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Users' adoption of mobile applications: Product type and message framing's moderating effect☆

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ABSTRACT

Downloading mobile applications (apps) becomes an indispensable part of smartphone users' life. In turn, users' apps evaluation is crucial for app service providers. This study develops a conceptual framework to outline users' behavior regarding apps that draws on signaling theory and regulatory focus theory. The study conducts two experiments involving 476 participants to test the research hypotheses. The results suggest that app type and perceived risk moderate reputation source's influence on users' attitude toward using apps. Message framing moderates the effect of app type on perceived usefulness of the app. This research advances signaling theory and message framing in explaining users' adoption and evaluation of mobile apps.

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1. Introduction

In 2007, Apple launches the first mobile phone integrating personal data and touch panel functions. The use of smartphones grows significantly, and consumer behavior in information searches and interpersonal communication changes dramatically. In early 2013, smartphone shipments first outnumbered traditional mobile phone sales. Smartphone global shipments amount to more than 900 million, with the smartphone accounting for more than 50% of all mobile phones (IDC, 2013).

With the fast-growing smartphone market, app services bring enormous business opportunities and change users' lives. By 2013, users could choose from among more than one million apps available in the two major mobile-app platforms (App Store and Google Play) (Ownby, 2013). PortioResearch (2013) forecasts that app downloads will grow to exceed 200 billion per year by the end of 2017, and that revenues in 2017 will reach \$63.5 billion US. The mobile app market is becoming increasingly competitive and contributing to information overload because users have access to a sometimes-overwhelming amount of product information when making a purchase decision. Resolving the information overload that might inhibit users' information-processing ability is crucial to business practice (Chen, Shang, & Kao, 2009; Hsu & Liao, 2014). Akerlof (1970) points out that

signals are one way to resolve problems relevant to asymmetric information (e.g., warranties, advertising, brand). Although a service provider can choose a broad range of signals to display quality, those potential signals influence on users' decision-making remains unknown.

Although several studies in the marketing literature concern reputation (Chen & Xie, 2008), messaging strategy (Drolet, Williams, & Lau-Gesk, 2007), and product type (Feiereisen, Wong, & Broderick, 2013; Kronrod, Grinstein, & Wathieu, 2012), research on how those factors affect consumers' attitude or on the possible consequences in the smartphone-based app context is scarce. This study aims to achieve a better understanding of effective outcomes through app design and messaging strategy. To do so, the study identifies the factors that influence users' attitude toward app use following the theoretical grounds of reputation, product type, and perceived risk from information economics, message framing from regulatory focus theory, and perceived usefulness and attitude from the technology acceptance model (TAM).

2. Hypotheses

2.1. Reputation source and product type

Signaling theory points out that to resolve problems resulting from asymmetric information in a transaction, one party can invest in a signal that reveals a piece of relevant information to the other party (Connelly, Certo, Ireland, & Reutzel, 2011; Lee, Ko, & Megehee, 2015; Spence, 1973). In the online environment, accessible cues such as rating scores help buyers choose the proper transaction party or product (Shen et al., 2011). The utilitarian and hedonic values users associate with a product may be the key factors that influence consumers' purchase

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decision (Kronrod et al., 2012; Sloot, Verhoef, & Franses, 2005). Hedonic products with enjoyable benefits may evoke consumers' pleasure-oriented consumption to pursue the entertainment value (Liu, 2006; Strahilevitz, 1999). Top charts displaying the most popular app downloads might create a herding effect to enhance users' attitude toward hedonic apps (Chen, 2008; Duan, Gu, & Whinston, 2008).

In contrast, apps with practical benefits regarding necessary functions might evoke consumers' need for diagnostic signals such as rating scores showing users' rating of an app's function (Filiari, 2015). Thus, rating scores containing users' reviews of the true experience of using an app might affect consumers' attitude toward the app more than a top rating signal does.

H1. App type moderates app reputation's effect on users' attitude toward using the app. High rating-score reputation's effect is greater for utilitarian apps; top charts reputation's effect is greater for hedonic apps.

2.2. Reputation source and perceived risk

Online app downloading exists in a virtual marketplace in which sellers and buyers do not meet in person to assess the physical attributes and quality of the transactional objects. Monetary cost and dysfunctional loss critically affect consumers' perceived risk in online purchasing (Walter, Gupta, & Su, 2006). The amount at stake and the buyer's subjective assessment of the possibility of an unfavorable consequence determine the risk level in any purchase decision (Dowling & Staelin, 1994; Grewal, Gotlieb, & Marmorstein, 1994). A shopping procurement with high monetary and psychological risk might motivate consumers to search diagnostic reputation signals. Rating scores from other users' experience might have a greater effect for consumers in high perceived-risk situations. In contrast, consumers might perceive low risk of monetary loss when procuring a free app; consumers might rely on the app popularity in top charts.

H2. Perceived risk moderates app reputation's effect on users' attitude toward using the app. High-rating score reputation's effect is greater when users are in high perceived-risk situations. Top-charts reputation's effect is greater when users are in low perceived-risk situations.

2.3. Attitude and intention to use

Both TAM and the theory of reasoned action (TRA) support the positive relationship between an individual's attitude and behavioral intention. People are more likely to perform behaviors regarding an object they evaluate positively (Ajzen & Fishbein, 1977; Davis, Bagozzi, & Warshaw, 1989).

H3. Attitude toward using the app positively affects the user's intention to use the app.

2.4. Product type and regulatory focus messaging

Regulatory focus theory proposes two motivational orientations that affect people's principles of pursuing a goal: promotional and prevention self-regulatory orientations (Higgins, 1997). Previous literature suggests that regulatory focus influences consumer judgments. By fitting the consumer regulatory focus and goals, consumers feel that the information is correct if the information and focus are consistent (Aaker & Lee, 2001; Cesario, Grant, & Higgins, 2004; Palazon & Delgado-Ballester, 2013).

Regulatory fit refers to the degree to which individuals' adopted goal-pursuit strategies are congruent with their status of regulatory orientation, which in turn affects individuals' decision making, attitude,

and behavior changes (Baek & Reid, 2013; Chernev, 2004; Higgins, 2005). Consumers in a promotion-focused situation are more likely to overestimate hedonic and attractive product attributes because such features are proximate to their regulatory goals of achieving pleasure and maximizing positive outcomes. On the other side, consumers primed in prevention-focused value typically overestimate reliability and utilitarian attributes because those product features are consistent with their regulatory goals of ensuring against failure and minimizing negative outcomes (Baek & Reid, 2013; Chernev, 2004; Ryu, Suk, Yoon, & Park, 2014).

H4. Regulatory focus framing moderates app type's effect on users' perceived usefulness. Promotion message's effect is greater for hedonic apps than for utilitarian apps; in contrast, a prevention message's effect is greater for utilitarian apps.

2.5. Product type and positive mood

Positive mood theory posits that individuals' positive mood affects thoughts organization and access, which may also shape decision-making. People in a positive mood are more likely to access a network of positive material from their cognitive system (Djamasbi, Strong, & Dishaw, 2010; Lewis & Haviland-Jones, 2000). Ahn, Ryu, and Han (2007) find that online shoppers have a positive attitude when they feel the features surrounding shopping are more playful. Liao and Tsou (2009) also show that playfulness has a considerable positive effect on user attitude toward using the service. Users' state of mind may affect their perception of an object's value; for example, users are more likely to perceive the enjoyable value and flow experience from hedonic apps than the functional value from utilitarian apps; this perception influences their attitude toward using the app.

H5. Positive mood moderates app type's effect on users' attitude toward using the app. Positive mood effect is greater on users' attitude toward using the hedonic app than the utilitarian app.

2.6. Perceived usefulness and attitude

TAM confirms perceived usefulness' positive effect on new technology acceptance (e.g., Lai & Li, 2007; Pikkarainen, Pikkarainen, Karjaluoto, & Pahlila, 2004). If users perceive that using an app is beneficial to them, their attitude toward using the app should be positive.

H6. Perceived usefulness positively affects users' attitude toward using the app.

3. Method

3.1. Participants and procedure

The research tests the main moderating effects appearing in the research model through two experiments. Most Internet users are in their mid-20s and hold a bachelor's degree (TWNIC, 2010); thus, using a student sample is appropriate. Study 1 is a 2 (high rating scores vs. top charts) \times 2 (hedonic vs. utilitarian type) \times 2 (low vs. high perceived risk) between-subjects design experiment conducted on the website. 234 students participate in the experiment, which randomly assigns the participants to one treatment. Study 2 involves a 2 (prevention framing vs. promotion framing) \times 2 (hedonic vs. utilitarian type) \times 2 (low vs. high positive mood) between-subjects design experiment; the program randomly assigns each of the 242 undergraduate and graduate students to one of the eight conditions.

To enhance the virtual reality of choosing apps in the app marketplace, the experiment takes place in a public computer room. Personal computers (PCs) collect and present the stimuli and questionnaires.

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