How Do Consumers Evaluate Mobile Apps? The Role of App Name Suffix, App Information Quality, and Consumer Characteristics

by

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A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
August 6, 2016

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Abstract

The great penetration of mobile devices in the consumer market has allowed consumers to perform specific tasks by installing and using mobile apps. Despite the great potential of mobile apps, no published work has paid attention to factors affecting consumers' app evaluation. This study identified app name suffix and app information quality as two potential antecedents to consumers' value perceptions of mobile apps. The purpose of this study is to examine how four selected app name suffixes (vs. no suffix) and high versus low app information quality would influence consumers' value perception and ultimately lead to download and word-of-mouth intentions in four selected app categories. In addition, this study explored the potential moderating roles of four consumer characteristics for the effects of app name suffixes and/or app information quality on perceived app value. Data were collected using an online experiment with a national sample of 1,268 mobile users aged from 19 to 34 years. Respondents were randomly assigned to one of 40 experimental conditions manipulated using experimental stimuli created and verified in three pretests and performed an online app evaluation task. The results from multivariate analysis of variance revealed that respondents perceived significant higher values for mobile apps in the high (vs. low) information quality condition. Perceived app value was found to be a strong predictor of both download intention and word-of-mouth intention. Further, the results reveal support for differential effects of app information quality among consumers with varying need for cognition and app savviness. On the contrary, no significant main or interaction effects were found for app name suffixes. Implications to these findings and suggestions for future research are also discussed.

Acknowledgement

Over the past six years I have received support and encouragement from a great number of individuals. I would like to thank my co-advisor, Dr. Wi-Suk Kwon for her guidance throughout my graduate career at Auburn University. Dr. Kwon has been a mentor, collaborator, and friend. Her unconditional support, genuine caring, and persistent faith in me has made this a thoughtful and rewarding journey. She has challenged me and pushed my growth than I ever thought possible. I am extremely grateful and indebted to her for bringing out the best in me throughout the school years.

I am also grateful to my co-advisor Dr. Sang-Eun Byun for her tireless effort to make this dissertation a sound project. Dr. Byun was among the first friendly faces to greet me when I began this doctoral program and has always been a wonderful friend. I cannot thank her enough for always taking time to help me grow into an independent and collaborative researcher.

My sincere appreciation is further extended to my dissertation committee members, Dr. Veena Chattaraman and Dr. Peng Zeng, for their support throughout the entire process of creating and completing this dissertation. Dr. Chattaraman supported me with her wisdom, expertise, and encouragement not only throughout the completion of my dissertation but also during the entirety of my studies at Auburn University. Dr. Zeng provided valuable statistics insights as I moved from an idea to a completed research project. The participant recruitment of my dissertation pretests could not have been made possible without his help.

I would like to thank Dr. Carol Warfield for her on-going encouragement and opportunities for financial support during my stay in Auburn. I would also like to thank Dr.

Alecia Douglas for serving as an outside reader. I would like to thank the amazing friends and colleagues from the graduate program. Dr. Manveer Mann and Dr. Soo-In Shim have offered me sincere help and emotional support during my first few years in Auburn. Many thanks to Olivia Johnson for helping me collect data in her class and offering great suggestions.

Lastly, I am heartily thankful to my parents and husband for their unconditional love and believing in me. I could not have reached this goal without their wholehearted encouragement and continuous support.

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Chapter 1. Introduction

Background

The continued innovation in hardware, software, and interaction design has enabled the explosive penetration of Internet-connected devices in consumer market. Five years after the first-generation iPhone was launched, the smartphone market has entered the "late majority" stage of the technology adoption cycle, manifesting more than 120 million owners in the U.S. market (comScore, 2013). The constant flow of information on smartphone devices is made mostly via mobile applications or "apps" (comScore, 2013). The apps, defined by Cellular Telephone Industry Association as "anything that adds a function or feature to a wireless handset" (CTIA, 2012, para. 7), are mostly known by colorful icons and widgets on the screen that perform almost any task for consumers, including emailing, messaging, photographing, and sharing, and so on. App markets are the places where apps are stored, categorized, and downloaded by users, such as Google's Play Store and Apple's App Store. There are many resources consumers can rely on to make a download decision. Except for the visual components such as icon and screenshots, app names, prices, descriptions, consumer ratings and reviews, number of downloads, version numbers, app size, time of the last update, and compatibility could all play a key role in a consumer's decision making.

In particular, app names and app descriptions stand out from other components due to their distinct characteristics. The name makes the first impression and represents what the app offers while consumers are exploring the app store. A good name may arouse a rich set of associations and meanings embodied by the app (Kohli et al., 2005). While an app description provides detailed features and user instructions, it is also a place for developers to attract new users and trigger downloads. Once a name catches consumers' attention and lead them to the

individual app display page, it is up to the visual and text description to convey what developers provide.

From a visual perspective, a name alone represents an app on many occasions. For example, when a user makes a query to search for specific apps, the result page pulled out by the search engines shows only app names, icons, and prices. Unless an app has established its awareness in consumers' mind, the app name serves as one of the communication media that create the first impression to potential buyers. From a branding perspective, brand names are the carrier of brand equity (Keller, 1993) and represent particular attributes, benefits, usage situations, and other brand associations in the consumer's mind (John, Loken, Kim, & Monga, 2006). A more distinguishable app name is more likely to be retrieved and has a higher possibility to elicit strong, positive, and unique brand associations (Samu & Krishnan, 2010). Furthermore, it is not uncommon to see app names consisting of two components: a brand as the first component to stand out from competitors with similar features, while the second component, which is labeled as the "name suffix" in this study, usually employs a numeric figure or a descriptive word to distinguish the app from its sibling apps under the same parent brand (R. D. Petty, 2010). In such a dual-component app name structure, the name suffix can play an important role in communicating a specialized focus and add incremental value to an app brand (Osler, 2007).

However, to the best knowledge of the researcher, no published research has examined the effect of name suffix on product evaluation in the app market, a gap that will be addressed in this study. Specifically, this study focuses on the following four representative types of name suffixes: (1) numeric figures that may document the app version (e.g., 3 as the 3rd version); (2) the word "premium," which may suggest advanced features and/or professional level usage; (3)

the phrase “ad free,” which is used to suggest that the app excludes pop-out or display advertisements; and (4) “donate,” which solicits consumers’ voluntary monetary help by paying download fee. It is likely that consumers refer to a straightforward name suffix to make an evaluation when little attribute related information could be accessed from the fanciful brand name. In other words, a consumer may perceive higher value for an app with a name suffix than an alternative app with no name suffix, holding other attributes fixed for both apps.

App descriptions are another information source where app developers introduce major app features and user directions. A good product alone without proper introduction or instruction would create adoption barrier for new users. If a customer is unable to comprehend certain functions from constrained screen space, cast doubt on developer’s claims, or has hard time grasping the relevance of information corresponding to the needs, he or she may lose confidence in the product. On the contrary, a well-presented description may communicate key features and provide effective guidance to aid customer’s decision making. In the advertising literature, product descriptions with higher information quality (i.e., more informative, relevant, and compelling descriptions) are likely to generate higher customer satisfaction with the product and eventually lead to a higher purchase intention (Bai, Law, & Wen, 2008; Chae, Kim, Kim, & Ryu, 2002). Similarly, a well-written description that gives specific, unbiased, and relevant information to its target customers is expected to enhance acceptability among consumers.

Product value perceived by consumers has often been associated with behavioral consequences such as purchase and word-of-mouth (Cronin, Brady, & Hult, 2000; del Rio, Vazquez, & Iglesias, 2001a). The overall relation between perceived value and consumer responses would apply to virtual products as well. Specifically, if an app is perceived to have a

higher utility, offer more pleasure in using, and gain more social approval, it is also more likely to be downloaded and mentioned in consumers' casual talks.

Consumers may perceive differently towards an app depending on how the same information is processed. R. E. Petty and Cacioppo (1986) proposed two processing routes to explain how people's attitude is formed and changed. In their Elaboration likelihood model (ELM), the central route involves diligent and effortful evaluation of issue relevant cues, while the peripheral route, in contrast, involves evaluation that relies on external cues, such as source credibility and expertise, to create a mental shortcut in making judgment (Bitner & Obermiller, 1985; R. E. Petty, Cacioppo, & Schumann, 1983). In R. E. Petty and Cacioppo (1984) study, a text description about product features and specifications is considered as an issue-relevant stimulus to trigger the central processing route. Brand names, on the contrary, are often used as a heuristic cue for the peripheral route of processing (Maheswaran, Mackie, & Chaiken, 1992).

Furthermore, consumer characteristics may generate different tendencies in choosing information processing routes. For example, need for cognition describes consumers' general tendency of enjoying effortful thinking (Cacioppo & Petty, 1982). Consumers high in need for cognition tend to form their attitudes based on a thorough evaluation of argument-relevant cues. In contrast, consumers low in need for cognition (i.e., those who do not usually allocate cognitive resources in argument evaluation) tend to use environmental characteristics as mental shortcuts in their information evaluation (Cacioppo & Petty, 1982; Cacioppo, Petty, Kao, & Rodriguez, 1986). Following this argument, the influence of elaborated written information should be greater among those who normally evaluate available messages with greater effort. On the contrary, for those who prefer mental shortcuts than cognitive analysis, a name suffix that suggests functionality or quality would be a preferable source to make judgment.

Tech-savvy, computer-savvy, and Internet-savvy are terms used to describe people who are literate and proficient in the use of technology, computer, and the Internet, respectively (Ahmann, 2000; Schrum, Shelly, & Miller, 2008; Wilde, Kelly, & Scott, 2004). Macdonald and Uncles (2007) study on consumer savviness suggests that the ability to adopt new technology, especially various Internet-based services, is the core characteristic of savvy consumers. Similarly, app savvy consumers would be those who are knowledgeable about and competent with a variety of apps, willing to try out new app features, and sensitive about app updates. It is possible that app savvy consumers tend to delve into specific app feature descriptions and not likely to rely on a mere numerical name suffix as a surrogate of updated features or high values.

In addition, consumers' tendency to seek products' social meanings may influence their evaluation of the same product. In rare occasions, consumers make a purchase decision solely based on product utility. Rather, their concerns may be associated with a symbolic meaning of the consumption (Veblen, 1899). Researchers have used the term status consumption tendency to describe individual's personal nature of being conscious of displaying and acquiring status through consumption (Eastman, Fredenberger, Campbell, & Calvert, 1997; O'Cass & McEwen, 2004). Accordingly, consumers with a high status consumption tendency are more likely to purchase status-laden products (e.g., luxury brands) and notice subtle cues that communicate status connotations (Han, Nunes, & Drèze, 2010). The higher ability to recognize and adopt status-laden products may make it easier for consumers with a high status consumption tendency to associate the name suffix "premium" with a higher status value.

Further, researchers have shown that consumers who have extremely negative opinions about advertisements are likely to refuse ads and even willing to pay for not having the information of advertisements (Baek & Morimoto, 2012; Tåg, 2009). According to Gupta (2013),

consumers find mobile ads more intrusive and more unacceptable than ads on desktop screens. Therefore, consumers who have a more negative attitude towards ad interruptions may appreciate apps with no advertisements. Accordingly, an app with the name suffix "ad free" would be more valuable to these consumers.

Consumers feel grateful for other people's services and make reciprocal actions such as purchasing and paying tips (Kolyesnikova & Dodd, 2008; Lynn, 2008). Grateful consumers also reward open software developers with monetary donations even when the software is freely available (Krishnamurthy & Tripathi, 2009). Therefore, there has been a considerable interest in exploring consumers' tendency to reciprocate app developers' work and volunteer to pay for an app that is free to download. It is possible that consumers high in reciprocal inclinations would feel more obligated to reciprocate developers' work and value apps with the name suffix "donate."

Problem Statement

App name suffixes are used inconsistently across different developers. For example, "lite" (e.g., Hunting Calendar Lite in Google Play, $1.99; PAC-MAN lite in App Store, free) is used both by free and paid apps to indicate limited functionality (in comparison with the high priced full edition) or advertisements placement. "Ad free" is also seen used by both free and paid apps to signify no ads displacement using experiences. "Pro" (short for "professional"), "premium," and "prime" are other examples of name suffixes associated with mixture pricing strategies and feature indications. When a developer offers a series of apps under a same parent brand, "pro," "premium," and "prime" are often used by the full edition that provides advanced features. However, the same suffixes can also be used by a standalone app (i.e., the same brand is not shared by other apps) that do not offer more features than its competitors. Numerical name

suffixes, such as an edition number (e.g., "2") and time stamp (e.g., "2013"), are usually attached to the brand name to identify its versions. However, apps with various numerical name suffixes under a same parent brand could coexist in the app market, making it difficult to infer app updates simply based on numerical name suffixes. The last name suffix example, "donate," expresses app developer's expectation to receive monetary compensation for their work. Some developers may place advanced features (e.g., no ads interruptions) in the "donate" edition but not the slim down free edition. Others may simply label a full-functional app with the name suffix "donate" and do not trim down features in the free edition. The indiscriminate use of name suffixes may cause various interpretations on the price (e.g., whether it is free) and features (e.g., whether it is supported by advertisements) of the app and accordingly make differentiated influences on consumers' value perceptions. In addition, despite the widely recognized effects of product names on consumers' impression formation and evaluation (Charmasson, 1988; Schmidt, 2011), researchers have paid little attention to how an app name suffix influences consumers' evaluation of app value prior to download behaviors.

Although being extensively studied in advertising and persuasion literature, the role of information quality in consumers' decision-making process of mobile apps has not been examined. Researchers have invested extensive efforts in defining and dimensioning product information quality (Kahn, Strong, & Wang, 2002; Miller, 1996). However, no guidance has provided for developers on how to write a high quality description. A popular way to communicate the value of an app is to introduce the app with a description with a powerful summary line, provide features and benefits in bullet points, and provide a short snippet from a review. However, the ways to present these description elements vary among developers. For example, app features could be listed succinctly with a few key words or sufficiently with

examples, directions, and potential usage scenarios. Some developers may use testimonials from an influential reviewer to boost credibility while others provide positive quotes from a random user. Some app descriptions are structured to have a two-level hierarchy that includes keyword headings and supportive sentences. Others may employ a very concise way to include only keywords. Therefore, theoretical and empirical examinations are warranted to investigate how app information quality influences consumers' perceived app value, which in turn predicts app downloading decisions and word of mouth activities.

Although the effect of perceived value on purchase and word-of-mouth intentions has long been studied in many product categories, it has never been studied in the context of app markets. The fact that not all apps in the market require fees at the point of download may result in a revolutionary change in consumers' decision-making process. Given that most paid apps in the current market are priced low as compared with computer software, it is possible to assume that consumers evaluate apps based on limited information such as a name suffix. Also, it is unclear whether app viewers would like to engage in word-of-mouth activities prior to actual usage. This study attempts to extend the understanding of app value perception and its behavioral consequences by proposing a model in which perceived value directly influences both purchase and word-of-mouth intentions in the context of mobile apps.

Lastly, empirical research on the role of need for cognition, technology savviness, need for status, and ad intrusiveness on product or service evaluation has been focused on non-digital goods. Moreover, although having been independently studied in different contexts, these consumer characteristics have not been systematically studied in a holistic view. A lack of research in the digital product markets, such as app stores, makes it difficult to predict the effect of the aforementioned consumer characteristics on the evaluation process of digital products. The

current study will address this gap by proposing these consumer characteristic variables as moderators influencing the effects of app name suffixes and/or app information quality on consumers' app evaluation.

Purpose

In response to the aforementioned research gaps, the current study attempts to explain how app name suffixes and app information quality would influence consumers' value perception and ultimately lead to purchase and word-of-mouth intentions. R. E. Petty and Cacioppo (1986's) ELM that illustrates two distinct routes of persuasion in attitude formation is used as the theoretical framework. In addition, this study aims at identifying and verifying consumer characteristics that may moderate the effects of app name suffixes and app information quality on consumers' app value perceptions. Specifically, the objectives of this study are multiple-folded:

(1) To examine the effect of app name suffixes on consumers' perceived app value;

(2) To examine the effect of app information quality on consumers' perceived app value;

(3) To investigate the effect of perceived app value on consumers' app download intention and word-of-mouth intention.

(4) To examine the moderating roles of need for cognition and app savviness for the effects of app name suffix and app information quality on perceived app value; and

(5) To investigate the moderating roles of need for status, perceived ad intrusiveness, and reciprocal inclination in the effects of corresponding app name suffixes on perceived app value.

Definition of Terms

Applications (apps): "Downloadable tools, resources, games, social networks or almost anything that adds a function or feature to a wireless handset which are available for free or a fee" (CTIA, 2012, p. 7).

App name suffixes: the common elements used in a wide variety of app names as version or classification identifiers (R. D. Petty, 2010). In the current study, app name suffixes are manipulated in five levels, including a control level with no name suffix, a numeric name suffix, the word "premium," the phrase "ad free," and the word "donate."

Numerical name suffix: an app name suffix that contains one or more numbers either in digit or written form (Pavia & Costa, 1993).

App information quality: the extent to which the app description provided by the developer is informative, relevant, and objective (Rieh, 2002). In the current study, informative is defined as the extent an app description covers a sufficient and appropriate amount of app features (Y. W. Lee, Strong, Kahn, & Wang, 2002; Miller, 1996). Relevancy is defined as the extent an app description is closely associated with app features and applications (Kahn et al., 2002). Objectivity is defined as the extent an app description is presented in an impartial way (Kahn et al., 2002).

App savviness: an individual's propensity to embrace and use apps for accomplishing goals in home life and at work (Goldsmith & Hofacker, 1991).

Digital products: intangible products, services, and information that are traded between developers and consumers in the digital format and distributed via the Internet (Bradley, Kim, Kim, & Lee, 2012).

Elaboration Likelihood Model (ELM): an information processing model proposed to describe how message is processed and change people's attitude. The ELM proposes two independent routes to persuasion: the central route and the peripheral route. Under the central route, persuasion occurs from a person's deliberate evaluation of all available cues, while under the peripheral route, persuasion results from a simple inference about selected cues without thoughtful elaboration (R. E. Petty & Cacioppo, 1981, 1986).

Need for cognition (NFC): "an individuals' tendency to engage in and enjoy effortful cognitive endeavors" (Cacioppo, Petty, & Chuan Feng, 1984, p. 306).

Need for status: an individual's "tendency to purchase goods and services for the status or social prestige value that they confer on their owners" (Eastman & Goldsmith, 1999, p. 41).

Perceived ad intrusiveness: an individual's tendency to react negatively to commercials or advertisements that interfere with the ongoing cognitive process (Li, Edwards, & Lee, 2002).

Reciprocal inclinations: an individual's an individual's tendency to reciprocate others' behavior (Perugini, Gallucci, Presaghi, & Ercolani, 2003)

Perceived app value: consumers' overall assessment of an app (Zeithaml, 1988). In the current study, the overall app value is further decomposed into four dimensions: value for money, functional value, hedonic value, and symbolic value (Sweeney & Soutar, 2001).

Download intention: The likelihood that a consumer will download a particular app (Kalwani & Silk, 1982).

Word-of-mouth intention: the likelihood to communicate informal and interpersonal information regarding a brand, a product, an organization, or a service (Harrison-Walker, 2001).

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Chapter 2. Literature Review and Hypotheses Development

To understand how brand name structure influences consumers' perceptions about mobile apps, the literature review is organized as follows: first, existing views and studies on brand name effects will be introduced, emphasizing the effects of a name suffix. Next, literature on mobile apps and app name suffixes follows. App information quality, the characteristic of a mobile app's text description, is discussed as another drive of app value. Elaboration likelihood model is reviewed in the next section as a theoretical framework to explain how name suffixes and information quality may influence consumers' evaluation of an app's value. Lastly, four consumer characteristics— app savviness, need for status, ad intrusiveness, and reciprocal inclination— are discussed separately as moderating variables that explain why consumers respond differently to specific name suffixes.

Brand Name Effect

In order to differentiate a brand from its competitors, marketers have to rely heavily on advertising and other marketing communications and focus on what a brand symbolically connotes in the eyes of consumers (del Rio, Vazquez, & Iglesias, 2001b; Durgee & Stuart, 1987). A well-recognized definition of a brand is given by Kotler (1991) as "a name, term, sign, symbol, or design, or combination of them which is intended to identify the goods and services of one seller or group of sellers and to differentiate them from those of competitors" (p. 442). A primary component of differentiating a brand from its competitors is the selection of a brand name (Turley & Moore, 1995). As Turley and Moore (1995) note, a well-chosen brand name can suggest product benefits, imply product quality, communicate symbolic meanings such as status and exclusivity, evoke favorable feelings of confidence, security, and strength, and simplify

consumers' information evaluation process. Brand names are also a brand element that can be vocalized and profusely linked with brand associations, such as brand attributes and benefits that relate to the product consumption (Keller, 1993). For this reason, researchers and practitioners invest huge resources on how to craft an impressive brand name and build the brand a competitive edge.

Brand managers apply a combination of naming tactics to safeguard their brand equity. A meaningful, memorable, and attractive brand name is the first step to achieve this goal (R. D. Petty, 2008a). Charmasson (1988) suggested that a fabricated brand name that has no prior meaning attached to a product category creates a distinguishable brand identity. For example, "Kodak" as a photographic film brand was invented by its founder in 1880s. On the contrary, a suggestive name that alludes to product features or a descriptive name that directly describes product attributes would be less preferable for a distinct brand name because they can be used to designate any products within the same category (Charmasson, 1988). The drawback of a fabricated brand name is that unless consumers have prior experience with the brand and recognize the fabricated name on first sight, they may not feel any familiarity or closeness to the brand as when seeing an existing word (Blake & Blake-Bohné, 1991; R. D. Petty, 2008a). In some situations, consumers may even attach negative meanings to an unfamiliar brand name. To avoid creating brand awareness for each new product, marketers may consider taking advantage of an established brand by using the same brand for a family of products, which is referred to as brand extensions.

Brand extensions are a strategy used by firms to introduce a series of products under the same brand name (Martinez & de Chernatony, 2004). Brand extensions considered to be beneficial because the quality, dependability, and identity associated with the pre-existing brand

name are easily transferred to the new product (Katsanis & Pitta, 1995; Swaminathan, Fox, & Reddy, 2001). The brand name shared by extended products or lines is referred to as the parent brand or umbrella brand (Erdem, 1998; Montgomery & Wernerfelt, 1992). For example, Kiehl's, an upscale skincare brand known for its natural ingredients, also provides hair care and men's shaving products. However, adding new lines of products to a well-established brand may put the umbrella brand at risk if the new products fail to meet consumers' expectations (Dacin & Smith, 1994; John, Loken, & Joiner, 1998). Brand dilution describes such situations when the new extension damages the unique and specific beliefs established for the parent brand (Loken & John, 1993; Martinez & de Chernatony, 2004).

Brand naming strategies used for brand extensions can vary. First, when a slighted modified product is launched, the pre-existing brand name may be used along with a generic term to signal the modified aspect of the product and differentiate the new model from the original product. For example, Coca-Cola launched several coke variations by combining the core brand "Coca-Cola" with generic terms. As such "Caffeine-Free Coca-Cola" refers to a caffeine free variation of the original coke, while "Coca-Cola Cherry" and "Coca-Cola with lemon" signify flavor modifications. In another example, Microsoft highlights the second generation of its tablet offerings by attaching a numerical number "2" to its existing brand "Surface." In other cases, a pre-existing brand name can be assigned to a completely new product category and its variations. For example, the Internet company Google introduces a wearable computing device "Google Glass" using the brand of its primary searching service "Google." Lenovo, best known as a computer brand, launched cellphone offerings with the same name "Lenovo." Lastly, a compromised naming strategy, establishing a series of sub-brands under the parent brand, is often used to identify distinctive attributes jointly owned by a line of

products, (R. D. Petty, 2010). For example, Volkswagen brands their supermini car models with the sub-brand "Polo" while the subcompact models are identified with "Golf."

Brand extension names commonly use a dual structure. In the dual structure, the parent or umbrella brand signals quality, value, and other brand associations as a whole to facilitate consumers' judgment, while the second component – either a sub-brand name or a generic word – differentiates the specific product from the whole family and allows brand associations in a specific level. Baltas and Saridakis (2009) developed a regression model to explore the impact of a brand name dual structure on price premium. An example given by Baltas and Saridakis (2009) was that series 1 in BMW's family commands the lowest premium, whereas the luxury 6 and 7 series denote the highest premium. In other words, the second component of the brand name (i.e., the numerical number "1," "6," and "7" in the BMW example) creates product value in consumers' mind. However, researchers have paid little attention to the second component of the brand name with only a few exceptions. The limited published articles have either focused on very specific but non-virtual product categories (e.g., cars by Baltas and Saridakis, 2009) or emphasized the sub-brands – the registered trademark shared by another family of products.

Despite the growing popularity of mobile apps, a brand naming effect in the app market has not yet received academic attention. Brand extension is commonplace in the mobile application market where developers often launch an app with different editions under the same brand name. When multiple app editions of an app are introduced to the same market, app developers often use generic terms as the supplement component of the app name in addition to the primary component (i.e., the parent brand) to distinguish among various editions. However, little is known about the effect of the dual-structured brand names on consumer perceptions and

evaluations on mobile apps. To explore characteristics that are pertaining to apps, mobile applications and its naming practice are discussed in the following section.

Mobile Applications

Apps refer to a type of digital products, either free or paid, that add functions or features to a wireless mobile device (CTIA, 2012). Digital products, such as digital books, online games, and streaming music, are not a new concept for today's consumers. Digital products are intangible by definition and typically distributed via the Internet (Q.-H. Wang, Mayer-Schönberger, & Yang, 2012). Apps differ from other forms of digital goods in a way that they rely heavily on distribution platforms (Liu, Safavi-Naini, & Sheppard, 2003) and smart devices (Jain, 2011). Application distribution platforms are managed by operation system (OS) developers. Two dominant mobile platforms, Google's Android and Apple's iOS, have taken the worldwide lead in terms of the market share of devices and data traffic (comScore, 2012). Although RIM's Blackberry OS and Microsoft's Windows Phone are regarded as strong competitors, this study will not draw examples from these platforms given their relatively small market share in the United States and the similar distribution mode across all apps platforms (comScore, 2012). Mobile devices, in this study, broadly refer to any wireless Internet-connected devices, including smart phones and tablets, which integrate an app market into their OS and offer convenient payment methods to facilitate purchasing.

App markets are the places where app developers can upload their intellectual goods (apps) and sell them directly to end users (Sharma, 2010). The distribution of apps involves a long value chain of hardware makers and software developers. *Device manufacturers* like Samsung and Nokia order chips and display boards from upper stream providers. *Mobile platform providers* like Google and Microsoft license their mobile systems to the device

manufacturers so that consumers are facing a limited number of operating systems. *Communication service providers* like Verizon and AT&T offer wireless and data services so that consumers are able to stay connected all the time. *App market providers* develop their own app communities on specific operating systems and distribute apps to end consumers. Apple, the leading mobile device provider, could be considered as a device manufacturer, a platform provider, and an app market provider all together because Apple designs its own hardware and software and runs the App Store. Apple launched the very first app distribution platform, the App Store, in 2008 (Apple Inc., 2009). The App Store, now targeting at both mobile and tablet devices, is still the leading app market by far (comScore, 2013). Google's Android platform plants Google Play as its official app market. Microsoft opened Windows Phone Store to distribute mobile applications and Windows Store for apps running on the desktop operating system. Except for platform developers, app distributors may also establish their own consumer community and open a customized app market in addition to the market opened by platform providers (Kimbler, 2010). For example, Amazon and Samsung both have their own app store (Amazon Appstore and Samsung Apps, respectively) for Google's Android system.

Despite all these parties involved in the app supply chain, app developers are the key innovators that provide customized experiences to consumers and the major beneficiary of the whole value chain, receiving 70% of the gross revenue of the major markets (Kimbler, 2010). However, in the current market, only a few successful apps are widely accepted and downloaded by consumers, leaving the vast majority of the remaining ones sparingly tried (Jain, 2011). Thus, it is important for app developers to present their works in a way that can maximize their target consumers' favorable attitudes and trigger downloading activities.

Shopping for an app in the app market is not very different from buying other products online. In an app market, consumers turn to the search engine for a specific app if they have a keyword in mind, flick through the top chart to check out trending apps, or browse each app category to get a sense of what apps are available. Regardless of the search method, consumers face a huge amount of app information once they step into the app market. An app name, an icon, a price, a screenshot, and an app description are provided by an app developer, while the number of downloads that have been made since the app hits shelves, customer ratings, and reviews are generated by users' accumulated actions.

Free, paid, advertising, and in-app virtual goods are the major pricing strategies adopted by app developers in terms of revenue generation (Sharma, 2010). Free apps, if offered by major players in other retailing segments, are most likely extensions of existing online services to the mobile markets. For example, Bank of America provides free apps through Apple's App Store and Google Play, allowing customers to check account balances and pay bills from their smartphones and tablets. Paid apps, which generate revenues by charging certain amount of fees per download (e.g., $0.99/user/app/download) or per subscription (e.g., $0.99/user/app/year), are commonly found in gaming and news app categories. Advertising and in-app virtual goods are two alternative ways to generate revenues from free download apps, with the former displaying or popping out advertisements and the latter charging additional fees to app users for virtual goods or services (Feijóo, Maghiros, Abadie, & Gómez-Barroso, 2009; Sharma, 2010). For example, game players may be exposed to advertisements of new games when they enter into a game app. As the game starts, options to purchase "gold" (in equivalent to real money) are put in prominent places for players to gain privileges in the game.

Developers may adopt a hybrid pricing mode that combines two or more pricing strategies in one app or providing a line of apps with terraced prices (Docters, Tilstone, Bednarczyk, & Gieskes, 2011). For instance, the "freemium" model, derived from the open-source software concept, describes a basic-premium strategy that provides basic features for the free edition and ask fees for an upgrade if premium features are requested (Teece, 2010). Since apps adopting free, advertising, and in-app virtual goods pricing strategies do not request fees at the point of downloading, consumers may perceive them as free apps that do not require an immediate payment at the point of downloading.

The current study will emphasize the paid apps that charge a certain amount of fees to download for the following three reasons: First, although free apps spur downloads and increase exposure, they do not produce as much profit as paid apps do (Erman, Inan, Nagarajan, & Uzunalioglu, 2011). For app developers, a paid app would be a better choice to generate revenues than a free app. For consumers, downloading a paid app would require an action of paying, which resembles purchasing of a non-virtual product. Thus, paid apps necessitate a better tactic to communicate the value of paid apps, such as the use of a name suffix and a well-organized app description, to allow developers to gain visibility over other competitors. Second, although free apps may also carry a name suffix such as "free" and "premium," some name suffixes are used exclusively by paid apps, such as "donate," "key," and "unlocker" (e.g., Out of Milk Pro Unlocker, Trickster MOD Donate Key). When a developer offers a line of apps under a same brand name, name suffixes are usually added to the paid variations to designate certain features. Third, the tradeoff decision between the money spent to buy a paid app and the value that is obtained of the app would prevent situations in which consumers mindlessly download an app and uninstall it instantly after an initial trial. In other words, consumers are expected to be

more engaged to process available information before they make a charged download decision, which shares more similarities with offline buying behaviors than with trying out free samples.

App Name Suffixes

Although some app brand names are descriptive in nature (e.g., Camera Effects, Task Killer, and Network Speed), many apps are branded with a name consisting of fanciful make-up words or arbitrary words that are not associated with a particular function or benefit. For example, Quip, a word literally means "a witty comment" (New Oxford American Dictionary), does not seem to be compatible with a word processor app as it represents. In the brand literature, fanciful words that have no prior meanings have higher brand strength than descriptive words (Charmasson, 1988; R. D. Petty, 2008a). However, those fanciful words could be hard to comprehend and remembered for the first time since no prior knowledge or associations can be made. Consumers would hardly deduce features or quality from merely looking at the unknown words. Thus, many developers market their apps with a descriptive or suggestive element in addition to the brand name as a way to deliver what the app is offering, while not compromising the distinguishable image it aims to brand. Those descriptive or suggestive elements that are attached to a variety of brand names are referred by R. D. Petty (2010) as name suffixes. Extending R. D. Petty (2010) definition to the app world, an app name suffix in the current study is defined as a descriptive word or phrase, a number, or combination of both that suggests app characteristics.

In brand extension naming practices, the intent of a second descriptive component in addition to the primary (parent) brand name is to distinguish a product within the brand portfolio and to convey a degree of specialization of the product (Osler, 2007). Unlike sub-brands that are exclusive to the brand owner, name suffixes are descriptive words or phrases that can be attached

to any brand names. For example, “Carrera” is a sub-brand for a luxury sporting car owned by the automobile company “Porsche,” a parent brand sheltering multiple other sub-brands. An acronym “RS” attached to “Carrera” is a name suffix that demonstrates a model that emphasizes sporting and racing. The “RS” is also used by Porsche’s rivals to suggest sport performance. Similarly, app name suffixes are shared by all kinds of apps regardless of their brands and developers.

Table 0.1 introduces app name suffixes frequently found in the current app market and their common use cases or meanings. Among these examples, the four most frequently used app name suffixes— numeric name suffix, name suffix "premium," "ad free," and "donate" — are discussed below.

First, numbers are a name suffix type frequently found in the app market. Numeric name suffixes mostly signal version numbers. For instance, "Essential Skeleton 2" suggests that the medical anatomy app has been updated to the second major version. However, the number used in the app name suffix does not necessarily match the actual version number shown in a less obvious place. For example, "Paper Toss 2.0," a free game designed for both iOS and Android devices, is an upgrade from the original game "Paper Toss." The name suffix "2.0" symbolically delivers the notion of version upgrades but does not match its actual version number (which is 1.2.2). Sometimes a year number is used as the numeric name suffix to signal the app release year (e.g., "2013" in "Baseball Superstars 2013"). This study opts a numeric name suffix using a single non-year number for its wide applicability and low time sensitivity.

Table 0.1

Examples of App Name Suffixes

App name suffix	Example	Use cases or meanings
Numbers	III, 2	The version number the app is currently on
	2013	The year the app version is released.
Descriptive words	Free	Free of charge at the time of downloading
	Full, key	Unlocking advanced features that are not allowed to use in low-end versions
	Pro, prime, premium, ultimate	Containing advanced features
	Donate, donation	Usually irrelevant to app features unless specified in the app description
Descriptive phrases	Ad free	No ad interruption
	Full edition	Full features included

Second, app name suffixes "prime," "premium," "pro," "plus," and "ultimate" are frequently used to suggest advanced features and/or more user controls. For example, "Nova Launcher Prime," a home screen replacement app (http://novalauncher.com/) for Android devices, is the upgraded edition of "Nova Launcher," a free edition that offers basic features. Though "Nova Launcher" has supported a bunch of customization features, consumers have to pay a one-time download fee of four dollars (regular price) for "Nova Launcher Prime" to unlock advanced personalization options and visual effects. In the further discussion, "premium" is used to represent this category of name suffixes that are used to indicate prime features or benefits.

Third, another type of name suffixes frequently seen in app markets uses phrases such as "ad free" or "ad remover," which suggest no display of advertisements during the app use. Apps with the name suffix "ad free" do not necessarily have a sibling edition that embeds advertisements, nor is it associated with a higher price that consumers have to pay in order to enjoy non-interruptive experience. For example, "Tip Calculator- AD FREE" is a free app designed to calculate tips and the developer for this app does not offer other "Tip Calculator"

editions. In addition, some apps that use “pro” or “donate” as the name suffix could also offer the ad-free feature and indicate such feature in a less prominent place, such as a “no ads” bullet point in the app description. However, only apps explicitly use “ad free” as the name suffix will be considered for this study, given that naming effect is the key purpose of the current study.

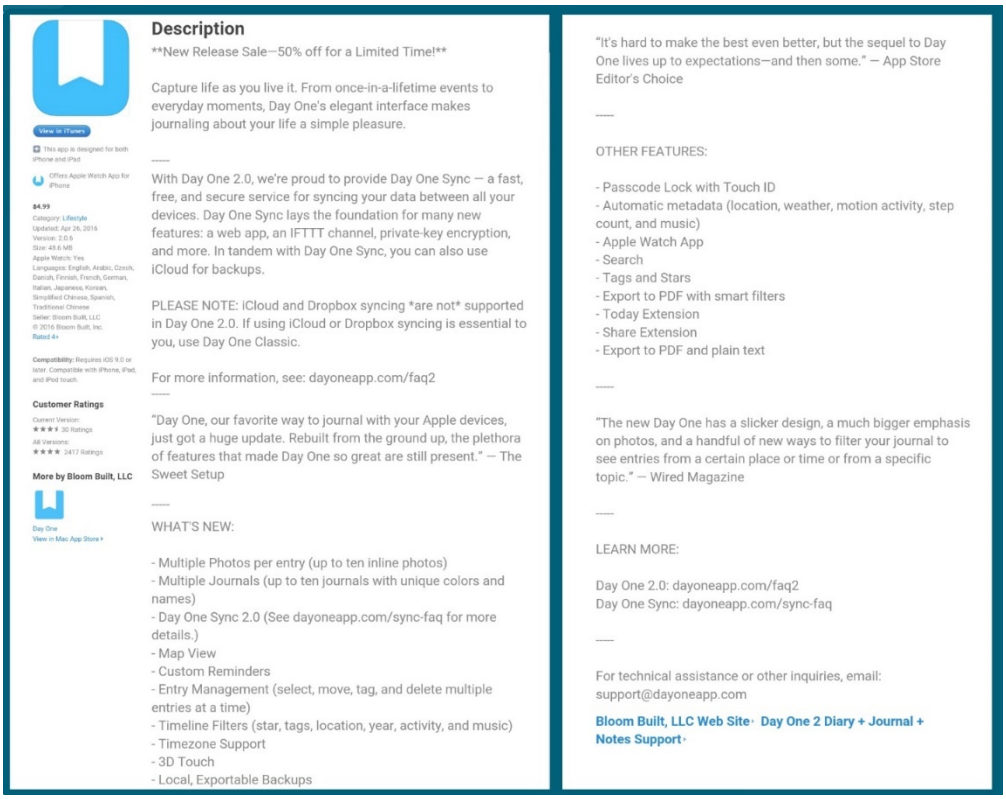
Finally, the word “donate” is another commonly observed name suffix. “Donate” or “donation” indicates that consumers can voluntarily download an app at a pre-determined price (e.g., $1.99) as a way to show appreciation and support. Besides the donate edition, an identical low priced edition (e.g., free) may be offered by the same developer for consumers who have no intention to donate. For example, “Discount Calculator Donate” on Google Play is a paid app that lists identical features as the free edition “Discount Calculator,” both of which are offered by the same developer. Some apps with the “donate” name suffix may provide additional features over their free siblings. For instance, “Music Folder Player Donate” takes out intrusive advertisements while the free edition “Music Folder Player Free” does not. Thus, under these circumstances, it is hard to determine whether consumers opt for the “donate” edition for advanced features or merely to show their appreciations, or both. To specify the motive of showing kindness and support, this study uses the name suffix “donate” to refer to a paid app edition that has identical features and services as its free edition.

App Description

Consumers are able to browse a summarized description of an app before they hit the “install” (Google Play) or “get” (Apple’s App Store) button. Except for the screenshots and videos that give an intuitive introduction of an app, text descriptions are the primary place for a developer to communicate app features and benefits. Neither Apple nor Google gives much guidance on how to writeof app description. Many app developers use a brief introductory

description to tell customers what the app does. Specific features, benefits, and user directions are usually assembled after the introductory section using bullet points. Other commonly seen information, such as social media links, limited time offer notes, customer service email, and update notes may also be placed before or after the feature listing section.

The first few lines of the description text, the short preview of a full description before the "more" button, is usually a complete sentence to summarize the selling point of an app. All remaining text is hidden unless the viewer click on the "more" button to check the full text. For example, the *Instagram* app on iTunes uses the following short description "Instagram is a simple way to capture and share the world's moments" before listing specific features. The introduction section may include media mentions or a short snippet from an influential reviewer to make a powerful impression. However, there is no consensus on where to place and what to reveal in the testimonials. Endorsements from well-respected reviewers and/or favorable reviews from random customers could be placed at the opening section to raise consumers' attention, or after the feature listing section as supplemental assurance. For example, the *Day One 2* app (see *Figure 0.1*) on iTunes quoted two review lines from *The Sweet Setup* website and the *App Store Editor's Choice* note to highlight its strong market place. The *SmartNews* app (see *Figure 0.2*) handles the testimonials in the opposite way. Three quotes from Paste Magazine, CNET website, and Fast Company Magazine are affixed after the feature listing section. In addition, *SmartNews* lists recent awards received from Apple and Google at the end to mark its superiority. Sometimes a testimonial could be used to highlight specific features. The *Day One 2* app also places a quote from *The Wired Magazine* at the end of the app description, in which two appealing improvements (photo editing and journal filters) are mentioned.



Description

New Release Sale—50% off for a Limited Time!

Capture life as you live it. From once-in-a-lifetime events to everyday moments, Day One's elegant interface makes journaling about your life a simple pleasure.

With Day One 2.0, we're proud to provide Day One Sync — a fast, free, and secure service for syncing your data between all your devices. Day One Sync lays the foundation for many new features: a web app, an IFTTT channel, private-key encryption, and more. In tandem with Day One Sync, you can also use iCloud for backups.

PLEASE NOTE: iCloud and Dropbox syncing *are not* supported in Day One 2.0. If using iCloud or Dropbox syncing is essential to you, use Day One Classic.

For more information, see: dayoneapp.com/faq2

"Day One, our favorite way to journal with your Apple devices, just got a huge update. Rebuilt from the ground up, the plethora of features that made Day One so great are still present." — The Sweet Setup

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WHAT'S NEW:

- Multiple Photos per entry (up to ten inline photos)
- Multiple Journals (up to ten journals with unique colors and names)
- Day One Sync 2.0 (See dayoneapp.com/sync-faq for more details.)
- Map View
- Custom Reminders
- Entry Management (select, move, tag, and delete multiple entries at a time)
- Timeline Filters (star, tags, location, year, activity, and music)
- Timezone Support
- 3D Touch
- Local, Exportable Backups

"It's hard to make the best even better, but the sequel to Day One lives up to expectations—and then some." — App Store Editor's Choice

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OTHER FEATURES:

- Passcode Lock with Touch ID
- Automatic metadata (location, weather, motion activity, step count, and music)
- Apple Watch App
- Search
- Tags and Stars
- Export to PDF with smart filters
- Today Extension
- Share Extension
- Export to PDF and plain text

"The new Day One has a slicker design, a much bigger emphasis on photos, and a handful of new ways to filter your journal to see entries from a certain place or time or from a specific topic." — Wired Magazine

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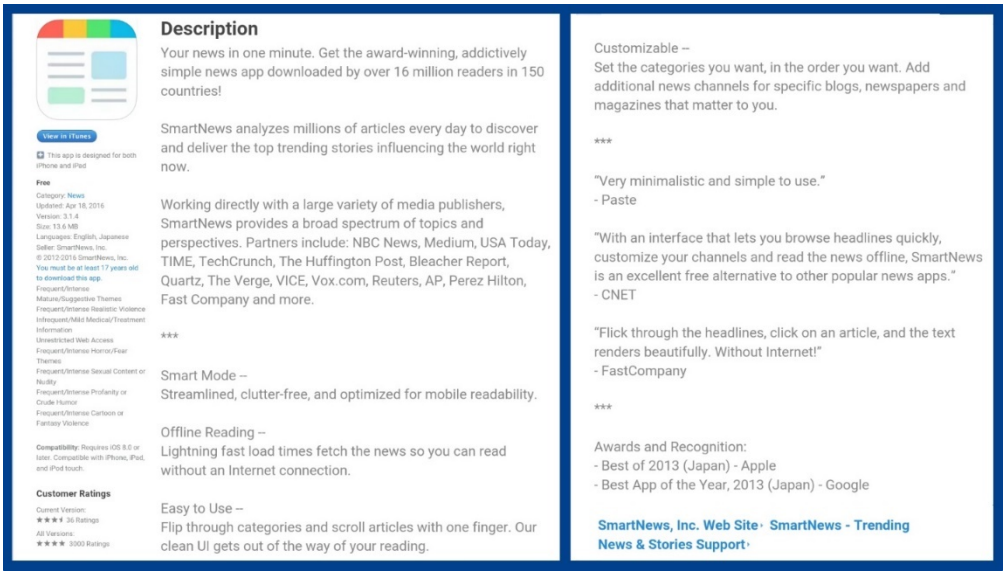
LEARN MORE:

Day One 2.0: dayoneapp.com/faq2
Day One Sync: dayoneapp.com/sync-faq

For technical assistance or other inquiries, email: support@dayoneapp.com

Bloom Built, LLC Web Site · Day One 2 Diary + Journal + Notes Support ›

Figure 0.1 Screenshots of Dayone app description on Apple's iTunes



Description

Your news in one minute. Get the award-winning, addictively simple news app downloaded by over 16 million readers in 150 countries!

SmartNews analyzes millions of articles every day to discover and deliver the top trending stories influencing the world right now.

Working directly with a large variety of media publishers, SmartNews provides a broad spectrum of topics and perspectives. Partners include: NBC News, Medium, USA Today, TIME, TechCrunch, The Huffington Post, Bleacher Report, Quartz, The Verge, VICE, Vox.com, Reuters, AP, Perez Hilton, Fast Company and more.

***

Smart Mode --
Streamlined, clutter-free, and optimized for mobile readability.

Offline Reading --
Lightning fast load times fetch the news so you can read without an Internet connection.

Easy to Use --
Flip through categories and scroll articles with one finger. Our clean UI gets out of the way of your reading.

Customizable --
Set the categories you want, in the order you want. Add additional news channels for specific blogs, newspapers and magazines that matter to you.

***

"Very minimalistic and simple to use."
- Paste

"With an interface that lets you browse headlines quickly, customize your channels and read the news offline, SmartNews is an excellent free alternative to other popular news apps."
- CNET

"Flick through the headlines, click on an article, and the text renders beautifully. Without Internet!"
- FastCompany

***

Awards and Recognition:
- Best of 2013 (Japan) - Apple
- Best App of the Year, 2013 (Japan) - Google

SmartNews, Inc. Web Site · SmartNews - Trending News & Stories Support ›

Figure 0.2 Screenshots of smart news app description on Apple's iTunes

Another fundamental section of an app description is the feature section. A popular way to present details of an app is to list features in bullet points. Outstanding attributes and advantages over competitors usually come at the top of the list. Recent improvements could also make up a huge part of the feature section. For example, the *Day One 2* app splits app features in two lists: a "what's new" list highlighting the newly developed features in the latest app version, and a "other features" list giving out core features carried on from the previous version. Again, no agreement has been reached on how to present app features. Some serious developers (e.g., the Bloomberg Businessweek) offer elaborated features and user directions as in an app manual. Some developers (e.g., the *Day One 2*) use phrases rather than complete sentences to keep the list clear and concise. Some developers use short phrases as headings to highlight the key points and reveal the specifics under each heading. For instance, the *SmartNews* app prioritizes four key features, "Smart Mode," "Offline Reading," "Easy to Use," and "Customizable" and structures corresponding explanations under each heading.

App Information Quality

Product or service information presented to consumers varies in amounts and formats, which in turn lead to differences in consumer evaluations. Information quality has been defined in a variety of ways. A widely practiced way is listing a series of characteristics that may represent high quality information. For example, Keller and Staelin (1987) define information quality as "the usefulness of the available attribute information" (p. 202) in assisting consumers' evaluation of alternative options. Similarly, Rieh (2002) defines information quality as the extent to which the information is perceived to be "useful, good, current, and accurate" (p. 146). Another way of defining information quality is considering the fit of information to consumers' expectations. Salaün and Flores (2001) argue that consumers are given a great deal of

information and are not always able to grasp all given information. Thus, good information should satisfy "criteria of appreciations specified by the user" (Salaün & Flores, 2001, p. 26). Similarly, Kahn et al. (2002) define information quality as characteristics of information that are supposed to "meet or exceed customer expectations" (p. 185). It is also well acknowledged that information for products versus services would have distinct emphases (Kahn et al., 2002; Y. W. Lee et al., 2002; Salaün & Flores, 2001). For example, product information may focus on specifications while service information may address customized experience and personal interactions.

Moreover, researchers have made efforts to identify dimensions of information quality in diverse contexts. For example, Miller (1996) summarizes 10 dimensions of information quality for information-based products, including relevance, accuracy, timeliness, completeness, coherence, format, accessibility, compatibility, security, and validity. The importance of each dimension and how each dimension is translated into technology strategies depend largely on customers' needs and capabilities (Miller, 1996). The product service performance/information quality model (PSP/IQ), developed by Y. W. Lee et al. (2002), contains 15 dimensions and 65 items to measure information quality (see Table 0.2). These 15 dimensions are further grouped into four quadrants - sound, useful, dependable, and usable – based on whether product or service is involved and whether information quality can be assessed against a formal specification or customer expectation (Y. W. Lee et al., 2002).

Though no consensus has been reached in conceptualizing and measuring information quality, several characteristics of high quality information have been agreed among researchers (e.g., Chae et al., 2002; Y. W. Lee et al., 2002; Miller, 1996). Eppler and Wittig (2000) summarized seven common elements of information quality after reviewing relevant literature on

between 1989 and 1999 and: timeliness, accessibility, objectivity, relevancy, accuracy, consistency, and completeness. However, those multi-dimensional criteria are not suitable for experiment manipulations, the research design for this study. Therefore, to achieve simplicity in manipulating high versus low information quality conditions, this study follows earlier studies which manipulated argument quality, a term used to address the overall favorability of arguments in persuasion literature.

Table 0.2

The Product Service Performance / Information Quality Model: Four Quadrants and 15 Dimensions of Information Quality

	Conforms to specifications	Meets or exceeds consumer expectations
Product Quality	Sound information • Free-of-error • Concise representation • Completeness • Consistent representation	Useful information • Appropriate amount • Relevancy • Understandability • Interpretability • Objectivity
Service Quality	Dependable information • Timeliness • Security	Usable information • Believability • Accessibility • Ease of operations • Reputation

Note. From "AIMQ: A Methodology for Information Quality Assessment" by Y. W. Lee, D. M. Strong, B. K. Kahn, and R. Y. Wang, 2002, *Information & Management, 40*(2), p.137.

Argument quality consists of both strength and valence dimensions (Areni & Lutz, 1988). According to R. E. Petty, Cacioppo, and Heesacker (1981), arguments can be characterized as either favorable or unfavorable, on an association with the outcome or consequence of the evaluation (valence). On the other hand, argument strength is defined in terms of the impact (R.

E. Petty & Cacioppo, 1986). Strong arguments trigger predominantly favorable thoughts, while weak arguments are ostensibly compelling but open to skepticism and refutation (R. E. Petty & Cacioppo, 1986; R. E. Petty, Cacioppo, & Heesacker, 1981). A widely cited example of strong versus weak arguments used by R. E. Petty et al. (1983) is shown in Table 0.3. In this example, participants were instructed to read an advertisement booklet about a fictitious disposable razor. In both strong and weak editions, five arguments were provided so that the total number of messages is the same. However, the strong version adds greater emphasis on scientific design, while the weak version simply characterizes the same product as "design for beauty." In addition, the arguments in the strong version are expressed in a more specific and concrete way. For example, the weak version simply introduces the razor to have "a minimum of rust," while the strong version specifies a special coating that leads to rust preventing. Another widely adopted way of manipulating argument strength is through controlling importance of product attributes to consumers. For instance, Andrews and Shimp (1990) conducted a pretest to obtain a pool of product features from which potential arguments were constructed. They did a second pretest to select five most and five least persuasive arguments for the main study. Similarly, Martin, Lang, and Wong (2003) rated a list of attributes from a content analysis and picked the five most important attributes for the strong argument ads while kept the five least important attributes for the weak version. This approach does not fit the purpose of current research because it only focuses on the impact of the message and fails to detect where the impact is coming from. Consumers may evaluate a message differently due to "what" the message is argued (i.e., product features) rather than "how" it is argued (i.e., how product features are portrayed). Thus, high versus low level of information quality should be differentiated through the way product functions and benefits are presented to the target market. The same feature will be worded more

persuasively and generate more favorable thoughts in the high information quality condition than in the low quality condition.

Table 0.3

Petty et al.'s (1983) Example of Advertisements in Strong versus Weak Argument Versions

Strong version of the mock ads	Weak version of the mock ads
• Scientifically designed • Advanced honing method creates unsurpassed sharpness • Special chemically formulated coating eliminates nicks and cuts and prevents rusting • Handle is tapered and ribbed to prevent slipping. • In direct comparison tests, the Edge blade gave twice as many close shaves as its nearest competitor. • Unique angle placement of the blade provides the smoothest shave possible.	• Designed for beauty • Floats in water with a minimum of rust. • Comes in various sizes, shapes and colors. • Designed with the bathroom in mind. • In direct comparison tests, the Edge blade gave no more nicks or cuts than its competition. • Can only be used once but will be memorable.

Note. From "Central and Peripheral Routes to Advertising Effectiveness: The Moderating Role of Involvement" by R. E. Petty, J. T. Cacioppo, and D. Schumann, 1983, *Journal of Consumer Research, 10*(2), p.140.

In the mobile app market, an app's description is supposed to convey valuable information of an app to the target consumers. From the pool of information quality measures summarized by Eppler and Wittig (2000), informativeness, relevancy, and objectivity will be selected in the current study as criteria to evaluate information quality level. Informativeness, based on Y. W. Lee et al. (2002) and Miller's (1996) completeness dimension of information quality, describes the extent information has a sufficient and appropriate volume to cover consumers' needs. In the case of app markets, an informative app description should cover a sufficient breadth and depth of app features. According to Kahn et al. (2002), the relevancy dimension represents the extent to which information is applicable and helpful for the task at

hand. Thus, a relevant app description should provide usage scenarios and user directions that are closely associated with the app (i.e., its features, applications, and user directions). Lastly, objectivity requires information to be presented in an impartial way (Kahn et al., 2002). Accordingly, an objective app description should stick to facts and support arguments using specific app features. In contrast, an app description low in objectivity would be likely to use emotional and subjective conclusions.

Table 0.4

An Example of High and Low Quality in Terms of Relevance, Informativeness, and Objectivity

High review quality	Low review quality
The picture on the 3.5' LCD monitor is absolutely amazing, I am really impressed with the colors and the contrast between darks on such a small screen. Plays songs at top-quality sound with 5.1 channels. Almost every format is supported.	Wooooooooow! I searched for days and compared every PMP and finally bought one. I'm really enjoying it and it is tough to put it down. All my friends envy my PMP. Right now I'm writing a review, but I can't wait to play my PMP.

Note. From "The effect of on-line consumer reviews on consumer purchasing intention: the moderating role of involvement" by Park, Lee, and Han, (2007), *International Journal of Electronic Commerce, 11*(4), p.132.

D.-H. Park, Lee, and Han (2007) provide an example of creating high versus low quality reviews using relevance, objectiveness, understandability, and sufficiency (similar to informativeness) as criteria, which is shown in Table 0.4. This example uses subjective expressions in the low quality version while giving numbers to support the same conclusion in the high quality version. Similarly, in this study, high versus low app information quality were created according to the following criteria: (1) In the high information quality version, app features are introduced with examples and are relevant to the usage situations, while in the low information quality version, neither examples nor usage directions are available. (2) In the high information quality version, an endorsement on the superiority of the app is made by a specific

person with full name and work affiliation. In the low quality condition, the endorser's identity is not disclosed. (3) A summative introduction is available before listing specific features in the high information quality condition. Such introduction is not included in the low information condition.

Perceived App Value

Unlike product attributes that can be specified and explicitly expressed, consumers' value perception of a product is a high-level abstraction, representing their overall assessment of a product based on personal perceptions of the benefits they would achieve from the product consumption (Zeithaml, 1988). The value of the same product may be interpreted differently among consumers. For coupon collectors, value may mean low price (Zeithaml, 1988); for quality-seekers, value may have a similar definition as quality (Cronin et al., 2000; Reeves & Bednar, 1994); for others, value may be considered as a trade-off between what they give and what they get (Grewal, Monroe, & Krishnan, 1998; Monroe, 1990).

The overall perceived value is often decomposed into multiple dimensions. For example, Keller (1993) discussed three major dimensions of the benefits that come with product consumption: (1) functional benefits that relate to intrinsic features of a product and satisfy consumers' physical motives, (2) experiential benefits that also come from product-related attributes but relate more to what it feels like to use the product, and (3) symbolic benefits that correspond to non-product related attributes and focus more on consumers' extrinsic needs such as self-expression and group identification. Sheth, Newman, and Gross (1991) identified five consumption values determining consumers' purchase decisions: (1) functional values that represent utilitarian or physical performance, (2) social values that are associated with imagery of specific social groups, (3) emotional values that relate with affective responses, (4) epistemic

value that come from consumers' curiosity and desire to learn, and (5) conditional values that depend on specific circumstances. Sweeney and Soutar's (2001) four-dimension framework of perceived value (see Table 0.5) provides a similar value model: (1) monetary value that are associated with low price or discount, (2) functional or utilitarian value that are derived from expected product or service performance, (3) experiential/hedonic/emotional/epistemic value that deals with consumers' affective feelings, and (4) symbolic/social value that denotes consumers' self-recognition, status or prestige.

Table 0.5

Sweeney and Soutar's (2001) Four Dimensional Model of Consumer Perceived Value

Dimension	Description
Functional value (price / value for money)	The utility derived from the product due to the reduction of its perceived short term and longer term costs
Functional value (performance / quality)	The utility derived from the quality and expected performance of the product
Emotional value	The utility derived from the feelings or affective states that a product generates
Social value	The utility derived from the product's ability to enhance social self-concept

Reviewing earlier researchers' work (e.g., Sweeney and Soutar, 2001; Keller, 1993) on the decomposition of perceived value, two salient dimensions were unanimously present: the functional aspects derived from instrumental attributes of products (and/or services) and the emotional aspects that related to the sensory gratification from consumption. The functional/emotional approach was also accepted in understanding the characterization of products: utility products whose consumption are primarily driven by instrumental needs and hedonic products whose consumption are consumed primarily for affective benefits, though the

consumption of a particular product category may involve both utilitarian and hedonic dimensions (Crowley, Spangenberg, &Hughes, 1992; Dhar & Wertenbroch, 2000). In the current study, the overall perceived value of an app is decomposed into utilitarian and hedonic aspects. When an app is compared across situations in which it is offered with varying name suffixes and levels of information quality, its value would be perceived to be high when (1) the expected performance of this app is superior (i.e., it provides utilitarian benefits); (2) the app provides pleasure and enjoyable experience (i.e., it offers hedonic benefits); or (3) a combination of both.

Effects of App Name Suffixes on Perceived App Value

Although the dual structure of brand names has received rare academic attention, marketers have long practiced a dual structure in naming products. As introduced earlier, brand name suffixes are used as the supplement component in addition to the primary component (i.e., the parent brand) of the brand name to differentiate attributes and functionalities in brand extensions. In developing a dual-structured naming strategy, brands are considered as "tokens" that distinguish a product from other competitors and deliver the majority of brand equity to consumers, while name suffixes can play a role in communicating a specialized focus on certain features and an add incremental value to a brand (Osler, 2007). In the mobile app market, unless consumers are searching an app store for a specific app by its name (in which case a brand has been established and can be recalled by consumers), an app has to stand out from the competition by its name and icon alone. When an app makes its first appearance in the market, it is hard for consumers to judge its features, benefits, or reputations solely based on the brand name because no associations with the brand have been developed. However, if an app name has a dual structure, it would be easier for consumers to deduct associations based on the name suffix, the self-explanatory component that may attract consumers' attention. In other words, a descriptive

name suffix may create a specific brand image and help the brand communicate app value to consumers.

Specifically, considering the long-practiced tradition in the software industry where escalating numbers or letters are often used to label milestone updates, a numeric name suffix is likely to be identified as a version identifier. For instance, the numerical number "8" in "Windows 8" – an operation system offered by Microsoft -- indicates that it is the successor of its earlier released version of "Windows 7." In fact, prior to wide acceptance of software products, alpha-numeric product names which combine letters and numbers have been recorded to indicate chemical content, scientific formulae, or nutrient value among technical or chemical products (Costa & Pavia, 1992; Pavia & Costa, 1993). Auh and Shih (2009) suggested that the use of alpha-numeric names is a cost-efficient and effective way to describe a product's placement in its product line because consumers can draw inferences from this naming convention. In Auh and Shih's (2009) study, a non-sequential name suffix was a signal of revolutionary innovation, while a serial numerical name suffix on software products was found to indicate progressive improvement over the last generation, leading to a greater perception on product differentiation, attribution upgrade, and technological improvement. Therefore, it is speculated that consumers would associate numerical name suffixes with version updates and make an inference that an app with a numerical name suffix would receive regular maintenances or updates from its developer. In addition, regular updates and maintenance would easily be associated with a high app value. Accordingly, the following hypothesis is proposed:

H1: Consumers perceive a higher app value for an app named with a numerical suffix than an app named without a suffix.

In addition, software retailers use segmentation strategies to group consumers according to their needs and characteristics (Raghunathan, 2000). For example, an app line could have several editions under the same family brand. A basic edition, targeting the mainstream consumers, may provide fundamental features for individual work and may be sold at the base price. By contrast, a "professional" or "enterprise" edition, targeting corporate users, may contain premium features for advanced work on top of the basic features. Aligned with added features or services, those high-end editions come with a price premium. Since software editions are often designated with name suffixes such as "standard," "home and student," "professional," and "enterprise," consumers may easily detect a difference in value conveyed by the name suffixes. For instance, Microsoft released several traditional editions for its productivity suite Office 2013: the name suffix "home and student" indicates an edition with core applications, while the name suffixes "home and business" and "professional," suggest editions with application expansions for business use. Accordingly, the "home and student," "home and business," and "professional" editions are priced at $99.99, $219, and 399, respectively. Since the price-value association consumers frequently rely on to make purchase decisions (Vigneron & Johnson, 1999; Zeithaml, 1988), it is highly possible that consumers have established a name suffix-value scheme to infer the value of software products. Applying the name suffix-value scheme to the mobile apps market, it can be speculated that the name suffix "premium," suggesting value-added functionalities and services, would be treated as a badge of high app value. Thus, the following hypothesis is proposed:

H2: Consumers perceive a higher app value for an app named with the suffix "premium" than an app named without a suffix.

The name suffix "ad free" does not seem to make frequent appearances until the era of mobile apps. As Gupta (2013) noted, while computer users are accustomed to find ads in the right margin of the screen, mobile users often find ads extremely unacceptable due to a much smaller screen where no margin can be spared. Nevertheless, since free apps have been an efficient way to lower app price and improve visibility, developers are likely to tradeoff between use experience and price by implementing sponsored ads in the free version of an app, while simultaneously offering a paid, ad-free version of the app (Wagner, Benlian, & Hess, 2013). Thus, when the name suffix "ad free" is attached to an app brand name, it is likely to imply added value due to the freedom from ad interruptions. Specifically, the value or an app is likely to be perceived higher when the ad free feature is explicitly labeled as its name suffix than when it is named without a suffix. Therefore, the following hypothesis is proposed:

H3: Consumers perceive a higher app value for an app named with the suffix "ad free" than an app named without a suffix.

Lastly, the name suffix "donate" does not necessarily suggest a refined feature or a personalized service. Instead, "donate" is often seen in high-priced app editions. While a cheaper but fully functional edition is available only a click away, consumers who opt for a donate edition wish to show their kindness, appreciation, and support to developers' work. In some sense, the name suffix "donate" is a help-wanted sign to gain voluntary monetary support from app users. Although the word "donate" may not be associated with a specific app feature, it may encourage consumers to consider developers' efforts in designing and programming an app. As Gipp, Kalafatis, and Ledden's (2008) study suggested, an introduction of donors, such as efforts and time invested into a project, is an important determinant of donation value. In other words, a donation may be considered to have high value when donation related information is easily

accessible. Similarly, the value of a "donate" app could be perceived higher than an app without a name suffix because the name suffix "donate" may encourage consumers to support developers' work.

In addition, Verplanken and Holland (2002) noted that a particular value (e.g., social value) is not automatically accessible in all situations. Instead, values may be activated when they are implied by a particular situation or by the given information (Verplanken & Holland, 2002). For example, if consumers are primed with environment related information, their environmental values would more likely to be activated in evaluating product attributes. Therefore, the name suffix "donate" may activate consumers' value perceptions about generosity and rewarding others' work. As a result, the overall value attached to the "donate" edition would be higher than the edition without a name suffix. Accordingly, the following hypothesis is proposed:

H4: Consumers perceive a higher app value for an app named with the suffix "donate" than an app named without a suffix.

Effects of App Information Quality on Perceived App Value

In the case of the mobile app market, developers are manufactures and vendors. As a manufacturer, a developer creates an app with certain features that appeal to the target market. As a vendor, a developer gives a name and an icon to their work, writes short text descriptions to introduce the major features, and attaches app screenshots to give consumers a visible impression. Consumers choose an app market and look for products by keywords searching, category-based browsing, or picking from the top charts generated from other consumers' activities. Unlike picking up groceries from a store shelf, consumers cannot physically touch or examine the apps (Q.-H. Wang et al., 2012), nor could they ask help from a service agent when they need further

information. As a result, consumers have to make a download decision based on limited cues on the mobile screen.

Once the icon and name help an app stand out from other competitors, it is the app description that introduces what the app offers and stimulates the sales. Researchers have agreed that consumers shopping on the Internet are forced to form their first impression about a product based on the interface and content of the website (Harrison McKnight, Choudhury, & Kacmar, 2002; Kelton, Fleischmann, & Wallace, 2008). Specifically, Siau and Shen (2003) argue that a well-designed mobile Website should provide sufficient information and necessary links to other Websites to facilitate consumers' purchase decision making. Consumers reading an "informative" app description, which covers sufficient information on major features, user directions, and developer announcements, are more likely to be effective in communicating app value. Rieh (2002) find that consumers' judgments about information goodness are not only based on objective characteristics but also on their expectations and situations. Thus, a "relevant" description, referring to a description that is applicable and helpful for using the app (Kahn et al., 2002), is likely to help match their expectations with the described app features. Finally, Ford, Smith, and Swasy's (1990) study on advertising claims also revealed that consumers are less skeptical about objective attribution claims than subjective preferences claims. J. Lee and Lee (2009) echoed with a similar view that consumers evaluate product quality more seriously as the level of information objectivity increases. Since quality and value perceptions are highly correlated (Zeithaml, 1988), a positive association between objectivity and value perception should also stand. Therefore, an "objective" app description, referring to a description that uses facts and descriptive examples to rationalize the argument instead of subjective language appealing to personal feelings, is expected to help consumers infer the app value. As a result, an

app presented with a high quality description (i.e., relevant, informative, and objective) is likely to be perceived to have a greater value than an app having low quality description. The following hypothesis is thus proposed:

H5: App information quality has a positive effect on perceived app value.

Effects of Perceived App Value on Behavioral Intentions

If viewers are persuaded by an app page presenting the app's name and feature descriptions, they would form intentions to download the app, and/or talk to other people about their experiences with this app. Therefore, the ultimate effectiveness of app name suffix and app information quality can be assessed by consumers' behavioral intentions. Positive behavioral consequences in the quality and value literature typically include paying price premium, remaining loyal to a brand (repurchasing), recommending the brand to others, and willing to search further information about the brand (Grewal et al., 1998; Zeithaml, Berry, & Parasuraman, 1996). On the contrary, negative behavioral consequences in response to poor quality and low value perceptions include complaining to the company and/or to a third-party, switching to other brands, and communicate their disappointments to other consumers (Wangenheim, 2005; Zeelenberg & Pieters, 2004). In the current study, consumers' download intention and positive word-of-mouth intention are considered as the consequences of greater value perceptions of apps, formed based on an app name suffix and information quality of an app description.

Download Intention

In the app market, consumers download what they find interesting but not necessarily have to sacrifice an immediate amount of money for an app. From consumers' perspective, the moment they click on the download button is the moment they agree to the user agreement statement and make a transaction. Following earlier researchers' work on purchase intention

(Grewal et al., 1998; Kalwani & Silk, 1982), download intention in the current study is defined as the likelihood that a consumer intends to download an app. Purchase intention has long been found to be influenced by perceived value of a product (O'Cass & Frost, 2002; S.-P. Tsai, 2005) or services (Cronin et al., 2000), and associated with actual purchase behaviors (Kalwani & Silk, 1982). Zeithaml (1988) argues that perceived value is a higher-level abstraction than specific attributes, benefits, and quality perceptions of a product, and proposes value to be an intervening factor between quality perception and purchase. Chen and Dubinsky (2003) study support Zeithaml (1988) view by empirically testing the relations among price, quality, perceived risk, perceived value, and purchase intention. They conclude that perceived value, as an overall evaluation of a product, would be a more immediate predictor of purchase intention than product quality. Likewise, download intention for paid apps could be influenced by perceived value of the app and be an effective way to forecast consumers' purchase behaviors. Thus, the following hypothesis is proposed:

H6: Perceived app value of a paid app positively influences download intention.

Word of Mouth Intention

Unlike formal customer complains that are made directly to the seller, word-of-mouth activities are characterized by the casualness and spontaneity in consumers' communications about brand, product, and service (Arndt, 1967). Researchers have shown that satisfied consumers tend to articulate their appreciation of products and make recommendations to others (Anderson, 1998). In contrast, disappointed consumers are likely to engage in negative word-of-mouth activities such as sharing their bad feelings with friends and relatives (Mattila & Ro, 2008) and broadcasting their experiences in the online forum (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004). However, word-of-mouth is often considered as a post-purchase activity and

often discussed in cases when consumers have cognitively evaluated their overall experiences and formed emotional responses (Swan & Oliver, 1989). The direct impact of perceived value on word-of-mouth intention in decision-making has been less studied than other antecedents of word-of-mouth intention (e.g., satisfaction). In addition, word-of-mouth activities are often discussed in the service literature. For example, Hartline and Jones (1996) reported a relatively large impact of value (compared with quality) on recommendation intentions in evaluating hotel's service performances. Similarly, Cronin et al. (2000) looked into a more complex model by integrating quality, value, and satisfaction perceptions collectively in the decision making process and established a direction relationship between value perception and recommendation intention. In the current study, browsing a mobile app and evaluating an app value prior to actual use may not result in extreme affections (e.g., satisfaction) or complaints. However, the overall positive impression of an app may still trigger consumers' word-of-mouth behavior in interpersonal small talks. For example, when the app-related topics are mentioned, consumers may tell mostly positive things about an app and recommend to others whom have similar needs. Thus, an app of higher perceived value is proposed to generate word-of-mouth intentions in a greater possibility than an alternative perceived to be inferior. The following hypothesis is plausible:

H7: Perceived app value of a paid app positively influences word-of-mouth intention.

Moderating Effects of Consumer Characteristics

When consumers searching for mobile apps in an app market, it is unlikely that all consumers pay equal attention to given information (app name and description in the current study) or give all factors equal weight in judging the app value. Since consumers differ in motivations to download apps, vary in abilities to comprehend app feature descriptions, and

interpret app value based on personal needs, the same communication of an app name suffix and app information quality may be evaluated differently. In the following session, Petty and Cacioppo's (1986) ELM is introduced as the theoretical background to explain how information is processed and evaluated in general. Need for cognition and app savviness are discussed as two predispositional traits influencing consumers' information processing routes under ELM's assumption. A discussion of three additional consumer characteristics —need for status, ad intrusiveness, and reciprocal inclination— follows to explain how they may moderate effects of certain name suffixes on consumers' app evaluation.

Elaboration Likelihood Model

As depicted in Figure 0.3 (R. E. Petty & Cacioppo, 1986), the ELM postulates two qualitatively distinct routes to persuasion, the central and peripheral routes, based on how carefully issue-relevant messages are processed. The essential difference between the central and peripheral routes lies in the likelihood of elaboration, the extent to which a person exerts extensive mental effort on issue-relevant information (R. E. Petty & Cacioppo, 1986). According to the ELM, the probability of adopting the central route to persuasion increases as the elaboration likelihood heightens. Namely, when people are motivated and able to scrutinize relevant message arguments, persuasion is likely to happen as a result of diligent and thoughtful consideration of issue-relevant information (i.e., the central route); on the contrary, when people are not motivated or lack the ability to evaluate the merits of various information, their attitudes are likely to be formed or changed by associating the issue with simple cues without argument scrutiny (i.e., the peripheral route) (R. E. Petty & Cacioppo, 1981; R. E. Petty et al., 1983).

Furthermore, the circumstances under which a route is more likely to be adopted than the other depend on both environmental and personal factors that affect the perceiver's motivation

and/or ability to elaborate on issue-relevant information (Bitner & Obermiller, 1985). As shown in Figure 0.3, when issues are of high personal relevance (R. E. Petty, Cacioppo, & Goldman, 1981), when the perceiver generally enjoys effortful thinking (i.e., the perceiver has high need for cognition) (Haugtvedt, Petty, & Cacioppo, 1992), and when the situation assumes a high personal responsibility, the perceiver's motivation of elaborating issue-relevant messages is stimulated (R. E. Petty & Cacioppo, 1986). In R. E. Petty and Cacioppo (1984) experiment, high motivation was manipulated through personal relevance – students were presented with a tuition raise proposal at their own university or at a distant but comparable university. It turned out that students in the high motivation condition tended to scrutinize each argument (i.e., the central route) while students in the low motivation condition tended to make their decisions based on the number of arguments (i.e., the peripheral route). In terms of elaboration ability, an environment with low distraction and moderate message repetition, and a message perceiver with prior knowledge and high message comprehensibility would enhance the perceiver's ability of elaboration (R. E. Petty & Cacioppo, 1986). For example, in Maheswaran's (1994) experiment, when presented with a product booklet of a fictitious stereo system, experts who have prior knowledge tend to focus on complex technical attributes and generate more attribute related thoughts (i.e., the central route), while novice who have little knowledge on stereo systems tend to rely more on the country of origin information and generate more stereotypical thoughts.

According to the ELM, the issue-relevant message is the central cue that is carefully processed and evaluated by perceivers. Thus, how persuasive messages are narrated and presented would be a critical determinant of persuasion as the persuasion follows the central route. Reardon (1991) proposed three criteria people rely on to determine when they are motivated to reason and whether they are capable of reasoning about alternative choices: (1)

appropriateness, the extent to which the message is accepted by important others; (2) consistency, the extent to which the message is similar across over situations and times; and (3) effectiveness, the extent to which a message would lead to desired results. On the contrary, source credibility and attractiveness, environment pleasantness, and other non-attribute related information are often used as non-issue relevant, peripheral cues as the persuasion follows the peripheral route (Bitner & Obermiller, 1985). Sometimes a cue can be evaluated in both persuasive routes depending on whether the motivation and ability criteria are satisfied. For instance, shopping atmosphere (non-issue relevant information) is less of a concern than price, promotion, and other product features (issue-relevant information) if the shopper is determined (i.e., high motivation) to make a purchase and knows what attributes to look for (i.e., high ability). Yet, a prestige-image shopping ambient could be elaborated as a sign of service and play a decisive role in buying for a browsing consumer (i.e., low motivation) who has little knowledge on products (i.e., low ability) (Baker, Parasuraman, Grewal, & Voss, 2002).

In addition, R. E. Petty and Cacioppo (1981) argue that attitude change through the central processing route stores new cognitions in the memory and is relatively enduring and more predictive of behavior. On the other hand, the attitude shift based on peripheral cues is relatively temporary, less reliable in predicting behavior, and susceptible to further changes. In a study on advertising endorsers, Priester and Petty (2003) identified that the endorsers low in trustworthiness elicit more product-related cognitive thoughts and are more effective in affecting consumer attitudes towards advertised products than endorsers with high trustworthiness.

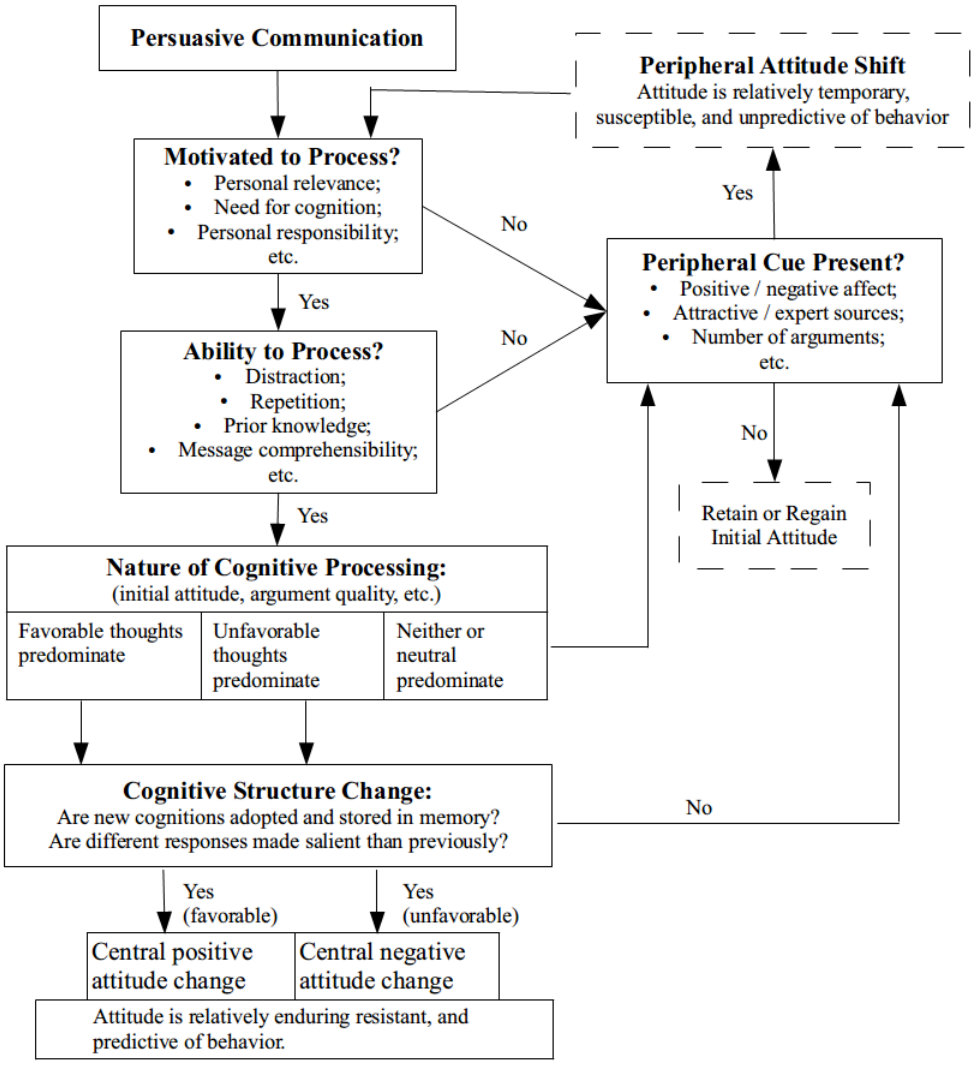


Figure 0.3. Schematic depiction of Elaboration Likelihood Model. Adapted from "Communication and Persuasion: Central and Peripheral Routes to Attitude Change," by R. E. Petty and J. T. Cacioppo, 1986, p. 4.

According to the ELM, when a consumer is motivated and has the ability to review issue-relevant information, the central information-processing route is activated (R. E. Petty & Cacioppo, 1984, 1986). In the app market, app descriptions should be the issue relevant information because app features, functionalities, and performances are the key indicators of

functional value (Sheth et al., 1991). On the other hand, when a consumer is not motivated or has limited ability to process app description in great detail, the peripheral route is more likely to be activated, in which non-issue relevant information is relied on as the surrogate of app value. App name suffixes may be used a mental shortcut that allows consumers to jump into ultimate conclusions without analyzing features and options in the app description.

Need for Cognition

As conceptualized by Cacioppo and Petty (1982), need for cognition (NFC) describes a consumer's general tendency to engage in and enjoy effortful, analytic thinking. People high in NFC tend to process and evaluate available information thoroughly and thus are likely to be influenced by message-relevant thoughts (Haugtvedt et al., 1992). However, people with a low NFC tend to accept already processed information. For example, when facing the same arguments of a typewriter advertisement from two different types of endorsers, low NFC individuals are found to be more influenced by the attractiveness of the product endorser than the high NFC individuals (Haugtvedt et al., 1992). In a decision making scenario to purchase a laptop computer, individuals with a high NFC tend to engage in more extensive information search and process relevant information thoroughly, while individuals with a low NFC prefer to accept information from interpersonal sources (Mourali, Laroche, & Pons, 2005). Inman, Peter, and Raghubir (1997) found that promoting a brand with a restriction in quantity terms (e.g., "limit 1 per customer") yields an increase in likelihood of purchase for low NFC individuals while the same restriction does not affect high NFC individuals. Therefore, high NFC consumers are more likely to follow the central route of persuasion and form their attitudes towards a product based on a comprehensive evaluation of product attributes; in contrast, consumers low in NFC tend to avoid effortful thinking and form their attitudes through the peripheral route

(Cacioppo et al., 1986). Similarly, in the app market, consumers low in NFC would pay less attention to complex app information and rely more on peripheral cues such as a name suffix. On the contrary, consumers high in NFC may be more likely to evaluate app information thoroughly and rely less on the app name suffix. The following hypotheses are thus proposed:

H8: The effect of a name suffix on perceived app value is stronger among low (vs. high) NFC consumers.

H9: The effect of app information quality on perceived app value is stronger among high (vs. low) NFC consumers.

App Savviness

Consumers differ in the degree to which they embrace new technologies to accomplish goals in home life and at work (Parasuraman, 2000). Technology-savvy consumers have the ability to adopt ever changing computer-based tools and can usually figure out the latest technology products without help (Shanahan & Hyman, 2010). Technology savviness, or tech savviness, is a construct that has been used in various contexts. For example, in health-related research, Internet savvy users access health information through websites, newsgroups, chat rooms, and other variety of ways and are able to evaluate reliability of each source (Ahmann, 2000). In the Internet piracy study, technology savviness is described as an ability to search for, download, and share an unauthorized copy of files (Shanahan & Hyman, 2010). Tech savvy educators are identified as teachers who devote to integrate technology, such as word processing, PowerPoint presentation, and Internet search, into their classrooms (Schrum et al., 2008).

Analogous to technology savviness in the aforementioned contexts, app savviness in the current study refers to consumers' propensity to embrace the mobile technology and the ability to use apps to accomplish personal and work tasks. One common characteristic among tech savvy

consumers is high innovativeness, or the likelihood of adopting the latest new product in a product category (Goldsmith, d'Hauteville, & Flynn, 1998). Innovativeness is found to have positive correlations with product knowledge and product involvement (Flynn & Goldsmith, 1993), suggesting that innovators in one field demonstrate (1) a high level of interest and experience in researching, purchasing, and using a certain product type and (2) are knowledgeable about product attributes, applications, and usage. Likewise, app savvy consumers tend to have (1) extensive experiences in downloading, installing, and using apps and (2) considerable knowledge about app features, personalization options, and benefits.

R. E. Petty and Cacioppo (1986) recognized both involvement and knowledge among the important factors influencing people's motivation and/or ability to process information. According to R. E. Petty et al. (1983), for matters that are personally involved, an individual is highly motivated to process incoming messages thoroughly, evaluate the merits or flaws carefully, and draw conclusions based on multiple sources. On the contrary, low-involved individuals are less motivated to devote their cognitive efforts but tend to make judgments on heuristics. In the ELM, knowledge is associated with the ability to process issue-relevant information. Rao and Monroe (1988) noted that individuals with well-developed knowledge structures are capable of assessing intrinsic attributes and are informative about evaluating criteria for product assessments. Considering that scrutinizing and evaluating issue-relevant information (i.e., the central route) demands a considerable amount of cognitive resources, consumers with high knowledge would be more capable to perform such information processing than consumers with low knowledge. As defined earlier, app savviness is associated with consumers' knowledge and prior involvement levels with an app category. Thus, consumers with high app savviness would be those who have both motivation and ability to perform cognitive

thinking, while consumers with low app savviness would be those who either lack the motivation or ability to allocate cognitive resources on issue-relevant information.

As mentioned earlier, version numbers followed by a brand name is not uncommon in the software market (Bhat & Burkhard, 1998; Raghunathan, 2000). Developers often use escalating version numbers to identify feature improvements and upgrades (J. Lee & Lee, 2009). For example, Samsung's flagship smartphone Galaxy 4 is introduced in 2013 as the successor to Galaxy S3, which is updated from Galaxy S2 a year after S2's release. In the app market, the version number is placed at an inconspicuous place unless it is used as a name suffix. For low-savvy consumers who either have little experience in using apps or are not motivated to explore further information, a numeric app name suffix creates a mental shortcut to represent the developer's maintenance and updates, which would be further associated with a high app value. On the contrary, since product-related experiences have been accumulated and held in their memory, app savvy consumers would be more motivated to explore and more capable of assessing specific app features in the app description. In sum, a numerical name suffix would be more likely to be processed as a peripheral cue to infer app value for consumers low in app savviness than consumers with high app savviness.

H10: The effect of a numeric app name suffix on perceived app value is stronger among consumers low (vs. high) in app savviness.

H11: The effect of app information quality on perceived app value is stronger among consumers high (vs. low) in app savviness.

Effects of Other Personal Characteristics on Information Processing

Although the ELM has been widely acknowledged as the framework to explain attitude formation and change, researchers have endeavored to identify its limitations in consumer

behavior, marketing, and advertising fields. One critique from Bitner and Obermiller (1985) specified that the central route and the peripheral route, originally presented by Petty and Cacioppo as alternatives, could be non-mutually exclusive routes. Bitner and Obermiller (1985) hypothesized that advertising may work through the peripheral processing route and have a marginally determinant role in affecting attitude change if the central processing results in an indecisive situation. Chaiken and Maheswaran (1994) confirmed Bitner and Obermiller (1985) view by showing a biased central processing situation, in which a contradictive peripheral cue was present along with a central cue. Chaiken and Maheswaran (1994) concluded that the peripheral and central information processing could co-occur and help determine the decisiveness of potential consequences of co-occurrences. The independent effect of peripheral processing to central processing and the potential interaction effect between them are meaningful in the marketing field because the objective differences of products and services could be small in a mature product category, in which evaluations may be more likely to be influenced by peripheral cues such as brand names.

Cho (1999) pointed out that the ELM does not describe how consumers are exposed to persuasive communications or how they are attracted by persuasive messages. For example, in an advertisement sponsored website, the possibility a banner ad gets exposed to consumers depends on its position and appearance (e.g., color and size). Whether a consumer has the motivation to process the banner ad is yet to be determined unless the banner ad gets an opportunity to be noticed. Tam and Ho's (2005) study on product personalization echoed with Cho's (1999) opinion by arguing that messages do not get an equal opportunity to be processed because of personal preferences and tastes. In addition, Tam and Ho (2005) noted that the primary focus of the ELM is on attitude change rather than choice decision. Since consumers

would like to rely on multiple decision aids to reduce the cognitive load, a peripheral cue that matches consumers' personal dispositions could play a pivotal role in the entire decision making process (Tam & Ho, 2005). In sum, personal characteristics could influence the likelihood of a cue (central or peripheral) being relied on in the decision making process. Three personal variables, need for status, ad intrusiveness, and reciprocal inclinations will be discussed in detail in corresponding to their effects on information processing of three name suffixes, premium, ad free, and donate.

Need for Status

It is generally understood that social status characteristics, such as occupation, education, and positions in a hierarchy, have strong power in determining social influence, decision making, and prestige standing among group members (Berger, Cohen, & Zelditch, 1972). These social characteristics are signaled by the acquisition and consumption of material goods, such as what and where people eat, how they dress to present themselves, and how they communicate with others (O'Cass & McEwen, 2004). Consumers in the upper social class have long been identified to have the traits of spending excessive amounts of fortune and leisure time on goods and services that are ostensibly designed to show the taste of upper class (Veblen, 1899). The phenomenon of consciously displaying goods, however, can be explained by two often interchangeably used but conceptually distinct constructs: status and conspicuous consumption. Eastman and Goldsmith (1999) identify need for status as the desire of signaling social status through the possession of products and services. Consumers high in need for status tend to be more conscious of status-laden products and show their consciousness in the consumption behavior. For example, Han et al. (2010) study demonstrated that consumers low in need for status do not use products with overt status signals because they are low in need to disassociate

themselves with the masses. On the other hand, consumers high in need for status are highly motivated to use easily decipherable signals, such as prominent brand logos and designs, to disassociate with other classes (Han et al., 2010). The other construct, conspicuous consumption, defined by Bagwell and Bernheim (1996) as "a willingness to pay a higher price for a functionally equivalent good, arise from the desire to signal wealth" (p. 350), emphasizes more on signaling – possessions are publically demonstrated in the presence of other people (O'Cass & McEwen, 2004). Therefore, it is concluded that status consumption emphasizes consumers' desire to possess a status-laden product, which may or may not be conspicuously demonstrated (O'Cass & McEwen, 2004). For example, a consumer high in need for status may wear high-end sleepwear at home to match the status of being able to afford luxury lingerie. In contrast, consumers engaging in conspicuous consumption may wear a signature design or labeled outfit to signal their social standing in a social setting.

Mobile apps are not as ostentatious as other symbolic products, such as apparel and automobiles in signaling one's standing. Thus, a name suffix implying premium features may not be obvious enough for other people to notice. However, consumers high in need for status should have the consciousness to possess various status-laden products and may desire to use premium branded apps even if the premium features are not visible to other consumers. For consumers who are sensitive to social status and self-consciousness, a product's (or a service's) social value, defined by Sweeney and Soutar (2001) as "the utility derived from the product's ability to enhance social self-conception" (p. 211), should be weighted heavier than for consumers who generally do not infer social status from consumption behaviors. Therefore, it is reasonable to assume that consumers who generally use products as social status symbols tend to perceive a

higher value of an app in which premium features are implied in the name suffix. The following hypothesis is proposed:

H12: The effect of the app name suffix "premium" on perceived app value is stronger among consumers high (vs. low) in need for status.

Ad Intrusiveness

Advertisements broadcasted through televisions and radios are generally regarded as intrusive and avoided by media users through cognitive, behavior, and mechanical means (Speck & Elliott, 1997; Wilbur, 2008). For example, television viewers may divert their attention to other things and ignore the commercial (cognitive strategy), switch channels using remote control (mechanical strategy), or simply leave the room (behavioral strategy) to avoid ad exposure. The ads on the Internet, such as banner ads, pop-up ads, and paid-text links, are more intrusive than ads on television screens because the Internet is often used as a task-performing medium (Cho & Cheon, 2004). Accordingly, consumers' avoidance responses to online ads would be more intense compared with viewing ads in other media. Edwards, Li, and Lee (2002) argued that the perception of intrusiveness is caused by the feeling of reactance when consumers are engaging in important activities and treat the ad as a threat to their freedom of pursuing the activities. As such, ad intrusiveness is determined by the degree to which a consumer deems the placement of ads as pullbacks and the degree that the task is important to them. In the case of portable devices of which the media and texts have to fit the small screen size, ads are less likely to be welcomed due to four reasons. First, the personal nature of smartphones and tablets make their owners more control-oriented (Bellman, Potter, Treleaven-Hassard, Robinson, & Varan, 2011). Consumers are able to customize their devices according to personal preferences and have control over how much information they want to reveal. As a result, a new app is not allowed to

download if it does not get users' permission. Second, mobile ads are displayed or popped out on a small screen that could hardly show full content without scrolling down. The unexpected appearance of ads on a mobile device's small screen would make the ads not ignorable. Third, every app is designed for a certain purpose. Whether it is to book a flight, to chat with friends, or to kill leisure time, consumers use a app for a specific reason and thus value their use experiences. As a result, consumers who are indulged in their tasks are likely to perceive ad interference and become offended by the intrusive ads (Cho & Cheon, 2004). Lastly, location tracking techniques and personalized ads are likely to trigger privacy concerns (Baek & Morimoto, 2012; J. Y. Tsai et al., 2009), which may further push consumers away from ads during app uses.

Consumers have been accustomed to buy a digital video recorder to fast-forward through ads or to pay fees to remove the intrusive commercials in stream videos (Tåg, 2009; Wilbur, 2008). Likewise, the notion of paying for non-ad intrusive interactive experience on mobile phones might be readily accepted by consumers. When an ad-free feature is indicated by the app name suffix, it signifies zero or minimum ads interruption, which further indicates enhanced interaction fluency. For those who have low tolerance to ad intrusion, the "ad free" feature promises a non-disruptive interaction with their devices and thus could be readily recognized as an indicator of the app value. Thus, these consumers are more likely to perceive a higher value for apps indicating the ad free feature. On the contrary, for those who do not perceive such a level of ad intrusiveness, the app value brought by the ad free feature may not be perceived as high as the app price.

H13: The effect of the app name suffix "ad free" on perceived app value is stronger among consumers perceiving high (vs. low) ad intrusiveness.

Reciprocal Inclinations

Consumers tend to seek lowest price possible for the resources they need (Lynn, 2009). This holds true when consumers collect coupons and make evaluations carefully before the purchase decision is made. However, sometimes consumers behave in the opposite way. They donate their blood in exchange for nothing (Sojka & Sojka, 2008); they tip generously for an average dinner (Lynn, Zinkhan, & Harris, 1993); they spend an excessive fortune to buy souvenirs at the end of winery visiting (Kolyesnikova, 2006); they make donations to open-source software communities even when the software is distributed for free (Krishnamurthy & Tripathi, 2009). In sum, consumers are willing to make a donation for what they are involved. However, psychological motives behind these seemingly similar activities can be quite different. Some people naturally feel empathy for their surroundings and are always altruistic to others (Ashton, Paunonen, Helmes, & Jackson, 1998), while others want to make a good impression in front of others because social norm requires a gentleman to be generous (Lynn, 2008). Some users pay in advance to exchange for better service (Krishnamurthy & Tripathi, 2009), while some people feel obligated to reciprocate the nice services they have been offered (Kolyesnikova, 2006; Kolyesnikova & Dodd, 2008). In an wine visiting example, Kolyesnikova and Dodd (2008) noted that winery visitors are likely to feel appreciation for good service and develop a sense of gratitude, which leads to wine purchase. Perugini et al. (2003) define reciprocate inclinations as a general tendency that an individual is willing to reciprocate others' behavior, including rewarding good deeds and punishing hurting behaviors. Since donation is a reward behavior rather than a punishment, this study considers only the positive reciprocate inclination.

In the case of the mobile app market, the app name suffix "donate" is usually attached to a paid app that also has an identical free edition. Thus consumers opting to download a donate

edition would not receive better service for the price. Nor would they feel the social pressure to download the paid edition because free edition are as popular, if not more than, as the paid but functionally equivalent alternatives (comScore, 2013). It is likely that consumers would appreciate what programmers have invested in the app and thus feel it necessary to reciprocate the developer's good deed by paying a price premiere and/or making recommendations. As discussed earlier, consumers' value perception is influenced by the accessibility of particular information and whether a particular value component is activated. It is expected that consumers' value on reciprocation will be more accessible and easier to be activated for those who are naturally inclined to reciprocate good deeds and appreciate others' efforts. Therefore, it is hypothesized as follows:

H14: The effect of the app name suffix "donate" on perceived app value is stronger among consumers high (vs. low) in reciprocal inclinations.

Based on the conceptual discussions and theoretical applications above, an overall framework of this study is proposed (see

Figure 0.4). An experimental study is designed to examine to the proposed hypotheses. Prior to the experiment (presented in Chapter 4), three pretests (presented in Chapter 3) were conducted to determine the stimuli used in the experiment. The overall discussion of findings and conclusions are provided in Chapter 5.

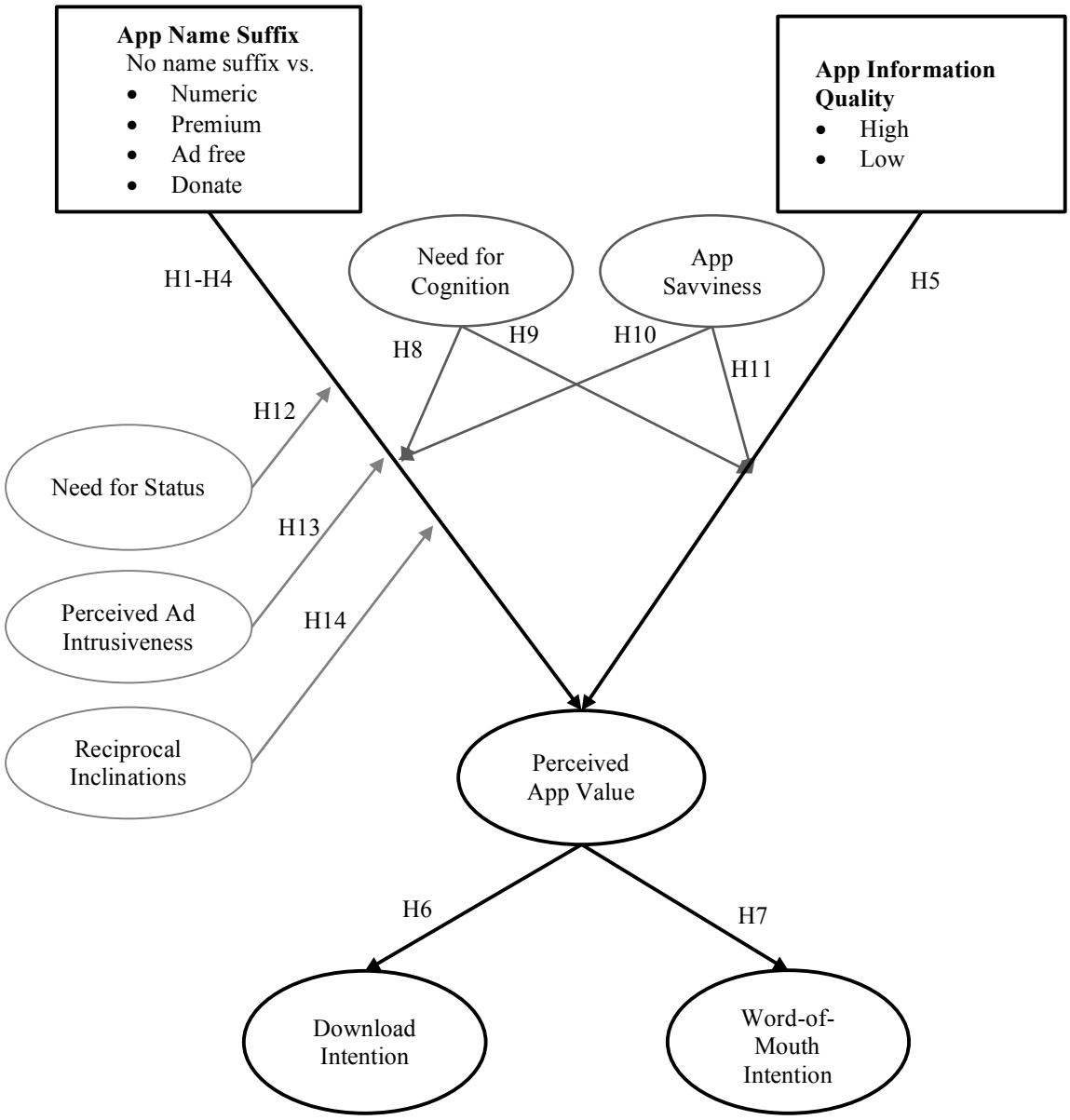


Figure 0.4 Proposed Framework

Chapter 3. Pretests for Stimulus Development

Chapters 3 and 4 describe the research method to test the hypotheses proposed in Chapter 2. Prior to the main study (in Chapter 4), three pretests were conducted to develop and validate experimental stimuli. The method and results for the three pretests are discussed in the current chapter.

Pretest 1: App Category and Price Selection

The objectives of Pretest 1 are twofold. First, as the initial step to create app downloading scenarios for the main experiment, Pretest 1 aimed to create four fictitious apps to be used in the scenarios so that they (1) are generally accepted by consumers (i.e., commonly downloaded and used), (2) address diverse consumption needs, and (3) carry features commonly provided by leading brands but not unique in the app market. In doing so, the selected apps were hoped to stimulate enough consumer motivation to evaluate or purchase them, and findings of the study would be applicable to broad categories of apps. Second, Pretest 1 determined adequate price points for the fictitious apps to be used in the main experiment.

Sampling Procedure

College students were used for these two pretests for the following reasons. First, young adults such as college students are the major adopters of Internet-connected devices such as smartphones and tablets, making them a target market for mobile apps. In a survey by Pew Research Center (Smith, 2013), 79% of 18-to-24 year olds were reported owning a smartphone. Second, the great penetration of Internet-connected devices has driven educational institutions to devote resources to online technologies, such as app compatible email services and campus apps (Fisher & Baird, 2006). As a result, college students tend to be very experienced in searching and downloading apps. Considering the qualitative and exploratory nature of Pretest 1, a convenience

sample of Auburn University students were recruited from courses in the College of Business and College of Sciences and Mathematics with the assistance of class instructors.

Instrument

A self-administered online questionnaire containing four sections was utilized to collect data for Pretest 1 (see Appendix D for the questionnaire). The questionnaire contained four sections addressing participants' (1) assessment of mobile apps' utilitarian and hedonic values, (2) app download and usage behaviors, and (3) maximum acceptable price for each of 27 app categories culled from existing app markets, as well as (4) demographic information.

In the questionnaire, a pool of 27 apps categories available in both Apple and Google's official app markets were presented. The apps categories used in the pretest were chosen from the top download charts using the following three criteria: the app categories should (1) contain the most downloaded paid apps in its generic app classification, which was determined by the platform developers (i.e., by Google and Apple), (2) have competitor apps with comparable features (i.e., consumers should not be able to trace given features back to a specific brand name), and (3) be applicable consistently to the diverse device hardware or carriers.

The selected app categories include dictionary, office suite, business card reader, PDF scanner, checkbook/expense manager, sports tracker, calorie counter, food nutrition, alarm/clock, FM radio, ringtone maker, medical, drug information, news reader, photo editor, camera, video creator, note pad, task planner/manager, shopping list, price comparison, emoji/emoticons, flight tracker, travel guides, free WiFi finder, weather radar, and games.

Utilitarian/hedonic value.

Prior research has demonstrated consumers pursue products for hedonic and/or utilitarian purposes, which would have differential effects on consumers' attitudes and purchases (Batra &

Ahtola, 1991; Dhar & Wertenbroch, 2000). Thus, efforts were made to increase the diversity of app categories by choosing presentable app categories for both hedonic and utilitarian consumption purposes. In the first section of the questionnaire, participants were asked to rate (1) the hedonic value and (2) the utilitarian value for each of the 27 app categories. Following Batra and Ahtola's (1991) definition, consumers' evaluation of a product can focus on "how useful or beneficial" the product is (utilitarian value), and/or on "how pleasant and agreeable" the consumption feelings are associated with the product (hedonic value) (p. 161). Sloot, Verhoef, and Franses (2005) commented that products with utilitarian benefits are primarily instrumental and functional; whereas products with hedonic benefits are typically associated with fun, pleasure, and exciting experiences. In addition, although utilitarian and hedonic values are often exemplified as utilitarian products (e.g., glue stick, detergent) versus hedonic products (e.g., M&Ms, ice-cream) in research manipulations (Dhar & Wertenbroch, 2000), they are considered as two separate dimensions and do not need to be mutually exclusive (Batra & Ahtola, 1991). Chun, Lee, and Kim (2012) found that a smartphone was a convergent device that satisfied utility-oriented needs such as task finishing and productivity, entertainment-oriented needs such as pleasure and enjoyment, and social-oriented needs such as self-image enhancement and group belonging. In line with prior researchers' arguments, a mobile app could also provide both utilitarian and hedonic benefits to its users. For example, a shopping app may have utilitarian-oriented functions such as comparing product price across multiple venues while providing hedonic-oriented pleasures such as browsing for trendy styles.

Participants were first given a definition of hedonic and utilitarian values along with examples products high in hedonic or utilitarian values to assure their comprehension of the meaning of these conceptual terms. Then, participants were asked to "indicate the level of

utilitarian (hedonic) value of each of the following app categories" along with the list of 27 app categories, each accompanying a 5-point Likert-type scale with 5 for "Very utilitarian (hedonic)" and 1 for "Not utilitarian (hedonic) at all."

App downloading and usage behavior. The second section of the questionnaire contained two rating tasks concerning consumers' app downloading and usage behaviors. Participants were asked to answer how frequently they (1) downloaded and (2) used each of the 27 app categories during the past six months on a 5-point Likert-type scale from 1 for "never" to 5 "always." The download and use frequency data were used to select apps that were frequently downloaded and/or used by young consumers for the main experiment stimuli.

App price. In the third section, respondents were asked to indicate the maximum price (in U.S. dollars) they would spend on each of the 27 app categories if given a $20 gift card. This item provided valuable information to identify a proper app price to be used for the experimental stimuli in the main experiment.

Demographic information. The fourth section contained items addressing respondents' gender, age, ethnicity, college/school, class standing, and smart device use/ownership.

Data Collection

Upon the approval from the Institutional Review Board (see Appendix A), an invitation email was distributed to selected classes with the assistance of course instructors. The invitation email (see Appendix B) informed the purpose of the study, expected time commitment for completion of the questionnaire, a description of an incentive (i.e., extra credits assigned by the class instructors) for participation, and a URL hyperlinked to an information letter (see Appendix C). Students indicated the willingness to participate by clicking the "Next" button at the bottom of the information letter, which took them to the pretest questionnaire. After completing the

questionnaire, students were asked to fill in a form which asked their course number and full name to redeem extra credit for taking the survey. The pretest survey questionnaire was created using Qualtrics, and the data collected through the questionnaire were saved on the Qualtrics server. Student names and course numbers were only saved temporary as a separate file from the survey data. The identifiable information was erased shortly after the corresponding course instructors were notified to assign extra credits.

A total of 167 responses were collected. One response was not retained for the age confliction (less than 19 years old) with the IRB requirement. Another response indicating no prior use of smart devices (i.e., having never used a smartphone or a tablet) was excluded from further analysis because participants had no prior involvement with smart devices could have limited knowledge of mobile apps and could make less reliable judgments on app categories or prices. Further, one response was eliminated from the data for potential validity issues because of an obvious tendency of selecting the same answer for all app categories and completing the questionnaire very quickly. Therefore, the remaining 164 responses were determined to be usable.

Results

Sample Characteristics

Among the 164 respondents who provided usable data, the majority (82%) were between 19 and 22 years old ($M = 20.94$, $SD = 1.56$), indicating a typical undergraduate student age characteristic. The participant age distribution was in line with Pew Research Center's (Smith, 2013) age profile of young smartphone users. Male and female participants were evenly divided (82 men and 82 women) in the sample. In terms of class standings, respondents in their senior year were the largest group (53.0%), followed by sophomores (28.0%) and juniors (18.9%). Participants' majors represented a wide variety of colleges across campus, with a majority in the

College of Business (48.8%), followed by the College of Sciences and Mathematics (17.1%) and College of School of Nursing (14.0%). Most respondents considered themselves to be part of the Caucasian/White ethnical groups (86.6%), followed by African American/Black (4.9%), Hispanic (3.7%), Asian/Pacific Islander (1.8%), and other (1.8%). Table 0.1 presents detailed demographic statistics of the sample.

In terms of smart device, a high penetration rate of Internet-accessible, computer-like smart devices was observed among the respondents (see Table 0.1). According to Nielsen's recent report of smartphone adoption during the second quarter of 2014 (Nielsen, 2014), 85% of Millennials aged 18-24 owned a smartphone. In Pretest 1, all but three participants owned or carried a smartphone, representing a 98.2% smartphone adoption rate. The adoption of tablet computers was less prevalent yet relatively high, with 95 participants (57.9%) reported owning or using a tablet. As for the operation platforms of the smart devices used by the respondents, iOS had the leading share, with 141 (86%) respondents using an iPhone or an iPad. In contrast, only 29 Android users (17.7%) and 3 Windows Phone users (1.8%) were reported, representing a lower adoption rate for non-Apple users than the national population. In Nielsen's mobile insights survey (Nielsen, 2015), Android users lead the board by a 51.7% share of the all smartphone users, followed by iOS (43.4%) and Windows Phone (2.8%).

Table 0.1

Pretest 1 Sample Demographic Characteristics

Variable	Category	*f*	%
Age			
	19	33	20.1
	20	29	17.7
	21	55	33.5
	22	29	17.7
	23 and over	18	11. 0
Class Standing			
	Sophomore	46	28.0
	Junior	31	18.9
	Senior	87	53.0
College			
	College of Agriculture	8	4.9
	Raymond J. Harbert College of Business	80	48.8
	College of Education	6	3.7
	Samuel Ginn College of Engineering	8	4.9
	School of Forestry and Wildlife Sciences	3	1.8
	College of Human Sciences	6	3.7
	College of Liberal Arts	2	1.2
	School of Nursing	23	14.0
	College of Sciences and Mathematics	28	17.1
Ethnicity			
	Caucasian / Non-Hispanic White	142	86.6
	African American / Non-Hispanic Black	8	4.9
	Hispanic	6	3.7
	Asian/Pacific Islander	5	3.0
	Other	3	1.8
Device			
	Smartphone User	161	98.2
	Tablet User	95	57.9
Operation Platform			
	iOS	141	86.0
	Android	29	1.8
	Windows Phone	3	0.6

Selection of App Categories

The Pretest 1 data were analyzed to select two utilitarian and two hedonic app categories that were frequently used and downloaded by college consumers. The mean utilitarian and hedonic value scores, the mean app downloading and usage frequency scores, and their corresponding standard deviation values were calculated for each app example (see In addition, as shown in **Error! Not a valid bookmark self-reference.**, participants had low downloading and use intentions towards ring tone maker, medical, and dictionary apps. Thus, these three apps were not retained as candidates for the main experiment. In addition, although games and sports tracker apps exhibited similar use frequency among participants, the game apps were retained for having a higher downloading score, which was close to the mid-point of the scale (occasionally downloaded). Therefore, the two utilitarian apps selected for the main experiment were alarm/clock and weather radar, while the two hedonic apps were emoji/emoticons and games. Two one-tailed t-tests (see Table 0.3) confirmed that the two utilitarian app examples had significantly higher utilitarian scores than the hedonic scores (alarm: $t = 22.896$, $p < .0001$; weather: $t = 17.569$, $p < .001$), while another two t-tests confirmed the significant higher hedonic scores of hedonic app examples than their corresponding utilitarian scores (emoji: $t = 23.541$. $p < .0001$; game: $t = 26.832$, $p < .001$).

Table 0.2). Among all app categories, alarm/clock, weather radar, medical, and dictionary had the highest utilitarian scores, while games, emoji/emoticons, ring tone maker, and sports tracker were considered to bear the most hedonic characteristics. In addition, the four app examples highest in utilitarian scores exhibited low hedonic scores ($M_{Hedonic} < 3$), while the four app examples highest in hedonic scores were rated low in utilitarian value ($M_{Utilitarian} < 3$),

presenting a clear division of apps that satisfying utilitarian or hedonic needs. Therefore, these eight app examples were selected as candidates to represents utilitarian or hedonic apps.

In addition, as shown in **Error! Not a valid bookmark self-reference.**, participants had low downloading and use intentions towards ring tone maker, medical, and dictionary apps. Thus, these three apps were not retained as candidates for the main experiment. In addition, although games and sports tracker apps exhibited similar use frequency among participants, the game apps were retained for having a higher downloading score, which was close to the mid-point of the scale (occasionally downloaded). Therefore, the two utilitarian apps selected for the main experiment were alarm/clock and weather radar, while the two hedonic apps were emoji/emoticons and games. Two one-tailed t-tests (see Table 0.3) confirmed that the two utilitarian app examples had significantly higher utilitarian scores than the hedonic scores (alarm: $t = 22.896$, $p < .0001$; weather: $t = 17.569$, $p < .001$), while another two t-tests confirmed the significant higher hedonic scores of hedonic app examples than their corresponding utilitarian scores (emoji: $t = 23.541$. $p < .0001$; game: $t = 26.832$, $p < .001$).

Table 0.2

Descriptive Statistics for Utilitarian Value, Hedonic Value, Download Frequency, and Use Frequency

	Utilitarian Value		Hedonic Value		Download Frequency		Use Frequency	
App Example	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Dictionary	4.06	0.96	1.80	1.01	2.35	1.30	2.43	1.22
Office Suite	3.23	1.29	2.24	1.15	1.79	1.16	1.96	1.32
Business Card Reader	3.02	1.30	1.90	1.01	1.27	0.70	1.31	0.75
PDF Scanner	3.51	1.14	1.88	1.02	1.70	1.06	1.77	1.12
Checkbook / Expense Manager	3.92	1.11	1.82	0.96	2.03	1.22	2.24	1.39
Sports Tracker	2.26	1.26	4.06	1.05	2.66	1.38	2.96	1.48

Calorie Counter	3.20	1.13	2.54	1.15	1.97	1.12	2.01	1.15
Food Nutrition	3.73	1.05	2.35	1.09	2.04	1.13	2.10	1.22
Alarm / Clock	4.41	0.91	1.79	1.11	3.41	1.60	4.43	1.09
FM Radio	2.33	1.08	3.84	1.06	2.15	1.35	2.32	1.46
Ringtone Maker	1.52	0.93	4.15	1.09	1.46	0.89	1.40	0.81
Medical	4.16	1.01	1.77	0.99	1.85	1.03	1.93	1.09
Drug Information	3.96	1.15	1.78	0.93	1.60	0.93	1.64	0.94
RSS Reader	3.34	1.01	2.68	1.10	2.45	1.24	2.68	1.28
Photo Editor	2.45	1.26	3.99	0.93	2.87	1.38	3.05	1.36
Camera	3.22	1.23	3.87	1.04	3.33	1.52	4.18	0.96
Video Creator	2.66	1.13	3.70	1.09	1.82	1.18	1.84	1.11
Note Pad	3.75	1.03	2.30	1.09	2.62	1.38	3.15	1.28
Task Planner/Manager	3.72	1.05	2.20	1.16	2.31	1.31	2.56	1.36
Shopping List	3.24	1.19	2.46	1.23	1.92	1.21	2.02	1.21
Price Compare	3.32	1.18	2.43	1.11	1.78	1.13	1.75	1.04
Emoji/Emoticons	1.68	1.20	4.49	0.95	3.02	1.46	3.60	1.41
Flight Tracker	3.60	1.12	2.18	1.08	1.78	1.03	1.77	0.99
Travel Guides	3.13	1.18	3.02	1.12	1.71	1.02	1.75	1.03
Free WiFi Finder	3.24	1.19	3.08	1.31	2.10	1.38	2.43	1.51
Weather Radar	4.20	0.98	2.09	1.17	3.38	1.38	3.88	1.18
Games	1.57	1.00	4.62	0.92	2.96	1.24	3.04	1.27

Table 0.3

t-Test Results Between Utilitarian and Hedonic Value Scores of the Four Selected Apps

	Utilitarian		Hedonic		*t* test	
App	*M*	*SD*	*M*	*SD*	*t*(163)	*p*
Alarm / Clock	4.41	0.91	1.79	1.11	22.896	<.001
Weather Radar	4.20	0.98	2.09	1.17	17.569	<.001
Emoji / Emoticons	1.68	1.20	4.50	0.95	23.541	<.001
Games	1.57	1.00	4.62	0.92	26.832	<.001

Price of Selected App Examples

Participants were asked to indicate the maximum price they would pay to every app category. The minimum, maximum, median, mean, and distribution of this maximum acceptable price data were reviewed for the four selected app categories to determine the price point to be used for them in the main experiment. The price data of unchosen app categories were not investigated and omitted from further discussion. Given the prevalent adoption of odd price points in the current app market, the final app prices in the main experiment were determined to carry a .99 ending.

As shown in Table 0.4, participants had deviated opinions towards the price they would pay for an app when offered with a $20 gift card. Some participants tended to spend all money on a single app (i.e., the maximum price equals to $20), while others refused to spend any money on apps (i.e., the minimum price equals to $0). Specifically, over 40% of the participants were reluctant to pay any for alarm (41.5%) or emoji apps (43.3%). Among those who chose to pay, quite a few participants (14.6%) would offer a price point higher than $3.99 for an alarm app. In contrast, only two participants (1.2%) would pay more than $3.99 for an emoji app. In comparison, over three quarters of the participants would pay for a weather app (76.2%) or a game app (82.3%). The price points for the app evaluation task in the main experiment was set at

$1.99 for the alarm app (*M* = 2.02, *SD* = 3.09; *Med*. = .99), $0.99 for the emoji app (*M* = 1.01, *SD* = 1.34, *Med*. = .99), $2.99 for the weather app (*M* = 2.77, *SD* = 3.80, *Med.* = 1.99), and $2.99 for the game app (*M* = 3.20, *SD* = 3.73, *Med*. = 1.99).

Table 0.4

Frequencies of the Maximum Acceptable Price for the Four Selected Apps

	$0		$0.01-$1.99		$2.00-$3.99		$4.00-$6.99		Above $7	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Weather	39	23.8	62	37.8	29	17.7	1	0.6	1	0.6
Alarm	68	41.5	50	30.5	22	13.4	12	7.3	12	7.3
Games	29	17.7	54	32.9	38	23.1	28	17.1	15	9.1
Emoji	71	43.3	59	36	35	21.3	20	12.2	11	6.7

Pretest 2: App Name Selection

The objective of Pretest 2 was to select four mock brand names for the four app categories (one brand name per app category) to be used in the main experiment. The brand name candidates that fit the corresponding app categories would be selected for the main experiment.

Sampling and Data Collection Procedures

A convenient sample of Auburn University undergraduate students aged 19 and older participated in pretest 2. Following the IRB approval (see 0) for conducting the study, instructors in selected classes from College of Human Sciences, College of Sciences and Mathematics, and College of Business were contacted for permission to recruit students. Students in four undergraduate classes were invited through an invitation email forwarded by the class instructors. The invitation email (see Appendix E) contained information about the study purpose, time expected to complete the survey, and ways to receive incentives. Upon clicking on the hyperlink

enclosed in the invitation email, potential respondents were presented with the information letter (see Appendix F). Respondents' consent to participate was expressed by clicking on the "NEXT" button at the end of the information letter, which led them to the online questionniare. On the questionnaire, participants were asked to rate 16 brand names on how well these names fit each of the four app categories selected from Pretest 1. For each brand name, participants also were asked to write down anything that came to their mind when they saw the names. After completing demographic questions, participants were asked to leave the course number and names to redeem one extra credit for taking the survey. To protect the identify information of participated students, their name and class number data were stored separately from the survey data and erased immediately once the respective class instructors were notified to assign the extra credit to the participants.

Instruments

A pool of 16 words were used as candidate brand names tested in Pretest 2. These words were randomly selected from Klink's (2000) 124 word-pairs. Klink (2000) pretested a set of word-pairs to eliminate any words that resembled real words or existing brand names, leaving 124 usable pairs to test the sound symbolism theory. Klink's (2000) word-pairs have been tested in brand naming research for various product categories, including dresses (hedonic products), laptop computers (utilitarian products), and Internet services (virtual products). To build the brand name candidate pool to be tested in Pretest 2, the researcher (1) randomly chose 16 word pairs from Klink's 124 pairs and (2) randomly selected one word from these chosen pairs.

The app name-category fit was measured by a question "how appropriate would you rate the name [one of the 16 brand name candidates] is" for each of the four app categories on a seven-point scale from 1 for "absolutely inappropriate" to 7 for "absolutely appropriate."

Potential app name associations were assessed using an open-ended question, “When you see the name [one of the 16 brand name candidates], what comes to your mind? Please list any thoughts in the box below.”

Results

Sample Characteristics

A total of 153 participants aged from 19 to 38 participated in the Pretest 2 survey. Characteristics of the Pretest 2 sample are summarized in

Table 0.5. Of the 153 participants, the majority were female (68.0%) and Caucasian (86.9%). Most of students were in their early 20s with a mean age of 20.9 years (SD = 2.165). In terms of the class standing, the largest student group was junior (32%), followed by seniors (28.1%), sophomores (26.1%), freshmen (9.8%), and graduate students (0.7%). Approximately half of the students were from the College of Human Sciences (49.7%). The other noticeable colleges include College of Business (34%), College of Engineering (7.2%), and College of Sciences and Mathematics (3.3%).

App Name Selection

App name-category fit scores (see Table 0.6) indicated that Renep was perceived to fit the best for the alarm app (M = 4.10, SD = 1.57), while Runder was the best fit name for the weather app (M = 4.69, SD = 1.46). Teyag (M = 4.36, SD = 1.52) and Fupple (M = 4.92, SD = 1.63) were identified as the best fitting names for the emoji and game apps, respectively.

Table 0.5

Pretest 2 Sample Demographic Characteristics

Variable	Category	*f*	%	*M*	*SD*
Gender					
	Male	48	31.4		
	Female	104	68.0		
	Missing	1	0.7		
Age				20.9	2.17
	19	26	17.0		
	20	46	30.1		
	21	42	27.5		
	22	25	16.3		
	23 and over	13	8.6		
	Missing	1	0.7		
Current Class Standing					
	Freshmen	15	9.8		
	Sophomore	40	26.1		
	Junior	49	32.0		
	Senior	43	28.1		
	Graduate	1	0.7		
	Other	4	2.6		
	Missing	1	0.7		
College					
	College of Architecture, Design, and Construction	1	0.7		
	Raymond J. Harbert College of Business	52	34.0		
	College of Education	2	1.3		
	Samuel Ginn College of Engineering	11	7.2		
	College of Human Sciences	76	49.7		
	College of Liberal Arts	3	2.0		
	College of Sciences and Mathematics	5	3.3		
	Interdisciplinary Studies	2	1.3		
	Missing	1	0.7		
Ethnicity					
	Caucasian / Non-Hispanic White	133	86.9		
	African American / Non-Hispanic Black	9	5.9		
	Hispanic	4	2.6		
	Asian/Pacific Islander	1	0.7		
	American Indian/Alaskan Native	3	2		
	Other	2	1.3		
	Missing	1	0.7		

Table 0.6

Descriptive Statistics of App Name–App Category Fit Scores

		Alarm		Weather		Emoji		Game	
App Name	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Dotil	75	3.55	1.40	3.29	1.32	4.19	1.37	4.67	1.58
Flimut	79	3.42	1.37	3.62	1.49	3.76	1.56	4.23	1.58
Fupple	76	3.11	1.38	3.07	1.36	4.03	1.60	4.92	1.63
Geleve	77	3.77	1.28	3.83	1.26	3.81	1.17	4.53	1.24
Golud	76	3.51	1.47	3.92	1.61	3.86	1.44	4.53	1.48
Inik	74	3.73	1.60	3.55	1.54	3.96	1.64	4.05	1.60
Kanup	75	4.09	1.65	3.89	1.56	3.81	1.50	4.67	1.44
Kelix	77	4.04	1.62	4.06	1.50	3.83	1.46	4.75	1.59
Lipush	76	3.50	1.51	3.26	1.40	3.87	1.72	4.03	1.68
Menom	75	4.05	1.61	3.72	1.51	3.99	1.54	4.45	1.66
Nodax	78	3.65	1.48	3.88	1.72	3.60	1.44	4.12	1.60
Renep	77	4.10	1.57	3.83	1.52	3.71	1.39	4.27	1.53
Runder	75	4.00	1.46	4.69	1.46	3.68	1.41	3.66	1.40
Teyag	77	3.66	1.40	3.70	1.39	4.36	1.52	4.81	1.48
Ucker	74	3.31	1.70	3.24	1.57	3.54	1.66	4.00	1.67
Velim	77	3.49	1.38	3.61	1.39	3.61	1.26	4.27	1.45

Pretest 3: Information Quality

The objective of Pretest 3 was to calibrate the mock app descriptions to be used in the main experiment to manipulate the high and low levels of app information quality for four fictitious apps (one developed for each of the four app categories—weather, alarm, emoji, and game— selected in Pretest 1). For each app, two mock app descriptions were created including information about five features and one appraisal comment. The information and comment were presented in an informative, relevant, and object way for the high app information quality condition, but in a subjective, irrelevant, and vague tone for the low app information quality condition.

Sampling and Data Collection Procedures

A convenience sample of undergraduate students aged 19 years or older was recruited from selected classes in the College of Human Sciences and College of Business. Upon the permission of class instructors, students were offered extra credit for participation. Students received an invitation email which included the purpose of the study, amount of time expected, assurance of confidentiality, contact information of the researchers, and a hyperlink to the study. Participant identity was protected by separating the study data and identity data (e.g., course number and student name) in the survey server. Students clicked on the study link in the invitation email and were led to the information letter page on which they read the letter and clicked on the "NEXT" button to indicate their consent to participate. Participants were then presented with each of the four apps' descriptions and asked to evaluate their information quality right after reading each app's description. For each app category, participants were randomly assigned to review only one of the two versions of app description (designed to manipulate the high and low information quality conditions).

Stimuli Development

To develop fictitious app descriptions, a pool of app features provided by top apps in the four app categories was collected from the Apple and Google app markets. Five common features were picked for each app category and used for descriptions in both high and low information conditions. One fictitious advocative comment was created by the researcher to resemble the endorsement section included in many existing app descriptions. High and low levels of app information quality were manipulated by varying how informatively, relevantly, and objectively the features and advocative comment were presented in the app descriptions (see Appendix H). Following R. E. Petty et al. (1983), D.-H. Park et al (2007) and H. S. Park, Levine,

Kingsley Westerman, Orfgen, and Foregger's (2007) argument quality manipulation, the high-quality app description provided a fictitious commentator's name and affiliation information for the advocative comment as if it was given by an expert reviewer. On the contrary, the low-quality app description presented the same comment without the source information. The fictitious commentator names and affiliations were given to increase the informativeness and credibility of the high-quality description. In terms of the app features presented in the app descriptions, the high-quality version had a summative heading for each specific feature, whereas the low-quality version used vague headings to create a difference in informativeness. In addition, each app feature in the high-quality version was presented with examples, use scenarios, and object data, whereas in the low-quality version, while the corresponding feature was presented without any supportive examples, use directions, or data facts. The supportive material as a whole under each feature heading was supposed to make a difference in the informativeness of the app description as it reveals details on one feature. Specifically, use scenarios and examples may increase the relevancy of the app to potential users, while figures and statistics may demonstrate objective evidence. Further, when the app description included a comparison between the app and its competitors, the high-quality version pointed out names of major well-known apps as competitors, whereas the low-quality version did not name the competitors, which was intended to lead to varying levels of objectivity and credibility between the two versions.

Measures

The information quality of the app descriptions was evaluated on a 12-item, 7-point Likert scale with 1 for "strongly disagree" and 7 for "strongly agree." Ten items addressing the informativeness, relevancy, and objectivity of the information quality were adapted from Y. W.

Lee et al.'s (2002) Information Quality Assessment (IQA) scale. In addition, two items measuring the overall information quality were adapted from R. E. Petty and Cacioppo's (1986) manipulation check questions created for the overall argument quality. The item wordings from both sources were modified to measure participants' perceptions of the information quality of the assigned app descriptions in the current study (see Table 0.7).

Table 0.7

Measures of App Information Quality Manipulation Check

Dimension	Item	Source
Informativeness	This app description is sufficiently complete for my needs. This app description covers the needs of my understanding. This app description has sufficient breadth and depth for my understanding.	Adapted from Y. W. Lee et al. (2002)
Objectivity	This app description is objectively written. This app description is based on facts. This app description presents an impartial view.	
Relevancy	This app description is useful to determine the app value. This app description is relevant to determine the app value. This app description is appropriate to determine the app value. This app description is applicable to my need.	
Overall	I feel this app description is convincing. I feel this app description is made to point effectively.	Adapted from R. E. Petty and Cacioppo (1986)

Table 0.8

Pretest 3 Sample Demographic Charateristics

Variable	Category	*f*	%
Gender			
	Male	22	44
	Female	28	56
Age (M = 22.2)			
	20	13	26
	21	16	32
	22	7	14
	23	7	14
	24 and over	7	14
Class Standing			
	Junior	14	28
	Senior	33	66
	Graduate	3	6
College			
	College of Business	27	54
	College of Human Sciences	23	46
Ethnicity			
	Caucasian / Non-Hispanic White	40	80
	Non-Hispanic Black (African American)	7	14
	Hispanic	1	2
	Asian/Pacific Islander	2	4

Results

Sample Characteristics

A total of 50 students participated in this pretest. The sample (see Table 0.8) consisted of 22 males (44%) and 28 females (56%), showing a relatively balanced gender distribution. A majority of participants (80%) identified themselves as a Caucasian, followed by Non-Hispanic Black (14%), Asian/Pacific Islander (4%), and Hispanic (2%). The age of participants ranged from 20 to 38 years old with a mean age of 22.2 (*SD* = 3.42). In terms of their academic standings, a majority of participants were seniors (66%), followed by juniors (28%) and graduate

students (6%). Respondents' majors were relatively equally distributed between the two colleges, with 54% from the College of Business and the remaining from the College of Human Sciences.

Measurement Dimensionality and Reliability

The dimensionality of the app information quality evaluation measure was assessed using a series of exploratory factor analysis (EFA) with Varimax rotation. In contrast to the four-factor structure proposed by the literature, the initial EFA resulted in a single factor solution for the weather app, a two-factor solution for the alarm and game apps, and a three-factor solution for the emoji. An examining of the factor loadings and item meanings for these four factor analyses results revealed that all and only the three objectivity items, according to the original scale (Y. W. Lee et al., 2002), were highly loaded on the second or the third factors. Scree plots for the alarm, game, and emoji apps showed only one large drop of the eigenvalues (i.e., from the first factor to the second). The eigenvalues of the second or third factors revealed the much greater importance of the first factor than the other factors (7.758 and 1.010 for the game app; 6.753, 1.150, 1.044 for the emoji app; 7.860 and 1.148 for the alarm app). Considering the one-factor solution was suitable for the alarm app, further EFAs were conducted for a one-factor solution for the other three apps. Considering one objectivity item, "this app description presents an impartial view," was the only item highly loaded on the second factor for the game apps and on the third factor for the emoji apps, a second round of EFAs was conducted excluding this objectivity item. It was revealed that factor structures for all four app categories resulted in satisfactory unidimensional solutions except one objectivity item, "this app description is based on facts," whose loading was less than .50 for the emoji app. Given its high loading for the other apps, this item was maintained for further analysis to retain the concept of objectivity in the information quality

measure. The retained 11 items achieved a satisfactory reliability with Cronbach's α greater than .90 (see Table 0.9).

Table 0.9

Pretest 3 Factor Analysis: Perceived Information Quality

	Factor Loading			
	Alarm	Emoji	Game	Weather
This app description is sufficiently complete for my needs.	.917	.844	.804	.854
This app description covers the needs of my understanding.	.898	.824	.813	.883
This app description has sufficient breadth and depth for my understanding.	.898	.836	.899	.931
This app description is objectively written.	.615	.617	.709	.671
This app description is based on facts.	.666	.455	.783	.865
This app description is useful to determine the app value.	.814	.845	.854	.900
This app description is relevant to determine the app value.	.874	.804	.898	.891
This app description is appropriate to determine the app value.	.856	.857	.864	.874
This app description is applicable to my need.	.792	.668	.780	.758
I feel this app description is convincing.	.920	.821	.856	.866
I feel this app description is made to point effectively.	.885	.817	.885	.918
Eigenvalues	7.69	6.56	7.64	8.11
% of Variance	69.91	59.64	69.44	73.73
Cronbache's α	.929	.955	.955	.962
Deleted Item				
This app description presents an impartial view.				

Manipulation Check

Success of the information quality manipulation was checked by a series of analysis of variance (ANOVA) tests within each app category with perceived information quality factor

score (i.e., the average score of the 11 retained perceived information quality items) as the dependent measure. The ANOVA results revealed a significant effect of the information quality manipulation on respondents' perceived information quality for all four app categories in that app information quality was perceived more positively in the high (vs. low) app information quality condition (see Table 0.10). Therefore, the four sets of app descriptions created to manipulate high and low information quality in four app categories were adopted for the main experiment.

Table 0.10

ANOVA Results for Perceived Information Quality from the Information Quality Manipulation

	Manipulation						ANOVA Result	
	Low Information Quality			High Information Quality				
App Category	*M*	*SD*	*n*	*M*	*SD*	*n*	*F*	*p*
Weather	4.57	1.20	21	5.79	.89	29	17.118	< .001
Game	3.47	1.28	24	5.24	1.02	26	29.67	< .001
Emoji	4.20	1.25	25	5.15	.70	25	10.977	.002
Alarm	4.48	1.37	25	5.49	1.09	25	8.347	.006

Chapter 4. Main Experiment

This chapter presents detailed information of the experiment manipulations, sampling and data collection procedures, measurements, data analysis, and results of the main experiment, which was conducted to test the hypotheses proposed in Chapter 2.

Research Design

An experiment with a 2 (app information quality: high and low) × 5 (app name suffix: no name suffix, a numerical name suffix, name suffixes "premium," "ad free," and "donate") × 4 (app category: weather, alarm, emoji, and game) factorial design was conducted. App information quality, app name suffix, and app category were all manipulated as between-subject factors. App category was not a variable of interest to this study but included for a stimulus sampling purpose to test the hypothesized relationships in a variety of contexts and enhance the generalizeability of the findings. The experiment was conducted online. Participants were asked to view a mock app in one of the 40 manipulation conditions (varied in app information quality, app name suffix, and app category) and completed a questionnaire. The questionnaire consisted of items measuring three dependent variables and five moderating variables, questions asking participants' use of mobile devices and apps, manipulation check questions, and attention check questions.

Stimulus Development

After experimental factors were manipulated by employing visual stimuli depicting mock app description screen shots as they would appear on a smart phone screen (see Figure 4.1). A visual stimulus was created for each of the 40 experimental conditions. Before viewing the visual stimulus, as a cover story, participants were told that an app developer was about to launch a mobile app in the market and was seeking consumer opinions on the app. Each visual stimulus

presented an app name (corresponding to the app category and app name suffix conditions), an app price (corresponding to the app category condition), and a description about the app (corresponding to the app information quality condition). The app names, prices, and descriptions developed and verified in the two pretests were employed to develop the visual stimuli. Figure 0.1 illustrates an example visual stimulus (e.g., a game app with the name suffix "ad free" in the high information quality condition) in the main experiment. Appendix L presents all 40 visual stimuli used for the main experiment.

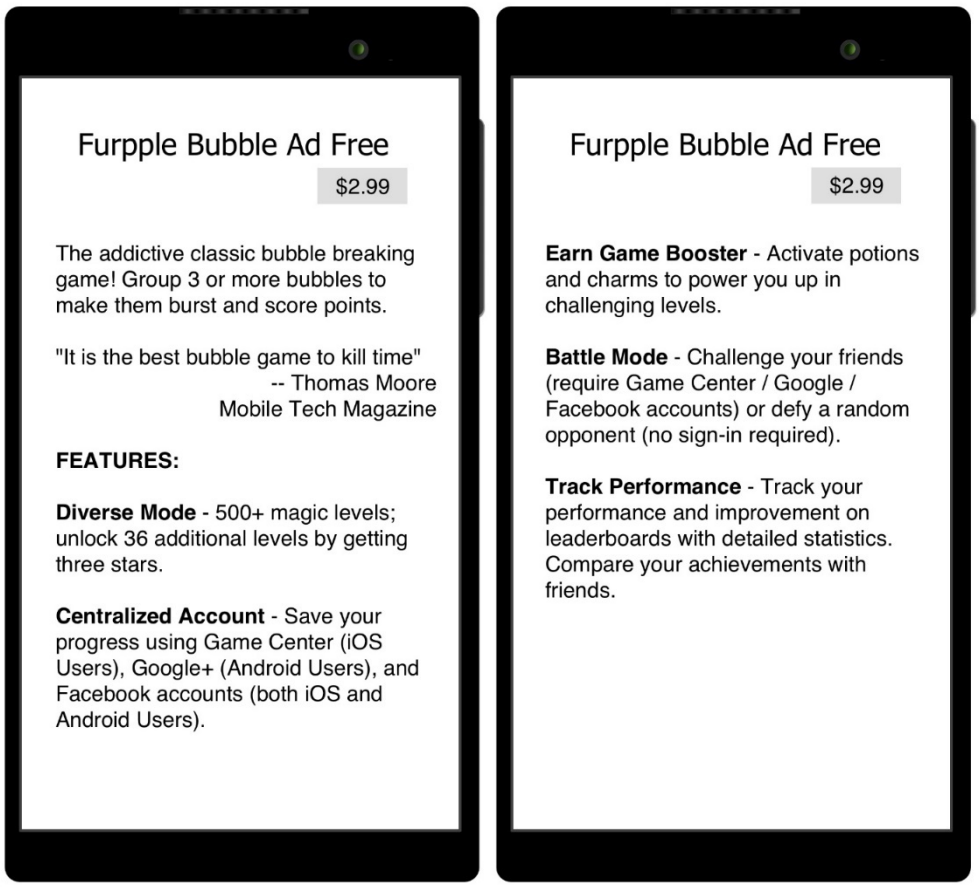


Figure 0.1 An Example of the Experiment Stimuli: A Game App in the High Information Quality Condition with "Furpple" as the Brand Name and "Ad Free" as the Name Suffix

App Categories, App Names, and App Prices

Pretest 1 identified two utilitarian apps (weather and alarm) and two hedonic apps (emoji and game) to increase the variety of apps used for hypothesis testing. Pretest 2 determined an app name for each of the four app categories to increase the credibility of stimuli. In the main experiment, a two-word structure was used for the app name, where a name selected from Pretest 2 was followed by its app category name (see Table 4.1). The only exception was the game app, where "Bubble" was used to instead of "game" to specify the particular type of game, considering rare cases for game apps to use the term "game" in their names. In addition to the notation of app name and category, the main experiment stimuli also presented the price of the app immediately below the app name using the app price determined to be appropriate for each category according to Pretest 1 results. Table 0.1 lists the four app categories and their app names and prices used in the main experiment stimuli.

Table 0.1

App Categories, Names and Prices of the Main Experiment Stimuli

App Category	App Name	Price
Weather	Runder Weather	$2.99
Emoji	Teyag Emoji	$0.99
Game	Furpple Bubble	$2.99
Alarm	Renep Alarm	$1.99

App Information Quality (INFO)

App information quality refers to the extent to which an app description is perceived as informative, objective, and relevant. In the main experiment, the high and low information quality conditions were manipulated through fictitious app descriptions incorporated in the visual stimuli. Each app description included an overall description followed by five specific feature

descriptions developed and validated in Pretest 3. An app description in the high information quality (INFO-H) condition was written in an objective, relevant, and informative manner. On the other hand, an app description in low information quality (INFO-L) condition introduced the same features with vague terms without specific examples, quote sources, or relevant explanations. Table 0.2below shows the 8 (2 information quality condition by 4 app categories) app descriptions used in the experiment.

App Name Suffix (SUFF)

Five app name suffix conditions including no suffix (control condition, SUFF-C), a numerical suffix "3" (SUFF-N), suffix "premium" (SUFF-P), "ad free" (SUFF-A), and "donate" (SUFF-D) were utilized in the main experiment. All name suffixes were attached to the app name except for the no suffix conditions.

Measures

Screening Questions

Respondents' eligibility to participate in the main experiment was checked by four screening questions which were asked before the information letter. The first two screening questions, adapting from smartphone ownership surveys by Pew Research Center (Smith, 2013), checked potential participants' use of smart devices. Specifically, the first question, "Some cell phones are called smartphones because of certain features they have. Is your cell phone a smartphone, such as an iPhone, Android, or Windows phone, or are you not sure," provided three choices: "Yes, I own/use a smartphone," "No, my cellphone is not a smartphone," and "I'm not sure what I have." The second question, "Do you currently own or use a tablet computer (e.g., an iPad, Samsung Galaxy Tab, Google Nexus, or Kindle Fire)," also provided "Yes," "No," and

"I'm not sure" choices similar to the first question. Participants were required to own or have used a smart device to be eligible for the study.

The third question checked whether participants' ages fell between 19 and 34. According to a report by Pew Research Center (Smith, 2013), 79% of 18-to-24 year olds and 81% of 25-to-34 year olds were owners of a smartphone by May 2013. In comparison, the ownership of smartphones dropped to 69% among consumers in the age group of 35-44 and 55% among 45-54 year-olds. Thus, an age criterion (i.e., between 19 and 34 years old) was imposed to capture the major app purchaser population.

The fourth question examined participants' residency. Since the sample for the main study were recruited via Amazon Mechanical Turk (MTurk), where potential participants had a higher possibility to be located outside the U.S. and use English as a second language than other sampling methods (Goodman et al., 2013), the residency was included in the screening question to match the desired sample characteristics of the study. The residency question, "which country do you live in?" listing 21 country names (including the United States) and an "Other" choice. Only those who chose the "United States" were admitted to the study.

In sum, participants were allowed to proceed to next page of the survey website to view the information letter only when they met all of the following screening criteria: they (1) owned or had used at least one smart device (select at least one "Yes" for the first two screening questions), (2) aged between 19 and 34 years (i.e., selected the 19 to 24 years old or 25 to 34 years old category in response to the third screening question), and (3) lived in the United States (based on the response to the fourth screening question).

Table 0.2

App Descriptions in Both Low and High Information Quality Conditions

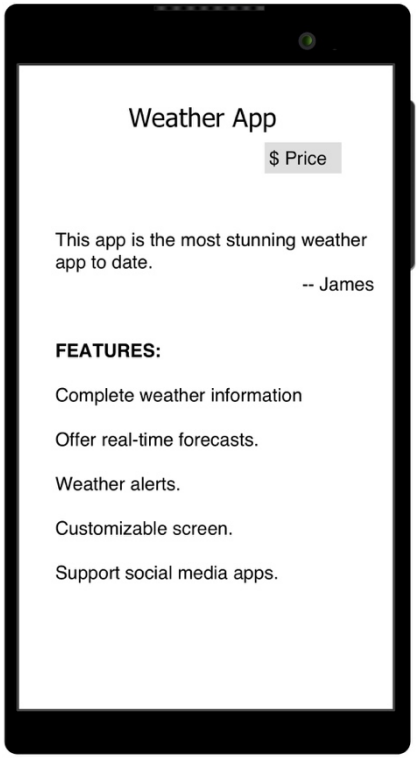
	Low Information Quality	High Information Quality	
Weather App			

Table 4.2 (continued)

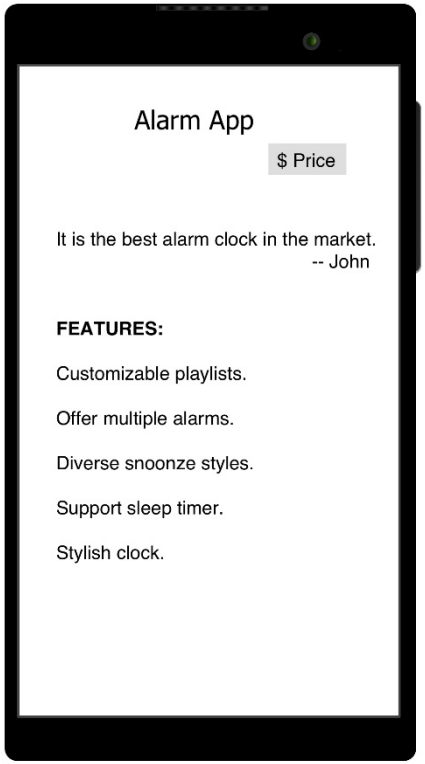
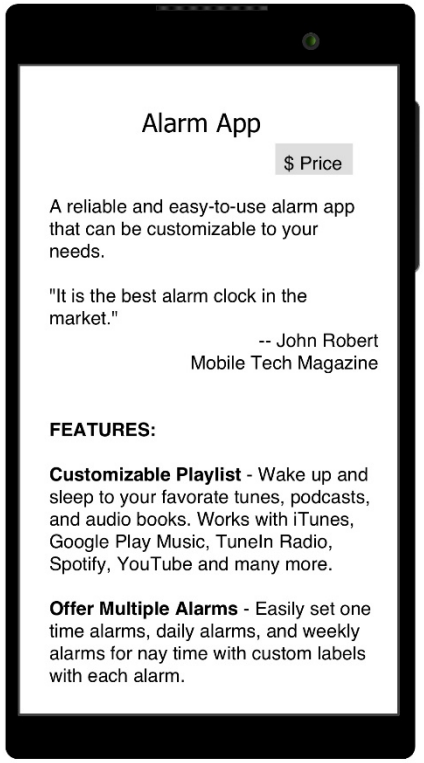
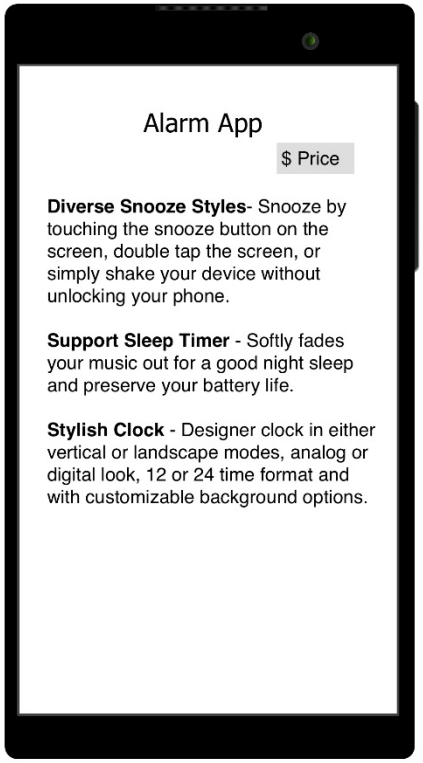
	Low Information Quality	High Information Quality	
Alarm App			

Table 4.2 (continued)

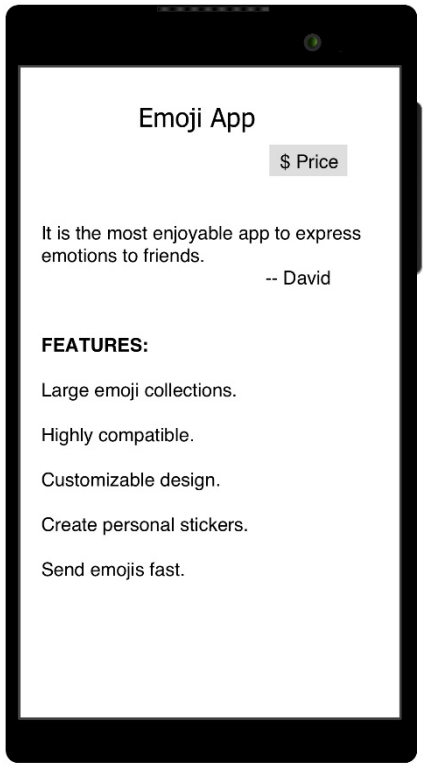
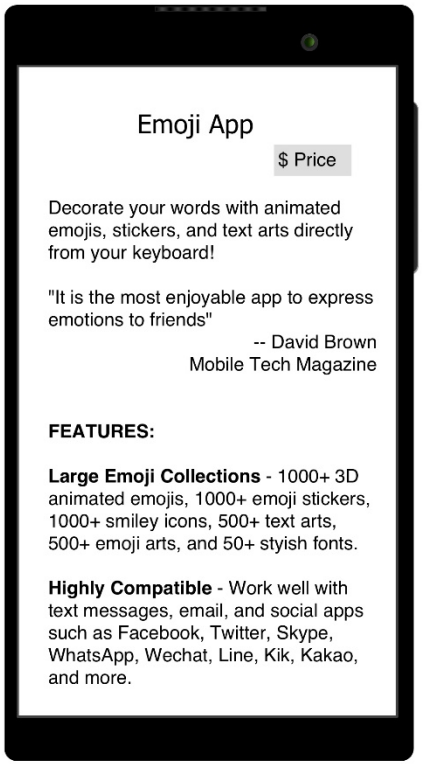
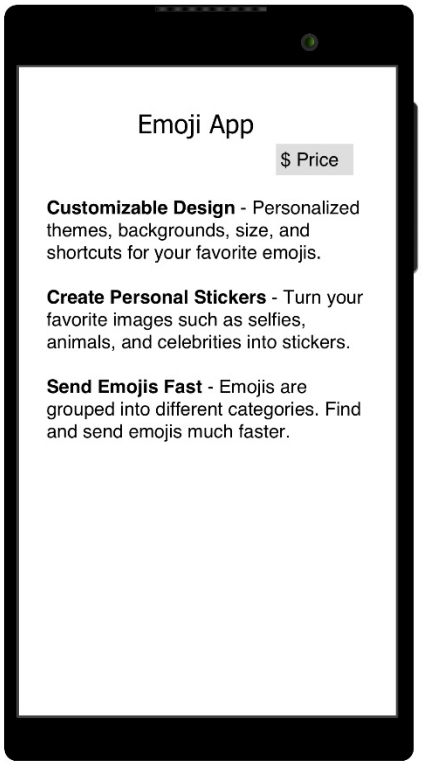
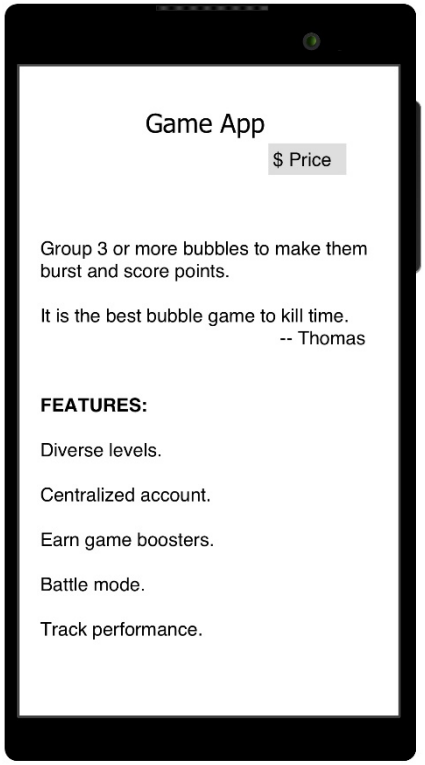
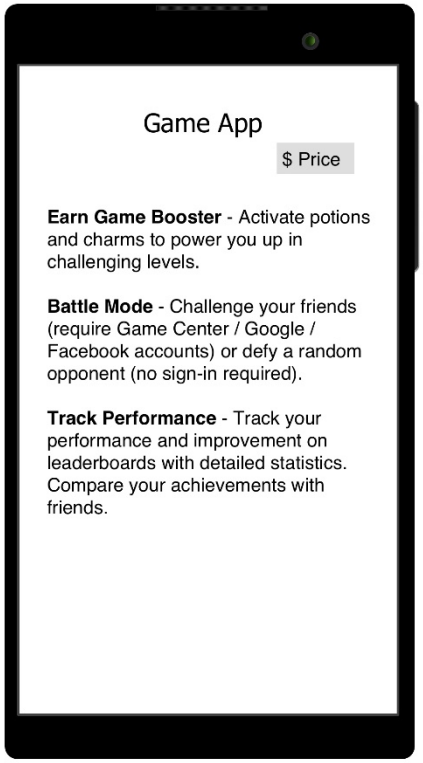
	Low Information Quality	High Information Quality	
Emoji App			

Table 4.2 (continued)

	Low Information Quality	High Information Quality	
Game App			

Manipulation Checks

App Name Suffix

Participants' awareness of the app name suffix was checked using a multiple-choice question, "which of the following apps is the app you evaluated?" with six response categories: an app name with each of the five name suffix manipulation conditions (i.e., no name suffix or with one of the following name suffixes: "3," "premium," "ad free," and "donate") and an "I do not know" choice. The app name suffix manipulation was included in the app evaluation task among half of the participants (n = 588).

App Information Quality

Success of the manipulation of app information quality was checked using the 12 perceived app information quality items used in Pretest 3 (see Table 0.9). The perceived app information quality scale addressed the informativeness, relevance, objectiveness, and overall quality of the app description.

Dependent Measures

Perceived App Value

Perceived App Value. Perceived app value was measured by 10 items adapted from Sweeney and Soutar's (2001) Perceived Value Scale (PERVAL) in utilitarian and hedonic dimensions (see Table 4.1). The PERVAL was originally developed to assess consumers' perceived value of durable goods in four dimensions: quality (performance), price (value for money), emotional, and social. Sweeney and Soutar (2001) noted that both price and quality dimensions contributed to the functional aspect of consumption value. However, unlike traditional products sold at a fixed price range, a mobile app could be downloaded free of charge and remain as a free service for the whole product life time. The utility derived from cost

reduction of a mobile app could be hard to be evaluated. Thus, the price dimension of PERVAL, defined as "the utility derived from the product due to the reduction of its perceived short term and longer term costs" (p.211), was not retained in the currently study. In addition, unlike the consumption of a physical product that could be seen by other people, using a mobile app could more likely to be a personal behavior than a social act unless a consumer intentionally and explicitly shows off the app. Thus, the social dimension of the app was eliminated from the original scale. Wording of the remaining items were modified to clarify the product being evaluated was a mobile app. One item, "(this product) has poor workman ship" was eliminated from the quality scale because the "workman ship" describes the skill of crafting a handmade object rather than a virtual product. The remaining two dimensions were renamed as utilitarian (for the quality dimension) and hedonic (for the emotion dimension) to be aligned with Batra and Ahtola (1991) consumer attitudes model. Utilitarian usefulness and hedonic enjoyment were also proved as two distinct yet convergent attributes perused by smartphone users (Chun et al., 2012). All perceived app value items were rated on a 7-point Likert scale with 1 for "strongly disagree" and 7 for "strongly agree." Item scores addressing each dimension of perceived app value were averaged to serve as the dependent variables in hypothesis testing.

App Download Intention

Since mobile apps as a product category was relatively new to the academic world, no existing scale was available to measure consumers' intention to download apps. In the current study, Grewal et al.'s (1998) purchase intention scale, originally measuring consumers' willingness to buy a bicycle, was adapted to measure respondents' intention to download an app. The wordings of Grewal's (1998) measure was modified to better fit the context of downloading

a mobile app. Respondents were asked to indicate their likeliness to download the evaluated app on a 7-point scale from 1 for "very low" to 7 for "very high" (see Table 0.3).

Table 0.3

Depdent Measures in the Main Experiment

Variable	**Item**	**Source**
Perceived App Value	Utilitarian value This app would have consistent quality. This app would be well made. This app would have an acceptable standard of quality. *This app would not last a long time. This app would perform consistently. Hedonic value I would enjoy this app. I would want to use this app. I would feel relaxed using this app. I would feel good using this app. This app would give me pleasure.	Sweeney and Soutar (2001)
Download Intention	If I were going to buy a [app category] app, the probability of downloading this app is … If this app was publicly available in the market, the probability that I would consider downloading this app is … If this app was publicly available in the market, the likelihood that I would consider this app is …	Grewal et al. (1998)
Word-of-mouth Intention	I would recommend this app to other people. I would tell other people positive things about this app. When I tell others about this app, I would talk about it in great detail.	T. Kim et al. (2009) and Harrison-Walker (2001)

* Reverse-coded items

Word-of-Mouth Intention

Respondents' word-of-mouth intention was measured using two items from T. Kim, Kim, and Kim's (2009) word-of-mouth scale and one item from Harrison-Walker's (2001) word-of-mouth activity scale. T. Kim et al.'s (2009) scale captures both positive saying and

recommendation, while Harrison-Walker's (2001) item reflects the speaker's amount of product-related information in a word-of-mouth communication. All three items were rated on a 7-point Likert scale with 1 for "strongly disagree" to 7 for "strongly agree" (see Table 0.3).

Consumer Characteristics

All personal characteristics variables (need for cognition, need for status, app savviness, perceived app intrusiveness, and reciprocal inclination) were measured using 7- point Likert scales with 1 for "strongly disagree" and 7 for "strongly agree." Exact item wordings, and sources are shown in

Table 0.4.

Need for Cognition (NFC)

Cacioppo et al.'s (1984) 18-item Need for Cognition Scale was utilized to assess participants' tendencies to engage effortful cognitive thinking in information processing. This 18-item Need for Cognition Scale is a short version of the original 34-item scale measuring the same construct and has been widely accepted by researchers (e.g., Chatterjee, Heath, Milberg, & France, 2000; Gangadharbatla, 2008). The original NFC items were measured using a 9-point scale with 4 indicating a "very strong agreement" and -4 indicating a "very strong disagreement" statement. To maintain participants' consistent experience and avoid their confusion, all NFC items was answered on a 7-point Likert scale like the other measurements in this study, with 1 for "strongly disagree" and 7 for "strongly agree."

App Savviness (SAVVY)

An 8-item App Savviness Scale was utilized to measure respondents' general tendency to adopt mobile apps. Consumers with high app savviness are supposed to feel more comfortable with mobile apps and more likely to integrate mobile apps into their lives. The App Savviness Scale was adapted from Shanahan and Hyman's (2010) tech-savviness scale that measures consumers' ability to adopt current technologies. The word "technology" in the tech-savviness scale was changed to "apps" to better reflect the subject of the current study. Accordingly, "high tech products" (the third item) in the original scale was replaced with "advanced app versions." The term "techie" (the eighth item) was considered as a description of a technology expert and thus was changed to "an app expert" in the current study.

Need for Status (STATUS)

Eastman and Goldsmith's (1999) 5-item Status Consumption Scale was adapted to assess respondents' general tendency to purchase products and services for status or social prestige reasons. The fifth item in the original scale, "a product is more valuable to me if it has some snob appeal," was slightly modified to "a product is more valuable to me if it indicates my superiority." All the other item wordings remained unchanged.

Perceived Ad Intrusiveness (INTRU)

Perceived ad intrusiveness has been used in the literature to refer to consumers' general tendency to treat commercials as an intrusive presence and react negatively towards ads in the media (Li et al., 2002). In this study, Li et al.'s (2002) 7-item Ad Intrusiveness Scale was adapted to measure respondent's perception of ads as an intrusion when using smartphones or tablets. Li et al.'s (2002) original question, "When the ad was shown, I thought it was …" was modified to "I think the ads shown on my smartphone/ tablet is …" with seven adjective categories which remained unchanged from the original scale. Participants rated the level of agreement with seven adjectives (e.g., distracting) that describe the feelings upon seeing ads.

Table 0.4

Measurements for Personal Characteristic Variables

Variable	Item	Source
Need for cognition	I would prefer complex problems to simple problems. I like to have the responsibility of handling a situation that requires a lot of thinking. * Thinking is not my idea of fun. * I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. * I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something I find satisfaction in deliberating hard and for long hours. * I only think as hard as I have to. * I prefer to think about small, daily projects to long-term ones. * I like tasks that require little thought once I've learned them. * The idea of relying on thought to make my way to the top appeals to me. I really enjoy a task that involves coming up with solution to problems. * Learning new ways to think doesn't excite me very much. I prefer my life to be filled with puzzles that I must solve The notion of thinking abstractly is not appealing to me. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought. * I feel relief rather than satisfaction after completing a task that requires a lot of mental work. * It's enough for me that something gets the job done, I don't care how or why it works. I usually end up deliberating about issues even when they do not affect me personally.	Cacioppo et al. (1984)
App Savviness	Other people come to me for advice on new apps. I'm among the first to acquire new apps. I can usually figure out advanced app versions without help. I keep up with the latest app developments. I enjoy the challenge of figuring out apps. I find I have fewer problems than most making apps work. I understand how most apps work. People think of me as an app expert.	Adapted from Shanahan and Hyman (2010)

Table 4.4 (continued)

Variable	Item	Source
Need for Status	I would buy a product just because it has status. I am interested in new products with status. I would pay more for a product if it has status. * The status of a product is irrelevant to me. A product is more valuable to me if it indicates my superiority.	Eastman and Goldsmith (1999)
Perceived Ad Intrusiveness	I think the ads shown on my smartphone/ tablet is Distracting Disturbing Forced Interfering Intrusive Invasive Obtrusive	Adapted from Li et al. (2002)
Reciprocal inclinations	I am ready to undergo personal costs to help somebody who helped me before. If someone does a favor for me, I am ready to return it. If someone is helpful with me at work, I am pleased to help him/her. I am ready to do a boring job to return someone's previous help. When someone does me a favor, I feel committed to repay him/her. If someone asks me politely for information, I'm really happy to help him/her. If someone lends me money as a favor, I feel I should give him/her back something more than what is strictly due. If someone suggests to me the name of the winning horse at the race, I would certainly give him/her part of my winnings. I go out of my way to help somebody who has been kind to me before.	Perugini et al. (2003)

* Reverse-coded items

Reciprocal Inclination (RECI)

Reciprocal inclination describes consumers' willingness to appreciate and reciprocate others' good deeds. Nine items measuring the positive reciprocity tendency from Perugini et al.'s (2003) Personal Norm of Reciprocal Scale were utilized to measure respondents' reciprocal inclinations. The original scale has three dimensions that assess individuals' differences in positive reciprocity, negative reciprocity, and beliefs in reciprocity. Since the tendency to perform retaliate behaviors against bad behaviors was not of interest to the current study, the negative reciprocity dimension of Personal Norm of Reciprocal Scale was dropped. The beliefs in reciprocity dimension was also not used in this study because it contains items measuring avoidance behaviors to escape a vengeance.

Demographic and Attention Check Questions

Demographic items were asked on the last page of the study website. The items included age, marital status, educational level, ethnicity, occupation, and household income. Participants also answered two general app use questions (download and use frequency) for all four app categories prior to the app evaluation task.

In addition, four attention check questions were imbedded in the questionnaire to check whether respondents were paying attention to the questions while completing the. First, respondents were asked to check smart devices they used to run mobile apps. Six choices were available, including iPhone/iPad, Android, Windows Phone/Tablet, Blackberry, something else (if this choice was selected, respondents were required to specify the kinds of smart device they used), and none of the above. Only respondents who selected one of the smart devices from the first four choices were allowed to continue participating in the remaining study. Next, the question, "If you are reading this question, please select Somewhat Agree," was asked on the

page that included measures of perceived app value, app download intention, and word-of-mouth intention. Only those who selected “Somewhat Agree” were allowed to continue to the remaining study. Third, the question, “If you live in the U.S., please select Disagree. Otherwise, please select Agree," was placed along with the seven questions asking respondents’ reciprocal inclinations. Only those who selected “Disagree” were able to proceed to the following page. Finally, along with demographic questions, respondents were asked to write down their age in numbers of years. Numbers between 19 and 34 were considered as valid answers. Although the residency and age questions were asked as screening questions before the respondents were allowed to enter the study website, they were asked these questions in a different way again in the main experiment questionnaire to check if they were paying attention to the questions as well as to double check their participation eligibility. Those who failed to provide valid responses to any of the four attention check questions were considered not having paid attention to the questions, and thus their participation was immediately terminated because the validity of their responses could not be assured.

Sample

A total of 2,524 MTurk workers attempted to participate in the study. Among these workers, 1,441 passed all screen questions and entered the experiment. Another 173 participants did not complete the task (voluntarily or got terminated due to invalid responses to attention check questions), leaving 1,268 completed questionnaires for the main experiment. Among all 1,268 submitted MTurk tasks, 30 workers were rejected by the researcher for not providing proper confirmation codes (e.g., the codes submitted to MTurk did not match the researcher’s record) and thus were excluded from the data. The remaining 1238 respondents’ data were determined to be usable (650 and 588 usable data from the first and second rounds, respectively).

The usable sample aged from 19 to 34 (M = 27.34, SD = 4.03). The age distribution showed that fewer MTurk worker aged from 19 to 22 (13.7%) participated in the survey than the remaining age groups (all remaining groups were over 25%). The majority of participants considered themselves to be part of the non-Hispanic White group (71.5%), followed by Asian/Pacific Islander (10.5%), non-Hispanic Black (8.6%), Hispanic (5.9%), American Indian/Alaskan Native (1.7%), bi-racial (1.5%), and other (0.4%). Participants obtained a college degree formed the largest group (41.6%), followed by those who had some college or technical school education (34.7%), and had a graduate degree (10.5%). Occupation of the participants varied greatly, including the largest group specialized in professional or technical activities (30.8%), followed by students (14.1%), clerical workers (9.9%), homemaker (9.5%), sales workers (8.8%), and manager (8.6%). In terms of marital status, most participants were either single (66.2%) or married (29.6%). The annual household income of $25,000 to $49,000 (34.7%) was the single largest group of all participants, followed by $50,000 to $74,000 (22.1%), under $25,000 (18.7%), and $75,000 to $99,000 (12.8%).

The gender question was accidentally omitted from the main experiment questionnaire. Thus, a supplementary survey was conducted among the 1238 respondents who had successfully completed the main experiment after obtaining approval from the Institutional Review Board (see 0). To contact these respondents, an invitation email was sent to MTurk workers who had submitted correct confirmation code in the main experiment. A total of 400 respondents clicked on the survey link included in the questionnaire, among whom 398 provided usable data. The data from the supplementary survey revealed an almost evenly divided gender distribution between male (52.3%) and female (46.3%) respondents. The frequencies and percentages of each sample demographic characteristic are presented in **Error! Reference source not found.**.

According to a recent smartphone user report published by Pew Researcher Center, 64%

According to a recent smartphone user report published by Pew Researcher Center, 64% of Americans own a smartphone by December 2014 (Pew Researcher Center, 2015). The ownership is highest among young and relatively high income, highly educated users. Specifically, young adults aged from 18 to 29 has the highest smartphone penetration rate of 85%, followed by middle aged adults from 30 to 49 with a relatively lower penetration rate of 79%. In comparison, only 27% of seniors aged over 65 own a smartphone. The ownership level is slightly lower among females, as 63% female and 66% male adults own a smartphone. In terms of the income level, 84% of those who lived in households with an annual income of $75,000 and higher, followed by 72% of those with income levels between $50,000 and $74,999, 71% of those with income levels between $30,000 and $49,999, and 50% of those with income levels less than $30,000 a year. For education levels, college graduates (78%) are more likely to own a smartphone as compared to adults with some college (69%) or even less experience (52%). Thus, respondents in the current study were relatively less educated and had lower income than typical smartphone users.

Table 0.5

Demographic Characteristics of the Main Experiment Sample

Variable		*f*	%
Age			
	19-22	169	13.7
	23-26	365	29.5
	27-30	390	31.5
	31-34	314	25.4
Gender*			
	Male	208	52.3
	Female	185	46.5
	Prefer Not to Answer	5	1.3
Ethnic			
	Non-Hispanic White	885	71.5
	Non-Hispanic Black	106	8.6
	Hispanic	73	5.9
	Asian/Pacific Islander	130	10.5
	American Indian/Alaskan native	21	1.7
	Mixed	18	1.5
	Other	5	0.4
Education			
	Some High School	6	0.5
	High School Diploma	104	8.4
	Some College or Technical School	430	34.7
	College Degree	515	41.6
	Some Graduate School	53	4.3
	Graduate Degree	130	10.5
Occupation			
	Professional or Technical	381	30.8
	Manager or Administrator	107	8.6
	Sales Worker	109	8.8
	Clerical Worker	123	9.9
	Crafts worker	25	2.0
	Machine Operator or Laborer	24	1.9
	Farmer, Farm Manager, Or Farm Laborer	4	0.3
	Service Worker or Private Household Worker	61	4.9
	Military	3	0.2
	Homemaker	117	9.5
	Student	175	14.1
	Other	57	4.6
	Prefer Not to Answer	52	4.2

Table 4.5 (continued)

Variable		*f*	%
Income			
	Under $25,000	231	18.7
	$25,000 to $49,999	429	34.7
	$50,000 to $74,999	273	22.1
	$75,000 to $99,999	159	12.8
	$100,000 to $124,999	68	5.5
	$125,000 to $149,999	20	1.6
	$150,000 to $174,999	18	1.5
	$175,000 to $199,999	5	0.4
	$200,000 and over	6	0.5
	Prefer Not to Answer	29	2.3
Marriage			
	Single and never married	819	66.2
	Married	367	29.6
	Separated	12	1
	Divorced	18	1.5
	Widowed	1	0.1
	Prefer Not to Answer	21	1.7

*Note: The gender data were collected from a supplementary survey among a subset of participants who had successfully completed the main experiment

Data Collection

The main experiment was conducted via Amazon Mechanical Turk (MTurk), an online cloud sourcing marketplace that allows a large, diverse group of people to complete "human intelligent tasks" in exchange for money (Amazon.com Inc., 2014). Goodman, Cryder, and Cheema (2013) compared MTurk participants with student and community samples in terms of demographic features, attention tests, personality measures, and decision-making tests. They concluded data collected from MTurk were as reliable and consistent as those collected from traditional sampling methods. Mason and Suri (2012) reviewed several comparison studies (between MTurk and other online/offline contexts) and drew a similar conclusion that MTurk provides valid and consistent subjects for researchers. However, researchers cautioned that

MTurk participants had a higher possibility to be located outside the U.S. and use English as a second language (Goodman et al., 2013). Since the U.S. app market was the major concern of this study, care was taken with the use of the screening questions, described earlier, to recruit only U.S. residence.

The recruitment announcement for the main experiment was posted as a "Human Intelligence Task" (HIT) on MTurk. A MTurk worker is able to view an introduction and keywords of a HIT from a list of all HITs available in the market. The HIT introduction includes the title, the requester (the researcher), the wage offered (the compensation offered to participants), qualifications imposed by the requester (e.g., over 95% of all HITs completed by a worker have been accepted), the number of HITs available (the number of participants requested by the researcher), the time allotted to complete the task (expected duration of the study), and the time the task expires. A MTurk worker is able to decide to accept, submit, or return a HIT task on the individual HIT page. Once a task has been successfully submitted, requesters review all data and decide to either accept or reject the worker's assignment. When the assignment is accepted, MTurk takes the base pay from the requester's account and deposits into the work's account.

The current experiment was posted as an external HIT on MTurk. MTurk workers only saw an instruction section of the HIT and was given a hyperlink to the study hosted on Qualtrics. The instruction (shown in 0) stated the existence of screening questions, the requirement of reviewing the information letter prior to participation, the mechanism to check workers' attention, and the procedure of receiving the compensation. MTurk workers were redirected to an external screening page when they clicked on the hyperlink provided at the end of the instructions. On the screening page, MTurk workers responded to the four screening questions, and only those who

were determined to meet the screening criteria (e.g., selecting "Yes" to at least one of the two smart device ownership/use questions, residing in the U.S., and being 19-34 years old) were led to the information letter page. On the information letter page, participants reviewed the study purpose, procedure, benefits and risks of the study, incentives upon complete the study, and the confidential nature of the study. Workers decided to participate in the study gave their consent by clicking on the "next" button at the bottom of the information letter page and started the experiment directly.

As a cover story, participants were informed to evaluate a mobile app to be marketed in app stores. They were presented with a visual stimulus randomly chosen from 40 experimental conditions and instructed to answer app evaluation questions based on all information on the screen. After viewing the visual stimulus randomly assigned to them, participants answered a manipulation check question confirming their awareness of the app name suffix, followed by app evaluation items including app information quality, perceived app value, download intention, and word-of-mouth intention. Identical app stimuli and evaluation questions were used in both rounds, but the app name suffix manipulation check question was included only in the second round due to its accidental omission in the first round (n = 650) of data collection. After the app evaluation task, participants completed measures assessing personal characteristics including need for cognition, app savviness, need for status, ad intrusiveness, and reciprocal inclinations, followed by demographic questions.

After finishing the questionnaire, respondents were debriefed that the app they evaluated earlier had been created for the study and would not be released to real app markets. Finally, respondents were directed to a closing page where they were given a randomly generated confirmation number. They were instructed to navigate back to the original HIT task page on the

MTurk website and submit the task with the confirmation code. A one-dollar compensation was assigned to a participated MTurk worker if the confirmation number submitted to MTurk matched the researcher's record on Qualtrics. MTurk workers who did not answer attention check questions correctly were rejected immediately from the study without payment. On a rejection page (see 0), rejected respondents were advised to return the HIT task and release the opportunity to another worker.

Data Analyses and Results

Measurement Reliability and Validity

Since the name suffix manipulation check question was not asked to respondents of the first batch, independent sample *t*-tests were conducted to detect possible differences between answers of this two batches. It was revealed that the means of all question items between the data from the first (n = 650) and second (n = 588) rounds were not significantly different at the alpha level of .05 (see Appendix N). Thus, data from both batches were merged for further analysis.

The reliability and dimensionality of the manipulation check measure (information quality), dependent variables (perceived information quality, download intention, and word-of-mouth intention), and personal variables (need for cognition, app savviness, need for status, perceived ad intrusiveness, and reciprocal inclination) were evaluated before conducting further analysis for hypothesis testing. A series of exploratory factor analysis (EFA) using the principle components analysis procedure with Varimax rotation was conducted to identify the underlining structure of all measures. Kaiser's eigenvalue criterion (retain factors with eigenvalue of 1.0 or higher) and scree plots (major eigenvalue drops on the plots) were employed to determine the number of factors to retain. Component loadings from rotated component matrices were reviewed along with the conceptual meaning of each item to ensure each component was clearly

identified. Items with low loading scores on all components (< .60) or cross-loaded on multiple components were eliminated unless they were conceptually critical to retain for the component meaning and consistent with other items on the same component. Cronbach's α was used to assess the reliability of all finalized scale items. For each scale or scale dimension, item scores were averaged to produce a mean score for further hypothesis testing.

Information Quality

Through the initial EFA of the 12 items measuring perceived information quality of the app description used in the stimuli, two components were extracted from the original four-dimensional measure. All items except for two of the three objectiveness items loaded onto the first component. The second component contained only the two items measuring the objectiveness aspects of information quality. The scree plot showed only one steep drop from the first to the second component (from eigenvalues of 7.205 to 1.115), suggesting the most variance (60.038%) explained by the first component. Given these results, a follow-up EFA was conducted after excluding the two items loading onto the second component, which resulted in a clear single-component structure of the remaining items (see Table 0.6). The 10-item unidimensional measure had high reliability (Cronbach's $\alpha = .945$).

Perceived App Value

The initial EFA pointed to a 2-component solution for perceived app value. However, one reverse-coded item "this app would not last a long time" was eliminated from further analysis because it had a loading score lower than the cutoff value of .60 for both components. A second EFA with the retained nine items revealed a clear two-component structure of the perceived app value measure (see Table 0.7). The first component, Hedonic Value, included five items capturing emotional aspects of the app, whereas the second component, Utilitarian Value,

contained four items related to the functional aspect of the app. Cronbach's αs for both components were above .90 (see Table 0.7), revealing their high reliability.

Table 0.6

Exploratory Factor Analysis Results: Information Quality

Item	Loading
Items Retained	
This app description is useful to determine the app value.	.868
This app description is sufficiently complete for my needs.	.858
I feel this app description makes a point effectively.	.850
This app description covers the needs of my understanding.	.841
This app description has sufficient breadth and depth for my understanding.	.841
This app description is appropriate to determine the app value.	.838
I feel this app description is convincing.	.821
This app description is relevant to determine the app value.	.805
This app description is applicable to my need.	.756
This app description is based on facts.	.693
Eigenvalue	6.702
% Variance Explained	67.022
Cronbach's α	.945
Items Deleted	
This app description is objectively written.	
This app description presents an impartial view.	

Need for Cognition

The initial EFA revealed a two- component structure for the need for cognition scale, with all reverse-coded items loading onto a second component. Since the reverse-coded items did not differ conceptually from the remaining items, a second EFA was conducted to impose a single-component solution. All items except for two "I prefer to think about small, daily projects to long-term ones" and "I usually end up deliberating about issues even when they do not affect me personally" showed components loadings above .60 (see Table 0.8). Since the 18-item need

for cognition scale was an established measure and had been tested by multiple studies (See, Petty, & Evans, 2009; Simon, Fagley, & Halleran, 2004), the two items with loadings lower than .50 (but > .40) were retained for further hypothesis testing. Cronbach's α of .935 indicated high reliability of the 18-item scale in spite of the inclusion of the two low-loading items.

Table 0.7

Exploratory Factor Analysis Results: Perceived App Value

	Loading	
Item	Hedonic	Utilitarian
Items Retained		
This app would give me pleasure.	.858	
I would enjoy this app.	.851	
I would want to use this app.	.795	
I would feel good using this app.	.787	
I would feel relaxed using this app.	.675	
This app would perform consistently.		.840
This app would have consistent quality.		.831
This app would be well made.		.810
This app would have an acceptable standard of quality.		.801
Eigenvalue	3.561	3.225
% Variance Explained	39.564	35.833
Cronbach's α	.908	.901
Item Eliminated		
This app would not last a long time (reverse-coded).	.144	.524

App Savviness

The EFA of the eight app savviness items resulted in two components. Four items describing the behavior of early app adoption loaded high (> .80) on the first component, three items related to the competency of using sophisticated app functions had high loadings (> .7) onto the second component, and one item, "I enjoy the challenge of figuring out apps," cross-

loaded on both components. However, since the consumer innovativeness scale (from which the current app savviness items were developed) had been widely accepted and tested as a one-factor scale, a second EFA imposing a one-component solution was conducted (see Table 0.9). All items showed high loadings (> .6) on the single component. The Cronbach's α calculated from the eight items was .880, indicating their high internal consistency. Therefore, the single-component solutation was adopted for further hypothesis testing.

Table 0.8

Exploratory Factor Analysis Results: Need for Cognition

Item	Loading
*Thinking is not my idea of fun.	.816
*I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.	.809
I would prefer complex problems to simple problems.	.770
I really enjoy a task that involves coming up with solution to problems.	.768
I like to have the responsibility of handling a situation that requires a lot of thinking.	.768
I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.	.747
I find satisfaction in deliberating hard and for long hours.	.728
Learning new ways to think doesn't excite me very much.	.728
*I only think as hard as I have to	.726
*The idea of relying on thought to make my way to the top appeals to me.	.725
The notion of thinking abstractly is not appealing to me.	.704
*I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.	.679
I prefer my life to be filled with puzzles that I must solve.	.653
*I like tasks that require little thought once I've learned them.	.646
*It's enough for me that something gets the job done, I don't care how or why it works.	.637
*I feel relief rather than satisfaction after completing a task that require a lot of mental work.	.613
*I prefer to think about small, daily projects to long-term ones.	.496

Table 4.8 (continued)

Item	Loading
I usually end up deliberating about issues even when they do not affect me personally.	.441
Eigen Value	8.785
% Variance Explained	48.803
Cronbach's α	.935

* Reverse-coded items

Need for Status

Five items measuring consumers' need for status converged into a single component, with all items' loadings above .60 (see Table 0.10). Both Kaiser's rule (eigenvalue > 1.0) and scree plots suggested a unidimensional solution. Thus all items were retained for further analysis. Cronbach's α of .896 showed a satisfactory reliability of this scale.

Table 0.9

Exploratory Factor Analysis Results: App Savviness One Factor Solution

Item	Loading
I keep up with the latest app developments.	.809
Other people come to me for advice on new apps.	.803
People think of me as an app expert.	.802
I'm among the first to acquire new apps.	.785
I enjoy the challenge of figuring out apps.	.716
I can usually figure out advanced app versions without help.	.678
I find I have fewer problems than most making apps work. (6)	.651
I understand how most apps work.	.628
Eigen Value	4.351
% Variance Explained	54.389
Cronbach's alpha	.880

Table 0.10

Exploratory Factor Analysis Results: Need for Status

Item	Loading
I would pay more for a product if it has status.	.895
I would buy a product just because it has status.	.881
A product is more valuable to me if it indicates my superiority.	.868
I am interested in new products with status.	.866
The status of a product is irrelevant to me.	.694
Eigen value	3.562
% Variance Explained	71.244
Cronbach's α	.896

Table 0.11

Exploratory Factor Analysis Results: Perceived App Intrusiveness

Item	Loading
I think advertisements shown on my smartphone/ tablet are:	
Intrusive	.897
Invasive	.895
Interfering	.882
Obtrusive	.865
Forced	.846
Distracting	.824
Disturbing	.674
Eigen value	4.983
% Variance Explained	71.179
Cronbach's α	.927

Perceived Ad Intrusiveness

The EFA with eight items measuring consumers' perceived ad intrusiveness revealed the unidimensionality of the scale based on Kaiser's rule (eigenvalue > 1.0), the scree plot analysis,

and component loadings above .60 for all items (see Table 0.11). Reliability of the perceived ad intrusiveness scale was high, given Cronbach's α of .927.

Reciprocal Inclinations

Among the nine items measuring participants' reciprocal inclinations, two items addressing monetary paybacks of good will were eliminated for due to their low loadings. The other items showed their unidimensionality (see Table 4.11) and a satisfactory reliability with the Cronbach's α of .884.

Table 0.12

Exploratory Factor Analysis Results: Reciprocal Inclinations

Item	Loading
If someone does a favor for me, I am ready to return it.	.841
If someone is helpful with me at work, I am pleased to help him/her.	.812
I go out of my way to help somebody who has been kind to me before.	.805
If someone asks me politely for information, I'm really happy to help him/her.	.775
I am ready to undergo personal costs to help somebody who helped me before.	.750
When someone does me a favor, I feel committed to repay him/her.	.744
I am ready to do a boring job to return someone's previous help.	.677
Eigen Value	4.191
% Variance Explained	59.870
Cronbach's α	.870
Items Eliminated:	
If someone lends me money as a favor, I feel I should give him/her back something more than what is strictly due.	
If someone suggests to me the name of the winning horse at the race, I would certainly give him/her part of my winnings.	

Download Intention and Word-of-Mouth Intention

The factor analysis results confirmed the unidimensionality of each of the download intention and word-of-mouth intention scales (see Table 0.13). The Cronbach's αs for both measures were above .85, demonstrating high scale reliability.

Table 0.13

Exploratory Factor Analysis Results: Download Intention and Word-of-Mouth Intention

Item	Loading	Eigen Value	% Variance Explained	Cronbach's α
Download Intention		2.658	88.59%	.872
If this app were available in the market, the likelihood that I would consider downloading this app is	.962			
If this app were available in the market, the probability that I would consider downloading this app is	.959			
If I were going to buy an alarm app, the probability of downloading this app is	.902			
Word-of-Mouth Intention		2.396	79.88%	.935
I would recommend this app to other people.	.919			
I would tell other people positive things about this app.	.902			
When I tell others about this app, I would talk about it in great detail.	.860			

Manipulation Checks

The manipulation of name suffix was checked through one question "Which of the following app is the app you evaluated?" asked after the participant's exposure to their assigned app stimulus. This question was asked only in the second batch of the data (n = 588). Among those who received this question, 95.98% (f = 562) correctly selected their assigned app name suffix, indicating the general recognition of the app name suffix information from the

experimental stimuli among participants of this study. However, because this study does not distinguish the subconscious effect from participants' mere exposure to the app name suffix from the effect of participants' conscious awareness of the app name suffix, further analysis for hypothesis testing included data from both participants who correctly recognized their assigned app name suffix and ones who did not. Further, for the same rationale, data from participants who were not asked the app name suffix manipulation check question were also included in further analysis.

To evaluate the success of the information quality manipulation, a three-way univariate ANOVA test was conducted with the perceived app information quality composite scores as the dependent variable and the three experimental factors—information quality, app name suffix, and app category—as fixed factors. The univariate results revealed two significant main effects, the information quality manipulation ($F_{1, 39} = 125.193$, $p < .001$, partial $\eta^2 = .095$) and app category ($F_{3, 39} = 4.949$, $p = .002$, partial $\eta^2 = .012$), and a marginal significant main effect of name suffix ($F_{4, 39} = 2.182$, $p = .069$, partial $\eta^2 = .007$) on perceived information quality. All two-way interactions, including app information quality × app category ($F_{3, 39} = .262$, $p = .853$, partial $\eta^2 = .001$), app information quality × app name suffix ($F_{4, 39} = 125.193$, $p = .792$, partial $\eta^2 = .001$), and app category × app name suffix ($F_{12, 39} = 125.193$, $p = .613$, partial $\eta^2 = .008$), and the three-way app information quality × app category × app name suffix interaction ($F_{12, 39} = 125.193$, $p = .720$, partial $\eta^2 = .007$) were not significant. A further examination of the mean score between high and low information quality manipulation conditions revealed that the perceived information quality composite score ($M = 5.096$, $SD = 1.056$) was higher in the high information quality condition as compared to the low information quality condition ($M = 4.349$, $SD = 1.282$), suggesting a successful manipulation of the app information quality.

Hypothesis Testing

Hypotheses proposed in the current study were tested using a series of MANOVA (for H1-H5 and H8-H14) and regression tests (H6 and H7) (see

Table 0.14).

Hypotheses 1 through 5.

To examine H1-H5, a MANOVA was run with the three experimental factors, app information quality (high vs. low) and app name suffix (no name suffix, a numerical name suffix, name suffixes "premium," "ad free," and "donate"), and app category (weather, alarm, emoji, and game) as fixed factors. The two perceived app value component mean scores (i.e., composite scores calculated by averaging the scores of the items retained for each component, utilitarian and hedonic values) were entered as dependent variables.

Results from the MANOVA revealed two significant main effects, app category (Wilk's $\lambda = .942$, $F_{6, 1238} = 12.050$, $p < .001$, partial $\eta^2 = .029$) and app information quality (Wilk's $\lambda = .961$, $F_{2, 1238} = 24.549$, $p < .001$, partial $\eta^2 = .039$), and a significant name suffix × information quality interaction effect (Wilk's $\lambda = .986$, $F_{8, 1238} = 2.089$, $p < .001$, partial $\eta^2 = .034$) at an alpha level of .05. However, the main effect of app name suffix (Wilk's $\lambda = .992$, $F_{8, 1238} = 1.136$, $p = .336$, partial $\eta^2 = .004$), the app category × app name suffix interaction (Wilk's $\lambda = .975$, $F_{24, 2394} = 1.293$, $p = .154$, partial $\eta^2 = .013$), the app category × app information quality interaction(Wilk's $\lambda = .994$, $F_{6, 2394} = 1.299$, $p = .254$, partial $\eta^2 = .003$), and the three-way app category × app name suffix × app information quality interaction (Wilk's $\lambda = .980$, $F_{24, 2394} = 1.027$, $p = .426$, partial $\eta^2 = .010$) were all not significant.

Table 0.14

Hypothesis Test Summmaries

	Hypothesis	Result
H1	Consumers perceive higher app value for an app named with a numerical suffix than an app named without a suffix.	Not Supported
H2	Consumers perceive higher app value for an app named with the suffix “premium” than an app named without a suffix.	Not Supported
H3	Consumers perceive higher app value for an app named with the suffix “ad free” than an app named without a suffix.	Not Supported
H4	Consumers perceive higher app value for an app named with the suffix “donate” than an app named without a suffix.	Not Supported
H5	App information quality has a positive effect on perceived app value.	Supported
H6	Perceived app value of a paid app positively influences download intention.	Supported
H7	Perceived app value of a paid app positively influences word-of-mouth intention.	Supported
H8	The effect of a name suffix on perceived app value is stronger among low (vs. high) NFC consumers.	Not Supported
H9	The effect of app information quality on perceived app value is stronger among high (vs. low) NFC consumers than consumers low in NFC.	Supported
H10	The effect of a numeric app name suffix on perceived app value is stronger among consumers low (vs. high) in app savviness.	Not Supported
H11	The effect of app information quality on perceived app value is stronger among consumers high (vs. low) in app savviness	Partially Supported
H12	The effect of the app name suffix “premium” on perceived app value is stronger among consumers high (vs. low) in need for status.	Not Supported
H13	The effect of the app name suffix “ad free” on perceived app value is stronger among consumers perceiving high (vs. low) ad intrusiveness.	Not Supported
H14	The effect of the app name suffix “donate” on perceived app value is stronger among consumers high (vs. low) in reciprocal inclinations.	Not Supported

H1 through H4 predicted higher app value perceptions when an app is introduced with (vs. without) a name suffix. All four hypotheses were rejected due to the non-significant app name suffix main effect revealed from the MANOVA. Subsequent ANOVA also confirmed the non-significant main effect of name suffixes (see Table 0.15). Planned pair-wise comparisons between the no-suffix condition and each of the name suffix conditions also confirmed that none of the suffix conditions produced a more positive value perception than the no-suffix condition in both the utilitarian and hedonic value dimensions (see Table 0.16 Table 0.17).

Table 0.15

ANOVA Results for Perceived App Value Scores: H1 to H5

Dependent Variable	Source	MS	*df*	F	Sig.	partial η^2
Perceived App Value - Utilitarian	App Category (CATE)	17.63	3	15.461	<.001	.037
	App Name Suffix (SUFF)	1.683	4	1.476	.207	.005
	Information Quality (INFO)	51.938	1	45.547	<.001	.037
	CATE * SUFF	.947	12	.830	.619	.008
	CATE * INFO	1.485	3	1.302	.272	.003
	SUFF * INFO	2.796	4	2.452	.044	.008
	CATE * SUFF * INFO	1.435	12	1.259	.237	.012
	Error	1.14	1198			
Perceived App Value - Hedonic	App Category (CATE)	1.868	3	1.16	.324	.003
	App Name Suffix (SUFF)	.375	4	.233	.92	.001
	Information Quality (INFO)	56.826	1	35.291	<.001	.029
	CATE * SUFF	1.636	12	1.016	.431	.010
	CATE * INFO	2.877	3	1.787	.148	.004
	SUFF * INFO	4.871	4	3.025	.017	.010
	CATE * SUFF * INFO	1.893	12	1.176	.295	.012
	Error	1.61	1198			

On the other hand, the MANOVA results revealed support for H5 which predicted a positive effect of app information quality on perceived app value due to the significant main effect of app information quality. The subsequent ANOVA also confirmed significantly higher

utilitarian and hedonic value perceptions when the app information quality was manipulated to be high (vs. low) (see Table 0.17).

Table 0.16

Planned Contrasts Results for Perceived App Value Scores

	Dependent Variable	Contrast	*S.E.*	*p*
Numeric vs. No Name Suffix	Perceived App Value - Utilitarian	-.020	.096	.838
	Perceived App Value - Hedonic	-.060	.115	.598
Premium vs. No Name Suffix	Perceived App Value - Utilitarian	.061	.096	.525
	Perceived App Value - Hedonic	-.067	.114	.559
Ad Free vs. No Name Suffix	Perceived App Value - Utilitarian	.041	.096	.673
	Perceived App Value - Hedonic	-.017	.115	.880
Donate vs. No Name Suffix	Perceived App Value - Utilitarian	-.150	.097	.121
	Perceived App Value - Hedonic	-.097	.115	.400
Information Quality: High vs. Low	Perceived App Value - Utilitarian	.410	.061	<.001
	Perceived App Value - Hedonic	.429	.072	<.001

Table 0.17

Descriptive Statistics for Perceived App Value Scores

Dependent Variable	App Name Suffix Group	Information Quality						Total		
		Low			High					
		M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
Perceived App Value: Utilitarian	No Suffix	4.53	1.15	121	4.89	0.94	123	4.71	1.06	244
	Numeric	4.50	1.20	122	4.89	1.08	127	4.70	1.16	249
	Premium	4.51	1.09	129	5.07	0.91	125	4.78	1.04	254
	Ad Free	4.43	1.13	125	5.09	1.09	123	4.76	1.16	248
	Donate	4.51	1.20	120	4.61	1.04	123	4.56	1.12	243
	Total	4.50	1.15	617	4.91	1.03	621	4.70	1.11	1238
Perceived App Value: Hedonic	No Suffix	4.17	1.28	121	4.48	1.20	123	4.33	1.25	244
	Numeric	4.17	1.25	122	4.34	1.39	127	4.26	1.33	249
	Premium	3.97	1.36	129	4.56	1.23	125	4.26	1.33	254
	Ad Free	3.88	1.25	125	4.74	1.26	123	4.30	1.33	248
	Donate	4.13	1.34	120	4.34	1.11	123	4.23	1.23	243
	Total	4.06	1.30	617	4.49	1.25	621	4.28	1.29	1238

Hypotheses 6 and 7.

H6 and H7 proposed a positive relationship between app value perceptions and app download and word-of-mouth intentions. To test H6 and H7, two multiple regression analyses were employed using the two perceived app value dimensions as the independent variables, while each of the download intention and word-of-mouth intention as the dependent variable, respectively. Using the stepwise method, the regression analyses revealed that perceived app values explained a significant amount of the variance in download intention ($F_{2,1235} = 644.127$, $p < .001$, *Adj.* $R^2 = .510$) and word-of-mouth intention ($F_{2,1235} = 1207.465$, $p < .001$, $R^2 = .661$). Both utilitarian ($\beta = .141$, $t_{1235} = 5.219$, $p < .001$) and hedonic ($\beta = .612$, $t_{1235} = 22.688$, $p < .001$) value perceptions significantly predicted respondents' intention to download an app. Similarly, both the utilitarian ($\beta = .139$, $t_{1235} = 6.218$, $p < .001$) and hedonic ($\beta = .713$, $t_{1235} = 31.784$, $p < .001$) app value perceptions were found to be significant, positive predictors of respondents' word-of-mouth intentions.

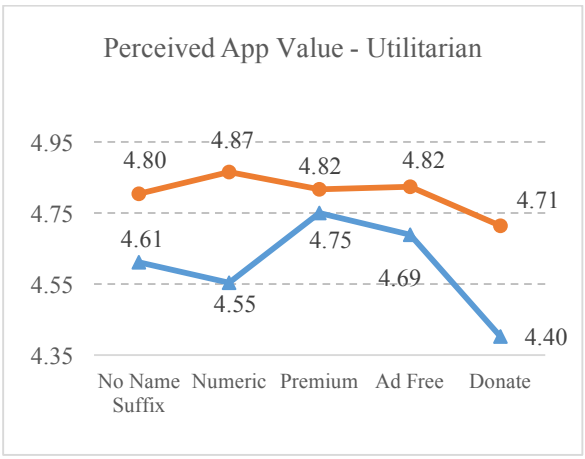
Hypotheses 8 and 9.

To prepare the testing of moderating hypotheses (H8-H14), respondents were classified into the high or low groups according to the respective moderating variable mean scores using a medium split method. For example, to examine the moderating effects of need for cognition (NFC), all respondents were grouped in either the high- or low-NFC group based on their need for cognition mean score calculated from the 18 NFC items.

H8 and H9 proposed the moderating role of NFC for the effects of name suffix (H8) and app information quality (H9) on perceived app values. To test H8 and H9, a four-way MANOVA was conducted with both perceived app value composite scores (utilitarian and hedonic) as dependent variables, and app name suffix, app information quality, app category, and need for

cognition as fixed factors. The MANOVA test was followed by univariate ANOVAs. Results from the MANOVA revealed significant main effects of app category (Wilk's $\lambda = .941$, $F_{6, 2438} = 12.432$, $p < .001$, partial $\eta^2 = .030$), information quality (Wilk's $\lambda = .960$, $F_{2, 1214} = 12.050$, $p < .001$, partial $\eta^2 = .040$), and need for cognition (Wilk's $\lambda = .990$, $F_{2, 1214} = 12.050$, $p = .002$, partial $\eta^2 = .010$). Two significant two-way interaction effects on perceived app value were observed: (1) information quality × NFC (Wilk's $\lambda = .992$, $F_{2, 1214} = 4.645$, p = .01, partial $\eta^2 = .008$) and (2) information quality × app name suffix (Wilk's $\lambda = .985$, $F_{8, 2428} = 2.298$, p = .019, partial $\eta^2 = .008$). The main effect of app name suffix (Wilk's $\lambda = .992$, $F_{8, 2428} = 1.205$, p = .292, partial $\eta^2 = .004$), the name suffix × NFC interaction effect (Wilk's $\lambda = .995$, $F_{8, 2428} = .795$, p = .607, partial $\eta^2 = .003$), and the three-way interaction effect among name suffix, information quality, and NFC (Wilk's $\lambda = .992$, $F_{8, 2428} = 1.172$, p = .312, partial $\eta^2 = .004$) were not significant.

H8 proposed that low-NFC individuals would be more likely to be influenced by a name suffix than high-NFC individuals. This hypothesis was rejected due to the non-significant name suffix × NFC interaction effect reported above. In fact, compared with high-NFC respondents, the low-NFC respondents did not show higher perceived values for apps with a name suffix than apps without a name suffix. In fact, the high-NFC condition revealed consistently higher perceived value scores than the low-NFC condition, although statistically non-significant, regardless of the app name suffix conditions (see *Figure 0.2*). The subsequent ANOVA tests also confirmed the non-significant name suffix × NFC interaction effects for both utilitarian and hedonic value perceptions (see Table 0.18), rejecting H8.



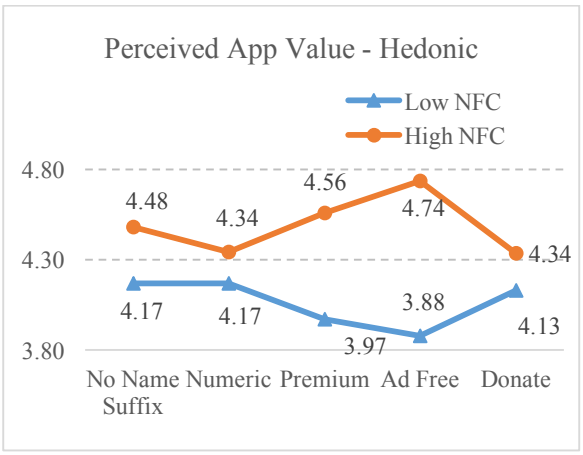
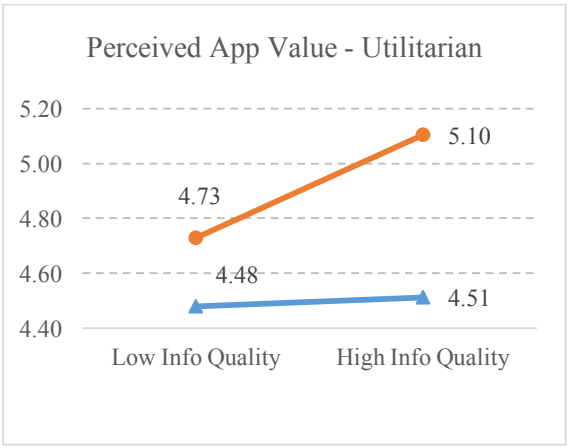


*Figure 0.2.*Means of perceived app value by app name suffix and need for cognition

H9 predicted that the influence of information quality on perceived app values would be greater among high-NFC consumers than among low-NFC consumers. The MANOVA and subsequent ANOVA (see Table 0.18) results revealed the significant information quality × NFC interaction effects for both perceived app value dimensions. The perceived app value mean differences between the high and low information quality conditions were greater for the high-NFC group than for the low-NFC group. Thus, H9 was supported.



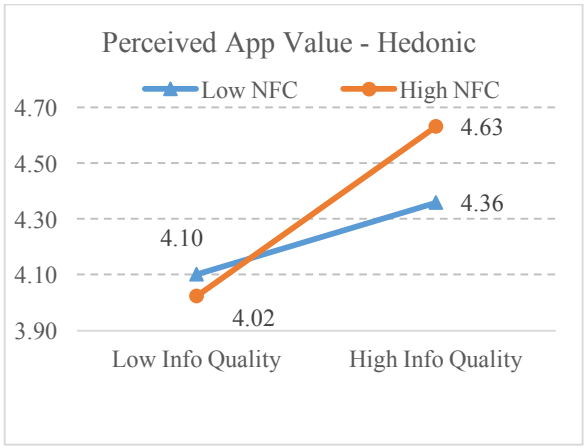


Figure 0.3 Means of perceived app value by information quality and need for cognition

Hypothesis 10.

H10 predicted that effect of the numeric name suffix on perceived app values would be moderated by app savviness. To test this hypothesis, the mean difference of the numeric name suffix and no suffix conditions (n = 493) was compared between the high and low app savviness groups. A four-way MANOVA was utilized with app category (four categories) and app information quality (high vs. low) as well as app name suffix (numeric vs. no suffix) and app savviness (high vs. low) as the fixed factor. App category and information quality were included despite their irrelevance to H10 testing in order to increase the power of the analysis given their significant effects found from earlier analyses. In addition to the expected significant main effects of app category (Wilk's $\lambda = .917$, $F_{6, 962} = 12.091$, $p < .001$, partial $\eta^2 = .043$) and app information quality (Wilk's $\lambda = .963$, $F_{2, 481} = 9.277$, $p < .001$, partial $\eta^2 = .037$), the MANOVA results also revealed a significant app savviness main effect (Wilk's $\lambda = .937$, $F_{2, 481} = 16.191$, $p < .001$, partial $\eta^2 = .063$). However, no two-way or three-way interaction effects were found significant, rejecting H10.

Hypothesis 11.

H11 predicted that the effect of information quality on perceived app values would be stronger among respondents with high (vs. low) app savviness. The H11 test was conducted employing in a similar four-way MANOVA as that used for H10 testing except that respondents from all name suffix conditions were included (n = 1238). Results revealed that the main effects of app category (Wilk's $\lambda = .943$, $F_{6, 2428} = 12.091$, $p < .001$, partial $\eta^2 = .029$), app information quality (Wilk's $\lambda = .953$, $F_{2, 1214} = 29.727$, $p < .001$, partial $\eta^2 = .047$), and app savviness (Wilk's $\lambda = .962$, $F_{2, 1214} = 23.691$, $p < .001$, partial $\eta^2 = .038$) were significant. In addition, a two-way

interaction between information quality and app name suffix was also significant (Wilk's λ = .987, $F_{8, 2428}$ = 1.978, p = .045, partial η^2 = .006). The predicted H11-relevant interaction between information quality and app savviness was marginally significant (Wilk's λ = .996, $F_{2, 1214}$ = 2.717, p = .066, partial η^2 = .004). No other interaction effects were significant.

Table 0.18

ANOVA Results for H8 and H9

Dependent Variable	Source	MS	*df*	*F*	*p*	partial η^2
Perceived App Value - Utilitarian	App Category (CATE)	18.117	3	16.089	< .001	.038
	Information Quality (INFO)	53.937	1	47.898	< .001	.038
	App Name Suffix (SUFF)	1.773	4	1.574	.179	.005
	Need for Cognition (NFC)	12.299	1	10.922	.001	.009
	INFO * NFC	9.938	1	8.825	.003	.007
	INFO * SUFF	2.984	4	2.650	.032	.009
	SUFF * NFC	.855	4	.760	.552	.002
	INFO * SUFF * NFC	1.228	4	1.090	.360	.004
	Error	1.126	1215			
Perceived App Value - Utilitarian	App Category (CATE)	2.051	3	1.273	.282	.003
	Information Quality (INFO)	57.482	1	35.661	< .001	.029
	App Name Suffix (SUFF)	.411	4	.255	.907	.001
	Need for Cognition (NFC)	2.638	1	1.636	.201	.001
	INFO * NFC	10.084	1	6.256	.013	.005
	INFO * SUFF	5.339	4	3.312	.010	.011
	SUFF * NFC	0.610	4	.378	.824	.001
	INFO * SUFF * NFC	1.536	4	.953	.432	.003
	Error	1.612	1215			

The follow-up ANOVA (see Table 0.19) revealed that the information quality effect on perceived utilitarian app value was greater among respondents with high (vs. low) app savviness (see *Figure 0.4*). However, no such interaction effect was detected for the hedonic app value. Thus, H11 was partially supported.

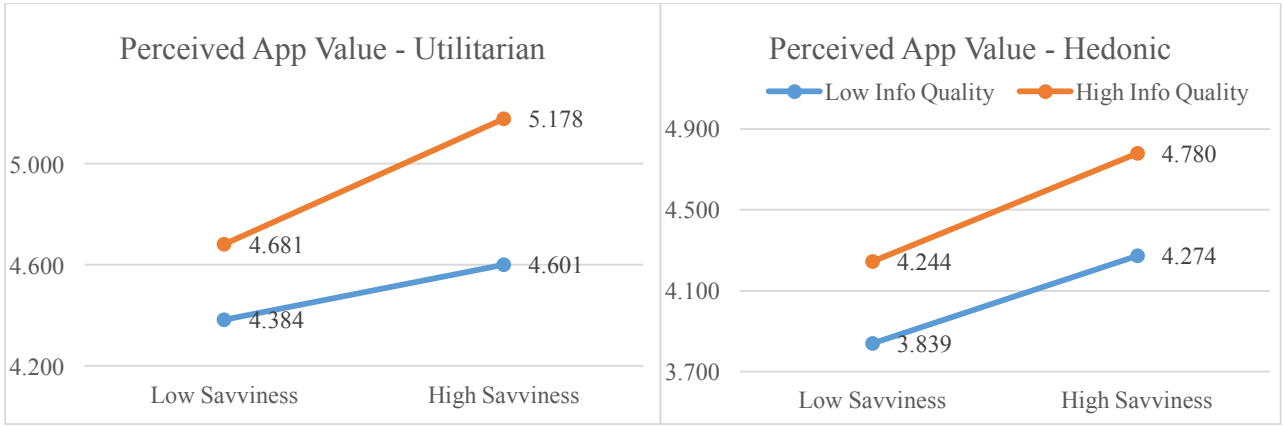


Figure 0.4 Means of perceived app value by information quality and app savviness

Table 0.19

ANOVA Results for H11

Dependent Variable	Source	MS	*df*	*F*	*p*	partial η^2
Perceived App Value - Utilitarian	App Category (CATE)	17.203	3	15.555	<.001	.037
	Information Quality (INFO)	60.377	1	54.591	<.001	.043
	App Name Suffix (SUFF)	1.345	4	1.216	.302	.004
	App Savviness (SAVV)	35.204	1	31.830	<.001	.026
	INFO * SAVV	5.186	1	4.689	.031	.004
	INFO * SUFF	2.464	4	2.228	.064	.007
	SUFF * SAVV	0.803	4	0.726	.574	.002
	INFO * SUFF * SAVV	2.815	4	2.545	.038	.008
	Error	1.106	1215			

Table 4.19
(continued)

Dependent Variable	Source	MS	*df*	*F*	P	partial η^2
Perceived App Value - Hedonic	App Category (CATE)	2.042	3	1.310	.270	.003
	Information Quality (INFO)	66.672	1	42.755	<.001	.034
	App Name Suffix (SUFF)	.474	4	.304	.876	.001
	App Savviness (SAVV)	69.770	1	44.742	<.001	.036
	INFO * SAVV	.942	1	0.604	0.437	<.0010
	INFO * SUFF	4.570	4	2.930	.020	.010
	SUFF * SAVV	1.914	4	1.227	.297	.004
	INFO * SUFF * SAVV	1.753	4	1.124	.343	.004
	Error	1.559	1215			

Hypotheses 12 through 14.

H12 through H14 were tested using a series of four-way MANOVAs with the three experimental factors (app category, app information quality, and app name suffix) and the respective consumer characteristic moderator variable (need for status, perceived app intrusiveness, or reciprocal inclination) as fixed factors, and the two perceived app value dimensions as dependent variables. Since these three hypotheses addressed the moderating effect for the comparison between the no suffix condition and another name suffix (premium, ad free, or donate) condition, the analyses were conducted using data from only the corresponding name suffix groups (e.g., only data from the premium and no name suffix conditions are used to test H12).

Table 0.20

ANOVA Results for H12

Dependent Variable	Source	MS	*df*	*F*	*p*	partial η^2
Perceived App Value - Utilitarian	Information Quality (INFO)	28.61	1	28.994	<.001	.056
	App Name Suffix (SUFF)	.455	1	.461	.497	.001
	App Category (CATE)	12.106	3	12.269	<.001	.070
	Need for Status (NFS)	.480	1	.486	.486	.001
	INFO * NFS	2.231	1	2.261	.133	.005
	INFO * SUFF	.633	1	.641	.424	.001
	SUFF * NFS	.471	1	.478	.490	.001
	INFO * SUFF * NFS	.368	1	.373	.542	.001
	Error	.987	487			
Perceived App Value - Hedonic	Information Quality (INFO)	26.412	1	16.533	<.001	.033
	App Name Suffix (SUFF)	.748	1	.468	.494	.001
	App Category (CATE)	1.346	3	.842	.471	.005
	Need for Status (NFS)	15.123	1	9.466	.002	.019
	INFO * NFS	.004	1	.002	.962	<.001
	INFO * SUFF	1.900	1	1.189	.276	.002
	SUFF * NFS	.001	1	<.001	.986	<.001
	INFO * SUFF * NFS	.018	1	.011	.917	<.001
	Error	1.598	487			

The MANOVA for H12 resulted in significant main effects for information quality (Wilk's $\lambda = .943$, $F_{2, 486} = 14.790$, $p < .001$, partial $\eta^2 = .057$), app category (Wilk's $\lambda = .904$, $F_{6, 972} = 8.384$, $p < .001$, partial $\eta^2 = .049$), and need for status (Wilk's $\lambda = .976$, $F_{2, 486} = 6.094$, $p = .002$, partial $\eta^2 = .024$). None of the two-way or three-way interactions were significant. Due to the non-significant app name suffix × need for status interaction effect (Wilk's $\lambda = .998$, $F_{2, 486} = .391$, $p = .677$, partial $\eta^2 = .002$), H12 was not supported. Follow-up ANOVAs (see Table 0.20) revealed that the main effect of need for status was significant for the utilitarian value perception but not for the hedonic value perception. ANOVA results also revealed that need for status had

no significant interactions with the other factors, confirming the non-significant H12 testing result from the MANOVA.

The MANOVA for H13 revealed two significant main effects of information quality (Wilk's $\lambda = .929$, $F_{2, 480} = 14.790$, $p < .001$, partial $\eta^2 = .071$) and app category (Wilk's $\lambda = .939$, $F_{6, 960} = 5.104$, $p < .001$, partial $\eta^2 = .031$), while the only significant interaction effect was between app name suffix and information quality (Wilk's $\lambda = .986$, $F_{2, 480} = 3.326$, $p = .037$, partial $\eta^2 = .014$). Due to the non-significant app name suffix × perceived ad intrusiveness interaction effect (Wilk's $\lambda = .999$, $F_{2, 480} = 0.310$, $p = .734$, partial $\eta^2 = .001$), H13 was rejected. Follow-up ANOVAs also revealed non-significant main or interaction effects of ad intrusiveness (see Table 0.21).

Lastly, H14 MANOVA results revealed significant main effects of information quality (Wilk's $\lambda = .984$, $F_{2, 950} = 3.801$, $p = .023$, partial $\eta^2 = .016$), app category (Wilk's $\lambda = .957$, $F_{6, 475} = 3.540$, $p = .002$, partial $\eta^2 = .022$), and reciprocal inclinations (Wilk's $\lambda = .971$, $F_{2, 475} = 7.032$, $p = .001$, partial $\eta^2 = .029$). No two-way or three-way interactions between information quality, app name suffix, and reciprocal inclinations were significant. H14 was not supported due to the non-significant name suffix × reciprocal inclination interaction effect (Wilk's $\lambda = .995$, $F_{2, 475} = 1.099$, $p = .334$, partial $\eta^2 = .005$). Follow-up ANOVAs (see Table 0.22) showed that perceived app value was higher among consumers with high (vs. low) reciprocal inclination for both the utilitarian ($M_{\text{low RI}} = 4.450$, $M_{\text{high RI}} = 4.808$) and hedonic ($M_{\text{low RI}} = 4.119$, $M_{\text{high RI}} = 4.427$) dimensions, regardless of the app name suffix conditions.

Table 0.21

ANOVA Results for H13

Dependent Variables	Source	MS	*df*	*F*	*p*	partial η^2
Perceived App Value - Utilitarian	Information Quality (INFO)	35.301	1	31.478	<.001	.061
	App Name Suffix (SUFF)	.118	1	.105	.746	<.001
	App Category (CATE)	9.191	3	8.195	<.001	0.049
	Ad Intrusiveness (AD)	.205	1	.183	.669	<.001
	INFO * AD	.369	1	.329	.567	.001
	SUFF * ADD	.770	1	.687	.408	.001
	INFO * SUFF	3.202	1	2.855	.092	.006
	INFO * SUFF * AD	1.761	1	1.57	.211	.003
	Error	1.121	487			
Perceived App Value - Utilitarian	Information Quality (INFO)	46.517	1	30.182	<.001	.059
	App Name Suffix (SUFF)	.204	1	.132	.716	<.001
	App Category (CATE)	4.861	3	3.154	.025	.019
	Ad Intrusiveness (AD)	3.594	1	2.332	.127	.005
	INFO * AD	.951	1	.617	.433	.001
	SUFF * ADD	.165	1	.107	.743	<.001
	INFO * SUFF	10.268	1	6.662	.01	.014
	INFO * SUFF * AD	3.934	1	2.552	.111	.005
	Error	1.541	481			

Table 0.22

ANOVA Results for H14

Dependent Variables	Source	MS	*df*	*F*	*p*	partial η^2
Perceived App Value - Utilitarian	Information Quality (INFO)	7.543	1	6.736	.010	.014
	App Name Suffix (SUFF)	1.562	1	1.395	.238	.003
	App Category (CATE)	5.795	3	5.175	.002	.032
	Reciprocal Inclination (RECI)	15.546	1	13.883	<.001	.028
	INFO * RECI	1.589	1	1.419	.234	.003
	INFO * SUFF	2.039	1	1.821	.178	.004
	SUFF * RECI	.670	1	.598	.440	.001
	INFO * SUFF * RECI	.584	1	.522	.470	.001
	Error	1.12	476			

Table 4.22 (continued)

Dependent Variables	Source	MS	*df*	*F*	*p*	partial η^2
Perceived App Value - Utilitarian	Information Quality (INFO)	8.772	1	5.832	.016	.012
	App Name Suffix (SUFF)	.390	1	.260	.611	.001
	App Category (CATE)	1.953	3	1.298	.274	.008
	Reciprocal Inclination (RECI)	11.768	1	7.824	.005	.016
	INFO * RECI	2.413	1	1.604	.206	.003
	INFO * SUFF	.352	1	.234	.629	<.001
	SUFF * RECI	3.219	1	2.140	.144	.004
	INFO * SUFF * RECI	.561	1	.373	.542	.001
	Error	1.504	476			

Chapter 5. Discussion and Implications

The purpose of this study was to investigate the effects of app name suffixes and app information quality on consumers' value perception of mobile apps and subsequent behavioral intentions. Additionally, the potential moderating roles of need for cognition, app savviness, need for status, ad intrusiveness, and reciprocal inclination for the aforementioned effects were explored. This chapter summarizes findings from the main experiment and discusses them pertaining to the research objectives of the study. Theoretical and practical implications of the findings, limitations of the study, and recommendations for future research are provided after the discussion of results.

Summary and Discussion of Findings

App Name Suffix and Perceived App Value

An app name suffix is widely used as a supplementary component added to the brand name to communicate specific characteristics to potential customers. This study proposed that the existence of a self-explanatory name suffix would help consumers comprehend the app offering and differentiate the app from alternative apps with no name suffixes. Four name suffixes were examined in the current study. A numeric name suffix was expected to signify the version advances of an app over the alternative without a name suffix. The name suffix "premium" was expected to be associated with premium features. In addition, it was likely that consumers associate a non-interruption experience with an app carrying the name suffix "ad free." Lastly, the name suffix "donate" was proposed to remind consumers with the developer's effort in making the app and stimulate consumers' rewarding thoughts. All these added values purported through the app name suffixes were hypothesized to enhance consumers' perceptions of the app values. However, these hypotheses were not supported by the consumer experiment

data collected in this study. The non-significant main effect of the name suffix indicated that respondents perceive the value of an app indifferently regardless of whether the app is named with or without a suffix. These findings suggest that a name suffix may not add functional or experiential values to a paid app and that a name suffix may not be used as a value indicator in consumers' app evaluation process.

A possible reason for no significant effect of the name suffix on perceived app value could be that consumers may not be able to associate an app name suffix with app value when an app is presented alone without alternatives to compare. The use of a name suffix in naming a product exists most commonly when a product is offered with a family of sibling products. For example, Microsoft launches its Office 365 consumer subscriptions with two variations: "Home" for family use and "Personal" for single use. Consumers considering purchasing an Office suite software knows these two variations have similar core features but vary in certain way. However, a name suffix such as "donate" may not be readily associated with value-related features in the consumer's mind when no alternative suffixes are presented together. When an app is marketed in multiple versions named with varying suffixes, an app search result would usually present all versions of the app with different suffixes together, allowing a direct comparison between different versions. This may draw consumers' attention to the different suffixes, potentially leading them to attribute distinctive meanings to the varying suffixes and thus perceive varying values among the different app versions. On the other hand, when an app is presented as a single version, as was in the current experiment, consumers may fail to pay attention to the meaning of the suffix as their evaluation may concentrate on other aspects of the app information such as descriptions of the app features.

It is also worth noting that when consumers encounter an unfamiliar app brand or have limited experience in the app category in general, they may focus on core offers and lack the motivation to invest in advanced features (e.g., ad free) or request special versions (e.g., donate). As the processing fluency model suggested, consumers base their evaluation on the readiness and easiness of information being processed (A. Y. Lee & Labroo, 2004). Feature introductions in written format, compared to a single word or a short phrase that requires interpretation, could be more accessible and reliable to determine the value of an app. Thus, the difficulty of obtaining complete and accurate product information prior to downloading an app may force consumers to rely more on reliable text descriptions rather than to interpret the meaning of a name suffix. As a result, consumers may be less likely to pay attention to heuristic cues in the app evaluation process and base their decision solely on the straightforward feature descriptions.

It is also possible that the existing indiscriminate, inconsistent use of name suffixes among free and paid apps may have caused confusion to consumers in terms of their exact meanings. For example, while the name suffix "premium" has been used to indicate "better" features for a paid app as compared to a free alternative, it has also been used to suggest simply that the app is "good" (without a specific comparable free alternative) or to indicate a subscription service requirement for an app after a free trial (e.g., "Xmarks for Premium Customers" requires premium subscription after a 14-day free trial). As a result, depending on the past experience with varying apps with the suffix "premium," consumers may attribute inconsistent meanings to the suffix or be confused when trying to decipher its true meaning under specific situations.

Information Quality and Perceived App Value

In this study, consumers are hypothesized to perceive higher app values when higher-quality information is presented in the app description. Information quality was defined and manipulated in the current experiment so that the high-quality app description contained more informative, relevant, and objective information as compared to the low-quality app description. Significant effects of information quality on perceived app value were found in both utilitarian and hedonic value dimensions, supporting the proposed hypothesis. This result supports past information processing research (Oh & Jasper, 2006; Rieh, 2002) in that information quality, the extent an app's features are described informatively, relevantly, and objectively influences a consumer's evaluation of an app. The current study took the information processing literature one step further by demonstrating that the persuasive effect of information quality on argument evaluation also holds for mobile products. Considering the particular setting of main experiment, the strong influence of information quality on perceived app value may be attributed to the lack of alternative choices. As has discussed earlier, when consumers do not have a pool of app variations to make a direct comparison, they may not notice the existence of a name suffix or do not make inference. As a result of lacking reliable information source, consumers are forced to use the text description as the major value embodiment.

Perceived App Value and Behavioral Intentions

A plethora of literature indicate that favorable value perceptions of a product directly drive positive behavioral intentions such as paying premium prices, staying loyal to the brand, saying positive things about a product, and recommending it to other consumers (e.g., Cronin et al., 2000; Swait & Sweeney, 2000). Extending this steam of literature to the mobile app downloading context, the researcher hypothesized that behavioral consequences such as purchase

and word-of-mouth activities would be more likely to follow if consumers anticipate a high value in terms of potential utility and pleasure from using an app. This study reveals that both utilitarian and hedonic value perceptions are significantly related to the download intention, supporting Zeithaml's (1988) and Chen and Dubinsky's (2003) view that perceived value is an immediate predictor of purchase intention. In addition, word-of-mouth activities, such as informal communications and recommendations between consumers, were also directly related to the overall assessment of the app value, confirming prior researchers' view that perceived value is an antecedent of word-of-mouth activities (de Matos & Rossi, 2008).

Moderating Effects of Consumer Characteristics

This study refers to the elaboration likelihood model in the hypothesis development to predict potential moderating roles of NFC and app savviness in the effects of app name suffix and information quality on perceived app value. The concept and measure of NFC were established by Cacioppo and Petty (1982) and Cacioppo et al. (1984) to distinguish people's varying tendencies to engage in effortful thinking. The elaboration likelihood model suggests that a consumer generally enjoying effortful cognitive activities tends to make judgments based on thorough scrutiny of relevant information, whereas a consumer less inclined to enjoy a complex and analytical thinking process tends to rely on heuristic cues, such as the attractiveness and credibility of the source (Cacioppo & Petty, 1982; Cacioppo et al., 1986). Thus, it was hypothesized that the effect of a name suffix, which is considered a peripheral cue, on perceived app value would be stronger among low (vs. high) NFC consumers, whereas the effect of information quality, a central cue, on the value would be stronger among high (vs. low) NFC consumers. The results from the main experiments revealed support for the moderating effect of NFC on the relationship between information quality and perceived app value. Consistent with

previous studies (Batra & Stayman, 1990; Haugtvedt et al., 1992), high NFC consumers are more likely to scrutinize information carefully and influenced by the cogency of app feature descriptions. However, the moderating role of NFC for the name suffix effect was not found in the current study as the NFC × name suffix interaction was not significant. The app name suffix showed no effect on perceived app values irrespective of the consumer's NFC level.

The elaboration likelihood model suggests motivation and ability as two decisive factors in choosing information-processing routes. Specifically, attitude change is more likely to stem from issue-relevant arguments when individuals possess both motivation and ability to evaluate information carefully. In contrast, some heuristic cues are more likely to function as the primary evaluation basis when individuals lack the motivation or ability to scrutinize issue-relevant information. In the current study, app savviness was proposed as a consumer characteristic that manifests the motivation and ability to process app-related information. It was conceptualized that consumers with higher app savviness are more likely to keep up with the latest news of mobile apps and thus possess a higher level of knowledge on app features. Such characteristics possibly lead to stronger motivation and ability to evaluate app feature descriptions, thus increasing the likelihood to rely on the app information quality while decreasing the likelihood to use heuristic cues such as app name suffixes to evaluate the value of an app. This study supports the moderating role of app savviness in the information quality effect; however, no support is found for the moderating role of app savviness in the app name suffix effect.

Need for status, ad intrusiveness, and reciprocal inclinations are three personal characteristic variable proposed to moderate the effects of certain name suffixes on perceived app values. Specifically, the name suffix "premium" was hypothesized to be more effective to those who are generally more sensitive to social status implied by a product, but such a

prediction was not supported by the main experiment data. Similarly, no support is found in this study for the prediction that the effect of the app name suffix "ad free" would be more pronounced among consumers who perceive ads to be more intrusive. Lastly, consumers' general tendency to reciprocate other people's good deeds is found to be ineffective in facilitating the effect of the name suffix "donate" on perceived app values.

In summary, the current experiment reveals support for differential effects of app information quality based on the two consumer characteristic moderators (NFC and app savviness) hypothesized in this study; whereas name suffixes do not affect app value perceptions regardless of any of the five consumer characteristics (NFC, app savviness, status consumption, ad intrusiveness, and reciprocal inclination) examined in this study. A possible reason for the failure to detect any moderating effects of the consumer characteristics on the relationship between app name suffix and perceived app values may be participants' lack of motivation to use name suffixes as a value indicator in general. As discussed earlier related to the non-significant name suffix main effects (H1-H4), participants in the current experiment may have ignored the name suffix information completely because of the experimental setting where no alternative app versions were available to compare the stimulus app. In other words, the differential value propositions associated with app name suffixes might not have been a useful heuristic cue when the app evaluation did not require a choice decision among alternatives.

Another possible reason may come from the private nature of the purchase and consumption of an app. Unlike the purchase of traditional products and services in an offline retail store, buying an app does not require face-to-face encounters with a sale associate or a cashier. The consumption of a mobile app is also generally more private because its consumption would keep to the user unless it is publically shared to a social networking site. Consumers may

find less need to reciprocate human services or need to pursue social status because of the lack of human interactions in purchasing and using an app, leading to the non-significant roles of these consumer characteristic variables in consumer information processing in the app market.

Theoretical Implications

As a seminal approach to address the lack of literature on consumers' mobile app download decision making, the current study contributed to the relevant literature in branding, virtual retailing, and consumer information-processing and decision-making theories. First, app information quality is found to be a critical factor influencing consumers' perception of app value. The role of information quality on shopping decision making has been studied extensively with various non-virtual products such as food (Andrews & Shimp, 1990), clothing (Oh & Jasper, 2006), electronics (H. S. Park et al., 2007), and services (Jun & Vogt, 2013). This study takes a step further to verify that the effect of information quality on purchase decision also holds for virtual products. Specifically, this study provide evidence that classic information-processing and decision-making theories successfully predict consumers' download behaviors of mobile apps (which correspond to purchase behaviors for non-virtual products). It is worth to mention that this study is the first to apply earlier researchers' information quality measures (e.g., Y. W. Lee et al., 2002; Miller, 1996) to create the high and low versions of text descriptions without varying app features. Inspired by earlier researchers' manipulation method for argument quality (e.g., D.-H. Park, Lee, & Han, 2007; H. S. Park et al., 2007), this study variated source affiliation, examples, use scenarios, competitors, and statistics to create differences in informativeness, relevancy, and objectivity of app descriptions, providing a great example to make use of existing information quality frameworks in marketing.

Second, the effect of app name suffixes on perceived app value is found to be insignificant in the current study. These results provide a foundation and reference for further investigations of unique characteristics of the app information processing. In contrast to earlier researchers' speculations that a descriptive name suffix may add incremental value to a product offer by conveying product differentiations (Pavia & Costa, 1993; Osler, 2007), this study did not find support for a name suffix effect on app evaluation. Auh and Shih (2009) had designed a series of experiments to prove that when a serial numerical brand name suffix is present to compare different generations of software, the chronic number is used by consumers to make inferences about the technological improvement. However, the current study presented only a single app stimulus to each participant without a context in which it can be compared to alternative apps or other versions of the same app. In doing so, none of the app name suffixes including the numeric suffix, were found to signal value improvement as compared to the no-suffix condition. Given that no systematic research has been conducted to explore the role of contexts in name suffix effects, this study provides a reference for future research. For example, further experiments could be conducted to examine the effect of name suffixes when multiple variations of the same brand are available. It also would be interesting to design an experimental setting to mimic real-world app search scenarios by providing a list of apps from different developers and thus carrying different name suffixes.

Next, results of the current study expand the applicability of the perceived value – behavioral intention association established by previous researchers (Cronin et al., 2000; Swait & Sweeney, 2000) to the mobile app market context. One unique characteristic of app distribution is that massive consumers are able to download a software for free while the developer behind the software is able to master making a profit by selling advertisements. As a result, the

traditional "purchase" behavior does not always work for a virtual product (e.g., a mobile app). This study uses download intention as an approximation of purchase intention in the app market. By relating perceived app value to app download intention, this study highlights the importance of perceived value in predicting consumers' shopping activity in the mobile app market. Existing product diffusion models recognize word-of-mouth activity as a facilitator of product penetration and represents interpersonal communications between early adopters of a new product and less innovative consumers (e.g., Arndt, 1967; Buttle, 1998). However, word-of-mouth has been discussed extensively as a post-purchase activity (e.g., Anderson, 1998; Hennig-Thurau et al., 2004) and mostly been examined in the service context. For example, the positive impact of service value on word-of-mouth recommendations has been reported in the context of evaluating the service of a hotel (Hartline & Jones, 1996), a life insurance plan (Durvasula, Lysonski, Mehta, & Buck Peng, 2004), and a health care plan (McKee, Simmers, & Licata, 2006).The current study extends the understanding of such relationship to a mobile app context, providing evidence that perceived value is a reliable predictor of word-of-mouth activities when shopping for a mobile app.

In addition, the perceived app value was found a predictor of behavioral intentions in both utilitarian and hedonic aspects. As earlier researchers noted (Crowley et al., 1992; Voss, Spangenberg, & Grohmann, 2003), consumers shop for both practical purposes (i.e., physical performance of a product) and emotional reasons (i.e., entertainment and enjoyment from experiencing a product). The current study echoes earlier studies on product value that consumers receive both utilitarian and hedonic benefits from mobile apps, providing evidence for the multi-dimensionality of perceived value among virtual products. The results also suggest that perceived hedonic value of a mobile app may be a stronger predictor of both behavioral

intentions than the utilitarian value. Experiential and emotional benefits gained from using mobile shopping services have been substantially investigated and reported to be a more salient driver of service adoption behaviors (e.g., Kim & Oh, 2011; Yang & Jolly, 2009). The current study confirms the relatively higher contribution of the sensual stimulation and enjoyment (than functional performance) to shopping behaviors and extends previous studies by revealing the importance of hedonic benefits gained from using mobile apps.

Fourth, the current study also expands the applicability of the elaboration likelihood model to mobile app markets by revealing the moderating effects of NFC and app savviness on the relationship between app information quality and perceived app value. The central route of elaboration likelihood model postulates that intensive processing of issue-relevant cues (e.g., app description) is more likely to occur for perceivers with higher motivation and ability to process the information (R. E. Petty & Cacioppo, 1986). The current study provides empirical evidence of the central information process route in the context of mobile apps by revealing a stronger effect of information quality for consumers high in NFC and app savvinesss. Although the role of periperal route of information processing received no support by the data, this study takes the first step to explore the role of app name suffix as a periperhal cue in app evaluation process. Further study on information processing for virtual products may build from the current study by changing experiment settings (e.g., provides alternative choice without a name suffix) or exploring other periperal cues (e.g., consumer ratings and reviews).

Lastly, the moderating roles of various consumer characteristics, such as status consumption tendency, perceived ad intrusiveness, and reciprocal inclination, for the name suffix effect were investigated in the current study. However, no significant two-way interactions are revealed between app name suffix and each one of these three characteristics. Specifically,

consumers do not give more credit to an app with the name suffix "premium," "ad free," or "donate" than an alternative app without a name suffix, regardless of their variations in general tendencies of seeking social status, preventing advertisements, or reciprocating good deeds. This study provides a seminal insight as to the role of these consumer characteristics variables. Given the no significant main effect of app name suffixes and probable reason for it stemming from the study design (i.e., presenting only a single app at a time), further investigation is needed to delve into the potential moderating roles of these consumer characteristic variables in consumers' app value perceptions when apps with varying name suffixes are presented together. The current study results also call for an exploration to find other relevant consumer characteristics that may play a role in the app evaluation process.

Managerial Implications

This study is among the first to explore the effect of name suffixes in the context of mobile apps. Early discussions of name suffix effects mainly focused on documenting the phenomenon of using various name suffixes and common naming practices adopted by retailers (Costa & Pavia, 1992; R. D. Petty, 2008b). The explosive development of the Internet allows wide applications of name suffixes, especially in mobile app markets. Four types of name suffixes, including a numeric name suffix "3" and descriptive name suffixes "premium," ad free," and "donate" were tested in comparison with the no name suffix condition. The results provide empirical evidence for the undetectable differential effect of name suffixes on consumers' perceived app value. Although further investigation of the app name suffix effect is needed in the context where comparative versions of an app are presented with varying name suffixes, findings of the current study indicate that consumers may not pay significant attention to the app name suffix when other usable information (e.g., app description, price, and brand name) is available

to infer the app value. App developers may not find growth in app downloading just because of the addition of a name suffix. Thus, it would be meaningless to add an arbitrary name suffix unless the name suffix helps to differentiate an app version from a series of other versions under the same parent brand name.

On the other hand, developers are strongly encouraged to provide a relevant, sufficient, and objective app description to attract potential users. In the app stimuli for the high information quality condition, app descriptions introduced the app features by using examples relevant to use situations, covering sufficient amount of details, and referring to non-subjective evidence. In doing so, the high-quality app descriptions engendered more positive app value perceptions among consumers than did the low-quality app descriptions, despite that functional features did not differ between the two quality conditions. This result implies the critical importance of crafting app descriptions with high information quality as a relatively inexpensive method to attract consumers to download an app, as compared to investing in the introduction of new features or rebuilding app layouts. Specifically, app developers are recommended to summarize key offerings in brief but explain further to make the feature descriptions informative, introduce core app features with supportive examples and user direction to increase the relevancy of the app to consumers, and use objective facts and numbers and provide references to enhance the objectivity of an app description.

By linking the perceived value of a paid app to the download and word-of-mouth intentions, this study also provides implications on the importance of transferring consumers' app evaluation into marketing. A consumer's product review (i.e., e-word-of-mouth) on an app may indicate various aspects of product value, including the utility and emotional gains from consuming the app. It may benefit app marketers if the value of a particular feature could be

estimated by how many more downloads have been generated and/or how many comments have been added since the introduction of the feature. For example, the value of premium features provided only in the advanced app version may be estimated by comparing the downloading activities between the basic and advanced app versions. In addition, app marketers could analyze all reviews on a specific feature, extract the utilitarian and hedonic demands associated with the feature, and put resources on satisfying the most relevant needs. For example, consumer reviews on the autocorrect feature of a keyboard app may indicate a need of the typing efficiency and satisfaction from using an artificial intelligence. Further development emphasis may be put on increasing typing efficiency and incorporating artificial intelligence into more features.

Limitations and Recommendations

Although three pretests were conducted prior to the main experiment with every step executed with extreme care, oversights existed, and methodological and conceptual limitations were present. Thus, results from the study should be interpreted with caution in light of these limitations. Limitations in the areas of the experimental design, measurements, and sampling are discussed along with recommendations for future research to address them.

Experimental Design

This study employs an experiment to examine the effects of app name suffixes, app information quality, and selected consumer characteristics on consumers' perceived value of a paid app. As a result of manipulating app evaluation scenarios with selected app name suffixes and verbal app descriptions while controlling for other contextual cues such as app name, app provider name, price, visual aspects of the app description, customer ratings and reviews, number of installations, and so on, the external validity of the study might have been compromised.

First, despite the attempt to select most representable name suffixes for testing the proposed model, this study chose only four name suffixes frequently used by paid apps in the main experiment. Certain name suffixes, such as "pro" and "plus," may play a noticeable role in enhancing the perceived app value. Other name suffixes, such as "free" and "trial," may reduce the app value perceptions remarkably for suggesting limited features. These name suffixes triggering negative associations were not examined in this study. Therefore, it would be a valuable contribution to the branding literature to investigate whether consumers perceive name suffixes negatively and rate the app value lower than alternative apps with the exact same features.

Second, since only four app categories were used in the main experiment, the conclusion about the effects of name suffixes and information quality on consumers' value perceptions may not be generalized across all app categories. Similarly, only one app example was used for each chosen app category, which again limits the generalizability of the findings even within the app categories used in this study. Future research is warranted to diversify the app categories used in app branding research. Further, app category was used as a between-subject variable in the main experiment. The main effect of app category was found in multiple MANOVA tests in examining all hypotheses except Hypotheses 6 and 7. Although the significant effect of app category was not expected and thus received no further examination in the current study, it is possible that consumers' evaluation of an app is influenced by the utilitarian/hedonic segmentation of the app category. For example, the text description of a game app may not receive as much attention as the description of a word processor app, necessitating visual demonstrations. Another example is that for apps providing immersive interactivities such as live

video streaming, the experience of ad interruptions may be less welcomed than apps that do not demand such immersive attention.

Third, although Pretest 2 tried to select a proper app name for each app categories in the main experiment, the potential effect of using varying brand names across the app categories has not been controlled. As a result, the app category variable actually reflected differences of experiment settings in both app category and brand name aspects. For example, part of the main effect of app category in testing H1 through H5 may have been contributed by the use of different brand names for each category. Future research may use a consistent brand name which works for all app categories to eliminate the confounding effect of using different brand names.

Fourth, app provider information was completely omitted from the main study stimuli. In the real-world app market, on an individual app page, other apps offered by the same developer are listed below the text description section. As a result, consumers may easily detect the reputation of an app developer by peeking into other offerings from the same developer. Under such circumstances, the maker of a mobile app may be an important indicator of app value. For example, a formal, conservative name for an app provider may convey a professional notion to a business app and outperforms a brand name using arbitrary combinations of letters. Another example is that when a known app developer expands its offerings using a new brand name, consumers may transfer their existing positive impression of this developer to the new app. Thus, further research is needed to explore the role of app developers in the app evaluation process.

Fifth, the visual appeal of a product has been proved to critically influence consumers' first impression of a product and judgement of is usability and enjoyment (Hagtvedt & Patrick, 2008; Oh & Jasper, 2006). The app stimuli used in the current study did not include visual information about the app (e.g., shots of various app screens) along with the text descriptions.

Additional research incorporating app icon and screenshots is recommended to understand the role of aesthetic app design in the app evaluation process. Examining which aspect of app information (narrative or visual) has a greater influence on consumers' app value perception will be an interesting future research topic. Potential moderating role of consumer characteristics could also be proposed. For example, some consumers may allocate their cognitive resources into texts while others may use visual appearance as the primary basis to form value perceptions.

User generated information, such as online consumer reviews and user ratings, has been established as important resources for consumers to rely on when making purchase decisions (Chen & Xie, 2008; de Matos & Rossi, 2008; Qiu, Pang, & Lim, 2012). The number of installations of an app is an intuitive message for consumers to know the app popularity. It would be interesting to see further researchers discuss the effect of user generated information on app evaluation. Adding user rating and installation numbers in the experiment may also help reveal the synergic effect of developer provided information and user generated information.

Next, although this study attempts to create a close approximation of the real-world app price offerings by pretesting the maximum acceptable prices in Pretest 2, the chosen price points may not reflect consumers' expectations of a particular app. Since the value of a product could also be interpreted as a tradeoff between the utility gaining from consuming the product and the monetary sacrifice of buying (S.-P. Tsai, 2005), the mechanism of determining the value of an app may be influenced by consumers' price perception. As suggested by earlier research, consumers have a region of reference price within which changes in price do not produce apparent price perception (Monroe, 1990). Thus, a price point within the comfort zone may be less likely to trigger elaborated information processing than an unexpected price. Consumers may allocate more cognitive resources to evaluate a relatively high-priced app (e.g., $9.99 for

Photoshop Touch in comparison with $1.99 for an alarm app used in the main experiment). In contrast, a name suffix may be viewed as a strong value indicator when the price is not within the comfortable range of consumers' expectation. For example, when an app is priced much higher than the upper threshold of a buyer, a name suffix "premium" may strengthen the price-quality association and confirm the high value of the app. As a result, the name suffix "premium" may be more readily to be entered into the evaluation process than a complete feature description. More research is needed on the potential role of app pricing that may moderate the consumer's processing of app descriptions and app name suffixes.

Lastly, the app information quality factor was manipulated by adjusting the way a group of attributes were communicated in terms of the objectivity, relevancy, and informativeness. To do so, the high-quality app information had to include more detailed descriptions (to enhance informativeness) with more examples (to enhance relevancy) and notes on the information source (to enhance objectivity), which inevitably lengthened the app description. It is not uncommon that research on argument strengths adopts the same approach as that used in this study to manipulate argument strengths or information quality in spite of its consequence on the argument length (Andrews & Shimp, 1990). However, argument lengths have been viewed as a type of information *quantity* by some researchers (Keller & Staelin, 1987; Petty & Cacioppo, 1984), and information quantity has been found to influence consumers' decisions. For example, the amount of information first increases decision effectiveness but too much information would cause overload and adversely impact consumers' decision (Keller & Staelin, 1987). Since information quantity could also serve as a peripheral cue in information processing (R. E. Petty & Cacioppo, 1984), further efforts could be made to operationalize information quality only while maintaining the quantity equal.

Measurements

Measurements used in this study also had their limitations. First, some measures used in the main experiment were adapted from earlier studies on traditional products and services. Considering the distinct characteristics in the distribution and consumption of virtual products, these measures may need to be re-evaluated. For example, although the term savviness has been widely used by researchers to imply consumers' innovative attitude and skillful use of technology, app savviness is defined and measured for the first time in this study. The proposed conceptualization and measure of app savviness in this study requires more rigorous tests using various types of apps. More comparison should be made between other savviness concepts and app savviness to form a holistic understanding of savvy users in mobile app markets.

The information quality measure originally covered the informativeness, objectivity, relevancy, and the holistic evaluation of product information (Y. W. Lee et al., 2002). However, in this study, the measure was used as a single factor scale due to the lack of support for its multidimensionality through the Pretest 3 and Main Experiment data analysis.

Similarly, Sweeney and Soutar's (2001) four dimensional measure of perceived product value was implemented as a two-dimensional scale to capture the utilitarian and hedonic aspects of app value. The social and monetary value dimensions from the original scale were not used in this study. Other scales that capture more diverse dimensions of app values may need to be used in future app value research.

Lastly, the failure to include the app name suffix manipulation check question in the first round of the main experiment data collection is a critical limitation in this study procedure that compromised the internal validity of the name suffix manipulation.

Sampling

This study used a combination of student samples and a national adult sample for different phases of the research. Limitations related to the sampling procedures cannot be ignored. First, convenience samples of students were used for the three pretests to calibrate the experimental stimuli. The use of convenience samples is justified because the goal of experimental research is to test theoretical relationships between constructs, not to describe and generalize population characteristics. In addition, college students are an appealing market for mobile apps since most college students fall into the age groups of the largest mobile device owners (Lella, 2015). However, given the use of a national sample in the main experiment, pretests would have allowed for more valid experimental manipulations if their samples possessed matching characteristics as those of the main experiment sample by including consumers from different regions of the U.S. and all target age groups.

Second, the sample used in the main experiment was drawn from a population determined as typical smartphone users. The narrow definition of the population in terms of age and smartphone experience may limit the external validity of findings from the experiment. For example, senior consumers may have less knowledge of various app editions and thus differ from younger consumers in the way they infer app values from app name suffixes or app descriptions. In addition, the non-significant moderating effect of app savviness might have been due to a small variance in this variable among the main experiment sample because of their general high familiarity with mobile devices and mobile apps. Results may be different for mobile device newbies and those who have little experience exploring apps from the app store. Future research may need to delve into this point by comparing findings from young consumers

in this study to those from less experienced mobile device users such as seniors or users in developing countries to see whether their app information processing differs.

Third, the Amazon Mechanical Turk was used as the venue to recruit participants for the main experiment. As suggested by earlier researchers (Mason & Suri, 2012; Paolacci, Chandler, & Ipeirotis, 2010), potential threats to the generalizability of recruiting subjects from Mechanical Turk may come from two facets. First, Mechanical Turk workers may not be representative of the general population in terms of gender, age, education, income, and the Internet literacy. Second, although multiple attention check questions were imbedded in the questionnaire to identify unattentive subjects, there is no guarantee that participants followed instructions closely. Thus, further research may employ a variety of recruiting strategies to cross-validate findings from the current study.

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Appendix A

IRB Approval for Protocol # 14-460 EP 1411

AUBURN UNIVERSITY INSTITUTIONAL REVIEW BOARD for RESEARCH INVOLVING HUMAN SUBJECTS

RESEARCH PROTOCOL REVIEW FORM

FULL BOARD or EXPEDITED

For Information or help contact **THE OFFICE OF RESEARCH COMPLIANCE (ORC)**, 115 Ramsay Hall, Auburn University
Phone: 334-844-5966 **e-mail:** IRBAdmin@auburn.edu **Web Address:** http://www.auburn.edu/research/vpr/ohs/index.htm

Revised 2.1.2014 **Submit completed form to IRBsubmit@auburn.edu or 115 Ramsay Hall, Auburn University 36849.**

Form must be populated using Adobe Acrobat / Pro 9 or greater standalone program (do not fill out in browser). Hand written forms will not be accepted.

1. PROPOSED START DATE of STUDY: October 1, 2014

PROPOSED REVIEW CATEGORY (Check one): ☐ FULL BOARD ☑ EXPEDITED

SUBMISSION STATUS (Check one): ☑ NEW ☐ REVISIONS (to address IRB Review Comments)

2. PROJECT TITLE: Consumers' Experiences and Evaluations of Mobile Applications

3.	PRINCIPAL INVESTIGATOR	TITLE	DEPT	AU E-MAIL
	Yishuang Li	Ph. D Student	CADS	yzl0050@auburn.edu
	MAILING ADDRESS		**PHONE**	**ALTERNATE E-MAIL**
	386A Spidle Hall, Auburn University		626-277-2707	ysl.shannon@gmail.c

4. FUNDING SUPPORT: ☑ N/A ☐ Internal ☐ External Agency: _____ ☐ Pending ☐ Received

For federal funding, list agency and grant number (if available). _____

5a. List any contractors, sub-contractors, other entities associated with this project:

_____

b. List any other IRBs associated with this project (including Reviewed, Deferred, Determination, etc.):

_____

The Auburn University Institutional Review Board has approved this document for use from 11/17/14 to 11/16/15 Protocol # 14-460 EP 1411

PROTOCOL PACKET CHECKLIST

All protocols must include the following items:

☑ **Research Protocol Review Form** (All signatures included and all sections completed)
(Examples of appended documents are found on the OHSR website: http://www.auburn.edu/research/vpr/ohs/sample.htm)

☑ **CITI Training Certificates** for all Key Personnel.

☑ **Consent Form or Information Letter** and any Releases (audio, video or photo) that the participant will sign.

☑ **Appendix A**, "Reference List"

☑ **Appendix B** if e-mails, flyers, advertisements, generalized announcements or scripts, etc., are used to recruit participants.

☑ **Appendix C** if data collection sheets, surveys, tests, other recording instruments, interview scripts, etc. will be used for data collection. Be sure to attach them in the order in which they are listed in # 13c.

☑ **Appendix D** if you will be using a debriefing form or include emergency plans/procedures and medical referral lists (A referral list may be attached to the consent document).

☐ **Appendix E** if research is being conducted at sites other than Auburn University or in cooperation with other entities. A **permission letter** from the site / program director must be included indicating their cooperation or involvement in the project. NOTE: If the proposed research is a multi-site project, involving investigators or participants at other academic institutions, hospitals or private research organizations, a letter of **IRB approval** from each entity is required prior to initiating the project.

☐ **Appendix F** - Written evidence of acceptance by the host country if research is conducted outside the United States.

FOR ORC OFFICE USE ONLY

DATE RECEIVED IN ORC: 9/24/14 **by** BK **PROTOCOL #** 14-460 EP 1411
DATE OF IRB REVIEW: _____ **by** _____ **APPROVAL CATEGORY:** 45CFR 46.110(7)
DATE OF IRB APPROVAL: 11/17/14 **by** BO **INTERVAL FOR CONTINUING REVIEW:** 1 year
COMMENTS:

6. GENERAL RESEARCH PROJECT CHARACTERISTICS

6A. Research Methodology

Please check all descriptors that best apply to the research methodology.

Data Source(s): ☑ New Data ☐ Existing Data

Will recorded data directly or indirectly identify participants?
☑ Yes ☐ No

Data collection will involve the use of:

- Educational Tests (cognitive diagnostic, aptitude, etc.)
- Interview
- Observation
- Location or Tracking Measures
- Physical / Physiological Measures or Specimens (see Section 6E.)
- ✓ Surveys / Questionnaires
- ✓ Internet / Electronic
- Audio
- Video
- Photos
- ✓ Digital images
- Private records or files

Other: _____

6B. Participant Information

Please check all descriptors that apply to the target population.
☑ Males ☑ Females ☑ AU students

Vulnerable Populations
☐ Pregnant Women/Fetuses ☐ Prisoners ☐ Institutionalized
☐ Children and/or Adolescents (under age 19 in AL)

Persons with:
☐ Economic Disadvantages ☐ Physical Disabilities
☐ Educational Disadvantages ☐ Intellectual Disabilities

Do you plan to compensate your participants? ☑ Yes ☐ No

6C. Risks to Participants

Please identify all risks that participants might encounter in this research.

☑ Breach of Confidentiality* ☐ Coercion
☑ Deception ☐ Physical
☐ Psychological ☐ Social
☐ None
☐ Other:

*Note that if the investigator is using or accessing confidential or identifiable data, breach of confidentiality is always a risk.

6D. Corresponding Approval/Oversight

- **Do you need IBC Approval for this study?**
  ☐ Yes ☑ No

  If yes, BUA #_____ Expiration date _____

- **Do you need IACUC Approval for this study?**
  ☐ Yes ☑ No

  If yes, PRN #_____ Expiration date _____

- **Does this study involve the Auburn University MRI Center?**
  ☐ Yes ☑ No

  Which MRI(s) will be used for this project? (Check all that apply)
  ☐ 3T ☐ 7T

  Does any portion of this project require review by the MRI Safety Advisory Council?
  ☐ Yes ☐ No

  Signature of MRI Center Representative: _____
  Required for all projects involving the AU MRI Center

  Appropriate MRI Center Representatives:
  Dr. Thomas S. Denney, Director AU MRI Center
  Dr. Ron Beyers, MR Safety Officer

7. PROJECT ASSURANCES Consumers' Experiences and Evaluations of Mobile Applications

A. PRINCIPAL INVESTIGATOR'S ASSSURANCES

1. I certify that all information provided in this application is complete and correct.
2. I understand that, as Principal Investigator, I have ultimate responsibility for the conduct of this study, the ethical performance this project, the protection of the rights and welfare of human subjects, and strict adherence to any stipulations imposed by the Auburn University IRB.
3. I certify that all individuals involved with the conduct of this project are qualified to carry out their specified roles and responsibilities and are in compliance with Auburn University policies regarding the collection and analysis of the research data.
4. I agree to comply with all Auburn policies and procedures, as well as with all applicable federal, state, and local laws regarding the protection of human subjects, including, but not limited to the following:
    a. Conducting the project by qualified personnel according to the approved protocol
    b. Implementing no changes in the approved protocol or consent form without prior approval from the Office of Research Compliance
    c. Obtaining the legally effective informed consent from each participant or their legally responsible representative prior to their participation in this project using only the currently approved, stamped consent form
    d. Promptly reporting significant adverse events and/or effects to the Office of Research Compliance in writing within 5 working days of the occurrence.
5. If I will be unavailable to direct this research personally, I will arrange for a co-investigator to assume direct responsibility in my absence. This person has been named as co-investigator in this application, or I will advise ORC, by letter, in advance of such arrangements.
6. I agree to conduct this study only during the period approved by the Auburn University IRB.
7. I will prepare and submit a renewal request and supply all supporting documents to the Office of Research Compliance before the approval period has expired if it is necessary to continue the research project beyond the time period approved by the Auburn University IRB.
8. I will prepare and submit a final report upon completion of this research project.

My signature indicates that I have read, understand and agree to conduct this research project in accordance with the assurances listed above.

Yishuang Li	Yishuang Li	09/22/2015
Printed name of Principal Investigator	**Principal Investigator's Signature**	**Date**

B. FACULTY ADVISOR/SPONSOR'S ASSURANCES

1. I have read the protocol submitted for this project for content, clarity, and methodology.
2. By my signature as faculty advisor/sponsor on this research application, I certify that the student or guest investigator is knowledgeable about the regulations and policies governing research with human subjects and has sufficient training and experience to conduct this particular study in accord with the approved protocol.
3. I agree to meet with the investigator on a regular basis to monitor study progress. Should problems arise during the course of the study, I agree to be available, personally, to supervise the investigator in solving them.
4. I assure that the investigator will promptly report significant incidents and/or adverse events and/or effects to the ORC in writing within 5 working days of the occurrence.
5. If I will be unavailable, I will arrange for an alternate faculty sponsor to assume responsibility during my absence, and I will advise the ORC by letter of such arrangements. If the investigator is unable to fulfill requirements for submission of renewals, modifications or the final report, I will assume that responsibility.

Dr. Wi-Suk Kwon; Dr. Sang-Eun Byun		9/23/14
Printed name of Faculty Advisor / Sponsor	**Faculty Advisor's Signature**	**Date**

C. DEPARTMENT HEAD'S ASSSURANCE

By my signature as department head, I certify that I will cooperate with the administration in the application and enforcement of all Auburn University policies and procedures, as well as all applicable federal, state, and local laws regarding the protection and ethical treatment of human participants by researchers in my department.

Dr. Carol Warfield	Carol L. Warfield	9/24/14
Printed name of Department Head	**Department Head's Signature**	**Date**

8. **PROJECT OVERVIEW: Prepare an abstract that includes:**
(350 word maximum, in language understandable to someone who is not familiar with your area of study**):**

a) **A summary of relevant research findings leading to this research proposal:**
(Cite sources; include a "Reference List" as ***Appendix A.)***
b) **A brief description of the methodology, including design, population, and variables of interest**

Brand name and product description have been identified as key elements to suggest product benefits, communicate symbolic meanings, and influence consumers' decision-making process (del Rio, Vazquez, & Iglesias, 2001). A brand name suffix, a descriptive word added to a parent brand to differentiate an extension product (Petty, 2010), is widely adopted in the mobile application market. Researchers have recognized variations in consumers' desire to pursue products that are most updated, ad-free, and reflective of social status and good deeds (Auh & Shih, 2009; Gipp, Kalafatis, & Ledden, 2008; O'Cass & McEwen, 2004; Wagner, Benlian, & Hess, 2013), leading to different market behavior among the consumers. Thus, four brand name suffixes and four personal characteristics associated with these consumers' needs are expected to affect the perceived value of mobile applications and download and word-of-mouth intentions. In addition, drawing from the literature (Kahn, Strong, & Wang, 2002), app information quality is identified as another key factor influencing consumers' app evaluations.

In order to examine the effects of ad suffixes and information quality and the roles of personal characteristics for these effects, this study will use an online experiment. The target population will be young consumers (ages between 19 and 34) who live in the U.S. and have used mobile apps.

To calibrate the experimental stimuli used in the main experiment, two pretests will be first conducted using a convenience sample of Auburn University students. The purpose of Pretest 1 and Pretest 2 are to (1) identify app brand names to be used in the experiment and select representative app categories and (2) to validate two app descriptions to manipulate app information quality, respectively. Both pretests will use online surveys. Then, the main experiment will be conducted with a national sample of U.S. young consumers (ages between 19 and 34) who have some experience with mobile apps. The main experiment will use a 2 (App Information Quality: high vs. low) × 5 (App Name Suffix: no name suffix vs. numeric name suffix vs. name suffix "premium" vs. name suffix "ad free" vs. name suffix "donate") between-subjects design. Dependent variables (perceived app value, download and word-of-mouth intention) will be measured through an online questionnaire following the experimental stimuli, along with demographic characteristics and other personal characteristics including need for cognition, app savviness, need for status, ad intrusiveness, and reciprocal inclination.

9. **PURPOSE.**
a. **Clearly state the purpose of this project and all research questions, or aims.**

The purpose of this study is to examine the following effects:
(1) the effect of app name suffixes (i.e., numeric, premium, ad-free, donate) on consumers' perceived app value
(2) the effect of app information quality on consumers' perceived app value
(3) the moderating effects of need for cognition, need for status, ad intrusiveness, app savviness, and reciprocal inclination for the effects of name suffixes and app information quality on perceived app value
(4) the effect of perceived app value on download and word-of-mouth intentions

b. **How will the results of this project be used? (e.g., Presentation? Publication? Thesis? Dissertation?)**

Data collected from this study will be used for (1) the principal investigator's dissertation, (2) presentations (oral/poster) at professional meetings, and (3) publications in academic journals

10. **KEY PERSONNEL.** Describe responsibilities. Include information on research training or certifications related to this project. **CITI is required. Be as specific as possible.** (Include additional personnel in an attachment.) *All key personnel must attach CITI certificates of completion.*

Principle Investigator Yishuang Li **Title:** Ph. D Student **E-mail address** yzl0050@auburn.edu

Dept / Affiliation: CADS

Roles / Responsibilities:

The principal investigator is responsible for participant recruiting, data collection and analysis, preparation of manuscripts, presentations, and reports

Individual: Wi-Suk Kwon **Title:** Associate Profe **E-mail address** kwonwis@auburn.edu

Dept / Affiliation: Department of Consumer and Design Sciences, Auburn University

Roles / Responsibilities:

Advising principal investigator throughout the entire research process, including experiment design, questionnaire development, data collection, data analysis, and result reporting.

Individual: Sang-Eun Byun **Title:** Associate Profe **E-mail address** seb0002@auburn.edu

Dept / Affiliation: Department of Consumer and Design Sciences, Auburn University

Roles / Responsibilities:

Advising principal investigator throughout the entire research process, including experiment design, questionnaire development, data collection, data analysis, and result reporting.

Individual: _____ **Title:** _____ **E-mail address** _____

Dept / Affiliation: _____

Roles / Responsibilities:

Individual: _____ **Title:** _____ **E-mail address** _____

Dept / Affiliation: _____

Roles / Responsibilities:

Individual: _____ **Title:** _____ **E-mail address** _____

Dept / Affiliation: _____

Roles / Responsibilities:

11. **LOCATION OF RESEARCH. List all locations where data collection will take place.** (School systems, organizations, businesses, buildings and room numbers, servers for web surveys, etc.) **Be as specific as possible. Attach permission letters in** Appendix E.
(See sample letters at http://www.auburn.edu/research/vpr/ohs/sample.htm)

All data will be collected via the Internet. Questionnaires for the pretests and the main experiment will be created on Qualtrics (an online survey provider) and accessed by participants from a device and location of their convenience (e.g., home PC, work PC, smart phone, tablet)

12. PARTICIPANTS.

a. **Describe the participant population you have chosen for this project including inclusion or exclusion criteria for participant selection.**

☐ **Check here if using existing data, describe the population from whom data was collected, & include the # of data files.**

The target population of this study consists of young mobile app users who live in the U.S.

Pretest 1 and Pretest 2 will use Auburn University students who are 19 years old or older as the participant population. College students are mostly young and tech savvy consumers who have experiences in searching and downloading mobile apps. Therefore, they are likely to share common characteristics with the target population of this study and thus be suitable to validate stimuli for the main experiment.

The participant population of the main experiment will be male and female consumers who (1) are members of Amazon Mechanical Turk (MTurk), (2) have experiences with smart devices, and (3) are between 19-34 years old. According to a recent report on mobile adoption (Smith, 2013), this age group constitutes one of the major smartphone owner groups. Since mobile applications are running on smart devices, this age criterion is considered appropriate for this experiment. MTurk is used for the sampling because it provides a reliable and inexpensively data source. Further, because this study is about mobile apps, participants must have experiences with mobile apps used on smart devices.

b. **Describe, step-by-step, in layman's terms, all procedures you will use to recruit participants.** *Include in Appendix B a copy of all e-mails, flyers, advertisements, recruiting scripts, invitations, etc., that will be used to invite people to participate. (See sample documents at http://www.auburn.edu/research/vpr/ohs/sample.htm.)*

• Pretests 1 and 2: An invitation email (see Appendices B.1 and B.3) will be sent to students in selected Auburn University courses with the permission of class instructors. A reminder email (see Appendices B.2 and B.4) will be sent 1 week after the invitation email. Potential participants will click on the URL given in the invitation email and be lead to the information letter page. After reading the information letter, students wanting to participate will click on the "next" button at the bottom of the letter and be directed to the online questionnaire. The investigators will not recruit participants in classes they are currently teaching or assisting.
• Main experiment: Participants will be recruited via the Amazon Mechanical Turk (MTurk), an online marketplace that allows people to complete "human intelligent tasks" (HITs). This study will appear as a HIT on MTurk. MTurk members will be able to view a brief introduction of the study (see Appendix B.5) and click on the URL given in the introduction to answer screening questions (age, U.S. residency, and smart device use experience). Based on their responses, only those who meet the screening criteria will be re-directed to the information letter page. MTurk members wanting to participate will click on the "NEXT" button at the bottom of the information letter and

c. **What is the minimum number of participants you need to validate the study?** 740

How many participants do you expect to recruit? 740

Is there a limit on the number of participants you will include in the study? ☑ **No** ☐ **Yes – the # is** _____

d. **Describe the type, amount and method of compensation and/or incentives for participants.**

(If no compensation will be given, check here: ☐)

Select the type of compensation: ☑ Monetary ☑ Incentives
- ☐ Raffle or Drawing incentive (Include the chances of winning.)
- ☑ Extra Credit (State the value)
- ☐ Other

Description:

Pretests 1 and 2: students will be compensated with extra credits agreed by the course instructors.
Main experiment: participants will be provided monetary compensation in the amount of $1.00 for their participation through Amazon MTurk.

13. **PROJECT DESIGN & METHODS.**

a. **Describe, step-by-step, all procedures and methods that will be used to consent participants. If a waiver is being requested, check each waiver you are requesting, describe how the project meets the criteria for the waiver.**

☐ **Waiver of Consent (including using existing data)**

☑ **Waiver of Documentation of Consent (use of Information Letter)**

☐ **Waiver of Parental Permission (for college students)**

We request to waive documentation of consent because we will use information letters.
• Pretests 1 and 2: Students recruited from participating classes will click on the URL included in the invitation email and be directed to the information letter page. After reading the letter, students will click on the "NEXT" button at the bottom of the letter, which will lead them to the online questionnaire.
• Main experiment: The study introduction will be posted on MTurk. MTurk workers who read the study introduction and are interested in participating in the study will click on the URL given in the study introduction to answer screening questions. Based on their responses, only those who meet the screening criteria will be re-directed to the information letter page. After reading the information letter, those who decide to participate in the study will click on the "NEXT" button at the bottom of the letter, which will lead them to the online experiment website.

b. **Describe the research design and methods you will use to address your purpose. Include a clear description of when, where and how you will collect all data for this project.** Include specific information about the participants' time and effort commitment. (*NOTE: Use language that would be understandable to someone who is not familiar with your area of study. Without a complete description of all procedures, the Auburn University IRB will not be able to review this protocol. If additional space is needed for this section, save the information as a .PDF file and insert after page 7 of this form.*)

Participants will be recruited and consent to participate in this study using the procedures described in item 12b and 13a.

Pretest 1: On the online questionnaire, participants will rate the hedonic and utilitarian value of app examples. Then, they will enter recent app downloading and using activities regarding each of the app examples. Participants will then indicate the money they would spend on one app for each of the app examples if given a $20 gift card. Finally, participants will answer demographic items.

Pretest 2: On the online questionnaire, participants will evaluate the information quality of given app descriptions. Then, participants write down anything that comes to their mind as looking at each of the given example app names. Then, they will rate how well each of the app names fits each of given app categories. Finally, participants will answer demographic items.

Main experiment: On the experiment website, participants will first see four apps that are introduced as apps that will soon be marketed in mobile app stores, and be asked to answer questions about each app, given its description and name. These questions will address perceived app value, download intention, and word-of-mouth intention. Then, participants will answer demographic and personal characteristics questions.

At the end of the questionnaire, participants will be presented with a thank-you page.

On the thank-you page:
• Student participants in the two pretests will be asked to provide their names and course numbers for the purpose of providing extra credits.
• In the main experiment, participants will be debriefed that the apps they have evaluated in the study were created for the study and will not actually be released to real app markets. They will be asked to enter a randomly generated confirmation code to their MTurk task page to receive the monetary compensation of $1.00.

Pretest 1 and pretest 2 survey questionnaires will take approximately 15 minutes for participants to complete. The main experiment participation is expected to take approximately 30 minutes.

13. **PROJECT DESIGN & METHODS.** *Continued*

c. **List all data collection instruments used in this project, in the order they appear in Appendix C.**
(e.g., surveys and questionnaires **in the format that will be presented to participants**, educational tests, data collection sheets, interview questions, audio/video taping methods etc.)

The questionnaires used in the two pretests and the main experiment are included in Appendices C.1 (Pretest 1), C.2 (Pretest 2), and C.3 (main experiment).

d. **Data analysis: Explain how the data will be analyzed.**

The quantitative data from the study will be entered into SPSS, for further assessment, while the qualitative data will be content analyzed. Various multivariate statistics including factor analysis, MANOVA, regression analysis, Cronbach's alpha, etc., will be used to assess the validity and reliability of the quantitative measurements and test the effects expected to be found in this study.Descriptive statistics will be used to profile the samples.

14. **RISKS & DISCOMFORTS: List and describe all of the risks that participants might encounter in this research.** ***If you are using deception in this study, please justify the use of deception and be sure to attach a copy of the debriefing form you plan to use in Appendix D.*** *(Examples of possible risks are in section #6D on page 2)*

1. Participants in the two pretests will be asked to indicate their name and course number in order to receive extra credits agreed by the class instructor. Therefore, although this identifying information will not be linked to the survey data, it can pose a potential for a breach of confidentiality.

2. Participants in the main experiment will be asked to evaluate four mobile apps based on their names and descriptions. In order to simulate a real app downloading scenario, participants will be informed that they will evaluate mobile apps that will soon be released in the app market. This scenario includes deception because all apps used in the study will be fictitious apps created by the investigators for the purpose of this study only.

3. Participants in the main experiment may not be compensated and their MTurk HIT may be rejected by the investigators if their responses did not meet the quality control guideline. Four attention-check questions (included in Appendix C.3) will be embedded in the questionnaire and displayed with other main experiment questions in a random order. Only participants who give correct answers to all attention-check questions will receive compensation.

15. **PRECAUTIONS.** Identify and describe all precautions you have taken to eliminate or reduce risks as listed in #14. If the participants can be classified as a "vulnerable" population, please describe additional safeguards that you will use to assure the ethical treatment of these individuals. ***Provide a copy of any emergency plans/procedures and medical referral lists in Appendix D. (Samples can be found online at http://www.auburn.edu/research/vpr/ohs/sample.htm#precautions)***

• To prevent the risk of breach of confidentiality of the two pretests' data, the respondents' pretest survey data will be first recorded in the Qualtrics server, and then transferred to a personal drive, which will be protected with an ID and a password. The respondent name and course name data will be programmed so that they are saved in a separate file on Qualtrics from the survey data file so that respondents' identifying information will never be linked to their survey data in the first place. Once the participant names are reported to the respective course instructors for giving extra credit, the participant name and course name data will be permanently deleted from the investigators' drive.
• With the main experiment data, no risk of breach of confidentiality is expected because no identifying information is collected by the investigators. MTurk's policy prohibits activities that "collecting personal identifiable information". Thus, the researcher will not access MTurk worker's personal information.
• To address the deception related risk in the main experiment, the investigators will debrief participants at the end of the study on the fact that the apps that have evaluated are not real apps but were created by the investigators for the purpose of the study only.
• The information letter will inform potential participants of the risk of the responses being rejected and time commitment not compensated Requirements and grounds for rejection will be outlined as a quality-control procedure in the information letter.

If using the Internet or other electronic means to collect data, what confidentiality or security precautions are in place to protect (or not collect) identifiable data? Include protections used during both the collection and transfer of data.

The online surveys for the two pretests and the main experiment will be hosted by Qualtrics (qualtrics.com). Qualtrics has SAS 70 Certification and meets the rigorous privacy standards imposed on health care records by the Health Insurance Portability and Accountability Act. The respondents' survey/experiment data will be first recorded in the Qualtrics server, and then transferred to a personal drive, which will be protected with an ID and a password. The respondent name and course number collected during the two pretests will be programmed so that they are saved in a separate file from their survey data. Thus, respondents' identifiable information will never be linked to the survey data in the first place. Once the participant names are reported to the respective course instructors for giving extra credits, the identifiable data will be permanently deleted from the investigators' drive. Participants in the main experiment will provide their MTurk ID at the end of the survey (hosted on Qualtrics) and receive a confirmation code upon completion. They will be asked to copy the confirmation code back to the MTurk interface to submit the HIT. The researcher will assign the payment (i.e., incentives) to qualified MTurk IDs on the MTurk interface. The MTurk website does not provide researchers with any information that would allow them to connect the MTurk ID to the identity of the participant. Thus, researchers will not have access to any personal information about the participants.

16. **BENEFITS.**
    a. **List all realistic direct benefits participants can expect by participating in this specific study.**
    (Do not include "compensation" listed in #12d.) Check here if there are no direct benefits to participants. ☑

No direct benefits are expected by participating in this survey.

    b. **List all realistic benefits for the general population that may be generated from this study.**

The findings will enrich marketers' knowledge of how to market an app in mobile application markets and how to communicate product value through app name suffixes and product descriptions. Mobile app users may benefit from this study if marketers utilize this knowledge to target potential consumers and efficiently communicate product value.

17. PROTECTION OF DATA.

a. **Data are collected:**

☑ **Anonymously with no direct or indirect coding, link, or awareness of who participated in the study (Skip to e)**

☑ **Confidentially, but without a link of participant's data to any identifying information (collected as "confidential" but recorded and analyzed as "anonymous") (Skip to e)**

☐ **Confidentially with collection and protection of linkages to identifiable information**

b. **If data are collected with identifiers or as coded or linked to identifying information, describe the identifiers collected and how they are linked to the participant's data.**

c. **Justify your need to code participants' data or link the data with identifying information.**

d. **Describe how and where identifying data and/or code lists will be stored.** (Building, room number?) **Describe how the location where data is stored will be secured in your absence. For electronic data, describe security. If applicable, state specifically where any IRB-approved and participant-signed consent documents will be kept on campus for 3 years after the study ends.**

e. **Describe how and where the data will be stored** (e.g., hard copy, audio cassette, electronic data, etc.)**, and how the location where data is stored is separated from identifying data and will be secured in your absence. For electronic data, describe security**

The raw data collected via the Internet will be stored in the server of the survey provider (protected by user name and password) before the completion of data collection. Once the survey process is complete, all data will be moved to the investigators' personal drives. Further analysis on the raw data will be accessed from and saved in investigators' personal drives. All research data in the investigator's personal drivers will be stored under a password-protected folder that requires a password upon every visit.

f. **Who will have access to participants' data?**
(*The faculty advisor should have full access and be able to produce the data in the case of a federal or institutional audit.*)

The key personnel listed in this protocol.

g. **When is the latest date that identifying information or links will be retained and how will that information or links be destroyed?**
(Check here if only anonymous data will be retained ☑)

The participant name and course data in the two pretests will be destroyed as soon as they are submitted to the class instructor for assigning extra credit. No identifying information will be collected in the main experiment. The MTurk website will destroy the HIT data after 120 days of inactiveness.

Appendix B

Invitation Email (Pretest 1)
Consumers' Experiences and Evaluations of Mobile Applications (Part I)

Dear students,

I am a graduate student in the Department of Consumer and Design Sciences at Auburn University. I would like to invite you to participate in my research study to answer a short questionnaire. You may participate if you are at least 19 years old.

The study session will be open from December 1 to December 7. If you are willing to participate, you will be asked to complete an online survey about your experiences with mobile apps. Your estimated time commitment is 15 minutes.

If you would like to know more about this study, an information letter can be obtained by clicking on the following link: [URL LINK TO INFORMATION LETTER IS PROVIDED HERE]. If you decide to participate after reading the letter, you can access the survey by clicking on the link provided in the letter.

To thank you for your time, participants will be given extra credit for [CLASS NUMBER & NAME]. The number of extra credit points will be determined by your class instructor.

If you have any questions about this study, please contact the study's investigators, Yishuang Li (yzl0050@tigermail.auburn.edu), Dr. Wi-Suk Kwon (kwonwis@auburn.edu), or Dr. Sang-Eun Byun (seb002@auburn.edu).

Thank you in advance for your participation.

Yishuang Li, Ph.D. Candidate
386A Spidle Hall, Department of Consumer and Design Sciences

Dr. Wi-Suk Kwon, Associate Professor
308 Spidle Hall, Department of Consumer and Design Sciences

Dr. Sang-Eun Byun, Associate Professor
308idle Hall, Department of Consumer and Design Sciences

Appendix C

Information Letter (Pretest 1)

AUBURN UNIVERSITY
COLLEGE OF HUMAN SCIENCES
DEPARTMENT OF CONSUMER AND DESIGN SCIENCES

INFORMATION LETTER
for a Research Study entitled
"Consumers' Experiences and Evaluations of Mobile Applications (Part I)"

You are invited to participate in a research study on college students' experiences with various mobile applications. The study is being conducted by Yishuang Li, Ph.D. student, under the direction of Drs. Wi-Suk Kwon and Sang-Eun Byun in the Department of Consumer and Design Sciences, Auburn University. You are contacted as a potential participant because you are at least 19 years old and are currently enrolled as students in Auburn University.

What will be involved if you participate? Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete an online questionnaire about your opinions and experiences with mobile apps. Your total time investment in this study will be approximately 15 minutes.

Are there any risks or discomforts? There are no foreseen physical or psychological risks associated with participation in this study.

Are there any benefits to yourself or others? Your participation in this study will contribute to our understanding of how consumers download mobile apps enable researchers to develop experiment interface for further studies.

Will you receive compensation for participating? To thank you for your time, you will be offered extra credit for the class from which you are recruited. The amount of credit will be determined by your class instructor. To assign the extra credit, you will be asked to provide your name and course number on the last page of the online survey. Your name and course number will not be associated with your responses to the survey and will be used solely for assigning extra credit.

If you change your mind about participating, you can withdraw at any time by closing your browser window and your data will be cleared as long as it is identifiable. Once you've submitted anonymous data, it cannot be withdrawn since it will be unidentifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University or the Department of Consumer and Design Sciences.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy. The data you provided will never be linked to your name or course number. Information collected through your participation may be published in professional journals and/or presented at professional meetings with no inclusion of your identifiable information.

If you have questions about this study, please contact Yishuang Li by email, yzl0050@tigermail.auburn.edu, or by phone, (334) 332-9756. You can also contact Dr. Wi-Suk Kwon (faculty advisor), kwonwis@auburn.edu, or Dr. Sang-Eun Byun (faculty advisor), seb0002@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334) 844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, PLEASE CLICK ON THE **NEXT** BUTTON AT THE BOTTOM OF THIS PAGE.

YOU MAY PRINT A COPY OF THIS LETTER TO KEEP.

Yishuang Li	12/01/2014
Investigator	Date
Dr. Wi-Suk Kwon	12/01/2014
Investigator	Date
Dr. Sang-Eun Byun	12/01/2014
Investigator	Date

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Next

Appendix D

Questionnaire Used (Pretest 1)

DIRECTION: We would like to learn about your opinions on the utilitarian and hedonic value of various mobile apps.

Products can be consumed for a **utilitarian** and/or **hedonic** reason. For example,

- Products high in **Utilitarian Value** (e.g., detergents, toilet papers) are consumed primarily for its practical reasons, such as functions, attributes, and usefulness.
- Products high in **Hedonic Value** (e.g., perfume, ice-cream) primarily provide non-functional reasons, such as enjoyment, fun, pleasure, and self-satisfaction.

A product may offer both utilitarian and hedonic benefits to consumers and those can be high in both utilitarian and hedonic values. For example, a tablet may be used as a productivity tool to process complex data files as well as a recreational tool to watch streaming movies.

The following list presents names of mobile app categories.
Please indicate the level of **Utilitarian Value** (the extent an app is used for practical reasons) of each of the following app categories).

	Not Utilitarian At All	A Little Utilitarian	Somewhat Utilitarian	Utilitarian	Very Utilitarian
Price Compare	○	○	○	○	○
Photo Editor	○	○	○	○	○
Note Pad	○	○	○	○	○
Ringtone Maker	○	○	○	○	○
Video Creator	○	○	○	○	○
Dictionary	○	○	○	○	○
Shopping List	○	○	○	○	○

	Not Utilitarian At All	A Little Utilitarian	Somewhat Utilitarian	Utilitarian	Very Utilitarian
Travel Guides	○	○	○	○	○
Drug Information	○	○	○	○	○
FM Radio	○	○	○	○	○
Task Planner/Manager	○	○	○	○	○
Checkbook / Expense Manager	○	○	○	○	○
Emoji/Emoticons	○	○	○	○	○
Medical	○	○	○	○	○

	Not Utilitarian At All	A Little Utilitarian	Somewhat Utilitarian	Utilitarian	Very Utilitarian
Sports Tracker					
Alarm / Clock					
Food Nutrition					
Office Suite					
Business Card Reader					
Games					
PDF Scanner					

	Not Utilitarian At All	A Little Utilitarian	Somewhat Utilitarian	Utilitarian	Very Utilitarian
Flight Tracker					
Calorie Counter					
News Reader					
Camera					
Weather Radar					
Free WiFi Finder					

Please indicate the level of **Hedonic Value** (the extent an app is used for fun, pleasure, enjoyment, or self-satisfaction) of each of the following app categories.

	Not Hedonic At All	A Little Hedonic	Somewhat Hedonic	Hedonic	Very Hedonic
Video Creator					
FM Radio					
Checkbook / Expense Manager					
Drug Information					
Flight Tracker					
PDF Scanner					
Price Compare					

	Not Hedonic At All	A Little Hedonic	Somewhat Hedonic	Hedonic	Very Hedonic
Business Card Reader					
News Reader					
Medical					
Office Suite					
Note Pad					
Alarm / Clock					
Photo Editor					

	Not Hedonic At All	A Little Hedonic	Somewhat Hedonic	Hedonic	Very Hedonic
Free WiFi Finder	○	○	○	○	○
Games	○	○	○	○	○
Ringtone Maker	○	○	○	○	○
Task Planner/Manager	○	○	○	○	○
Dictionary	○	○	○	○	○
Calorie Counter	○	○	○	○	○
Travel Guides	○	○	○	○	○

	Not Hedonic At All	A Little Hedonic	Somewhat Hedonic	Hedonic	Very Hedonic
Sports Tracker	○	○	○	○	○
Food Nutrition	○	○	○	○	○
Weather Radar	○	○	○	○	○
Shopping List	○	○	○	○	○
Camera	○	○	○	○	○
Emoji/Emoticons	○	○	○	○	○
	Not Hedonic At All	A Little Hedonic	Somewhat Hedonic	Hedonic	Very Hedonic

Next

For each of the following app categories, please indicate how often you have **downloaded** and **used** an app from that category for the last 6 months.

	DOWNLOAD					USE				
	Never	Rarely	Occasionally	Frequently	Always	Never	Rarely	Occasionally	Frequently	Always
PDF Scanner	○	○	○	○	○	○	○	○	○	○
Dictionary	○	○	○	○	○	○	○	○	○	○
Photo Editor	○	○	○	○	○	○	○	○	○	○
Checkbook / Expense Manager	○	○	○	○	○	○	○	○	○	○
News Reader	○	○	○	○	○	○	○	○	○	○
Free WiFi Finder	○	○	○	○	○	○	○	○	○	○
Drug Information	○	○	○	○	○	○	○	○	○	○
Emoji/Emoticons	○	○	○	○	○	○	○	○	○	○
Ringtone Maker	○	○	○	○	○	○	○	○	○	○
Travel Guides	○	○	○	○	○	○	○	○	○	○
Sports Tracker	○	○	○	○	○	○	○	○	○	○
Shopping List	○	○	○	○	○	○	○	○	○	○
Alarm / Clock	○	○	○	○	○	○	○	○	○	○
Task Planner/Manager	○	○	○	○	○	○	○	○	○	○
FM Radio	○	○	○	○	○	○	○	○	○	○
Medical	○	○	○	○	○	○	○	○	○	○
Flight Tracker	○	○	○	○	○	○	○	○	○	○
Food Nutrition	○	○	○	○	○	○	○	○	○	○
Office Suite	○	○	○	○	○	○	○	○	○	○
Camera	○	○	○	○	○	○	○	○	○	○
Video Creator	○	○	○	○	○	○	○	○	○	○
Calorie Counter	○	○	○	○	○	○	○	○	○	○
Games	○	○	○	○	○	○	○	○	○	○
Weather Radar	○	○	○	○	○	○	○	○	○	○
Price Compare	○	○	○	○	○	○	○	○	○	○
Business Card Reader	○	○	○	○	○	○	○	○	○	○
Note Pad	○	○	○	○	○	○	○	○	○	○

Next

If you are given a $20 gift card that can be consumed in the mobile app store, what is the **maximum price you will be willing to pay for a single app** in each of the following categories? Please type a enter number (e.g., $2.99 or $19.99, assuming that you are given a $20 gift card for each box below) in the box next to each app category name.

Ringtone Maker	
Alarm / Clock	
Note Pad	
Drug Information	
Business Card Reader	
Photo Editor	
Emoji/Emoticons	
Games	
Medical	
Flight Tracker	
Free WiFi Finder	
Food Nutrition	
Video Creator	
Shopping List	
Travel Guides	
PDF Scanner	
Camera	
Office Suite	
Price Compare	
News Reader	
Task Planner/Manager	
FM Radio	
Dictionary	
Calorie Counter	
Checkbook / Expense Manager	
Weather Radar	
Sports Tracker	

Demographic and Other Information

DIRECTION: The following set of questions asks general information about you. Please select the appropriate answer or write in a better description.

What is your gender?

- ○ Male
- ○ Female

What is your age (in number of years)?

What is your current class standing?

- Freshman
- Sophomore
- Junior
- Senior
- Graduate
- Other (Please specify)

Under which of the following colleges/schools does your major fall? (If you have multiple majors, choose the most central one)?

- College of Agriculture
- College of Architecture, Design, and Construction
- Raymond J. Harbert College of Business
- College of Education
- Samuel Ginn College of Engineering
- School of Forestry and Wildlife Sciences
- College of Human Sciences
- College of Liberal Arts
- School of Nursing
- College of Sciences and Mathematics
- School of Veterinary Medicine
- Interdisciplinary Studies
- Other (Please specify)

Which of the following ethnic groups do you consider yourself to be a member of?

- Non-Hispanic White (Caucasian American)
- Non-Hispanic Black (African American)
- Hispanic
- Asian/Pacific Islander
- American Indian/Alaskan Native
- Other (Please specify)

Appendix E

Invitation Email (Pretest 2)

Consumers' Experiences and Evaluations of Mobile Applications (Part II)

Dear students,

I am a graduate student in the Department of Consumer and Design Sciences at Auburn University. I invited you to participate in my research to answer a short questionnaire. You may participate if you are at least 19 years old.

The study session will be open from [open date] to [close date]. If you are willing to participate, you will be asked to complete in a questionnaire about your opinions and evaluations of mobile apps. Your estimated time commitment is 15 minutes.

If you would like to know more about this study, an information letter can be obtained by clicking on the following link: [URL LINK TO INFORMATION LETTER IS PROVIDED HERE]. If you decide to participate after reading the letter, you can access the survey by clicking on the link provided in the letter.

To thank you for your time, participants will be given extra credit for [CLASS NUMBER & NAME]. The number of extra credit points will be determined by your class instructor.

If you have any questions about this study, please contact the study's investigators, Yishuang Li (yzl0050@tigermail.auburn.edu), Dr. Wi-Suk Kwon (kwonwis@auburn.edu), or Dr. Sang-Eun Byun (seb002@auburn.edu).

Thank you in advance for your participation.

Investigators:
Yishuang Li, Ph.D. Candidate
386A Spidle Hall, Department of Consumer and Design Sciences

Dr. Wi-Suk Kwon, Associate Professor
308 Spidle Hall, Department of Consumer and Design Sciences

Dr. Sang-Eun Byun, Associate Professor
308 Spidle Hall, Department of Consumer and Design Sciences

Appendix F

Information Letter (Pretest 2 & Pretest 3)

AUBURN UNIVERSITY
COLLEGE OF HUMAN SCIENCES
DEPARTMENT OF CONSUMER AND DESIGN SCIENCES

INFORMATION LETTER
for a Research Study entitled
"Consumers' Experiences and Evaluations of Mobile Applications (Part II)"

You are invited to participate in a research study on college students' opinions and evaluations of mobile applications. The study is being conducted by Yishuang Li, Ph.D. student, under the direction of Drs. Wi-Suk Kwon, Associate Professor and Sang-Eun Byun, Associate Professor in the Department of Consumer and Design Sciences, Auburn University. You are contacted as a potential participant because you are at least 19 years old and are currently enrolled as students in Auburn University.

What will be involved if you participate? Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete an online questionnaire about your opinions and experiences with mobile apps. Your total time investment in this study will be approximately 15 minutes.

Are there any risks or discomforts? There are no foreseen physical or psychological risks associated with participation in this study.

Are there any benefits to yourself or others? Your participation in this study will contribute to our understanding of how consumers evaluate mobile apps based on app descriptions and enable the researchers to develop experiment interface for further studies.

Will you receive compensation for participating? To thank you for your time, you will be offered extra credit for the class from which you are recruited. The amount of credit will be determined by your class instructor. To assign the extra credit, you will be asked to provide your name and course number on the last page of the online survey. Your name and course number will not be associated with your responses to the survey and will be used solely for assigning extra credit.

If you change your mind about participating, you can withdraw at any time by closing your browser window and your data will be cleared as long as it is identifiable. Once you've submitted anonymous data, it cannot be withdrawn since it will be unidentifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University or the Department of Consumer and Design Sciences.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy. The data you provided will never be linked to your name or course number. Information collected through your participation may be published in professional journals and/or presented at professional meetings with no inclusion of your identifiable information.

If you have questions about this study, please contact Yishuang Li by email, yzl0050@tigermail.auburn.edu, or by phone, (626) 277-2707. You can also contact Dr. Wi-Suk Kwon (faculty advisor), kwonwis@auburn.edu, or Dr. Sang-Eun Byun (faculty advisor), seb0002@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334) 844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, PLEASE CLICK ON THE NEXT BUTTON AT THE BOTTOM OF THIS PAGE.

YOU MAY PRINT A COPY OF THIS LETTER TO KEEP.

Yishuang Li 03/04/2015
Investigator Date

Dr. Wi-Suk Kwon 03/04/2015
Investigator Date

Dr. Sang-Eun Byun 03/04/2015
Investigator Date

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Next

Appendix G

Questionnaire (Pretest 2)

DIRECTION:
The app developer is also considering several brand names for his/her apps. On next 8 pages, please indicate your opinions about each of the brand name candidates.

Next

When you see the name Dotil, what comes to your mind? Please list any thoughts in the box below.

How appropriate would you rate the name Dotil is for each of the following four apps?

	Absolutely Inappropriate	Inappropriate	Slightly Inappropriate	Neutral	Slightly Appropriate	Appropriate	Absolutely Appropriate
Alarm	○	○	○	○	○	○	○
Weather	○	○	○	○	○	○	○
Emoji	○	○	○	○	○	○	○
Game	○	○	○	○	○	○	○

Next

What is your gender?

- ○ Male
- ○ Female

What is your age (in number of years)?

What is your current class standing?

- Freshman
- Sophomore
- Junior
- Senior
- Graduate
- Other (Please specify)

Under which of the following colleges/schools does your major fall? (If you have multiple majors, choose the most central one)?

- College of Agriculture
- College of Architecture, Design, and Construction
- Raymond J. Harbert College of Business
- College of Education
- Samuel Ginn College of Engineering
- School of Forestry and Wildlife Sciences
- College of Human Sciences
- College of Liberal Arts
- School of Nursing
- College of Sciences and Mathematics
- School of Veterinary Medicine
- Interdisciplinary Studies
- Other (Please specify)

Which of the following ethnic groups do you consider yourself to be a member of?

- Non-Hispanic White (Caucasian American)
- Non-Hispanic Black (African American)
- Hispanic
- Asian/Pacific Islander
- American Indian/Alaskan Native
- Other (Please specify)

Next

Thank you for completing this survey! We recognize that your time is limited and we value your participation.

Please leave the Course Number and your Name to claim your extra/random points!

Course Number (Including the Department Code)	
First Name	
Last Name	

Note: Your privacy is important to use. You name will NOT be linked to the survey data and be used solely for assigning random points.

Finish

Appendix H

Questionnaire (Pretest 3)

Part I: App Evaluation

DIRECTION:

An app developer is planning on launching four mobile apps in October 2015 and wants to know consumer opinions about **the description of the app features** that will be used to introduce the apps in the market.

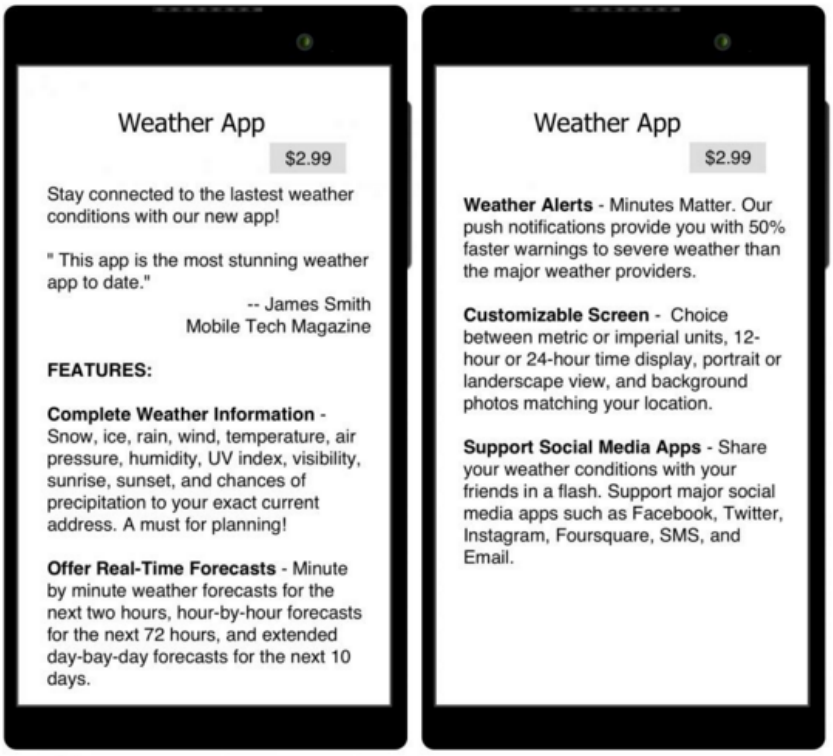
On next 4 pages, please read the descriptions of each of the four apps and answer the questions that follow.

Note: Only one of the two following stimuli was displayed to the participants:

Please read the following description for a **weather** app carefully.

Note: The brand name is omitted from the illustration above because it is yet to be determined by the app developer.

Please read the following description for a **weather** app carefully.



Note: The brand name is omitted from the illustration above because it is yet to be determined by the app developer.

Please indicate your level of agreement with each of the following statements about the above app description.

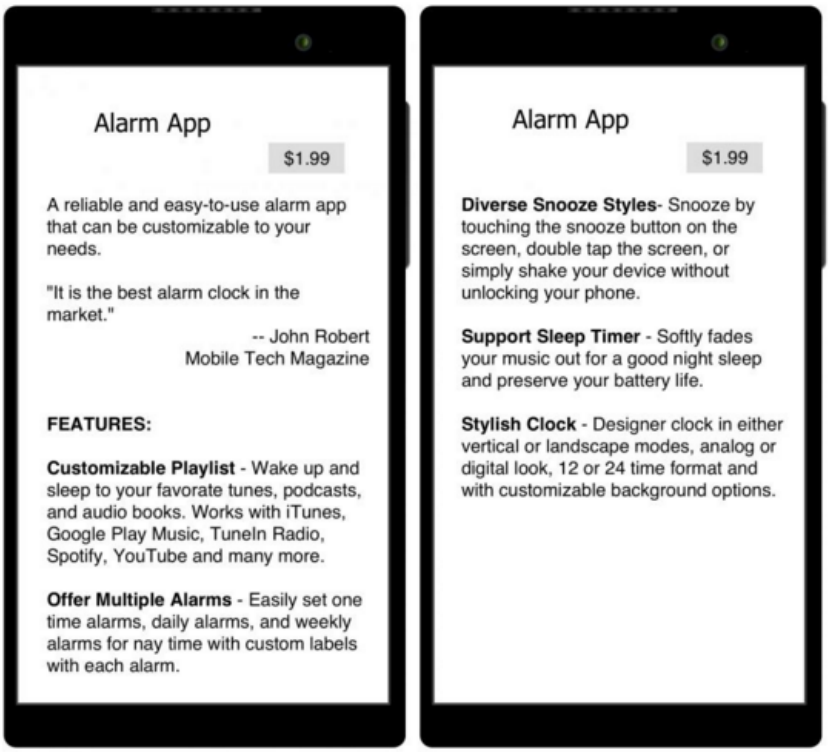
	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I feel this app description makes a point effectively.	○	○	○	○	○	○	○
This app description is appropriate to determine the app value.	○	○	○	○	○	○	○
This app description is based on facts.	○	○	○	○	○	○	○
This app description covers the needs of my understanding.	○	○	○	○	○	○	○
This app description presents an impartial view.	○	○	○	○	○	○	○
I feel this app description is convincing.	○	○	○	○	○	○	○
This app description has sufficient breadth and depth for my understanding.	○	○	○	○	○	○	○
This app description is objectively written.	○	○	○	○	○	○	○
This app description is applicable to my need.	○	○	○	○	○	○	○
This app description is sufficiently complete for my needs.	○	○	○	○	○	○	○
This app description is relevant to determine the app value.	○	○	○	○	○	○	○
This app description is useful to determine the app value.	○	○	○	○	○	○	○

Note: Only one of the two following stimuli was displayed to the participants:

Please read the following description for an **alarm** app carefully.

Note: The brand name is omitted from the illustration above because it is yet to be determined by the app developer.

Please read the following description for an **alarm** app carefully.



Note: The brand name is omitted from the illustration above because it is yet to be determined by the app developer.

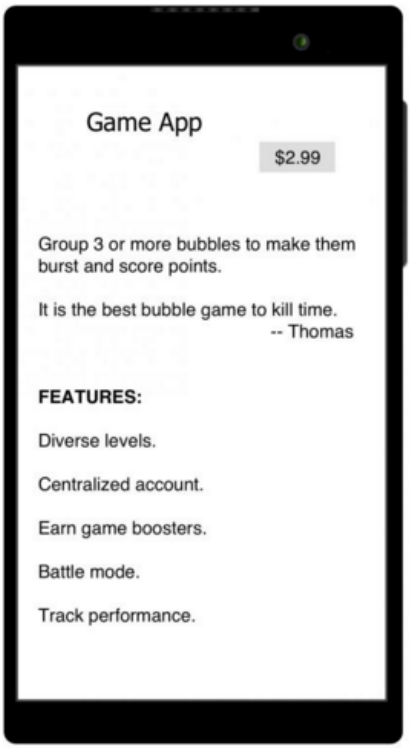
Please indicate your level of agreement with each of the following statements about the above app description.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
This app description presents an impartial view.	○	○	○	○	○	○	○
I feel this app description is convincing.	○	○	○	○	○	○	○
I feel this app description makes a point effectively.	○	○	○	○	○	○	○
This app description is useful to determine the app value.	○	○	○	○	○	○	○
This app description covers the needs of my understanding.	○	○	○	○	○	○	○
This app description is applicable to my need.	○	○	○	○	○	○	○
This app description is based on facts.	○	○	○	○	○	○	○
This app description is appropriate to determine the app value.	○	○	○	○	○	○	○
This app description is relevant to determine the app value.	○	○	○	○	○	○	○
This app description is sufficiently complete for my needs.	○	○	○	○	○	○	○
This app description is objectively written.	○	○	○	○	○	○	○
This app description has sufficient breadth and depth for my understanding.	○	○	○	○	○	○	○

Next

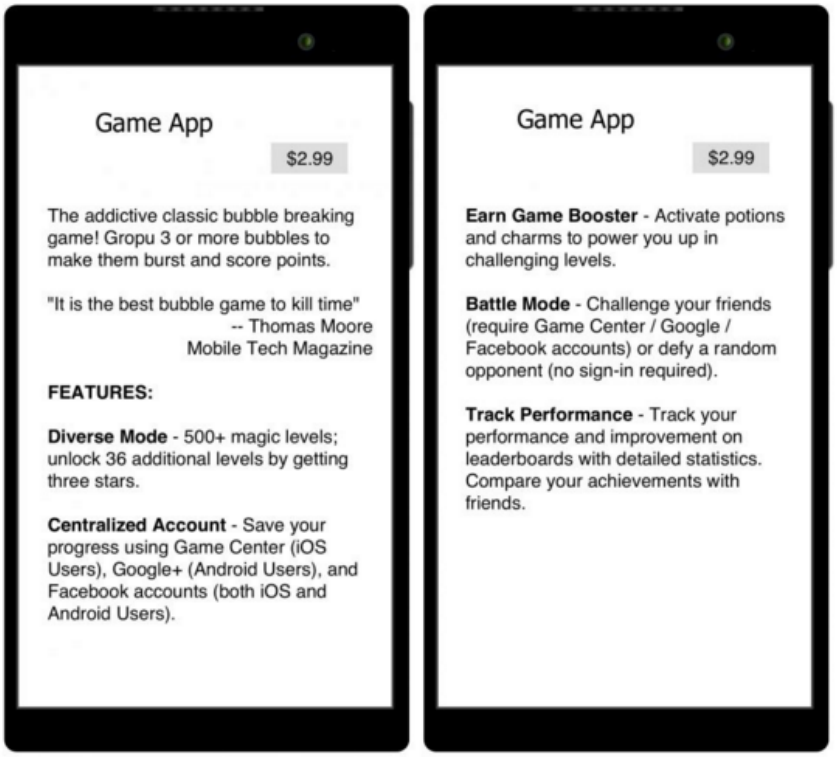
Note: Only one of the two following stimuli was displayed to the participants:

Please read the following app description for a **game** app carefully.



Note: The brand name is omitted from the illustration above because it is yet to be determined by the app developer.

Please read the following app description for a **game** app carefully.



Note: The brand name is omitted from the illustration above because it is yet to be determined by the app developer.

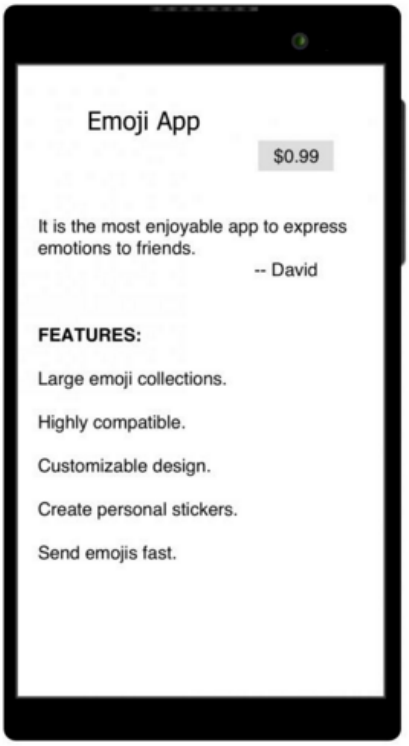
Please indicate your level of agreement with each of the following statements about the above app description.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
This app description has sufficient breadth and depth for my understanding.	○	○	○	○	○	○	○
This app description is based on facts.	○	○	○	○	○	○	○
This app description is objectively written.	○	○	○	○	○	○	○
I feel this app description is convincing.	○	○	○	○	○	○	○
This app description is applicable to my need.	○	○	○	○	○	○	○
This app description covers the needs of my understanding.	○	○	○	○	○	○	○
This app description is relevant to determine the app value.	○	○	○	○	○	○	○
This app description is useful to determine the app value.	○	○	○	○	○	○	○
This app description is sufficiently complete for my needs.	○	○	○	○	○	○	○
I feel this app description makes a point effectively.	○	○	○	○	○	○	○
This app description presents an impartial view.	○	○	○	○	○	○	○
This app description is appropriate to determine the app value.	○	○	○	○	○	○	○

Next

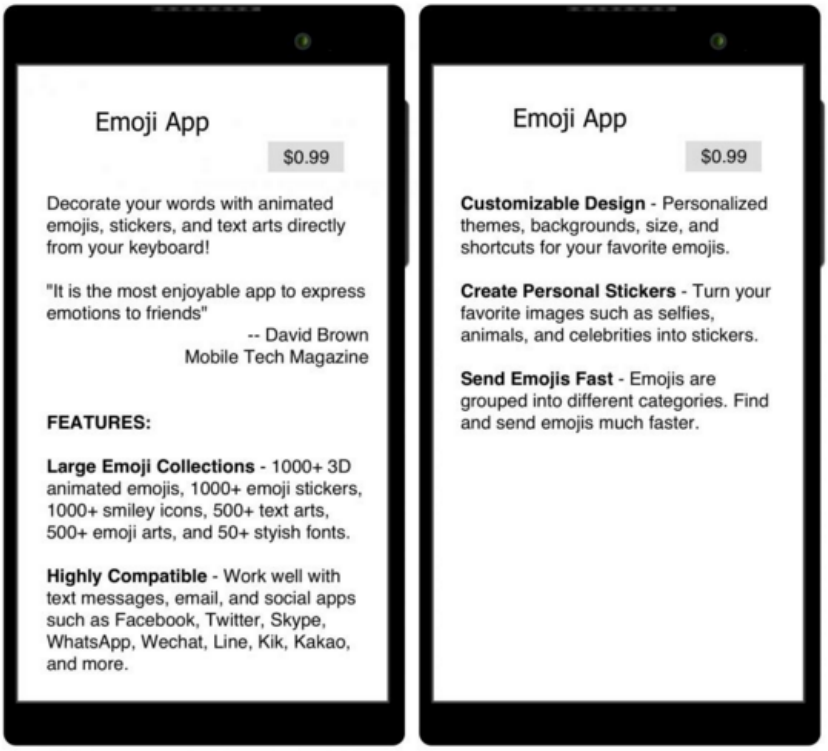
Note: Only one of the two following stimuli was displayed to the participants:

Please read the following description for an **emoji** app carefully.



Note: The brand name is omitted from the illustration above because it is yet to be determined by the app developer.

Please read the following description for an **emoji** app carefully.



Note: The brand name is omitted from the illustration above because it is yet to be determined by the app developer.

Please indicate your level of agreement with each of the following statements about the above app description.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
This app description is applicable to my need.	○	○	○	○	○	○	○
This app description is relevant to determine the app value.	○	○	○	○	○	○	○
This app description is useful to determine the app value.	○	○	○	○	○	○	○
This app description is based on facts.	○	○	○	○	○	○	○
This app description presents an impartial view.	○	○	○	○	○	○	○
This app description is appropriate to determine the app value.	○	○	○	○	○	○	○
This app description covers the needs of my understanding.	○	○	○	○	○	○	○
I feel this app description is convincing.	○	○	○	○	○	○	○
This app description is sufficiently complete for my needs.	○	○	○	○	○	○	○
This app description has sufficient breadth and depth for my understanding.	○	○	○	○	○	○	○
This app description is objectively written.	○	○	○	○	○	○	○
I feel this app description makes a point effectively.	○	○	○	○	○	○	○

Next

Part II: Demographics

What is your gender?

- ○ Male
- ○ Female

What is your age (in number of years)?

What is your current class standing?

- Freshman
- Sophomore
- Junior
- Senior
- Graduate
- Other (Please specify)

Under which of the following colleges/schools does your major fall? (If you have multiple majors, choose the most central one)?

- College of Agriculture
- College of Architecture, Design, and Construction
- Raymond J. Harbert College of Business
- College of Education
- Samuel Ginn College of Engineering
- School of Forestry and Wildlife Sciences
- College of Human Sciences
- College of Liberal Arts
- School of Nursing
- College of Sciences and Mathematics
- School of Veterinary Medicine
- Interdisciplinary Studies
- Other (Please specify)

Which of the following ethnic groups do you consider yourself to be a member of?

- Non-Hispanic White (Caucasian American)
- Non-Hispanic Black (African American)
- Hispanic
- Asian/Pacific Islander
- American Indian/Alaskan Native
- Other (Please specify)

App Description in High and Low Conditions:

Weather App

High Information Quality	Low Information Quality
Decorate your words with animated emojis, stickers, and text arts directly from your keyboard! "It is the most enjoyable app to express emotions to friends." - David Brown Mobile Tech Magazine **Features:** • **Large Emoji Collections** – 1000+ 3D animated emojis, 1000+ emoji stickers, 1000+ smiley icons, 500+ text arts, 500+ emoji arts, and 50+ stylish fonts • **Highly Compatible** – Work well with text messages, email, and social media apps such as Facebook, Twitter, Skype, WhatsApp, WeChat, Line, Kik, Kakao, and more • **Customizable Design** – Personalized themes, backgrounds, size, and shortcuts for your favorite emojis • **Create Personal Stickers** - Turn your favorite images such as selfies, animals, and celebrities into stickers • **Send Emojis Fast** – Emojis are grouped into different categories. Find and send emojis much faster.	This app is the most stunning weather app to date. -- James **Features:** • Complete weather information. • Offer real-time forecasts. • Weather alerts. • Customizable screen. • Support social media apps.

Game App:

High Information Quality	Low Information Quality
The addictive classic bubble breaking game! Group 3 or more bubbles to make them burst and score points. "It is the best bubble game to kill time." - Thomas Moore Mobile Tech Magazine **Features:** • **Diverse Levels** – 500+ magic levels; unlock 36 additional levels by getting three stars. • **Centralized Account**: Save your progress using Game Center (iOS Users), Google+ (Android Users), and Facebook accounts (both iOS and Android Users). • **Earn Game Booster**: Activate potions and charms to power you up in challenging levels. • **Battle Mode**– Challenge your friends (require Game Center / Google / Facebook accounts) or defy a random opponent (no sign-in required). • **Track Performance**- Track your performance and improvement on leaderboards with detailed statistics. Compare your achievements with friends.	Group 3 or more bubbles to make them burst and score points. It is the best bubble game to kill time. -- Thomas **Features:** • Diverse levels. • Centralized account. • Earn game booster. • Battle mode. Track performance.

Alarm App:

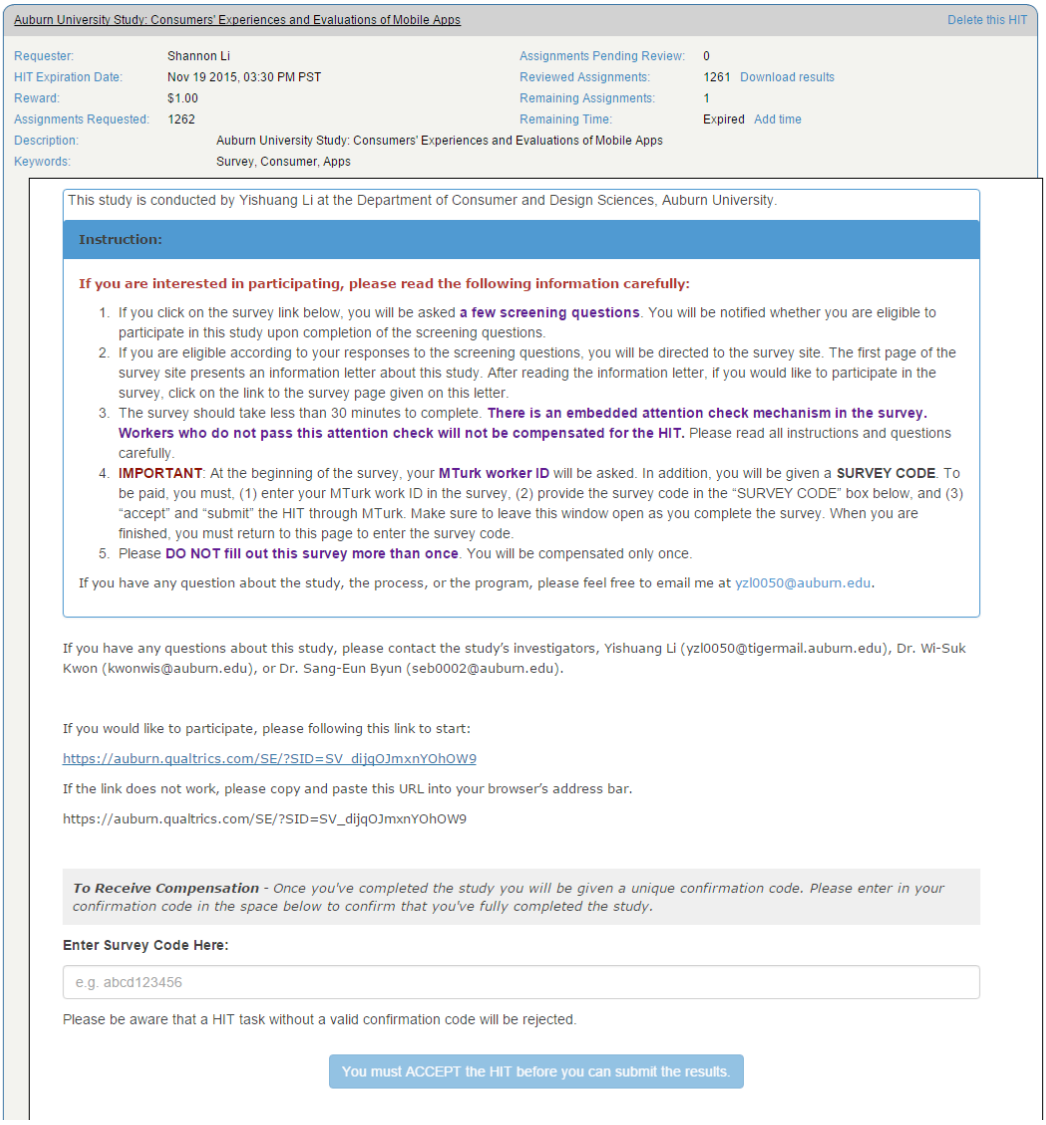
High Information Quality	Low Information Quality
A reliable and easy-to-use alarm app that can be customizable to your needs. "It is the best alarm clock in the market." - John Robert Mobile Tech Magazine Features: • **Customizable Playlist** – Wake up and sleep to your favorite tunes, podcasts, and audio books. Works with iTunes, Google Play Music, TuneIn Radio, Spotify, YouTube and many more. • **Offer Multiple Alarms** – Easily set one-time alarms, daily alarms, and weekly alarms for any time with custom labels with each alarm. • **Diverse Snooze Styles**– Snooze by touching the snooze button on the screen, double tap the screen, or simply shake your device without unlocking your phone. • **Support Sleep Timer** – Softly fades your music out for a good night sleep and preserve your battery life.	It is the best alarm clock in the market. -- John Features: • Customizable playlist. • Offer multiple alarms. • Diverse snooze styles. • Support sleep timer. • Stylish clock.

Emoji App:

High Information Quality	Low Information Quality
Decorate your words with animated emojis, stickers, and text arts directly from your keyboard! "It is the most enjoyable app to express emotions to friends." - David Brown Mobile Tech Magazine **Features:** **Large Emoji Collections** – 1000+ 3D animated emojis, 1000+ emoji stickers, 1000+ smiley icons, 500+ text arts, 500+ emoji arts, and 50+ stylish fonts **Highly Compatible** – Work well with text messages, email, and social media apps such as Facebook, Twitter, Skype, WhatsApp, WeChat, Line, Kik, Kakao, and more **Customizable Design** – Personalized themes, backgrounds, size, and shortcuts for your favorite emojis **Create Personal Stickers** - Turn your favorite images such as selfies, animals, and celebrities into stickers **Send Emojis Fast** – Emojis are grouped into different categories. Find and send emojis much faster.	It is the most enjoyable app to express emotions to friends. -- David **Features:** Large emoji collections. Highly compatible. Customizable design. Create personal stickers. Send emojis fast.

Appendix I

MTurk HIT Task Page (Main Experiment)



Auburn University Study: Consumers' Experiences and Evaluations of Mobile Apps — Delete this HIT

Requester:	Shannon Li	Assignments Pending Review:	0
HIT Expiration Date:	Nov 19 2015, 03:30 PM PST	Reviewed Assignments:	1261 Download results
Reward:	$1.00	Remaining Assignments:	1
Assignments Requested:	1262	Remaining Time:	Expired Add time
Description:	Auburn University Study: Consumers' Experiences and Evaluations of Mobile Apps		
Keywords:	Survey, Consumer, Apps		

This study is conducted by Yishuang Li at the Department of Consumer and Design Sciences, Auburn University.

Instruction:

If you are interested in participating, please read the following information carefully:

1. If you click on the survey link below, you will be asked **a few screening questions**. You will be notified whether you are eligible to participate in this study upon completion of the screening questions.
2. If you are eligible according to your responses to the screening questions, you will be directed to the survey site. The first page of the survey site presents an information letter about this study. After reading the information letter, if you would like to participate in the survey, click on the link to the survey page given on this letter.
3. The survey should take less than 30 minutes to complete. **There is an embedded attention check mechanism in the survey. Workers who do not pass this attention check will not be compensated for the HIT.** Please read all instructions and questions carefully.
4. **IMPORTANT**: At the beginning of the survey, your **MTurk worker ID** will be asked. In addition, you will be given a **SURVEY CODE**. To be paid, you must, (1) enter your MTurk work ID in the survey, (2) provide the survey code in the "SURVEY CODE" box below, and (3) "accept" and "submit" the HIT through MTurk. Make sure to leave this window open as you complete the survey. When you are finished, you must return to this page to enter the survey code.
5. Please **DO NOT fill out this survey more than once**. You will be compensated only once.

If you have any question about the study, the process, or the program, please feel free to email me at yzl0050@auburn.edu.

If you have any questions about this study, please contact the study's investigators, Yishuang Li (yzl0050@tigermail.auburn.edu), Dr. Wi-Suk Kwon (kwonwis@auburn.edu), or Dr. Sang-Eun Byun (seb0002@auburn.edu).

If you would like to participate, please following this link to start:

https://auburn.qualtrics.com/SE/?SID=SV_dijqOJmxnYOhOW9

If the link does not work, please copy and paste this URL into your browser's address bar.

https://auburn.qualtrics.com/SE/?SID=SV_dijqOJmxnYOhOW9

To Receive Compensation *- Once you've completed the study you will be given a unique confirmation code. Please enter in your confirmation code in the space below to confirm that you've fully completed the study.*

Enter Survey Code Here:

e.g. abcd123456

Please be aware that a HIT task without a valid confirmation code will be rejected.

You must ACCEPT the HIT before you can submit the results.

Appendix J

Information Letter (Main Experiment)

AUBURN UNIVERSITY
COLLEGE OF HUMAN SCIENCES
DEPARTMENT OF CONSUMER AND DESIGN SCIENCES

INFORMATION LETTER
for a Research Study entitled
"Consumers' Experiences and Evaluations of Mobile Applications (Part III)"

You are invited to participate in a research study to learn consumers' experiences and evaluation of mobile applications. The study is being conducted by Yishuang Li, Ph.D. student, under the direction of Dr. Wi-Suk Kwon, Associate Professor, and Dr. Sang-Eun Byun, Associate Professor in the Department of Consumer and Design Sciences, Auburn University, USA. You are contacted as a potential participant because you (1) are aged between 19 and 34 years old, (2) have some experience with smart devices (smartphones or tablets), (3) are currently living in the United States, and (4) are a registered MTurk worker.

What will be involved if you participate? Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete an online questionnaire about your opinions and experiences with mobile apps. Your total time investment in this study will be approximately 30 minutes.

Are there any risks or discomforts? We assure that the participation in this study will not put you in any physical or psychological risks. There will be no financial costs associated with your participation.

Are there any benefits to yourself or others? Your participation in this study will enable the researcher to understand how consumers evaluate and experience mobile apps.

Will you receive compensation for participating? To thank you for your time, you will be offered a compensation of $1. Please note a possibility that your responses could be rejected by the researchers, in which case you will not be compensated for your time, and your approval rates as an MTurk worker may be compromised. Such a rejection procedure is necessary to ensure accurate complete responses. MTurk guidelines specified that the acceptance or rejection of a response is at the discretion of the HIT requester to manage the work accuracy. Grounds for rejection include participating in the task more than once, not meeting the participation requirements (e.g., age and U.S. resident, etc.), or not completely and accurately completing the required task.

If you change your mind about participating, you can withdraw at any time by closing your browser window and your data will be cleared as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University or the Department of Consumer and Design Sciences.

Your privacy will be protected. Any data obtained in connection with this study will remain anonymous. We will not collect any identifiable information from you besides your MTurk work ID, which will be asked at the end of the survey. Your MTurk work ID will be used only for the purpose of compensating you for your time. Within 120 days after data collection, the records of your MTurk work ID in relation to this study will be destroyed permanently. Information collected through your participation may be published in professional journals and/or presented at professional meetings with no inclusion of your identifiable information.

If you have questions about this study, please contact Yishuang Li by email, yzl0050@tigermail.auburn.edu, or by phone, (334) 332-9756. You can also contact Dr. Wi-Suk Kwon (faculty advisor), kwonwis@auburn.edu, or Dr. Sang-Eun Byun (faculty advisor), seb0002@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334) 844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, PLEASE CLICK ON THE NEXT BUTTON AT THE BOTTOM OF THIS PAGE.

YOU MAY PRINT A COPY OF THIS LETTER TO KEEP.

Yishuang Li 10/01/2015.
Investigator Date

Dr. Wi-Suk Kwon 10/01/2015.
Investigator Date

Dr. Sang-Eun Byun 10/01/2015.
Investigator Date

The Auburn University Institutional Review Board has approved this document for use from 11/17/2014 to 11/16/2015. Protocol #14.460EP1411.

NEXT PAGE

Appendix K

IRB Modification Approval for Protocol # 14-460 EP 1411

AUBURN UNIVERSITY INSTITUTIONAL REVIEW BOARD for RESEARCH INVOLVING HUMAN SUBJECTS

REQUEST for MODIFICATION

For help, contact: **THE OFFICE OF RESEARCH COMPLIANCE (ORC)**, 115 Ramsay Hall, Auburn University
Phone: 334-844-5966 **e-mail:** IRBAdmin@auburn.edu **Web Address:** http://www.auburn.edu/research/vpr/ohs

Revised 2.1.2014 **Submit completed form to IRBsubmit@auburn.edu or 115 Ramsay Hall, Auburn University 36849.**

Form must be populated using Adobe Acrobat / Pro 9 or greater standalone program (do not fill out in browser). Hand written forms will not be accepted.

1. **Protocol Number:** 14-460 EP 1411
2. **Current IRB Approval Dates: From:** 11/30/2015 **To:** 11/16/2016
3. **Project Title:** Consumers' Experiences and Evaluations of Mobile Applications

4.

Principal Investigator	Title	Department	Phone	AU E-Mail (primary)
Yishuang Li		CADS	626-277-2707	yzl0050@tigermail.auburn.edu
PI Signature		**Mailing Address**		**Alternate E-Mail**
Yishuang Li		386A Spidle Hall		yslshannon@gmail.com
Wi-Suk Kwon	Wisuk Kwon	CADS	4-4011	kwonwis@auburn.edu
Faculty Advisor	**FA Signature**	**Department**	**Phone**	**AU E-Mail**

Name of Current Department Head: Carol Warfield **AU E-Mail:** warficl@auburn.edu

5. **Current External Funding Agency and Grant number:** N.A.

6. **a. List any contractors, sub-contractors, other entities associated with this project:**

N.A.

b. List any other IRBs associated with this project: N.A.

7. **Nature of change in protocol: (Mark all that apply)**

- ☐ **Change in Key Personnel** (attach CITI forms for new personnel)
- ☐ **Change in Sites** (attach permission forms for new sites)
- ☐ **Change in methods for data storage/protection or location of data/consent documents**
- ☐ **Change in project purpose or questions**
- ☐ **Change in population or recruitment** (attach new or revised recruitment materials as needed)
- ☐ **Change in consent procedures** (attach new or revised consent documents as needed)
- ☑ **Change in data collection methods or procedures** (attach new data collection forms as needed)
- ☐ **Other (explain):**

FOR ORC OFFICE USE ONLY

DATE RECEIVED IN ORC: _____ by _____ MODIFICAT
DATE OF IRB REVIEW: _____ by _____ PROTOCOL
DATE OF IRB APPROVAL: _____ by _____ MOD
INTE
COMMENTS:

The Auburn University Institutional Review Board has approved this Document for use from 02/11/16 to 11/16/16
Protocol # 14-460 EP 1411

1 of 2

8. **Briefly list** *(numbered or bulleted)* **the activities that have occurred up to this point, particularly those that involved participants.**

Data collection has been completed according to the IRB-approved procedures. The specific procedures completed are as follows:
1. Auburn University students were recruited via invitation emails upon the approval of class instructors for the pretests.
2. Students interested in participating were asked to review the information letter and indicated their agreements by clicking the next button to enter into the study.
3. Student participants were asked to fill a questionnaire and left their course number and name for the purpose of allocating one extra credit.
4. Amazon MTurk workers were recruited via a study HIT task on MTurk website for the main experiment.
5. MTurk workers interested in participating were screened and asked to review the information letter before taking to the study website.
6. Participants for the main experiment were given a task to evaluate a mobile app and fill a questionnaire on various aspects of the evaluation task.
7. At the end of the study, participants were briefed that the app they evaluated were created for the study. They were given a random generated code to fill on the MTurk task page to receive a monetary compensation of $1.00.

9. **For each item marked in Question #7, describe the requested changes to your research protocol, with an explanation and/or rationale for each. (***Additional pages may be attached if needed to provide a complete response.)*

One demographic question asking participants' gender was missing in the main experiment questionnaire (used for the MTurk data collection). Since gender is important information to profile the sample of the study, we would like to contact the 1156 MTurk workers who had successfully completed the study and submitted confirmation codes on MTurk website by sending an invitation email. The invitation email (attached below) will include a URL link to an anonymous questionnaire with a gender question (attached below). No identifiable information will be collected on the new questionnaire and no incentives will be involved. The MTurk provides a mechanism for survey requesters to send direct emails to existing MTurk workers without revealing their email addresses. Thus, no risk of confidentiality breach exists. There is no way to link this additional gender data to participants' previously submitted data to the main experiment questionnaire. The gender data will only be used for the purpose of running descriptive statistics of the sample's gender profile (i.e., how many males and females participated in the study).

10. **Identify any changes in the anticipated risks and / or benefits to the participants.**

N.A.

11. **Identify any changes in the safeguards or precautions that will be used to address anticipated risks.**

N.A.

12. **Attach a copy of all "stamped" IRB-approved documents you are currently using.** *(information letters, consents, flyers, etc.)*

Appendix L

Questionnaire (Main Experiment)

App Evaluation

DIRECTION:

We would like to know what you think of **game apps** in general.

Imagine that you are about to get a new **game** app for your smart device. Please indicate your level of agreement with each of the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I need to learn how to use a game app.	○	○	○	○	○	○	○
One knows rapidly about the performance of a game app by using it.	○	○	○	○	○	○	○
The knowledge required to use a game app is new for me.	○	○	○	○	○	○	○
I would need little time to know if a game app fits my needs.	○	○	○	○	○	○	○
I tend to resist adopting a new game app.	○	○	○	○	○	○	○
I need to change my behavior in order to adopt a new game app.	○	○	○	○	○	○	○

To me, **game** apps (are):

Mean nothing	○ ○ ○ ○ ○ ○ ○	Mean a lot
Worthless	○ ○ ○ ○ ○ ○ ○	Valuable
Irrelevant	○ ○ ○ ○ ○ ○ ○	Relevant
Not needed	○ ○ ○ ○ ○ ○ ○	Needed
Unimportant	○ ○ ○ ○ ○ ○ ○	Important

NEXT PAGE

For each of the following app categories, please indicate how often you have **downloaded** an app in that category for the last 6 months.

	Never	Rarely	Occasionally	Frequently	Always
Weather	○	○	○	○	○
Game	○	○	○	○	○
Alarm	○	○	○	○	○
Emoji	○	○	○	○	○

For each of the following app categories, please indicate how often you have **used** an app in that category for the last 6 months.

	Never	Rarely	Occasionally	Frequently	Always
Emoji	○	○	○	○	○
Game	○	○	○	○	○
Alarm	○	○	○	○	○
Weather	○	○	○	○	○

What device you use to run mobile apps?
Please check ALL that apply.

- iPhone/iPad
- Android
- Windows Phone/Tablet
- Blackberry
- Something Else (Please specify)
- None of the above

NEXT PAGE

DIRECTION:

An app developer is planning on launching a mobile app in December 2015. What you will see in the smartphone screen image(s) below is the app introduction message the app developer created to use in the market.

Imagine that you see this app introduction message while browsing in the app store on your smartphone. Please check out carefully all information on the screen (including the app name, the price, the description of the app, the screen design, etc.) and answer the questions that follow.

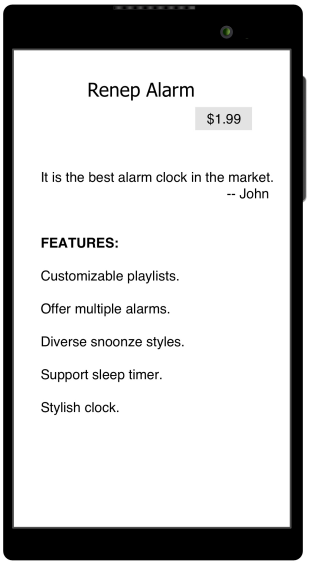
Note: Participants were randomly assigned to view one of the following stimuli:

Experiment Condition	Stimuli

App Category: Alarm

Information Quality: Low

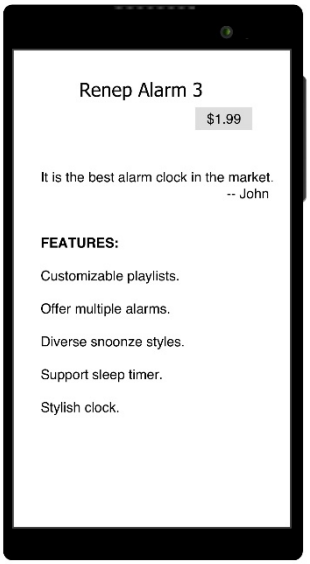
Name Suffix: No Name Suffix



App Category: Alarm

Information Quality: Low

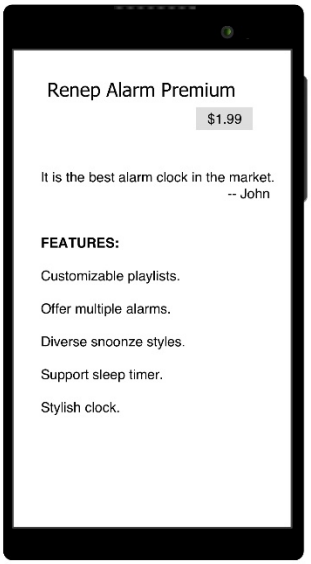
Name Suffix: Numeric



App Category: Alarm

Information Quality: Low

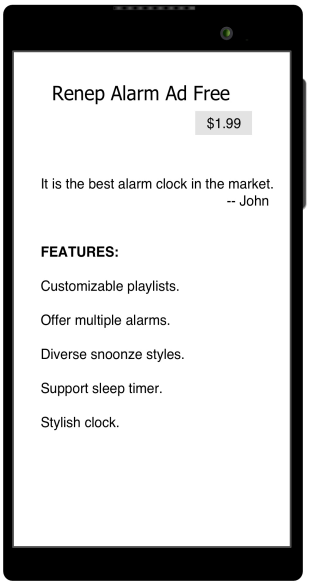
Name Suffix: Premium



App Category: Alarm

Information Quality: Low

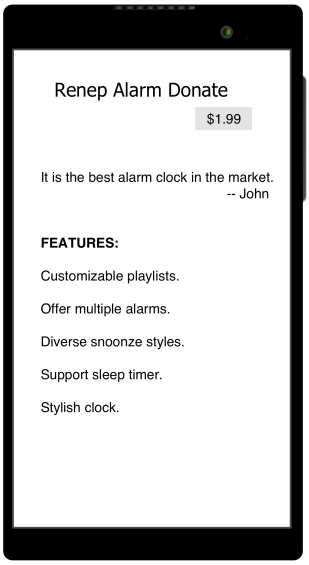
Name Suffix: Ad Free



App Category: Alarm

Information Quality: Low

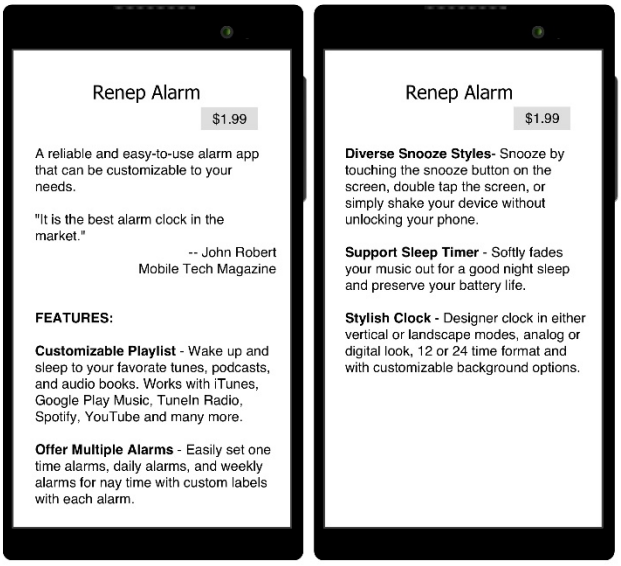
Name Suffix: Donate



App Category: Alarm

Information Quality: High

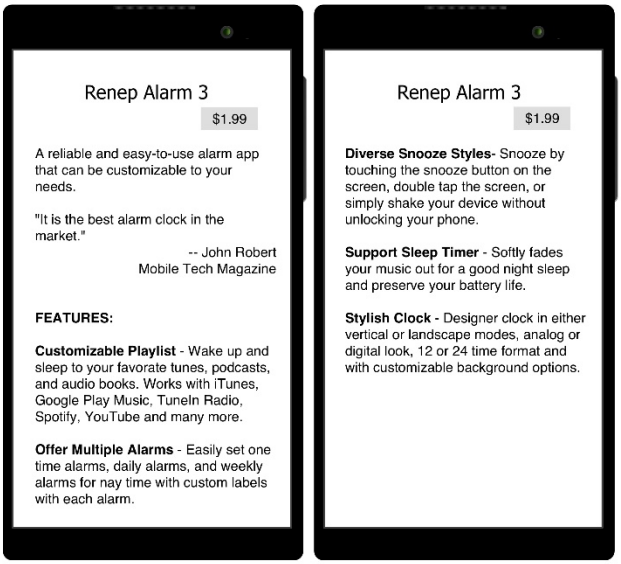
Name Suffix: No Name Suffix



App Category: Alarm

Information Quality: High

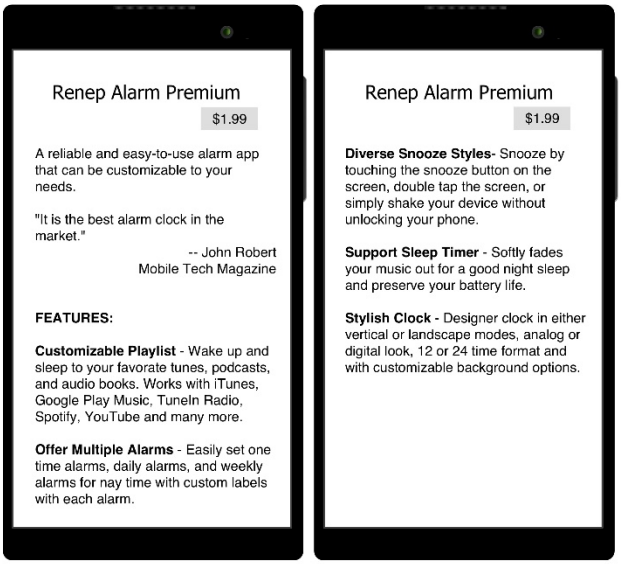
Name Suffix: Numeric



App Category: Alarm

Information Quality: High

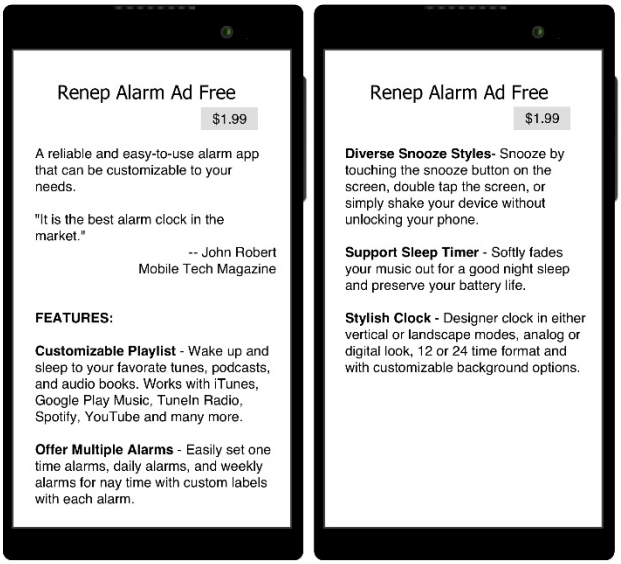
Name Suffix: Premium



App Category: Alarm

Information Quality: High

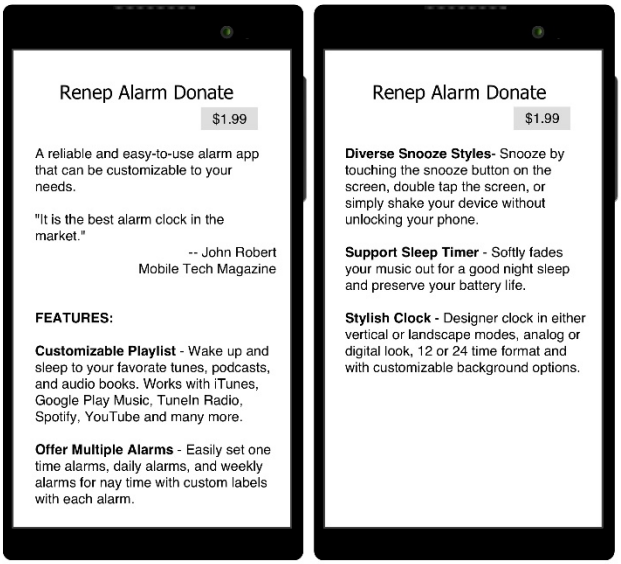
Name Suffix: Ad Free



App Category: Alarm

Information Quality: High

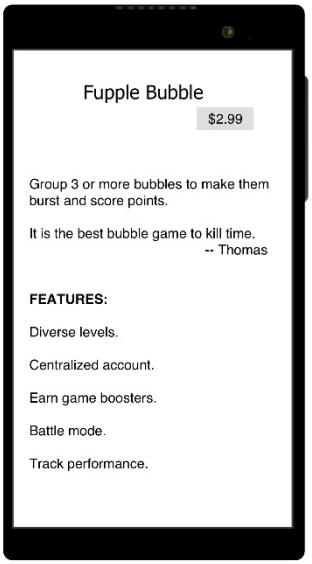
Name Suffix: Donate



App Category: Game

Information Quality: Low

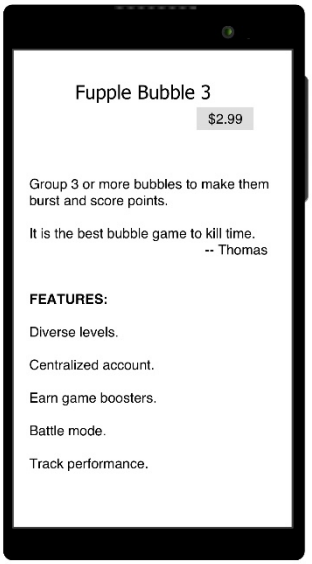
Name Suffix: No Name Suffix



App Category: Game

Information Quality: Low

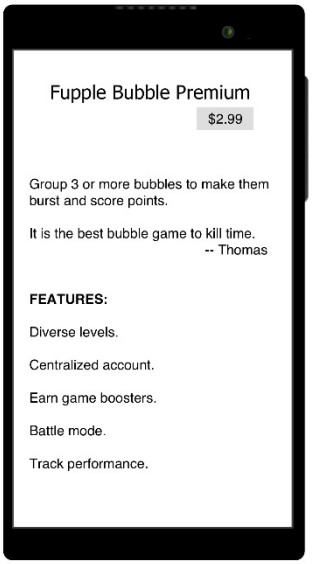
Name Suffix: Numeric



App Category: Game

Information Quality: Low

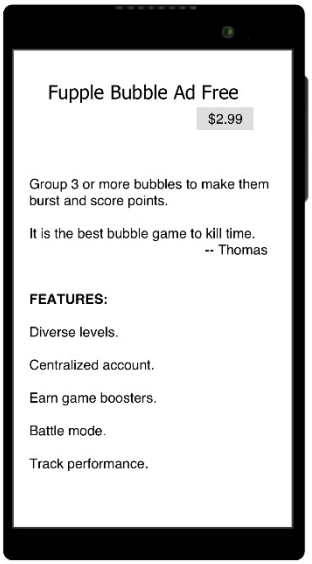
Name Suffix: Premium



App Category: Game

Information Quality: Low

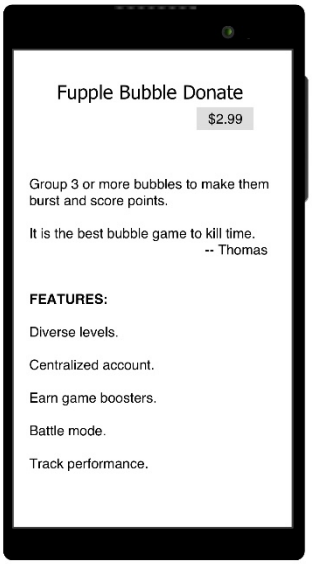
Name Suffix: Ad Free



App Category: Game

Information Quality: Low

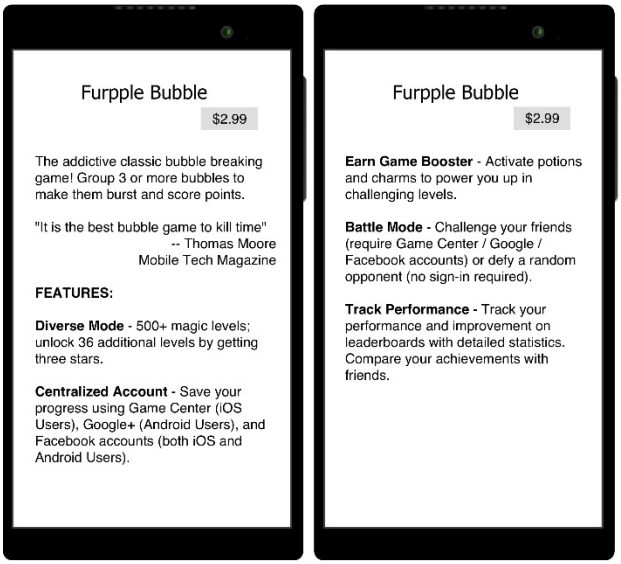
Name Suffix: Donate



App Category: Game

Information Quality: High

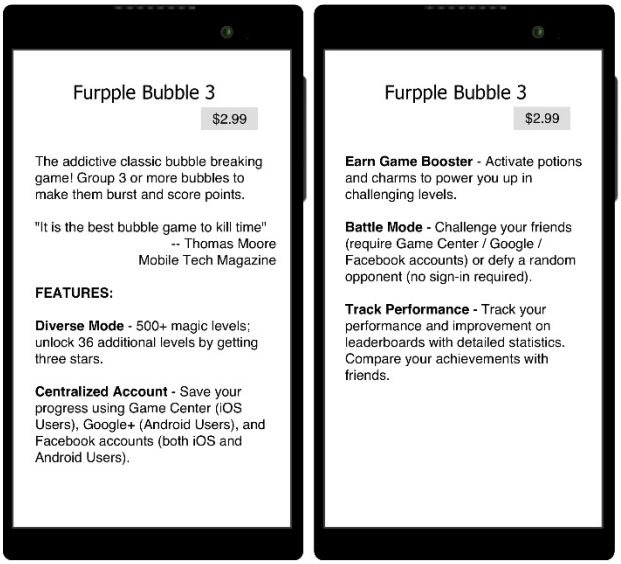
Name Suffix: No Name Suffix



App Category: Game

Information Quality: High

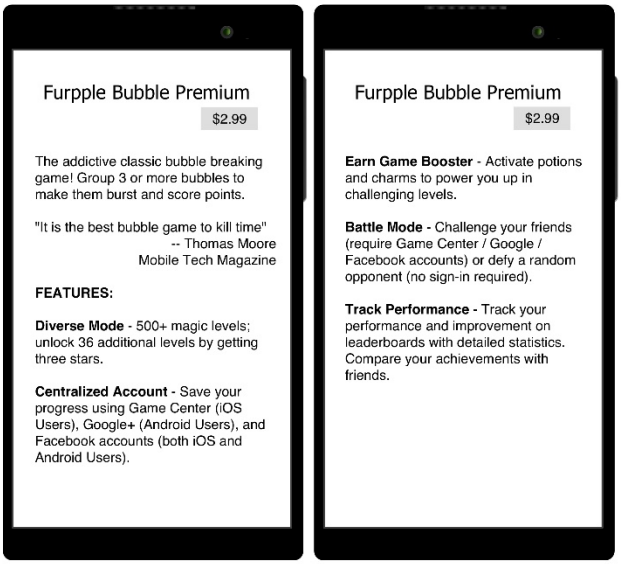
Name Suffix: Numeric



App Category: Game

Information Quality: High

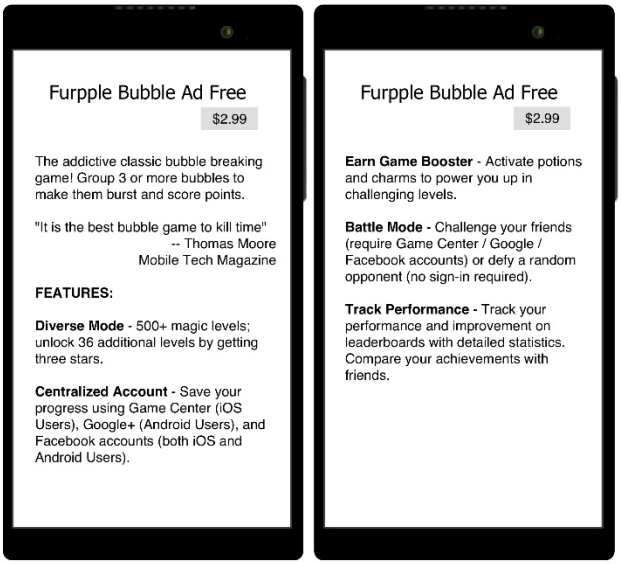
Name Suffix: Premium



App Category: Game

Information Quality: High

Name Suffix: Ad Free



App Category: Game

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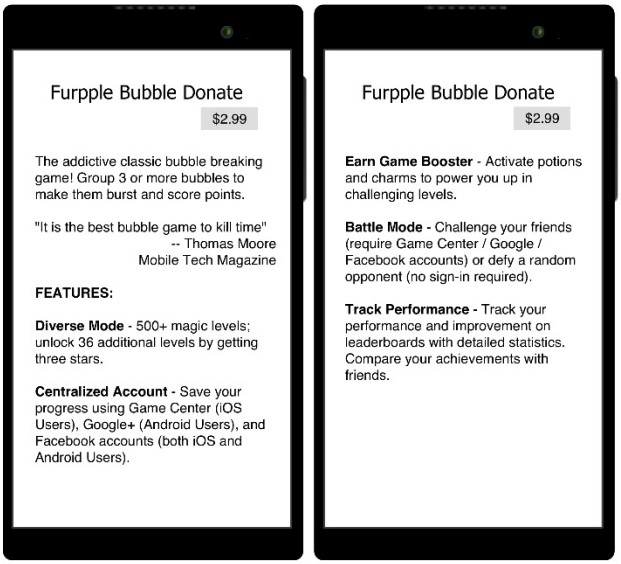
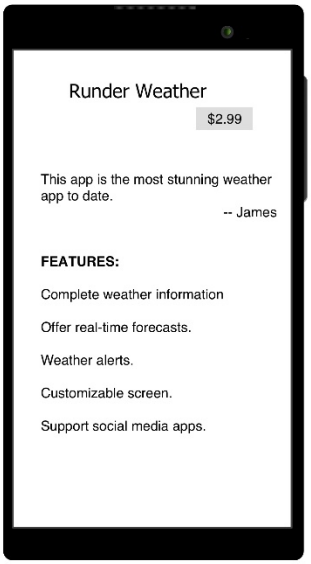
Name Suffix: Donate



App Category: Weather

Information Quality: Low

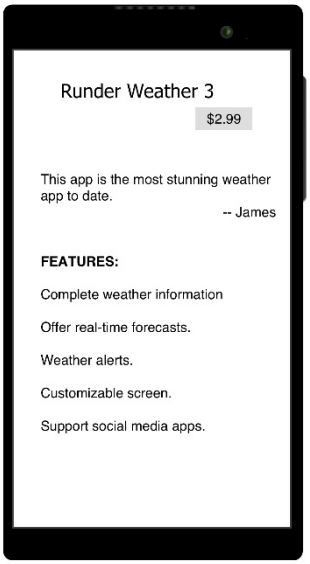
Name Suffix: No Name Suffix



App Category: Weather

Information Quality: Low

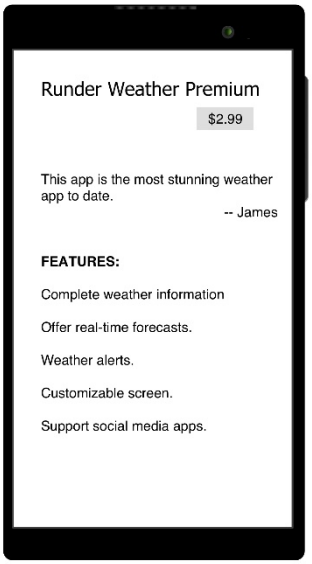
Name Suffix: Numeric



App Category: Weather

Information Quality: Low

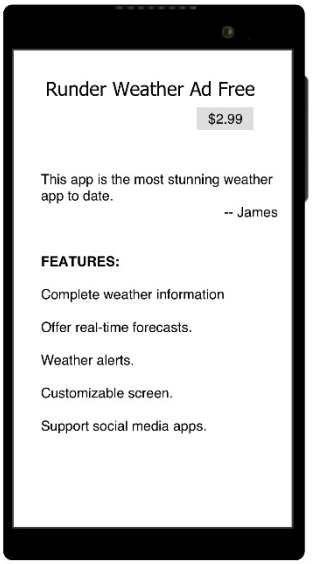
Name Suffix: Premium



App Category: Weather

Information Quality: Low

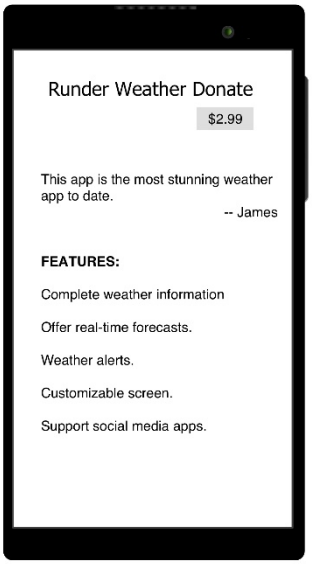
Name Suffix: Ad Free



App Category: Weather

Information Quality: Low

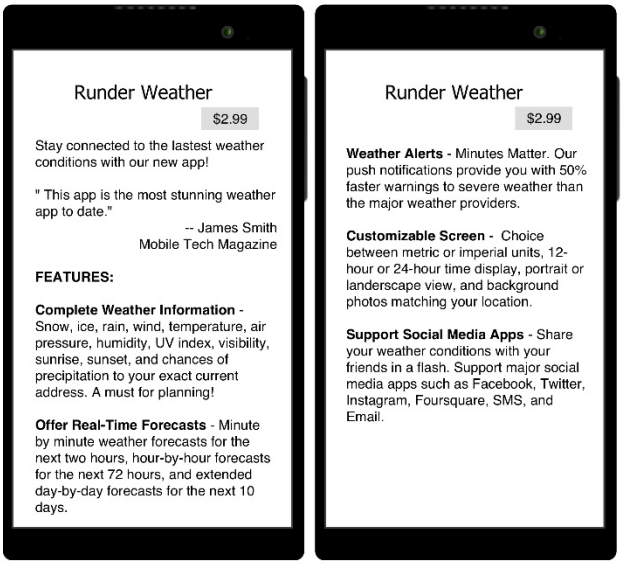
Name Suffix: Donate



App Category: Weather

Information Quality: High

Name Suffix: No Name Suffix



App Category: Weather

Information Quality: High

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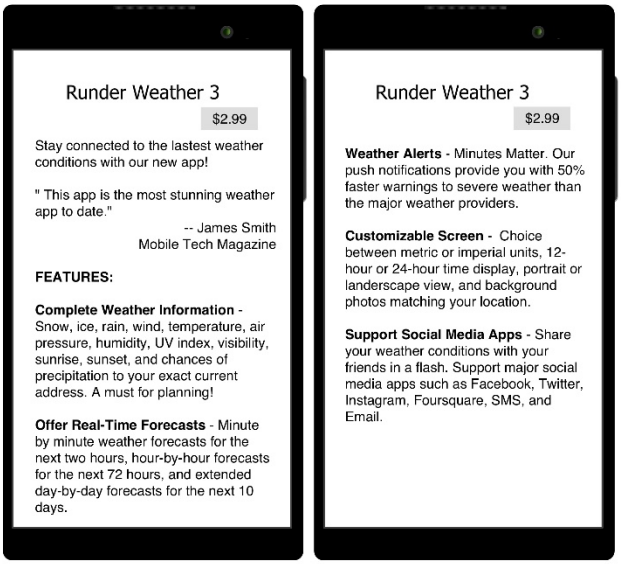
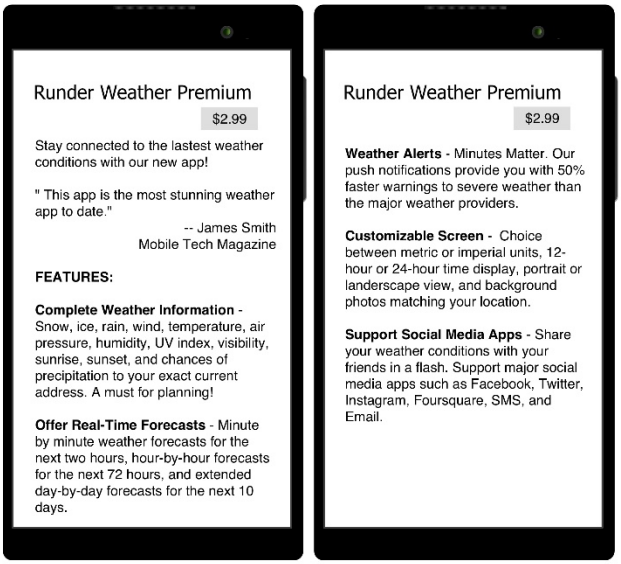


App Category: Weather

Information Quality: High

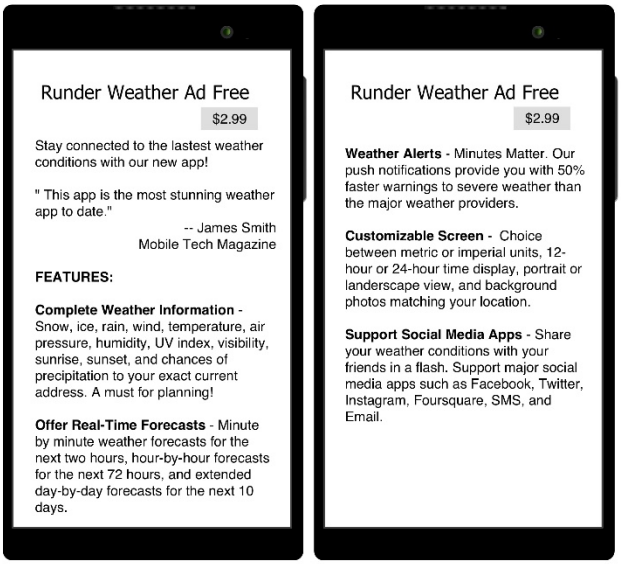
Name Suffix: Premium



App Category: Weather

Information Quality: High

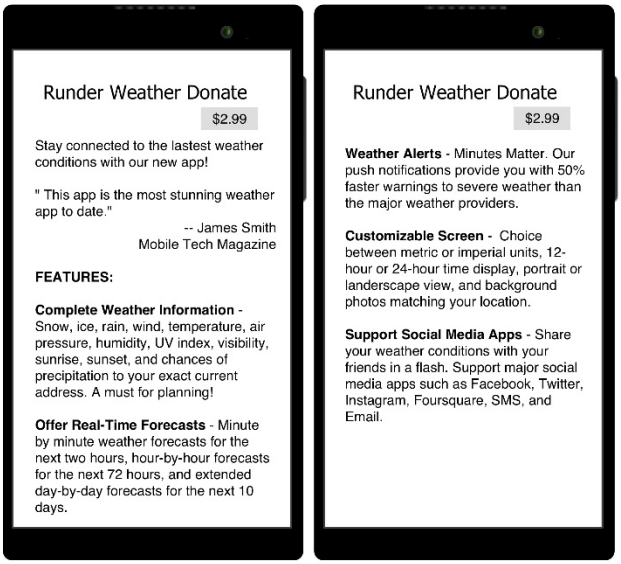
Name Suffix: Ad Free



App Category: Weather

Information Quality: High

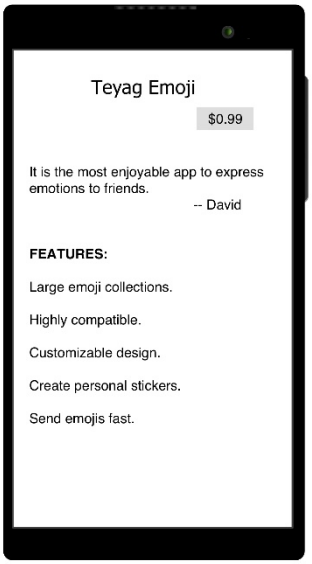
Name Suffix: Donate



App Category: Emoji

Information Quality: Low

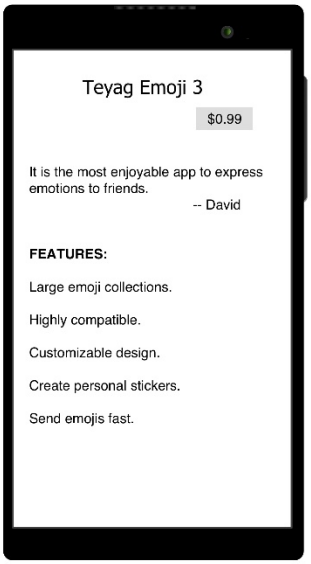
Name Suffix: No Name Suffix



App Category: Emoji

Information Quality: Low

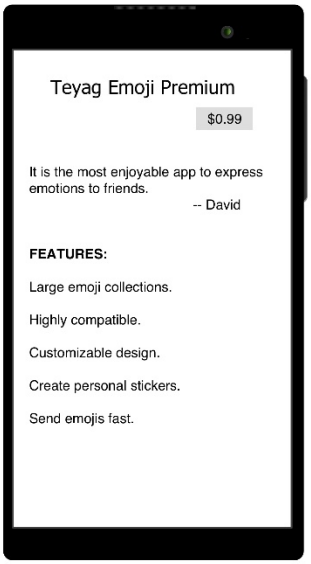
Name Suffix: Numeric



App Category: Emoji

Information Quality: Low

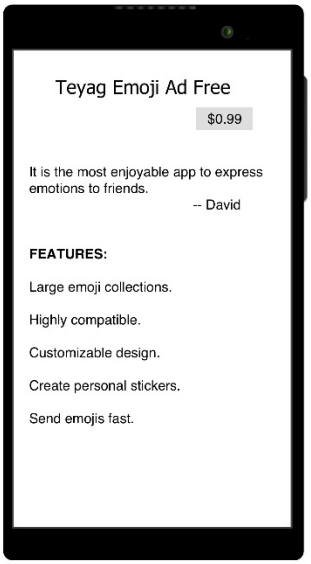
Name Suffix: Premium



App Category: Emoji

Information Quality: Low

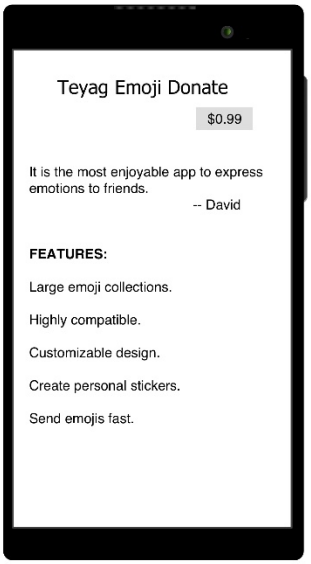
Name Suffix: Ad Free



App Category: Emoji

Information Quality: Low

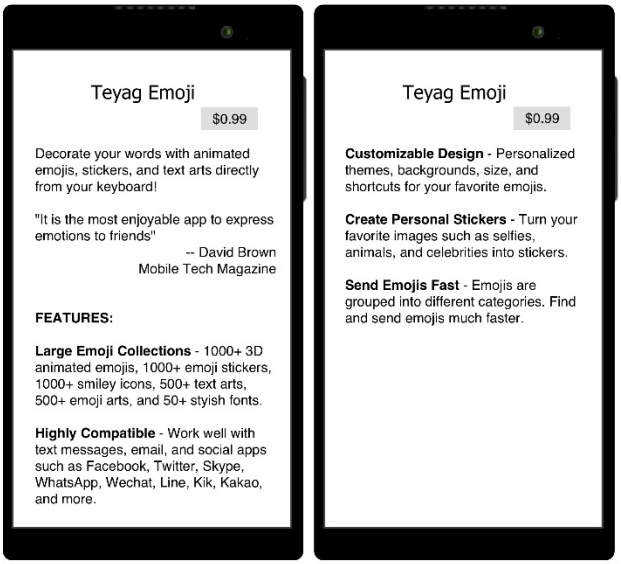
Name Suffix: Donate



App Category: Emoji

Information Quality: High

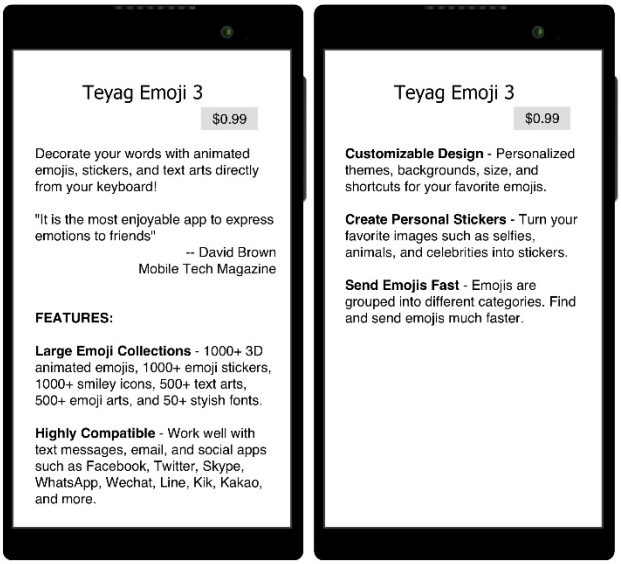
Name Suffix: No Name Suffix



App Category: Emoji

Information Quality: High

Name Suffix: Numeric



App Category: Emoji

Information Quality: High

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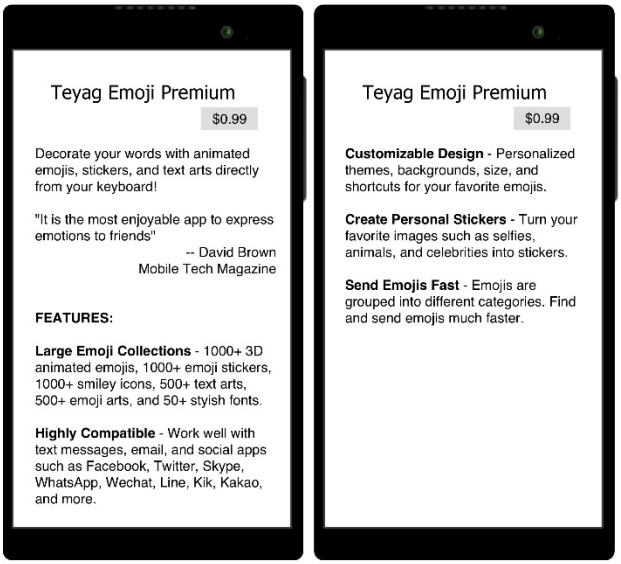
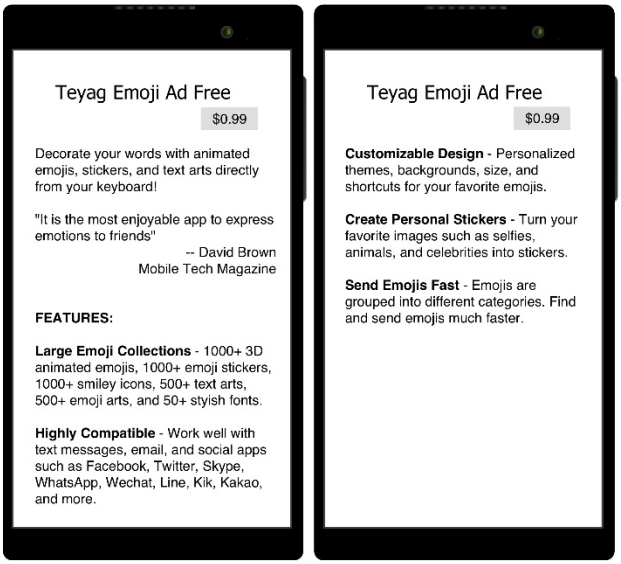


App Category: Emoji

Information Quality: High

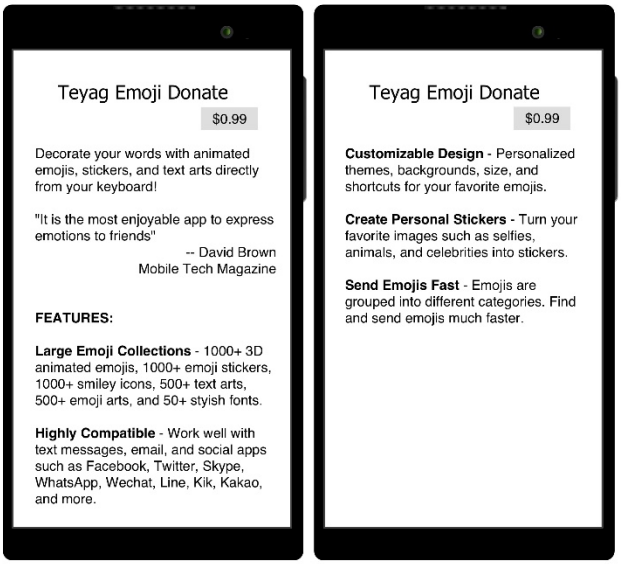
Name Suffix: Ad Free



App Category: Emoji

Information Quality: High

Name Suffix: Donate



Which of the following app is the app you evaluated?

- Fupple Bubble Ad Free
- Fupple Bubble
- Fupple Bubble Premium
- Fupple Bubble Donate
- Fupple Bubble 3
- I do not know.

We would like to learn how you think or feel about this app. Please indicate your level of agreement with each of the following statements with respect to the above app.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
This app would be well made	○	○	○	○	○	○	○
This app would be economical	○	○	○	○	○	○	○
This app would give me pleasure	○	○	○	○	○	○	○
This app would have consistent quality	○	○	○	○	○	○	○
I would recommend this app to other people	○	○	○	○	○	○	○
This app would offer value for money	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I would enjoy this app	○	○	○	○	○	○	○
When I tell others about this app, I would talk about it in great detail	○	○	○	○	○	○	○
This app would perform consistently	○	○	○	○	○	○	○
I would want to use this app	○	○	○	○	○	○	○
I would tell other people positive things about this app	○	○	○	○	○	○	○
This app would give its user social approval	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I would feel relaxed using this app	○	○	○	○	○	○	○
I would feel good using this app	○	○	○	○	○	○	○
This app would have an acceptable standard of quality	○	○	○	○	○	○	○
This app would help the user make a good impression on other people	○	○	○	○	○	○	○
This app would be a good product for the price	○	○	○	○	○	○	○
If you are reading this question, please select "Somewhat Disagree".	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
This app would improve the way I am perceived	○	○	○	○	○	○	○
This app would help me feel accepted by others	○	○	○	○	○	○	○
This app is reasonably priced	○	○	○	○	○	○	○
This app would not last a long time	○	○	○	○	○	○	○

Please indicate your level of agreement with each of the following statements with respect to the above app.

	Very Low	Low	Moderately Low	Neutral	Moderately High	High	Very High
If this app were available in the market, the likelihood that I would consider downloading this app is	○	○	○	○	○	○	○
If this app were available in the market, the probability that I would consider downloading this app is	○	○	○	○	○	○	○
If I were going to buy a game app, the probability of downloading this app is	○	○	○	○	○	○	○

Please indicate your level of agreement with each of the following statements about the above app description.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I feel this app description makes a point effectively.	○	○	○	○	○	○	○
This app description is appropriate to determine the app value.	○	○	○	○	○	○	○
This app description is based on facts.	○	○	○	○	○	○	○
This app description is relevant to determine the app value.	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
This app description is sufficiently complete for my needs.	○	○	○	○	○	○	○
I feel this app description is convincing.	○	○	○	○	○	○	○
This app description is applicable to my need.	○	○	○	○	○	○	○
This app description is objectively written.	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
This app description covers the needs of my understanding.	○	○	○	○	○	○	○
This app description is useful to determine the app value.	○	○	○	○	○	○	○
This app description presents an impartial view.	○	○	○	○	○	○	○
This app description has sufficient breadth and depth for my understanding.	○	○	○	○	○	○	○

Demographics and Other Information

Please indicate your level of agreement with each of the following statements:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
The status of a product is irrelevant to me	○	○	○	○	○	○	○
A product is more valuable to me if it indicates my superiority	○	○	○	○	○	○	○
I am interested in new products with status	○	○	○	○	○	○	○
I would pay more for a product if it has status	○	○	○	○	○	○	○
I would buy a product just because it has status	○	○	○	○	○	○	○

Please indicate your level of agreement with each of the following statements:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
When someone does me a favor, I feel committed to repay him/her	○	○	○	○	○	○	○
If someone does a favor for me, I am ready to return it	○	○	○	○	○	○	○
To help somebody is the best policy to be certain that s/he will help you in the future	○	○	○	○	○	○	○
I am ready to do a boring job to return someone's previous help	○	○	○	○	○	○	○
I avoid being impolite because I do not want others being impolite with me	○	○	○	○	○	○	○
I am ready to undergo personal costs to help somebody who helped me before	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
If I work hard, I expect it will be repaid	○	○	○	○	○	○	○
If you live in the U.S., please select "Disagree". Otherwise, please select "Agree".	○	○	○	○	○	○	○
If someone lends me money as a favor, I feel I should give him/her back something more than what is strictly due	○	○	○	○	○	○	○
If someone asks me politely for information, I'm really happy to help him/her	○	○	○	○	○	○	○
I go out of my way to help somebody who has been kind to me before	○	○	○	○	○	○	○
I fear the reactions of a person I have previously treated badly	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
If someone suggests to me the name of the winning horse at the race, I would certainly give him/her part of my winnings	○	○	○	○	○	○	○
I do not behave badly with others so as to avoid them behaving badly with me	○	○	○	○	○	○	○
When I pay someone compliments, I expect that s/he in turn will reciprocate	○	○	○	○	○	○	○
If someone is helpful with me at work, I am pleased to help him/her	○	○	○	○	○	○	○
If I don't leave a good tip in a restaurant, I expect that in future I will not get good service	○	○	○	○	○	○	○

Please indicate your level of agreement with each of the following statements:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I would buy a product just because it has status	○	○	○	○	○	○	○
A product is more valuable to me if it indicates my superiority	○	○	○	○	○	○	○
The status of a product is irrelevant to me	○	○	○	○	○	○	○
I am interested in new products with status	○	○	○	○	○	○	○
I would pay more for a product if it has status	○	○	○	○	○	○	○

What is your age (in number of years)?

Which of the following ethnic groups do you consider yourself to be a member of?

- Non-Hispanic White (Caucasian American)
- Non-Hispanic Black (African American)
- Hispanic
- Asian/Pacific Islander
- American Indian/Alaskan native
- Other (please specify)

What is the highest level of education you have completed?

- 8th Grade or Less
- Some High School
- High School Diploma
- Some College or Technical School
- College Degree (4 years)
- Some Graduate School
- Graduate Degree (Master's, Doctorate, etc.)

Which of the following best describes your current occupation?

- Professional or Technical (For Example, Accountant, Artist, Computer Specialist, Engineer, Nurse, Doctor, Teacher)
- Manager or Administrator (Non-Farm)
- Sales Worker (For Example, Insurance Salesperson, Real Estate Salesperson, Sales Clerk, Stockbroker)
- Clerical Worker (For Example, Bank Teller, Bookkeeping, Office Clerk, Postal Worker, Secretary, Teacher's Aide)
- Craftsworker (For Example, Baker, Carpenter, Electrician, Foreman, Jeweler, Mechanic, Plumber, Tailor)
- Machine Operator or Laborer (For Example, Bus Driver, Conductor, Factory Worker, Truck Driver)
- Farmer, Farm Manager, Or Farm Laborer
- Service Worker or Private Household Worker (For Example, Barber, Bartender, Cook, Firefighter, Police Officer, Waiter)
- Military
- Homemaker
- Student
- Other (Please Specify)

Which of the following ranges includes your annual household income from all sources?

- Under $25,000
- $25,000 to $49,999
- $50,000 to $74,999
- $75,000 to $99,999
- $100,000 to $124,999
- $125,000 to $149,999
- $150,000 to $174,999
- $175,000 to $199,999
- $200,000 and over
- Prefer Not to Answer

Which of the following describe your current marital status?

- Single and never married
- Married
- Separated
- Divorced
- Widowed
- Prefer Not to Answer

Appendix M

Rejection Page (Main Experiment)

Thank you for taking our survey. As stated in the Information Letter, there are certain requirements that must be met in order to participate and receive compensation.

You are seeing this message because you are not eligible to complete the study and receive compensation. This may be due to any of the following reasons:

- You are under 18 years old.
- You are over 34 years old.
- You do not live in the U.S.
- You do not use smart devices.
- You failed to answer a question that checked to see if you read and understood the instructions.

This follows Amazon Mechanical Turk policy, which states that "a Requester may reject your work if the HIT was not completed correctly or the instructions were not followed."

You may close this window or use your explorer bar to navigate back to the Amazon Mechanical Turk site.

The Information Letter from the beginning of the study is below if you would like to review it:

Appendix N

Independent Sample t-Test Results of Item Scores between the Two Batches of Main Experiments Data

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
NFC1	A	2.206	.138	-.180	1236.000	.857	-.015
	B			-.180	1232.687	.857	-.015
NFC2	A	6.185	.013	-1.872	1236.000	.061	-.150
	B			-1.879	1234.805	.061	-.150
NFC3	A	2.562	.110	.740	1236.000	.459	.065
	B			.742	1233.707	.458	.065
NFC4	A	.162	.687	.247	1236.000	.805	.022
	B			.247	1221.588	.805	.022
NFC5	A	2.726	.099	-.461	1236.000	.645	-.042
	B			-.462	1231.398	.645	-.042
NFC6	A	2.754	.097	-.249	1236.000	.804	-.022
	B			-.249	1233.201	.803	-.022
NFC7	A	1.797	.180	-.656	1236.000	.512	-.061
	B			-.657	1228.775	.512	-.061
NFC8	A	.000	.985	.330	1236.000	.741	.028
	B			.330	1223.328	.741	.028
NFC9	A	.004	.948	-.292	1236.000	.770	-.027
	B			-.292	1224.792	.770	-.027
NFC10	A	4.482	.034	.536	1236.000	.592	.044
	B			.537	1233.140	.591	.044
NFC11	A	1.047	.306	-.321	1236.000	.748	-.025
	B			-.321	1231.577	.748	-.025
NFC12	A	2.616	.106	-.203	1236.000	.839	-.018
	B			-.203	1230.532	.839	-.018
NFC13	A	4.219	.040	-.504	1236.000	.614	-.043
	B			-.506	1233.773	.613	-.043
NFC14	A	.064	.800	-.994	1236.000	.321	-.088
	B			-.994	1223.337	.321	-.088
NFC15	A	.201	.654	.197	1236.000	.844	.016
	B			.197	1228.094	.844	.016
NFC16	A	.000	.989	-.789	1236.000	.430	-.073
	B			-.788	1218.280	.431	-.073
NFC17	A	.409	.523	-1.098	1236.000	.272	-.102
	B			-1.099	1226.063	.272	-.102
NFC18	A	9.984	.002	-.139	1236.000	.889	-.012
	B			-.140	1235.967	.889	-.012
Ad Intrusiveness 1	A	.345	.557	.790	1236.000	.429	.067
	B			.789	1216.352	.430	.067
Ad Intrusiveness 2	A	4.902	.027	.756	1236.000	.450	.081
	B			.758	1232.395	.449	.081
Ad Intrusiveness 3	A	.006	.940	.955	1236.000	.340	.080
	B			.954	1220.277	.340	.080

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Ad Intrusiveness 4	A	.027	.869	.055	1236.000	.956	.005
	B			.055	1221.819	.956	.005
Ad Intrusiveness 5	A	.929	.335	.821	1236.000	.412	.072
	B			.822	1225.169	.411	.072
Ad Intrusiveness 6	A	.060	.807	.623	1236.000	.533	.055
	B			.622	1219.393	.534	.055
Ad Intrusiveness 7	A	.449	.503	1.415	1236.000	.157	.125
	B			1.415	1223.841	.157	.125
Reciprocal	A	.396	.529	-.459	1236.000	.647	-.035
Inclination 1	B			-.459	1228.070	.646	-.035
Reciprocal	A	2.713	.100	-.922	1236.000	.356	-.071
Inclination 2	B			-.921	1213.172	.357	-.071
Reciprocal	A	.433	.511	-.052	1236.000	.959	-.005
Inclination 3	B			-.052	1215.389	.959	-.005
Reciprocal	A	.012	.912	-.516	1236.000	.606	-.036
Inclination 4	B			-.516	1226.123	.606	-.036
Reciprocal	A	.280	.597	-.224	1236.000	.823	-.020
Inclination 5	B			-.224	1226.786	.823	-.020
Reciprocal	A	.002	.967	-.515	1236.000	.607	-.040
Inclination 6	B			-.515	1227.123	.606	-.040
Reciprocal	A	.037	.847	1.724	1236.000	.085	.164
Inclination 7	B			1.724	1222.039	.085	.164
Reciprocal	A	.154	.695	.013	1236.000	.990	.001
Inclination 8	B			.013	1225.069	.990	.001
Reciprocal	A	.243	.622	.048	1236.000	.962	.003
Inclination 9	B			.048	1227.566	.962	.003
Reciprocal	A	.960	.327	-.403	1236.000	.687	-.023
Inclination 10	B			-.403	1223.996	.687	-.023
Reciprocal	A	.553	.457	1.328	1236.000	.184	.094
Inclination 11	B			1.325	1212.425	.185	.094
Reciprocal	A	1.148	.284	-.434	1236.000	.665	-.030
Inclination 12	B			-.435	1234.819	.664	-.030
Reciprocal	A	.608	.436	.003	1236.000	.998	.000
Inclination 13	B			.003	1230.746	.998	.000
Reciprocal	A	.162	.687	1.488	1236.000	.137	.132
Inclination 14	B			1.489	1226.843	.137	.132
Reciprocal	A	.505	.477	.039	1236.000	.969	.003
Inclination 15	B			.039	1227.435	.969	.003
Reciprocal	A	.734	.392	.939	1236.000	.348	.060
Inclination 16	B			.938	1215.612	.349	.060
Complexity 1	A	2.158	.142	1.107	1236.000	.269	.072
	B			1.103	1202.873	.270	.072
Complexity 2	A	.001	.980	.555	1236.000	.579	.048
	B			.555	1222.074	.579	.048
Complexity 3	A	.845	.358	1.234	1236.000	.217	.104
	B			1.235	1228.092	.217	.104
Complexity 4	A	.678	.411	.283	1236.000	.777	.027
	B			.283	1219.066	.778	.027
Complexity 5	A	.000	.994	1.023	1236.000	.307	.104
	B			1.023	1225.633	.307	.104
Complexity 6	A	.281	.596	.272	1236.000	.785	.025
	B			.272	1218.504	.786	.025

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Relevancy 1	A	1.305	.253	-1.454	1236.000	.146	-.151
	B			-1.456	1228.515	.146	-.151
Relevancy 2	A	.053	.819	-1.066	1236.000	.287	-.102
	B			-1.067	1227.464	.286	-.102
Relevancy 3	A	.026	.871	-.591	1236.000	.555	-.058
	B			-.592	1229.459	.554	-.058
Relevancy 4	A	.038	.846	-.857	1236.000	.392	-.081
	B			-.857	1222.835	.392	-.081
Relevancy 5	A	3.138	.077	-1.109	1236.000	.268	-.117
	B			-1.111	1231.594	.267	-.117
App Value	A	2.194	.139	1.445	1236.000	.149	.103
Utilitarian 1	B			1.442	1209.975	.150	.103
App Value	A	.029	.865	1.158	1236.000	.247	.083
Utilitarian 2	B			1.157	1218.682	.247	.083
App Value	A	.371	.543	1.098	1236.000	.273	.084
Utilitarian 3	B			1.096	1215.853	.273	.084
App Value	A	.000	.984	-.316	1236.000	.752	-.027
Utilitarian 4	B			-.316	1225.223	.752	-.027
App Value	A	4.655	.031	1.525	1236.000	.128	.103
Utilitarian 5	B			1.519	1198.906	.129	.103
App Value Hedonic	A	1.303	.254	.656	1236.000	.512	.055
1	B			.655	1214.504	.513	.055
App Value Hedonic	A	.830	.362	-.046	1236.000	.963	-.004
2	B			-.046	1228.968	.963	-.004
App Value Hedonic	A	1.595	.207	1.221	1236.000	.222	.098
3	B			1.218	1206.775	.223	.098
App Value Hedonic	A	.178	.673	.039	1236.000	.969	.003
4	B			.039	1224.450	.969	.003
App Value Hedonic	A	.051	.821	.938	1236.000	.349	.083
5	B			.937	1220.642	.349	.083
WOM1	A	.438	.508	-.483	1236.000	.629	-.042
	B			-.482	1208.954	.630	-.042
WOM2	A	1.357	.244	-.938	1236.000	.348	-.077
	B			-.936	1212.178	.349	-.077
WOM3	A	1.017	.313	-.922	1236.000	.357	-.082
	B			-.920	1212.841	.358	-.082
Download	A	1.416	.234	.855	1236.000	.393	.085
Intention 1	B			.854	1215.190	.393	.085
Download	A	.003	.955	1.160	1236.000	.246	.117
Intention 2	B			1.160	1222.966	.246	.117
Download	A	.040	.841	1.011	1236.000	.312	.102
Intention 3	B			1.011	1220.578	.312	.102
Information	A	1.170	.280	-.245	1236.000	.806	-.022
Quality 1	B			-.246	1228.183	.806	-.022
Information	A	1.903	.168	-.380	1236.000	.704	-.031
Quality 2	B			-.380	1228.092	.704	-.031
Information	A	1.612	.204	-.633	1236.000	.527	-.054
Quality 3	B			-.634	1230.301	.526	-.054
Information	A	.287	.592	.479	1236.000	.632	.040
Quality 4	B			.478	1216.386	.632	.040
Information	A	.726	.394	.033	1236.000	.974	.002
Quality 5	B			.033	1227.943	.974	.002

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Information Quality 6	A B	1.351	.245	-.140 -.139	1236.000 1213.777	.889 .889	-.011 -.011
Information Quality 7	A B	1.515	.219	1.616 1.613	1236.000 1215.704	.106 .107	.138 .138
Information Quality 8	A B	1.451	.229	.008 .008	1236.000 1227.184	.993 .993	.001 .001
Information Quality 9	A B	.555	.457	.871 .872	1236.000 1228.170	.384 .383	.075 .075
Information Quality 10	A B	.027	.869	.607 .607	1236.000 1220.765	.544 .544	.054 .054
Information Quality 11	A B	1.343	.247	.364 .364	1236.000 1215.812	.716 .716	.033 .033
Information Quality 12	A B	.604	.437	.137 .137	1236.000 1214.205	.891 .891	.011 .011