes that underlie technology uses and the nature of the medium—in our study, the smartwatch—influence technology acceptance. We propose that researchers who study the uses of technology should focus on technology acceptance, and should consider both the nature of the medium and the psychological processes that underlie the individual's uses of the technology.

This study also has practical implications for both consumers and the technology industry. Consumers need to be aware of the true motives that underlie their upgrading decisions in order to benefit from these; they may believe that they have decided to upgrade their device because of improved functions or performance when their actual motive could be a wish to express themselves to others. Identity formation can be used strategically to achieve social goals, such as finding a mate or achieving status, but upgrading technological devices needs to be done with awareness that the decision to upgrade is not wholly motivated by considerations of functionality or device performance (Calvo-Porral & Levy-Mangin, 2015). The technology industry may use our study findings to promote upgrading by focusing on similarity avoidance and identity formation, rather than SI. Furthermore, when focusing on device functionality or performance, we recommend that promotion strategies be linked with the motives (i.e., similarity avoidance and identity formation) for upgrading.

This study has several weaknesses that should be addressed in future research. First, the results obtained may not be representative of other population groups. Furthermore, the validity of our conclusions can be challenged by questioning the observed correlations among the variables. Possible interactions among the variables may attenuate our study findings, given the limited sample size, although the experiments, methods, and models can be used in future studies with a fair measure of certainty. Future researchers should sample a larger population and achieve more generalizable results, while focusing on both interactive smart features and different user groups to examine how perceived activity is affected by different demographic variables.

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