

The Impact of the Mere Presence of a Free Version in the Freemium Strategy: Bidirectional Effects of a Free Version on Consumers' Preference for the Premium Option

프리미엄(freemium) 전략에서의 무료 버전(free version)의 존재가
프리미엄 버전(premium version)에 대한 선택에 미치는 이중적 효과

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ABSTRACT

In the freemium strategy, a free, basic version of a product is offered to promote a non-free premium version. Although the freemium strategy has become prevalent in the market, little research has investigated its impact on individuals' purchase decisions. This article focuses on how consumers are influenced by the mere presence of a free version (i.e., without engaging in an actual trial) when evaluating and choosing between premium products. Eight studies (N = 1,012) provide converging evidence that when consumers consider a premium purchase, the presence of a feature-limited free version can either increase or decrease the choice share of the target premium product (i.e., the product with a free version) relative to a standalone premium product (i.e., without a free version). The direction of the influence depends on whether the free version serves primarily as a quality assurance cue or a uniqueness dilution cue, which is ultimately determined by the perceived risk associated with the decision: high (low) perceived risk leads consumers to construe the presence of a free version as a quality assurance cue (uniqueness dilution cue), thereby increasing (decreasing) the preference for the target premium product over a standalone premium product. Consequently, we find that the mere presence of a free version acts in the company's favor when consumers perceive a high decision risk, regardless of whether the risk is heightened by decision characteristics (use of regular income vs. windfall money for the purchase), contextual differences (negative vs. positive mood), or individual differences (prevention focus vs. promotion focus, and low vs. high need for uniqueness). The bidirectional effects occur only when the basic version is offered free of charge, not when it is offered for a lower price. Theoretical and managerial implications of the findings are discussed.

Keywords: Freemium, Free Option, Zero Price, Pretrial Influences, Signaling, Decoy, Context Effects

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초 록

프리미엄(freemium)은 기능이 제한된 무료 제품을 고급화된 프리미엄(premium) 유료 제품과 함께 제공함으로써 소비자들이 유료 제품을 구매하도록 유도하는 전략이다. 프리미엄(freemium) 전략은 특히 스마트폰 애플리케이션, 온라인 구매와 같이 디지털 시장에서 소비자를 매혹시키는 수단으로 빈번히 이용되어 왔지만, 아직까지 무료제품의 제공이 소비자의 유료 제품 구매선택에 어떠한 영향을 미치는지에 대한 연구가 부족하다. 본 연구는 제품 사용 및 시연 여부와 무관하게 무료 제품의 존재 자체가 유료 제품 평가 및 선택에 어떠한 영향을 미치는가를 입증하고자 한다.

본 연구는 총 일곱 개의 실험을 통해 기능이 제한된 무료 제품을 제공하는 프리미엄(freemium) 전략을 택한 기업과 무료 제품을 제공하지 않는 경쟁사를 비교하여 무료 제품의 존재 자체가 소비자의 유료 제품 구매 의사에 어떠한 영향을 미치는가를 살펴보았다. 프리미엄(freemium) 전략의 일부로 무료 제품을 제공하는 것은 프리미엄(premium) 유료 제품 구매 의사에 양(兩)방향적, 즉, 긍정적 및 부정적 효과를 미쳤다. 이 효과의 방향성은 의사 결정 과정에서 지각된 위험 유무에 따라 결정되며, 소비자는 지각된 위험에 따라 무료 제품의 존재를 다르게 해석하였다. 인지된 위험이 높을 경우, 소비자는 무료 제품 제공을 기업이 프리미엄(premium) 유료 제품 품질을 보장하는 것으로 해석, 높은 구매 의사를 보였다. 반면, 인지된 위험이 낮을 경우, 무료 제품은 프리미엄(premium) 제품의 희소성을 감소시켜 유료 제품 구매에 부정적인 효과를 유발하였다. 따라서 본 연구는 프리미엄(freemium) 전략이 의사 결정 상황, 맥락, 개인차 변인에 따라 인지된 위험이 높아질 경우에 한해 긍정적인 효과를 거둘 수 있음을 입증하였다. 덧붙여 이 효과는 기능이 제한된 제품을 무료로 제공할 경우에 한해 나타나며, 단순히 유료 제품 대비 낮은 가격으로 제공하는 경우에는 효과가 사라진다는 점에서 프리미엄(freemium) 전략의 특수성을 시사한다.

핵심주제어: 프리미엄(freemium) 전략, 무료 제품, 사전 효과, 신호 효과, 맥락효과, 유인 효과

“In the new economy, free becomes inevitable”

- Chris Anderson

People often find it hard to resist free things. Marketers frequently provide consumers with free trials or samples of their products to promote sales. A similar but distinct promotion strategy is the “freemium,” in which a company offers a *free* version of a product (with limited features) to promote its non-free *premium* version with full features (Anderson 2009). For example, Dropbox offers both a free service with limited online data storage and support and a paid (non-free) version with extended storage and extra support. In fact, the freemium strategy is one of the most prevalent business trends in digital goods (Athey, Mobius, and Pal 2017), particularly for smartphone applications and games (Kumar 2014; Liu, Au, and Choi 2014). The freemium strategy accounted for more than 90% of Google Play’s total revenue in 2014 (App Annie 2014) and is widely used in many industries including music (Athey et al. 2017; Wagner, Benlian, and Hess 2014), news (Lambrecht and Misra 2017), and social media (Oh, Animesh, and Pisonneault 2016; Vock, van Dolen, and de Ruyter 2013).

Prior academic research on the freemium strategy has focused on assessing its impact on revenue and profitability at an aggregate level (e.g., Arora, Hofstede, and Mahajan 2017; Cheng and Tang 2010; Deng, Lambrecht, and Liu 2020; Lambrecht and Misra 2017; Li, Jain, and Kannan 2019; Liu, et al. 2014; Pauwels and Weiss 2008; Shi, Zhang, and Srinivasan 2019) and determining the conversion rate at which free-version users become paying customers of the premium version (e.g., Hamari, Hanner, and Koivisto 2017; Kumar 2014; Lambrecht and Misra 2017; Pattabhiramaiah, Sriram, and Manchanda 2019). We contend, however, that the impact of the freemium strategy may vary with individual differences and contextual factors in ways that are obscured

at the aggregate level. Variation at the individual level has been overlooked by prior research, but if present, it represents an opportunity for finer-tuned promotion strategies. Although there is evidence that a *zero-price* product induces positive affect toward the product itself (and thus is disproportionately chosen; Shampanier, Mazar, and Ariely 2007), it is unclear whether and how the presence of a free version influences consumers’ choice of the *associated*, paid premium version.

In addition, the smartphone application market is rife with products that offer free versions. Consumers in the real world are not likely to try all available free versions before purchasing a non-free premium product (Arora et al. 2017). Hence, it is both theoretically and practically important to understand how consumers are influenced by the *mere presence* of a free version (i.e., without engaging in an actual trial) when choosing between premium products. Although the literature on context effects (e.g., Huber, Payne, and Puto 1982; Kwak 2005; Park and Kim 2005; Simonson 1989) suggests that the inclusion of a free version in a choice set may influence the choice share of the associated premium version, no research has investigated how the *mere presence* of a free version may influence perceptions and choices among consumers who are seeking a premium product (i.e., the free version is not part of the choice set).

The present research aims to fill these gaps. Specifically, we investigate the impact of the mere presence of a free, basic version, offered as part of the freemium strategy, on consumers’ choice of the associated premium version (the “target product”) over a similar premium product that does not have a free version (a “standalone product”). We focus on the most prevalent kind of free offering in the software industry: a feature-limited free version with no time limit, which is different from a free trial (in which consumers can

use the regular version of the product for free for a limited time; see Arora et al. 2017). We propose and demonstrate that the mere presence of a free version can either increase or decrease the choice share of the target product; the direction of the effect depends on several contextual and individual difference variables such as the source of money, regulatory focus, need for uniqueness, and mood. We show that the bidirectional effects are driven by two possible inferences—quality assurance vs. uniqueness dilution—that consumers may draw from the presence of a free version; the relative salience of these inferences is governed by consumers’ perception of the risks associated with the purchase decision.

Our research makes three primary contributions to the literature. First, we establish a novel finding: the mere presence of a free, basic version has bidirectional effects on consumers’ choice of the target product (i.e., the paid premium version) over a similar standalone premium product. In doing so, we extend the literature on both the freemium strategy and zero-price effects. Second, we contribute to the literature on context effects by demonstrating that the mere presence of a free version has a different effect than the presence of versions that are cheaper but not free. Lastly, our findings suggest a wider role of four individual and contextual difference variables (regulatory focus, mood, source of money, and uniqueness-seeking motivation) that have not been previously considered in the context of the freemium strategy.

I . Theoretical Background

1. The Positive and Negative Influences of a Free Version in the Freemium Strategy

Since the term “freemium” was first introduced by Anderson (2009), many academic researchers have paid a great deal of attention to the impact of the freemium strategy on revenue and profits. Researchers have conducted empirical investigations in various industries, particularly in digital goods such as mobile apps (Arora et al. 2017; Chen et al. 2017; Liu et al. 2014; Runge et al. 2016), digital music (Athey et al. 2017; Wagner et al. Hess 2014), digital news (Lambrecht and Misra 2017; Olsen and Slovoll 2018), digital TV (Foubert and Gijbrecchts 2016), OTT service (Hoang and Kauffman 2018), and cloud storage (Lee, Kumar, and Gupta 2017). Some studies showed a positive effect (e.g., Liu et al. 2014), but others found a negative effect (e.g., Arora et al. 2017). We posit that these ostensibly conflicting results reflect diverging influences of a free version. On the one hand, a free version may increase consumers’ awareness of the target premium product (i.e., the product with a free version) and allow consumers to experience part of the premium version before making a purchase decision. On the other hand, a free version may decrease demand through cannibalization—that is, consumers who would have been willing to purchase the premium version in the absence of a free version end up sticking with the free version. Consequently, research has investigated the rate at which users of free versions convert to the associated premium versions, and some studies have documented factors, such as the premium price level, that influence the conversion rate (Hamari et al. 2017; Kumar 2014; Lambrecht

and Misra 2017; Pattabhiramaiah et al. 2019).

As noted already, there are many situations in which consumers are unlikely to try out a free version before purchasing the associated premium product. The smartphone application industry features over 5 million applications, with another 4,000 introduced daily.¹ It would be impossible for consumers to try all (or even most) of the free versions. Apps also come with a risk of malware (D’Orazio 2013; Perez 2013), so consumers who perceive this threat may not necessarily try products even if they are free. Under such circumstances, the freemium strategy comes with a low risk of cannibalization, but its effect on consumers’ purchase decisions is unclear. Therefore, it is both theoretically and practically important to understand whether, how, and why consumers are influenced by the *mere presence* of a free version (i.e., without engaging in an actual trial) when choosing between the target product and a standalone product.

Suppose that a person is trying to choose between two non-free products for purchase: the target product has an associated free version, while the standalone product does not. Even if the person is not interested in trying out the free version, does its mere presence still influence his or her choice? It might seem most intuitive that the free version would increase the person’s likelihood of choosing the target product, but we propose, building on prior literature, that it could have both positive and negative (i.e., “bidirectional”) effects, with the direction depending on the type of inference drawn from the existence of a free version.

On one hand, extant research on the signaling effect (e.g., Janakiraman, Syrdal, and Freling 2016; Kirmani and Rao 2000) suggests that marketing cues signal a product’s performance quality. For example, a product warranty and money-back guarantee can signal high product quality and

reliability (Janakiraman et al. 2016; Moorthy and Srinivasan 1995; Ostrom and Iacobucci 1998; Wiener 1985). That is, consumers perceive that a product with a warranty or money-back guarantee must be high quality and thus pose little purchase risk (Boulding and Kirmani 1993; Perry and Perry 1972; Price and Dawar 2002; Shimp and Bearden 1982). A similar signaling effect can occur with free trial opportunities (Marks and Kamins 1988; Seetharaman 2004; Villas-Boas 2004); companies offering warranties or free trials are likely to have confidence in their product quality and be motivated to maintain that quality to increase the conversion rate (or at least to avoid receiving warranty claims; Spence 1977). Based on these findings, it seems reasonable to predict that the presence of a free version can act as a quality-assurance cue for the target product, which in turn should increase consumers’ preference for the target product over a standalone product.

Other research suggests that the presence of a free version may hurt consumers’ perception of the premium version. People generally perceive scarce items as inherently desirable (Lynn 1991; Lynn and Snyder 2002), and some consumers have a strong desire to be distinct from others and thus focus on the uniqueness of owning a product when choosing between options (“the need for uniqueness”; Park and Yi 2019; Snyder and Fromkin 1977; Tian, Bearden, and Hunter 2001). Thus, limiting the availability of a product can increase consumers’ purchase intentions via enhancing the perceived uniqueness of owning the product (e.g., Gierl and Huettl 2010; Jang et al. 2015; Lee and Ahn 2012; van Herpen, Pieters, and Zeelenberg 2004; Wu et al. 2012). Given that the presence of a free version makes the target product (or at least some portion of it) more widely available, the freemium strategy is likely to dilute the perceived

1. <http://www.statista.com/topics/1729/app-stores/>

uniqueness of owning the target product, thereby decreasing consumers' preference for it.

In sum, the literature suggests that the mere presence of a free version can increase consumers' preference for the target product by providing a quality assurance cue and can decrease consumers' preference for the target by diluting uniqueness. These bidirectional effects need not be mutually exclusive; rather, we argue that the direction depends on which implication is more salient. Our studies identify conditions that influence the relative salience of the implications and thereby cause the freemium strategy to have an overall positive or negative effect on the choice share of the target product.

2. Determinants of the Direction of Influence

People often make decisions based on anticipated emotions (e.g., Loewenstein and Schkade 1999; Zeelenberg et al. 1996). In particular, people who face a risky decision often aim to minimize anticipated regret over a negative decision outcome (e.g., Cooke et al. 2001; Kwak and Park 2012; Park and Park 2013; Shiv and Huber 2000; Simonson 1992; Zeelenberg et al. 1996; Zeelenberg and Pieters 1999). In such cases, people tend to prefer higher-quality products over lower-quality (and usually cheaper) alternatives; if the choice options appear similar in quality, people who perceive a high decision risk are likely to choose the option with greater quality *assurance*. This suggests that consumers' perception of decision risk may be an important determinant of the relative salience of the quality-assurance versus uniqueness-dilution implications of the presence of a free version.

When choosing between a target product (i.e., the product with a free version) and a standalone product, consumers

with high perceived decision risk are likely to infer the quality-assuring implication from the presence of a free version and thus prefer the target product. When the perceived risk is low, however, quality assurance is no longer a concern, and people turn to the uniqueness-dilution implication of the free version, which should attenuate or even outweigh the quality-assurance implication and decrease the choice share of the target product.

The aforementioned discussion suggests that the direction of the impact of a free version will depend on consumers' perceived decision risk. Therefore, in the present research, we propose that the mere presence of a free version can either increase or decrease consumers' preference for the target product over a standalone product, and the direction of the effect depends on factors that theoretically affect perceived risk. Consumer decision risk comprises several components including financial risk, performance risk, and socio-psychological risk (Jacoby and Kaplan 1972). Further, the *perception* of these risks is influenced not only by the decision task characteristics (e.g., price level) but also by contextual and individual difference variables. We test our proposition with several types of variables: a decision task characteristic that affects the financial risk (money source: regular income vs. windfall gain; Arkes et al. 1994), two individual differences in chronic motivational orientation (regulatory focus: Higgins 1997; need for uniqueness: Tian et al. 2001), and one contextual variable (mood state: Isen 2001; Loewenstein et al. 2001), as explained in the next paragraphs.

Regulatory focus

Consumers vary in their chronic sensitivity to decision risks, and this individual difference is well captured by regulatory focus, a general motivational orientation in self-regulation (prevention vs. promotion focus; Higgins 1997; Higgins and

Spiegel 2004). The impact of regulatory focus on judgments and decision making has been documented extensively in the literature (e.g., Aaker and Lee 2001; Park, Ryu, and Park 2015; Pham and Chang 2010; Shine, Park, and Wyer 2007; Yeo and Park 2006; Yoon, Sarial-Abi, Gürhan-Canli 2012). A promotion focus is characterized by a heightened sensitivity to the positive outcomes of behavior, whereas a prevention focus is characterized by a heightened sensitivity to negative outcomes (e.g., Crowe and Higgins 1997; Higgins and Tykocinski 1992; Markman, Baldwin, and Maddox 2005). Thus, promotion-focused people are more likely to take a risk that might maximize a positive decision consequence, whereas prevention-focused people are more likely to avoid a risk that might lead to a negative decision outcome. For example, when a brand extension is dissimilar (vs. similar) to the parent brand's category, consumers perceive a high performance risk (i.e., uncertainty as to whether the extension's quality is comparable to that of the parent brand) and give a poorer evaluation of the extension (Aaker and Keller 1990; Keller 2003), and this effect is more pronounced for prevention-focused individuals than for promotion-focused individuals (Yeo and Park 2006).

In the present research context, prevention-focused individuals are likely to prefer a safer choice, such as an option with greater quality assurance. This might direct their attention to the quality-assurance implication (vs. uniqueness-dilution implication) of the presence of a free version, thereby increasing their choice of the target product over the standalone product. By contrast, promotion-focused individuals may be less concerned about quality assurance and instead may focus on the uniqueness-dilution implication of a free version, which will consequently decrease their choice of the target product. In sum, we expect that the choice share of the target product will be higher among consumers with a prevention focus than among consumers with a

promotion focus.

Mood

Mood is likely to affect consumers' perceived decision risk. Ample research suggests that a positive mood decreases perceived risk (e.g., Johnson and Tversky 1983; Fedorikhin and Cole 2004; Nygren, Isen, Taylor, and Dulin 1996) by increasing the accessibility and weight of the positive aspects of a risky option (e.g., Isen 1997; Loewenstein et al. 2001; Nygren et al. 1996; Yuen and Lee 2003; Tamir and Robinson 2007). In line with this finding, a positive mood increases the perceived likelihood of future positive events and decreases the perceived likelihood of negative events (MacLeod and Campbell 1992), and also increases risk-taking behaviors (Forgas 1995; Johnson and Tversky 1983; Kugler, Connolly, and Ordonez 2012; Isen 1997; Nguyen and Noussair 2014). By contrast, a negative mood heightens avoidance of potentially undesirable outcomes (e.g., Craver 2001) and thus leads to risk-averse, loss-minimizing behaviors (Jorgensen 1998; Kramer and Weber 2012; Lee and Ahn 2012). A negative mood also increases attention to potentially threatening information, thus amplifying the perceived risk associated with objects and decisions (Mogg and Bradley 1998; Williams et al. 1997). Finally, research on the affect-as-information hypothesis shows that people often interpret their own positive mood as a signal that the situation is benign, whereas they interpret a negative mood as a sign of a potential problem that warrants more vigilant processing (Schwarz 1990).

The above findings suggest that consumers in a negative mood might primarily focus on the quality-assuring implication of a free version and thus prefer the target product over the standalone product. By contrast, those in a positive mood are likely to focus on the uniqueness-dilution implication of a free version and thus not prefer the target product (or even

prefer the standalone product over the target product). Therefore, we expect that consumers in a negative mood will be more likely to choose the target product than consumers in a positive mood.

Need for uniqueness

Several studies have found a strong positive correlation between people's need for uniqueness and their risk-taking tendency (e.g., Schumpe, Herzberg and Erb 2016; Tepper and Hoyle 1996). Also, consumers with a high (vs. low) need for uniqueness are more (less) likely to pursue risk-taking behaviors such as the choice of atypical options (Cantarella and Desrichard 2020) and are less (more) prone to loss aversion in risky choices (Simonson and Nowlis 2000). These findings suggest that people with a high (vs. low) need for uniqueness tend to perceive a lower (higher) decision risk. As we already noted, many consumers have a strong desire to be distinct from others and thus focus on the uniqueness of owning a product when choosing between options (Snyder and Fromkin 1977; Tian et al. 2001), so the presence of a free version may decrease the perceived uniqueness of the target product. We expect that the uniqueness-dilution implication of the free version will be more salient among consumers with a high need for uniqueness, so consumers with a high need for uniqueness should be less likely to choose the target product than consumers with a low need for uniqueness.

Money source

The source of money for a purchase (regular income vs. windfall gain) affects the perceived financial risk associated with the purchase decision. The literature shows that windfall money increases individuals' risk-taking tendency (e.g., Arkes et al. 1994; Clark 2002) by reducing the financial risk and pain of payment (e.g., Soster, Gershoff,

and Bearden 2014). Similarly, in the *house money effect* (Thaler and Johnson 1990), people take more financial risks with profits that are obtained easily/unexpectedly. These prior findings suggest that people are less likely to think about the risks associated with a purchase decision when they use windfall money than when they use their regular income. In the present context, people who are using their regular income are more likely to attend to the quality-assurance implication of a free version and choose the target product, whereas those who are using windfall money should focus more on the uniqueness-dilution implication and choose the standalone product.

In sum, we hypothesize:

- H1: The mere presence of a free version increases the choice of the target product over a standalone product (i.e., a non-free premium option without a free version) among consumers with a prevention focus, whereas this effect diminishes or even reverses among those with a promotion focus.*
- H2: The mere presence of a free version increases the choice of the target product over a standalone product among consumers in a negative mood, whereas this effect diminishes or even reverses among those in a positive mood.*
- H3: The mere presence of a free version increases the choice of the target product over a standalone product among consumers with a low need for uniqueness, whereas this effect diminishes or even reverses among those with a high need for uniqueness.*
- H4: The mere presence of a free version increases the choice of the target product over a standalone product when consumers are spending their regular income, whereas this effect diminishes or even reverses when consumers are spending windfall gains.*

Three sets of studies (eight studies in total) confirm the above hypotheses, documenting the bidirectional influences of the mere presence of a free version. Table 1 summarizes the results. Studies 1a – 1c confirm the hypothesized role of individuals’ regulatory focus, mood, and need for uniqueness, respectively, on the effect of the mere presence of a free version on the choice between the target product and a standalone product (H1 – H3). In addition, studies 1b and 1c test the mediating roles of the quality-assurance and uniqueness-dilution implications. Studies 2a, 2b, a follow-up study, and 3 demonstrate that offering a free version is advantageous in standard purchase contexts but disadvantageous in windfall purchase contexts (H4) and that the results generalize over two different cultures (US and Korea). Study 3 also provides additional evidence for the mediation processes. Finally, study 4 tests the underlying assumption that the effect is limited to the mere presence of a *free* version; it does not extend to the presence of a *cheaper* version.

II. Stimulus Development Procedure

Prior to running the main studies, we took several steps to develop appropriate choice stimuli. First, we chose software categories for our experiments (specifically, smartphone camera applications, smartphone fitness applications, and anti-virus software packages) based on two considerations: (1) many brands in these categories do offer a free version with limited features, and (2) brands that adopt a freemium strategy often compete with others that have not adopted the strategy. Thus, our basic paradigm—a choice between one product with a free version (i.e., the target product) and another similar product without a free version (i.e., the standalone product)—should be familiar and realistic to most participants. Second, we conducted several pretests based on prior research (e.g., Rajagopal and Burnkrant 2009) to construct the choice stimuli with adult respondents recruited from Amazon MTurk. The pretest procedure was similar for all three software categories; we illustrate the

⟨Table 1⟩ Choice Share of Target Premium Product

	Stimuli	High perceived risk	Low perceived risk
Study 1a (prevention vs. promotion focus), N = 92	Fitness app	59.8%	38.2%
Study 1b (negative vs. positive mood), N = 62	Camera app	62.6%	34.8%
Study 1c (low vs. high need for uniqueness), N = 127	Antivirus software	70.8%	43.7%
Study 2a (standard vs. windfall), N = 120	Camera app	59.6%	38.6%
Study 2b (standard vs. windfall), N = 109	Camera app	58.3%	36.1%
Study 2 follow-up (standard vs. windfall), N = 169	Fitness app	65.5%	49.4%
Study 3 (standard vs. windfall), N = 117	Camera app	63.6%	45.2%
Study 4, N = 216	Antivirus software		
Free version (standard vs. windfall)		84.6%	64.7%
Cheaper version (standard vs. windfall)		53.3%	50.9%
Overall effect size (meta-analysis): $r = 0.207$ ($d = 0.423$), $Z = 6.459$, $p < .01$			

procedures for only the camera application for parsimony.

The first pretest confirmed that participants were neither extremely familiar nor extremely unfamiliar with camera applications. Ninety participants were asked to rate their frequency of use and knowledge level for camera applications on two 7-point scales (1 = not at all, 7 = very much). Participants reported moderate levels of both usage ($M = 4.30$) and product knowledge ($M = 4.23$; both means were not significantly different from midpoint 4, p 's $> .10$). The second pretest identified features that would be appropriate to include in a free vs. premium version of a camera application. We generated an initial list of features based on actual descriptions of camera applications available on Google Play and Appstore. Then, we presented the list to forty participants and asked them to rate the extent to which each feature was worth paying for on 7-point scales (1 = not at all, 7 = very much). Participants also selected the features from the list that would be typically found in free applications. As shown in table 2, this procedure yielded four “basic features” that are typical of free applications and six “extended features” that are worth paying for.

We used these ten features to develop the choice stimuli: two non-free camera application products and one free version that would be associated with one of the non-free products. The free version contained the four basic features. Both non-free products had the four basic features as well as four extended features. Two extended features were shared by the non-free products (“10x digital zoom” and “voice/remote shooting”), and the other two features were randomly selected from the remaining four extended features. Thus, each non-free product contained eight features: four basic features, two common extended features, and two unique extended features. In the main studies, we counterbalanced which non-free product was the target versus the standalone.

In the final stage of the pretest, thirty-seven participants were randomly assigned to one of the two non-free applications and were told that it was priced at \$0.99. Participants evaluated the application on four 7-point scale items (bad-good, unattractive-attractive, dislike-like, and unappealing-appealing; Cronbach $\alpha > .90$) and the appropriateness of the price on a 7-point scale (1 = inappropriate, 7 = appropriate). The results showed that the two non-free products were

〈Table 2〉 Pool of Features for Camera Applications

Basic Features	
	Frequency of being chosen as a typical free feature
1. User-friendly interface	55%
2. Various photo decoration tools	30%
3. Crop, straighten, rotate	58%
4. Color and brightness control	50%
Extended Features	
	Value rating (vs. midpoint 4)
5. 10x digital zoom	$M = 4.65$; $t(39) = 1.867$, $p = .069$
6. Voice/remote shooting	$M = 4.58$; $t(39) = 1.743$, $p = .089$
7. One-tap auto editing	$M = 4.63$; $t(39) = 2.298$, $p = .027$
8. High-speed shooting	$M = 4.90$; $t(39) = 3.030$, $p = .004$
9. Professional filters and effects	$M = 5.68$; $t(39) = 6.725$, $p < .001$
10. Anti-shake image stabilization	$M = 5.35$; $t(39) = 5.105$, $p < .001$

equally attractive ($M_A = 5.59$ vs. $M_B = 5.81$; $F(1, 35) = .482$, $p = .49$), and their prices were considered equally appropriate ($M_A = 6.00$ vs. $M_B = 6.17$; $F(1, 35) = .211$, $p = .65$). We concluded that the two non-free products were suitable choice stimuli for the main studies. Examples of the stimuli for all three product categories are shown in the appendix.

III. Studies 1A–1C: Individual Difference Variables

Studies 1a, 1b, and 1c test hypotheses 1, 2, and 3, respectively. Participants in all three studies chose between two non-free products; the target product offered a feature-limited free version, while the standalone product did not. Note that the two non-free products were pretested to be equally attractive and worth paying for; the only difference was the presence of a feature-limited free version. Also, we counterbalanced which non-free product had a free version. After participants chose between the target and standalone products, we measured participants' regulatory focus (study 1a), mood state (study 1b), and need for uniqueness (study 1c) to test the predicted bidirectional effects of the mere presence of a free version. Consistent with H1 – H3, we found that the mere presence of a free version increased the choice share of the target product among individuals for whom the decision risk was perceived to be higher (i.e., individuals with a prevention focus, negative mood, or low need for uniqueness). Studies 1b and 1c provide evidence of the mediating roles of the quality-assurance and uniqueness-dilution implications. Because the experimental procedure was very similar across the three studies, we report them together and note the relevant differences. For examples of the choice stimuli, see the appendix.

1. Method

Study 1a

One hundred one participants from Amazon MTurk ($M_{Age} = 39.3$, Male = 56.4%) participated for nominal compensation. The task involved a choice between the pretested fitness applications. Nine participants were excluded from analyses because they either failed to respond correctly to an attention check question (“If you are reading this question, please choose 2”; Oppenheimer, Meyvis, and Davidenko 2009) or did not own a smartphone. Participants chose between two non-free premium products (“A” and “B”); a free version was associated with only one of the products, counterbalanced between participants.

Participants were first asked to imagine that they were about to purchase a smartphone fitness application. They were also told that there might be a free application available with limited features, but regardless, they wanted to purchase a premium, paid application with full functionality. Then, participants were presented with two non-free fitness application products, A and B, both priced at \$1.99. One of the two (either A or B, counterbalanced) had a free version presented right next to the target product. Participants indicated which of the two non-free products (A or B) they would purchase, and they completed a regulatory focus assessment (RFQ questionnaire, 11 items on 5-point scales; Higgins et al. 2001).

Study 1b

Excluding participants who failed attention checks or did not own a smartphone, sixty-two participants from MTurk ($M_{Age} = 35.1$, Male = 56.5%) were randomly assigned to one of the two conditions (target product: A vs. B), as in study 1a. The procedure was identical to that of study 1a with

three modifications. First, for generalizability, the choice involved camera applications instead of fitness applications. Second, participants were asked how safe it felt to choose the target product as opposed to the standalone product (-5 = not at all safe, +5 = very safe). Finally, participants indicated their current mood on three 7-point scales (1 = unhappy/negative/bad, 7 = happy/positive/good; Cronbach's $\alpha = .97$).

Study 1c

One hundred twenty-seven participants from MTurk ($M_{Age} = 36.8$, Male = 55.1%) were randomly assigned to one of the two conditions (target product: A vs. B). Study 1c differed from study 1a in two aspects. First, for generalizability, the choice involved anti-virus software (priced at \$39.99) instead of camera applications (priced at \$1.99). Second, after making the choice, participants reported the extent to which they thought the non-free standalone product (as opposed to the non-free target product) was unique (-5 = not at all unique, +5 = very unique), and they completed the four-item avoidance-of-similarity scale developed by Tian et al. 2001 (see also Cheema and Kaikati 2010). We averaged participants' responses to create a composite index of participants' chronic need for uniqueness (Cronbach's $\alpha = .92$).

2. Results

We assessed the influence of each individual difference on the direction of the mere presence effect of a free version by comparing the choice share of the non-free target product

Study 1a

A composite index of regulatory focus was constructed by subtracting prevention scores ($M = 3.63$) from promotion scores ($M = 3.53$) such that a more positive number indicates

a stronger promotion focus (Cesario et al. 2004; Higgins et al. 2001). A binary logistic regression yielded a significant and negative coefficient of regulatory focus ($\beta = -.086$, $SE = .044$, $Wald(1) = 3.840$, $p = .050$). A spotlight analysis of this effect indicated that participants with a stronger prevention focus (below -1SD) were more likely to choose the target product (choice share of target: 59.8%), while those with a stronger promotion focus (above +1SD) were more likely to choose the standalone product (choice share of target: 38.2%). Thus, as hypothesized, the mere presence of a free version has a positive effect on the purchase of the target product among prevention-focused consumers, but the effect is negative among promotion-focused consumers. The results are consistent with our assumption that the bidirectional influences of the mere presence of a free version are a function of perceived decision risk.

Study 1b

A binary logistic regression analysis of participants' choice confirmed the hypothesized effect of mood ($\beta = -.427$, $SE = .216$, $Wald(1) = 3.883$, $p = .049$). A spotlight analysis indicated that participants in a negative mood (below -1SD) preferred the non-free target product (choice share of target: 62.6%), whereas participants in a positive mood (above +1SD) preferred the non-free standalone product (choice share of target: 34.8%), confirming H2. This result is consistent with our proposed mechanism: a negative mood increases participants' sensitivity to decision risk and thus leads participants to focus on the quality-assurance implication (rather than the uniqueness-dilution implication) of the free version. We confirmed this pathway by analyzing participants' perceived safeness. A mediation analysis using model 4 of PROCESS Macro (Hayes 2013) with 5,000 bootstrapped samples indicated that the impact of mood on choice was mediated by the safeness perception (95% CI [.097, .909]).

Study 1c

A binary logistic regression of participants' choice confirmed the hypothesized effect of the need for uniqueness ($\beta = -.657$, $SE = .240$, $Wald(1) = 7.496$, $p = .006$). A spotlight analysis indicated that participants with a low need for uniqueness (below $-1SD$) preferred the non-free target product (choice share of target: 70.8%), whereas participants with a high need for uniqueness (above $+1SD$) preferred the non-free standalone product (choice share of target: 43.7%), confirming H3. A mediation analysis using model 4 of PROCESS Macro (Hayes 2013) with 5,000 bootstrapped samples indicated that the choice was mediated by the perceived uniqueness of the non-free standalone product among participants with a high need for uniqueness (95% CI [-.353, -.008]).

3. Discussion

The first three studies showed that the mere presence of a free version can have a positive or negative effect on the choice of the non-free target product, and the direction of the effect depends on consumers' regulatory focus (H1; study 1a), mood (H2; study 1b), and need for uniqueness (H3; study 1c). That is, the positive mere presence effect of a free version can be attenuated or even reversed if participants are promotion-focused, if their mood is positive, or if they have a high need for uniqueness. Further, these differences are attributable to the relative salience of the quality-assurance and uniqueness-dilution implications of the presence of a free version. Together, studies 1a - 1c suggest that the level of perceived decision risk determines the direction of the effect of the freemium strategy, as we proposed. The next studies further confirm this proposition by manipulating the money source.

IV. Studies 2A And 2B: Windfall vs. Regular Money

Studies 2a and 2b tested our hypothesis concerning the impact of the money source (regular income vs. windfall gain) on the mere presence effect of a free version. We found that people are more (less) likely to choose the non-free target product when using their regular income (windfall gain) for the purchase, as predicted in H4 based on the different financial risks associated with spending each money source. We present the two studies together because they were identical with one exception: study 2a was conducted with participants in the US, and study 2b was conducted with participants in Korea.

1. Method

One hundred twenty respondents in the US from MTurk ($M_{Age} = 32.6$, Male = 67.0%) participated in study 2a, and 109 adults recruited from a national online panel in Korea ($M_{Age} = 28.6$, Male = 49.5%) participated in study 2b. In each study, participants were randomly assigned to either a standard-purchase or windfall-purchase condition and completed the camera application choice task from study 1b.

Studies 2a and 2b followed the experimental procedure of study 1b with one added manipulation: participants in the windfall-purchase condition were asked to imagine that they were buying a camera application with a free voucher they won from participating in an unrelated raffle, whereas those in the standard-purchase condition imagined that they were planning to buy an application with their own money. Then, all participants chose between two non-free camera applications; we used the same stimuli as in study 1b with minor adjustments, such as the monetary unit, for Korean participants. As in the previous studies, a free version was

offered for only one of the two products, counterbalanced between participants.

2. Results

Study 2a

As expected, the non-free target product was chosen by significantly more participants in the standard-purchase conditions (59.6%) than in the windfall-purchase conditions (38.6%; $\beta = -.855$, $SE = .383$, $Wald(1) = 4.978$, $p = .025$), confirming H4. Supplementary analyses indicated that the choice share in the windfall purchase conditions was marginally lower than the chance level ($\chi^2(1) = 2.965$, $p = .085$), whereas the choice share in the standard-purchase conditions was non-significantly higher than the chance level ($\chi^2(1) = 2.123$, $p = .145$).

Study 2b

The results aligned with those of study 2a. The non-free target product was chosen by significantly more participants in the standard-purchase conditions than in the windfall-purchase conditions (58.3% vs. 36.1%; $\beta = -.909$, $SE = .396$, $Wald(1) = 5.269$, $p = .022$). The choice share of the target product in the windfall-purchase conditions was significantly lower than the chance level ($\chi^2(1) = 4.738$, $p = .030$), whereas the choice share in the standard-purchase conditions was non-significantly higher than the chance level ($\chi^2(1) = 1.333$, $p = .248$).

3. Discussion

Both studies 2a and 2b found that the choice share of the target product was greater in a standard-purchase than in a windfall-purchase context, providing strong support for H4. Further, this difference generalized over participants from

two different countries.

Note, however, that the results of the supplementary analyses suggest that the difference seems to be driven primarily by the uniqueness-dilution implication of the presence of a free version in the windfall-purchase conditions (rather than by the quality-assurance implication in the standard-purchase conditions). We tested the robustness of this pattern in a replication study that used the procedure of study 2a with the fitness application stimuli instead of the camera application stimuli. We recruited US participants from MTurk ($N = 169$, $M_{Age} = 33.8$, $Male = 58.0\%$). As in studies 2a and 2b, the choice share of the non-free target product was greater in the standard-purchase conditions than in the windfall-purchase conditions (65.5% vs. 49.4%; $\beta = -.664$, $SE = .316$, $Wald(1) = 4.415$, $p = .036$). Unlike in the main studies, however, the choice share in the standard-purchase conditions was significantly higher than the chance level ($\chi^2(1) = 8.048$, $p < .01$), whereas the choice share in the windfall-purchase conditions was non-significantly lower than the chance level ($\chi^2(1) = .120$, $p = .914$). In other words, in the replication study, the difference in the choice shares between the two experimental conditions was driven primarily by the quality-assurance implication rather than the uniqueness-dilution implication of the presence of a free version.

To summarize, studies 2a, 2b, and the follow-up study consistently demonstrate that the choice share of the target product is greater in standard-purchase contexts than in windfall-purchase contexts. Further, the results of the supplementary analyses suggest that the difference may be driven by the quality-assurance implication, the uniqueness-dilution implication, or both. The results support our proposition that the presence of a free version has bidirectional influences; the direction depends on the perceived risk associated with the purchase decision.

V. Study 3: Anticipated Regret

In studies 2a, 2b, and the follow-up study, the relative salience of the quality-assurance versus uniqueness-dilution implications of the free version was theoretically governed by consumers' desire to choose a less risky option (i.e., a quality-assured option) in a high risk situation (i.e., the standard-purchase condition). The present study intends to provide additional evidence for this theorization. Prior research shows that anticipated regret over an outcome often leads to less risky decisions (e.g., Joesechs et al. 1992; Nordgren, van der Plight, and Harreveld 2007). We predicted and confirmed that consumers in the standard-purchase condition anticipated greater regret over choosing the standalone premium product than the target premium product, and anticipated regret mediated the effect of the money source on the choice share of the target product.

1. Method

One hundred seventeen participants recruited from MTurk ($M_{Age} = 31.8$, Male = 61.2%) were randomly assigned to either the windfall-purchase or standard-purchase condition and then were asked to choose between two non-free premium products ("A" and "B"; a free version being assigned with only one of the two products, counterbalanced). The experimental stimuli and procedures were identical to those of study 2a except that we added questions about participants' anticipated regret over purchasing each of the two non-free products (-5 = no regret, +5 = very much regret). We calculated net anticipated regret by subtracting regret over the standalone product from regret over the target product (Kwak and Park 2012; Park and Park 2013; Wong and Kwong 2007) such that a positive value indicates more regret over the target than the standalone, and a

negative value indicates the opposite.

2. Results

A binary logistic regression analysis confirmed the hypothesized influence of the money source on the mere presence effect of the free version: the non-free target product was chosen by significantly more participants in the standard-purchase conditions (63.6%) than in the windfall-purchase conditions (42.5%; $\beta = -.754$, $SE = .379$, $Wald(1) = 3.954$, $p = .047$). Supplementary analyses indicated that the choice share in the standard-purchase conditions was significantly higher than the chance level ($\chi^2(1) = 4.091$, $p = .043$), whereas the choice share in the windfall-purchase conditions was non-significantly lower than the chance level ($\chi^2(1) = .581$, $p = .446$).

An analysis of net anticipated regret as a function of the money source indicated that anticipated regret over choosing the standalone product exceeded regret over choosing the target product in the standard-purchase condition more than in the windfall-purchase condition ($M_{standard} = -1.18$ vs. $M_{windfall} = 0.23$; $F(1, 115) = 5.557$, $p = .020$). In line with our conceptualization, this pattern was primarily driven by a difference in anticipated regret over purchasing the standalone product ($M_{standard} = 4.53$ vs. $M_{windfall} = 3.32$; $F(1, 115) = 6.598$, $p = .011$), whereas there was no significant difference in anticipated regret over purchasing the target product ($M_{standard} = 3.35$ vs. $M_{windfall} = 3.55$; $F(1, 115) = .194$, $p = .66$). Further, a mediation analysis using Model 4 of the PROCESS Macro (Hayes 2013) with 5,000 bootstrapped samples revealed a significant indirect mediation by net anticipated regret (95% CI [-3.834, -.197]).

The results support our theorized mechanism for the bidirectional effects of the mere presence of a free version. Nevertheless, it remains unclear whether the bidirectional

effects are indeed idiosyncratic to the freemium strategy, as our theorization assumes. The next study addresses this important question by evaluating whether the effect is singular to situations in which the feature-limited version is free rather than low-priced.

VI. Study 4: Free Versus Cheaper Version

Study 4 provides additional evidence for the theorized mechanisms underlying the bidirectional effects of the freemium strategy. We argue that a free version both provides a quality-assurance cue and dilutes the uniqueness of the target product by allowing more consumers to enjoy a portion of it. These mechanisms should have an effect only in the presence of a free version, not in the presence of a low-priced version. The present study tested and confirmed this boundary condition, thereby providing support for our conceptualization.

1. Method

Two hundred forty participants recruited from MTurk ($M_{age} = 40.4$, Male = 56.0%) participated. They were randomly assigned to one of the four conditions of a 2 (money source: standard vs. windfall) x 2 (version type: free vs. cheaper) between-subjects design and then were asked to choose between two non-free premium products (“A” and “B”; a free version being assigned with only one of the two products, counterbalanced). Twenty-four participants were excluded from the analyses because they failed attention checks (the results were qualitatively the same when we included these participants).

The experimental procedure was identical to that of study

3 with two exceptions. First, participants chose between the anti-virus software packages from study 1c (instead of camera applications). Second, in the cheaper-version conditions, the target product was accompanied by a half-price version (\$19.95 instead of \$39.99) with limited features; the free-version conditions featured a free version with limited features, as in all other studies.

2. Results

Our conceptualization predicts that the money source affects the direction of the effect of the mere presence of a free version but not of a cheaper version. A logistic regression of the choice share of the non-free target product as a function of the money source (standard vs. windfall) and version type (free vs. cheaper) provided support for our prediction. In the free-version conditions, the choice share of the target product was greater in the standard-purchase condition than in the windfall-purchase condition (84.62% vs. 64.71%, $\beta = -1.099$, $SE = .483$, $Wald(1) = 5.167$, $p = .023$), consistent with our previous findings. On the other hand, the money-source manipulation had no influence on choice in the cheaper-version conditions (53.33% vs. 50.94%, $\beta = -.096$, $SE = .377$, $Wald(1) = .064$, $p = .800$). The interaction between money source and version type was not statistically significant ($\beta = -1.003$, $SE = .613$, $Wald(1) = 2.674$, $p = .102$).

3. Discussion

Study 4 bolsters our conceptualization by showing that the hypothesized effects are unique to the freemium strategy. That is, the manipulation of perceived decision risk (i.e., the financial risk is higher if the purchase is made with regular income than with windfall money) had no significant

influence on the purchase decision when the feature-limited version had a non-zero price. This suggests that the mere presence effect of a free version is a unique phenomenon that cannot be fully explained by prior research on price promotions or choice context effects. Given the bidirectional nature of the effects of the freemium strategy, managers need to carefully evaluate their consumer segments to determine whether the strategy is likely to promote or discourage the purchase of the non-free target product.

VII. General Discussion

The freemium strategy has become prevalent recently, especially for digital goods. However, little research attention has been given to how the mere presence of a free version might influence consumers' perception of the associated premium paid version and the brand itself. This question is particularly important given that consumers form these perceptions in the very early stages of product evaluation, long before completing a product trial, and also because consumers are likely to rely on pretrial perceptions when faced with an overwhelming number of choice alternatives. The present research represents a pioneering attempt to demonstrate how the effect of the mere presence of a free version on consumers' product perceptions varies with individual and contextual differences.

The series of studies documented here (seven studies and one follow-up study) consistently show that the presence of a free version has bidirectional effects. On one hand, a free version (albeit with functional limitations) provides a quality-assurance cue by implying that the company is confident in their product; this inference reduces the perceived risk associated with choosing the target product (i.e., the paid premium version with a free basic version).

On the other hand, a free version makes the product more widely available and thus dilutes its perceived uniqueness, paradoxically bolstering the attractiveness of standalone products. We observed the proposed bidirectional effects in both Western and Eastern cultures and found the effects only in the presence of a free version, not in the presence of a cheaper version.

Furthermore, perceived decision risk seems to lie at the core of the direction of the effect. When consumers have an elevated sense of risk, regardless of whether the perception of risk is rooted in the purchase context, chronic sensitivity (a prevention focus and need for uniqueness), or current affective state (mood), the presence of a free version increases the choice share of the target product. By contrast, the presence of a free version has a negative effect among consumers who are in a positive mood, have a high need for uniqueness, have a promotion focus, or are using windfall money for the purchase, as these factors decrease the perceived decision risk. This conceptualization is supported by the mediation analyses of participants' inferences about the products (safeness in study 1b and uniqueness in study 1c) and anticipated regret (study 3).

In short, results from our package of studies delineate the proposed effect and reveal a nuanced underlying process. To corroborate this conclusion, we conducted a single-paper meta-analysis (McShane and Böckenholt 2017) using a fixed-effect model over the 8 studies described in the article (excluding the cheaper-version condition in study 4). The average effect size was small to moderate ($r = 0.207$, $Z = 6.459$, $p < .01$; Cohen's $d = 0.4232$; see table 1). These results provide converging evidence that offering a free version may or may not have the desired impact on purchases of the associated non-free versions, depending on the purchase context and individual differences.

1. Limitations

It would have been ideal to establish both mediating links in a single experiment, but we did not attempt to do so because the safeness perception and uniqueness perception drive opposing choices and are innately conflicting. People tend to seek justification for their choices, so people who chose the target product may be motivated to say that it is unique (e.g., Shafir, Simonson, and Tversky 1993), as admitting otherwise would create dissonance (e.g., Cummings and Venkatesan 1976). The same issue applies to those who chose the standalone product. We concluded that a dual mediation model was unlikely to demonstrate the true underlying mechanisms, so we evaluated the links separately. We also deliberately avoided measuring perceptions prior to the purchase choice to preclude demand effects.

The present research focuses on digital goods because the freemium strategy is prevalent in that market (perhaps because the marginal cost of serving additional customers is negligible). However, the strategy is becoming more prevalent in other product categories, and future research may wish to replicate the results with other types of goods and services once the general public is sufficiently familiar with the offering of free versions in these categories. We anticipate that similar bidirectional effects will occur.

In all our experiments, participants chose between two non-free products; our pretests confirmed that the two non-free products were similarly attractive and worth the price, and we counterbalanced the assignment of the target and standalone products. Nonetheless, the validity of our test could be improved with a control condition in which participants choose between two non-free standalone products (i.e., neither product has a free version) to establish a baseline preference.

We tested H1 by measuring participants' chronic regulatory

focus (study 1a), but one's regulatory focus can shift situationally and can be experimentally induced. Future research may enrich our findings by directly manipulating participants' regulatory focus, perhaps in ways that practitioners could easily implement.

Finally, study 1b showed that a negative mood (vs. positive mood) increased the choice share of the target premium product, as hypothesized. We reason that the effect occurred because people in a negative mood perceive a higher risk and thus extract the quality-assurance implication from the presence of a free version. It is also possible, however, that people in a negative mood prefer the target premium product for mood regulation. Although our mediation analysis confirmed our theoretical process and cast doubt on the alternative explanation, future research might formally examine the alternative possibility.

2. Implications

The findings in this research make valuable academic and practical contributions. The article joins the stream of research on both the freemium strategy and context effects on choice by demonstrating the effect of the mere presence of a free version on consumers' perceptions of paid products in different choice contexts. The conclusions derived from the results of the study also indicate a previously undocumented sacrifice associated with offering a free version of a paid product. In addition, whereas the literature on regulatory focus has shown that the impact of regulatory focus on consumers' judgments and choices is largely the result of the fit between consumers' regulatory orientation and the type of information they are processing (Higgins 2002), our research shows that regulatory focus can also affect consumers' interpretation of an informational cue (in this case, the presence of a free version) and thereby affect their anticipated

regret over each possible decision outcome.

Practitioners can readily apply the implications when deciding whether to include a free version in the company's product line. Evidently, the freemium strategy is not a panacea, especially for consumers with a promotion focus and a high need for uniqueness. Practitioners should consider the prevalence of these traits in their consumer segments. For instance, if a product represents hedonic and symbolic values rather than functional values, then consumers are more likely to have a high need for uniqueness, and the freemium strategy may hurt sales unless marketers can elevate the perceived decision risk. For functional products, however, quality assurance is key, so the freemium strategy may have additional benefits beyond what has been demonstrated in previous research.

Managers should also keep abreast of their competitors' choices regarding the freemium strategy. We hope that future research will investigate whether the inferences consumers draw from the presence of a free version are influenced by other variables such as market share, price of the paid product, and expertise; these moderating effects would enable practitioners to further tailor the freemium strategy for different consumers. Building on the finding that a windfall gift voucher reduces the perceived risk and consequently results in a preference shift, it may also be interesting to evaluate the impact of payment method given that application gift cards (e.g., Google Play gift cards and Apple Store gift cards) are becoming widely available, and mobile transactions need not require immediate expenditure.

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〈Appendix〉 Choice Stimuli




- Smartphone application example: camera

Brand A		Brand B
  <small>i This app is compatible with all devices.</small> Free Install	  <small>i This app is compatible with all devices.</small> \$ 0.99 Buy Send Gift	  <small>i This app is compatible with all devices.</small> \$ 0.99 Buy Send Gift
<p>Brand A "Smart Camera App"</p> <p>Key Features</p> <ul style="list-style-type: none"> - User-friendly interface - Various decoration tools - Crop, straighten & rotate - Color and brightness control 	<p>Brand A "Powerful Camera App"</p> <p>Key Features</p> <ul style="list-style-type: none"> - Professional filters and effects - High-speed shooting (30FPS) - 10x digital zoom - Voice/Remote shooting - User-friendly interface - Various decoration tools - Crop, straighten & rotate - Color and brightness control 	<p>Brand B "Powerful Camera App"</p> <p>Key Features</p> <ul style="list-style-type: none"> - Anti-shake image stabilization - One-tap auto editing - Crop, straighten & rotate - 10x digital zoom - User-friendly interface - Voice/Remote shooting - Various decoration tools - Contrast and brightness adjustment

- Smartphone application example: fitness

Brand A		Brand B
  <small>i This app is compatible with all devices.</small> Free Install	  <small>i This app is compatible with all devices.</small> \$ 1.99 Buy Send Gift	  <small>i This app is compatible with all devices.</small> \$ 1.99 Buy Send Gift
<p>Brand A "Constructive Fitness App"</p> <p>Key Features</p> <ul style="list-style-type: none"> - Intake and exercise tracking - Calorie management with over 100k food items - Daily nutritional balance summary - Workout sharing with friends 	<p>Brand A "Powerful Fitness App"</p> <p>Key Features</p> <ul style="list-style-type: none"> - Comprehensive exercise planner - Diagnose and analyze intake and exercise pattern - Built-in step tracker - Sync with other apps and smart gears - Intake and exercise tracking - Calorie management with over 100k food items - Daily nutritional balance summary - Workout sharing with friends 	<p>Brand B "Powerful Fitness App"</p> <p>Key Features</p> <ul style="list-style-type: none"> - Customized exercise routines (weight loss, definition, golf program etc.) - 30-day challenge programs - Built-in step tracker - Sync with other apps and smart gears - Intake and exercise tracking - Calorie management with over 100k food items - Daily nutritional balance summary - Workout sharing with friends

- Computer software example: anti-virus software

	 ★★★★★ <small>CNET EDITORS' RATING</small> Brand A Standard Free	 ★★★★★ <small>CNET EDITORS' RATING</small> Brand A Advanced \$39.95	 ★★★★★ <small>CNET EDITORS' RATING</small> Brand B Advanced \$39.95
System Watcher	●	●	●
Real-Time Protection	●	●	●
Download & Share Files Safely	●	●	●
Secure Internet Passwords	●	●	●
Privacy Shielding		●	●
Two-way Firewall to Prevent Hacking		●	●
Includes mobile/wireless security		●	●
Fixes and optimizes systems		●	●