

Mobile Device-Based Offers: Determinants of Consumer Response in Sophisticated (Extreme) Users

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ABSTRACT

We explore empirically, using quantitative methods, factors affecting extreme-user response to mobile device promotional offers. A convenience sample of expert users was surveyed from a US Executive MBA Program. The data, consisting of survey responses (Likert-type scales and dummy variables), were analyzed using ordinary least squares (multiple) regression. Our findings show that (1) use of text media, (2) use of email media, (3) providing personal information, and (4) concern about privacy issues predict increased response to mobile phone promotional offers. This preliminary study offers insights for academics studying new technology adoption, as well as for retailers interested in enhancing their promotional strategies through pushing the frontier of mobile device technology. Our approach additionally has value for user-centric research under a design thinking framework; it represents a potentially powerful tool for data analysis that mitigates some of the issues with (more qualitative) anthropological ethnographic work, notably observer bias.

General Terms

User interface design, Experience design, Wireless mobile device, Future retail scenario, User-centric research.

Keywords

Mobile device-based offers, consumer response, extreme users, interface design, retail consumers.

1. INTRODUCTION

Broadly, we propose and demonstrate a novel approach to studying extreme mobile device-users' tendency to respond to location-based wireless offers under a user-centric research based on design thinking (Heiman and Burnett, 2009). Our main contribution is to deploy a "conventional social science" empirical method in a non-conventional manner, for interaction design purposes. Surveying extreme mobile device-users in a retail environment (receiving sales offers/promotions via smartphone) offers concrete insights regarding possible near-future transactional setups and the local positive network effects

of propagation through routine social media. We explore the latter primarily through a brief fictional scenario to increase clarity regarding the types of transactions we envision comprising early location-based, mobile-device-based transactions in the US. The existing convention for this type of exploration has been anthropological ethnography. Our approach identifies an alternative method with fewer methodological issues than ethnography. By using straightforward quantitative analysis (OLS regression) of survey data focused on perceived key factors, we mitigate issues of bias from subjective interpretation of observations and increase sample size while sacrificing minimal richness of findings.

Multiple strategies exist for exploring novel uses of forefront technologies for enhancing retail sales. We identify and test nine distinct approaches' effects determining consumer response to mobile device-based offers. The first strategy emphasizes perceived suitability of promotional offers to the consumer. The second focuses on the importance of receiving an offer within close proximity to the store. The third, fourth and fifth strategies explore whether offers arriving via text, email, and/or social media respectively predict consumer response to mobile-based offers. The sixth strategy examines the effect of the degree of consumers' willingness to provide personal purchasing information to retailers. The seventh strategy investigates consumers' feelings about privacy (degree of concern). The eighth looks at whether heavy use of social network sites (e.g., facebook) predicts response. Finally, the ninth strategy explores the impact of offer duration on response to offers via mobile devices.

Retailers able to adopt multiple effective strategies may achieve competitive advantage. Since this is a relatively new topic of exploration, there is very little research offering information regarding best practices for consumer response to mobile device-based offers. Our approach uses a small sample of extreme or sophisticated "smartphone" users. Using survey data from 34 subject matter experts in a US-based Executive MBA

Program, we explore how mobile device technology can be effectively utilized for increasing consumer response. Understanding more about the effects of offer suitability, store proximity, feelings about text media offers, email offers, and social networking-based offers, as well as willingness to provide personal information, privacy concerns, social network usage intensity and offer duration shed light on this nascent form of micro-marketing.

This paper first provides a stylized example of applied mobile device technology for making offers to users. We then offer a market overview of which firms are doing what at the time of writing this paper. We next argue for nine testable hypotheses, and then describe our methodology, sample data and variable construction. Next, we present the results of a controlled multiple regression model. We conclude with the implications of our findings, issues, and discuss future research directions. Our goal is to make a preliminary, exploratory contribution to understanding what factors determine extreme user response to mobile device promotional offers. By looking at extreme users rather than "average" users, per conventional marketing studies, we are able to reflect on possible, even likely, future usage patterns and preferences of all users. This approach to user-centric research is a potentially useful alternative method to both conventional marketing studies (which focus on understanding the "average" user/consumer), as well as ethnographic approaches.

2. STYLIZED EXAMPLE—A BRIEF SCENARIO

This section briefly conveys, through a fictitious, highly stylized scenario, the numerous opportunities for retailers to evoke consumer response through mobile device-based promotional offers. This approach is usefully clarifying because elements in this stylized scenario reflect many of the hypotheses argued for below, the veracity of which we subsequently test for in our quantitative analysis. Caveat: this speculative scenario is intended to offer prospective examples of mobile-based offers and consumer response, not a definitive picture of how wireless-based offers will take shape. We assume that retailers who fully capitalize on mobile device-based technologies for their shoppers take full advantage of being well-connected to consumers at all times.

Ally is a 29-year old female working in a large US city as a well-compensated management consultant. Ally has 350 total Facebook friends. Ally is on her way to work and passing by her favorite designer apparel store. Her mobile smartphone is able to sense that she is in an area that contains shopping destination interests. She receives a limited time promotional text message for a jewelry piece she has been eyeing both in the store and online. She notes this offer, but decides she needs to get to work and ignores it.

While at lunch, Ally receives an email invitation for an upcoming private event featuring her favorite designer visiting the store. Ally quickly checks her schedule on her smart mobile device, and accepts; the invitation is the result of the new customer loyalty rewards program she has registered for, using a smartphone application. Her response and a description of the event is instantly posted on her Facebook wall. Her 85 facebook friends that are also in the same customer reward program receive information not only about the event, but additionally receive promotional offers via emails and text messages depending on their personal contact preferences.

On the way home from work, Ally cannot bear to pass up a different promotional offer she was sent earlier that day via email, at which she glanced only briefly (during work hours). On a break, after closer inspection, and about 90 minutes or so before leaving work for the day, she looked over the offer: who could pass up 40% off the computer printer she had in mind to purchase anyway? She has to stop in. While entering the store she gets a text on her smartphone telling her that select print cartridges are on sale, today only on the salesfloor's back wall. She decides to check these out. On her way to the cartridges, Ally stumbles into the newest netbook computers. She loves the colors and the new styles. She decides it cannot hurt to purchase one of the full price items—she was planning to get a netbook soon anyway. It is a fast tiny machine and she feels that she will be able to use it for a long time.

While in the store, she notices that her friend, who is also a loyal customer, has commented in response to the status message posted earlier (automatically) on Facebook regarding the fashion designer event she will attend. Her friend refers to a limited edition item that is now at that store, nearby. Ally eyes her friend's suggestion. She decides this will be a future purchase. It might be a good purchase on the night of the event. Ally posts a message back to her friend about the uniqueness of the limited edition item and mentions all the great computer gear she bought today! Instantaneously, the rest of Ally's 350 friends each receive facebook feeds about all of Ally's exciting purchases of the day. Those that are members of the same computer-store loyalty rewards program as Ally receive text or email promotional offers for online purchases of similar, but distinct items, tailored to their own previously provided preferences.

As Ally is leaving the store, she receives another text thanking her for her purchases today; a phone number and the name of a service manager along with her photo appears on her smartphone screen offering personalized in-person or virtual shopping assistance as well as technical support. There is a touchscreen-based app button for instant IP-based voice and video communication on Ally's mobile device. Ally declines the offer of immediate personal contact, but saves this message for possible access/use later. This interaction takes about 20 seconds; Ally sees these offers all the time. As she is walking to her car, she receives a Tweet on her mobile device from a pizza place that she is walking by, offering two slices of pizza for the

price of one with a free coke. She ignores this message and tells the smartphone to stop recommending this restaurant.

After reaching her car, she drives away feeling she has received a great deal and personalized service. She cannot wait to attend the fashion event later that week with her friends. Without being connected by use of her mobile device, Ally would have never dreamed of responding to promotional offers by the above retailers—she would never have known about them without her smart mobile device. Moreover, her economic activity and social commitments resulted in contacts with 250 people, some of them several times, for different promotional opportunities. The result was that about 5% of the 250 friends (12 people) made purchases at one or the other retailer in excess of \$100, generating at least \$1200 in sales for these retail firms.

The above stylized scenario illustrates a speculative, yet conservative, series of transactions and interactions that have the potential to generate economic activity at very low cost once high bandwidth communications are available in most places, a condition already achieved in many high end retail areas. The intent of this section has been to justify the main question of this preliminary study: "what drives mobile-device consumer response among extreme users?" Having illustrated the potential for commerce in a speculative scenario, the next section discusses the present state of the market at the time of writing.

3. LITERATURE AND MARKET OVERVIEW

3.1 According to Kurkovsky & Harihar (2006) two components are involved in attracting customers to a mobile device-based promotional product. The product must fit the customers' preferences and be received via customers' preferred mobile media. We explore these and other factors in our study, and confirm these findings with quantitative evidence; our work goes a step further, and identifies specific media preferences as well as consumer attributes that determine willingness to act on mobile device-based offers.

Fitting customers' preferences is a form of personalization of promotional offers. Xu (2006/2007) found personalization the most influential factor in consumers' attitudes towards mobile advertising. Consumers want individual-relevant mobile promotions (see, for example, Barwise & Strong, 2002; Friedrich, Grone, Holbling & Peterson, 2009). Lee and Jun (2007) have suggested that the personal nature of mobile devices has led to the unique service features of ubiquity, constant reachability, personalization, and localization (see also Kurkovsky & Harihar, 2006, for similar taxonomies).

Consumers must also provide personal information and permission in order to create the most relevant offers (Barwise & Strong, 2002; Friedrich, Grone, Holbling & Peterson, 2009; Sinisalo, Salo, Karjaluoto & Leppaniemi, 2007). Collecting information and permission directly from the consumer initiates active communication and a high response rate. Communication and a high response rate is achieved through building and

keeping consumer trust. The formation of trust is an important factor leading to the success of mobile offers (Prykop & Heitmann, 2006). Establishing consumer trust builds credibility. The process of collecting consumer information is not only a way of creating relevant offers, but is also an opportunity to educate consumers regarding any privacy concerns and safeguards in order to gain consumer confidence and trust. Xu (2006/2007) states that Mackenzie and Lutz (1989) define advertising credibility as consumers' perception of the truthfulness and believability of advertising in general. Friedrich, Grone, Holbling and Peterson (2009); Sinisalo, Salo, Karjaluoto and Leppaniemi, (2007) and Prykop & Heitmann (2006) all subscribe to the notion that mobile offers create opportunities to enhance relationships between consumers and retailers while increasing customer loyalty. Tempering this view, "[i]f consumer concerns about privacy are not addressed, the growth of mobile advertising may well be jeopardised by the same lack of consumer trust that has discouraged the growth of e-mail marketing." (Cleff, 2007, 263).

Xu (2006/2007) found highly educated consumers have positive attitudes and intentions about mobile advertising and are more willing to give personal information to receive relevant offers. Lee and Jun's (2007) research found permission, content, wireless service provider control, and the delivery of the messages all determine consumer attitudes towards mobile marketing. Constantiou, Damsgaard, & Knutsen (2007) found that concentration of mobile marketing should be on text message services, a step behind current advanced mobile services, e.g., smart phone apps. Constantiou et al (2007) looked at consumer preferences of writers, photographers, and surfers. We study similar preference information of executive graduate students working in various professions. Friedrich, Grone, Holbling & Peterson (2009) report that their exploration suggests consumers are ready for mobile device-based offers.

4. Hypotheses: Consumer Response to Mobile Device-Based Offers

Recent economic conditions have caused a need for change in how the retail industry does business. With consumer spending flat at best for extended periods, and fierce competition in the retail sector, it has become essential for the industry to develop new strategies for reaching consumers and enhancing sales. Retailers will almost certainly be able to utilize consumers' purchasing power more effectively and enhance consumer response to promotional offers by sending messages directly to their customers' mobile devices. The question of how to best elicit a response from consumers comes to the foreground. The factors impacting consumer response to retailers through the use of mobile device technologies are largely unexplored in a quantitative sense. For example, the Survey of Manufacturer and Retailer Promotional Practices represents a qualitative approach (Angrisani, 2008). Loyalty program surveys represent one common marketing research approach currently used by retailers (Jaffee, 2007). It is important for retailers to understand the distinct drivers of consumer response to mobile device-based promotional offers in order to be at the forefront of developing a successful competitive strategy conducting future business (Perry, 2008). Below, we offer nine testable propositions asserting factors affecting consumer response to promotional

offers through the use of mobile device technology. Some of the factors are offer attributes, while others consumer attributes.

4.1 Offer Attribute: Suitable Offers

Consumers are currently bombarded by various promotional offers, some suitable, while others are not even close to suitable for a given consumer. Often suitable offers are ignored along with the rest of junk (e)mail or spam. It is no longer a valid assumption that a consumer will sift through multiple offers to locate a valued incentive offer. Location-based offers for mobile devices, however, offer a chance to reach self-selecting consumers: presence in or near a store suggests possible suitability for individual consumers, assuming consumers generally are where they want to be at a given moment. There are currently very few proximity-based promotional offers directed specifically to mobile devices, though the number is increasing. Most common offers are still directed in the form of email "blasts" which, in many cases are accessible through mobile devices. A low percentage of these email "blasts" are consistently read or acted upon. A blast refers to a non-targeted or minimally promotional offer sent to all current customer emails regardless of purchasing habits or segmented demographics. These offers are often ignored due to the high quantities sent and lack of individual consumer value. We see proximity-generated email offers as distinct from email offers for virtual shopping (location-independent web-based purchases). Given the technological ability to direct specific offers to particular individual consumers' phones based on prior purchases, purchasing habits, and micro-segmented demographics, these strategies may prove useful for both the retailer and the consumer. As promotional offers via mobile devices become more common, it will be feasible for retailers to send more customized offers. Sending suitable (custom) promotional offers will allow retailers to deliver value to consumers. When consumers recognize value, they will be more likely to respond to offers.

Hypothesis 1: Consumers are more likely to respond to promotional offers through the use of their mobile devices when suitable (customized) offers are received.

4.2 Offer Attribute: Store Proximity

It is critical for the retailer to be at the forefront of the consumer's mind; nothing achieves this goal like customers' physical proximity to or presence in the store. Proximity allows the retailer to capture instant advertising at a critical time and adds consumer value via an economic offer (a discount, for example) as well as the convenience of the nearby store. Consumers are generally happy to accept offers that allow them to access free location based services (Wilson, 2008). Because all mobile phone service providers are required to have E911, a service tracks phone users when there is an emergency situation, location detection systems are already largely functional (Reedy, 2008). The location-based service platform enhances the value of proximity-convenience to the consumer: "I have a promotional offer, I am right here, right now--I should redeem the offer while it is most convenient for me." The most popular real-time messaging service, Twitter, is allowing a number of businesses

to profit from proximity "because the messages pop into users' Twitter feeds while they're close enough to act on it" (Klaassen, 2009). Consumers are most likely to respond to mobile device-based promotional offers that are proximity-convenient to use.

Hypothesis 2: Consumers are more likely to respond to promotional offers through the use of their mobile devices when offers are received within the immediate proximity of an offering store.

4.3 Consumer Attribute: Text Media

Most mobile device users have and use text messaging services, making it a potential primary-choice media format that is both available and familiar to the majority of consumers. Text messaging is less complex than other forms of media owing to high compatibility across varying devices and service providers. Text media provides an opportunity for retailers to communicate promotional offers effectively by utilizing these uniquely personal communication tools (smart mobile devices). "But mobile advertising through text messages is the most focused: if marketers use mobile firms' profiles of their customers cleverly enough, they can tailor their advertisements to match each subscriber's habits" (Gomez-Zamalloa, 2007, 2). Text media also allows the opportunity for consumers to respond in the same manner as that used for friends. Consumers often choose to communicate through the use of text messages--indicating a high degree of comfort with the medium-- and may prefer to communicate with retailers using the same method (Perry, 2008). For example, one marketing campaign for Motorola's RAZR mobile phone involved receiving a text message from celebrity David Beckham (on behalf of the retailer). Beckham's message encouraged the recipient to "say goodbye" to a friend by snapping a photo in front of the poster advertisement. A message from Beckham was also included to the friend, and as a result "Motorola's RAZR sales jumped by 12%" (Quinton, 2008).

Hypothesis 3: Consumers are more likely to respond to promotional offers through the use of their mobile devices when offers are received by text media.

4.4 Consumer Attribute: Email Media

Though text messages are popular, increasingly, mobile device users are purchasing phones with internet capabilities and are subscribing to internet service plans (Perez, 2009). These mobile device users are able to access their email anywhere, which allows the retailer to reach a consumer at any time. Marketers enjoy an ROI (return on investment) that is two to three times higher with email than for any other form of direct marketing. The costs inherent in receiving and responding to offers via email versus other modes of communication (e.g., text messages) presently ensure that most promotional offers are sent by email.

Hypothesis 4: Consumers are more likely to respond to promotional offers through the use of their mobile devices when offers are received by email media.

4.5 Consumer Attribute: Social Media

Social media, on-line communities, form through common interests and friends connecting. A product or service highly preferred by one user may be suggested to another similar consumer, and also sought out by others within an on-line community (Baker, 2009). Retailers have the opportunity to profit from suggesting offers through social media customer groupings; the best example of this is facebook, which allows individuals to "like" firms (previously "become a fan"), allowing offers to flow to individuals from those firms. For example, San Francisco advertising company Rapleaf increased their average click-through rate by 200% when tailoring offers based on their friends' profiles (Baker, 2009).

Hypothesis 5: Consumers are more likely to respond to promotional offers through the use of their mobile devices when offers are made via social media.

4.6 Consumer Attribute: Provide Personal Info

The ability of retailers to gather consumer information is often limited because consumer consent is required. When consumers are willing to provide personal purchasing preferences, retailers can offer suitable promotions. Consumers are "in tune" with these offers because they know they have provided the appropriate information in order for the retailer to make valued offers. Also, we assert commitment breeds confidence in vendors, which may reflect consumers' desire to avoid cognitive dissonance: "I provided my information, so I must believe the vendor is secure and credible." Consumers also want to receive accurate promotional offers at the cost of making their purchasing history and habits accessible to other retailers (Wilson, 2008).

Hypothesis 6: Consumers are more likely to respond to promotional offers through the use of their mobile devices when they are willing to provide personal information to particular retailers.

4.7 Consumer Attribute: Privacy Concerns

Despite available advanced security technologies, consumers still remain concerned about personal information falling into the wrong hands. Consumers are wary of any possibility of revealing financial information, such as credit card numbers. Thomas and Maurer (1997) state that consumers are most concerned about information being used by those who are unauthorized. Privacy continues to be valued by consumers in order to avoid identity theft. Thomas and Maurer also observe that consumers are concerned about their personal information being held in databases. Retailers must operate strategically, yet with caution in order to retain their loyal customers and must avoid potential bad reputation that could taint potential new customers' attitudes. Most consumers do not understand the capabilities of the newest technologies, even when they are fully equipped with the latest technological devices (Reedy, 2008; Shah, 2008). For example, most consumers do not realize that many mobile devices include GPS or GPS-like functionality. Location-based functions seem to be one of the major areas for

privacy concerns; it is possible to know, at any given moment, consumer location when they are carrying their mobile device (Reedy, 2008). Widespread fear of identity theft suggests highly privacy-concerned consumers will act cautiously and may not respond to offers.

Hypothesis 7: Consumers are less likely to respond to mobile device-based promotional offers the greater their concerns about privacy issues.

4.8 Consumer Attribute: Social Networking (intensity of use)

Many retailers have created their own accounts systems within on-line communities (e.g., Facebook). This provides free public relations and allows the posting of promotional offers members of the on-line community may seek out. For example, Naked Pizza, a New Orleans pizza shop executed a social networking offer effectively and reported 15% of the day's business came exclusively from Twitter, an extraordinary finding hinting at the potential of mobile-device-based offers (Klaassen, 2009).

There exists an opportunity to build product and service reputation using social network media. For example, Fizzback, has worked with multiple retailers to make customer services available to consumers through the use of mobile devices (Perry, 2008). By listening to their current customers in actual- or near-real time, retailers will be able to effectively provide the greatest customer value, and increase consumer response.

Hypothesis 8: Consumers are more likely to respond to promotional offers through the use of their mobile devices, the more actively involved they are in social network sites.

4.9 Offer Attribute: Offer Length

An appropriate offer duration is critical to the success of promotional offers. The shorter the offer length, the greater the sense of urgency the retailer will be able to create within the consumer. For example, a mobile retailer reported a successful "Deal of the Day" marketing tactic at a mobile retailing conference in London (Perry, 2008). Fresh Encounter, a food retailer, has reported success sending out text messages valid for a couple of hours. "The message, sent at 2 p.m. on a Thursday or Friday, offered a deal on a whole rotisserie chicken...to shoppers who came to the store after 5 p.m. on those days" (Garry, 2009). According to Garry, these same-day chicken promotional text offers have an average response rate higher than 30%. Additionally, because technologies exist that allow the retail firm to locate mobile users, there are unlimited opportunities for retailers to create instant realistic limited time promotions (Quinton, 2008; Klaassen, 2009).

Hypothesis 9: Consumers are more likely to respond to promotional offers through use of their mobile devices when offers are valid for comparatively shorter lengths of time.

5. Method and Data

In order to gain an understanding of consumer response to mobile device promotional offers, we employed a survey instrument with which we gathered data from a total of 34 expert respondents, all of whom are or recent alumni of a major US-based west coast university's Executive Masters of Business Administration Program and are avid smart phone users. More specifically, most people in the sample (from multiple highly diverse executive MBA cohorts) use smart phones, which possess more characteristics of a small computer than solely a phone (e.g., they run applications or apps). We purposely selected a sample of people that could be properly labeled "sophisticated" or "expert" users of their personal communications smart media devices. We are looking at the perceptions of extreme users; this group of users already generally pushes the existing limits of current technology in the service of their full time jobs and personal lives; they should be rich with possibility to detect effects of our test factors on tendency to respond to mobile-based offers. The survey instrument consisted of nine numerically codeable questions and one open ended question. We collected data from consumers who are frequent and avid mobile device technology users: expert users of this new technology. We received a total of 34 responses from soliciting 61 subject matter experts, a response rate of 56%. 33 responses were complete and useable in the analysis.

We interviewed several key informants as subject matter experts in order to help in constructing the survey. These included mobile device service providers, software developers, marketing and advertising professionals, and retailers. We conducted ten personal interviews. Five interviews were conducted in person, two by email, and three were conducted by phone. The same six questions were posed to all interviewees (see Appendix A). The degree of participation varied based on willingness to participate, knowledge of the mobile shopping arena, and ability to share company specifics. These interviews informed the construction of the survey (Appendix B).

6. Construction of Variables

6.1 Dependent Variable – TendencyToRespond

Our analysis uses expert mobile device technology users' perceptions of consumer response to mobile phone promotional offers as a dependent variable (TendencyToRespond). Our dependent variable derives from the survey question, "Would you respond to a promotional offer you receive on your mobile phone?" This dependent variable is measured on a 3-point Likert-type Scale with a range of 0-2, where 0 is no, 1 is maybe, depends how busy I am and 2 is maybe, it depends on the retailer or product factors. We interpret product- or retailer-specific factors as reflecting a relatively greater tendency to respond than how busy a person is at the time of the offer. Our dependent variable tries to capture consumer openness to being influenced by the retailer—increasing tendency to respond—if the consumer has gotten past personal-time limitations and is considering the product or retailer, then this is evidence of the greatest tendency

to respond. The construct has a mean equal to 1.0 and a standard deviation of 0.953. For all measures, including the dependent variable, we assume that ordinal measures in the survey reflect underlying continuous scales. This allows us to use OLS regression without violating assumptions about the nature of measures employed.

6.2 Independent Variables

6.2.1 SuitableOffers

One independent variable, SuitableOffers, answers the question, "Would you be more likely to respond if you only received promotional offers suitable to your purchasing habits, needs, and desires?" This independent variable attempts to unpack how the fit of offers to consumers affects tendency to respond to offers. This variable is used to test Hypothesis 1, that consumers who receive suitable offers are more likely to respond to mobile device technology promotional offers. A dummy variable is used, where 0 is no and 1 is yes. The measure has a mean of 0.735 (indicating almost 74% of respondents would respond to a suitable custom offer) and a standard deviation of 0.448.

6.2.2 StoreProximity

Another independent variable, StoreProximity, answers the question, "If you received a promotional offer via your mobile phone while in the proximity of the store would you be more likely to purchase the item?" This independent variable attempts to explain the effects of purchasing habits on consumer response to nearby promotional offers. This variable is used to test Hypothesis 2, which asserts consumers who receive promotional offers while in the store proximity are more likely to respond. As above, a dummy variable is used, where 0 reflects no and 1 is yes. The construct has a mean equal to 0.500 and a standard deviation of 0.508.

6.2.3 TextMedia

A third independent variable, text media, partially answers the broader question, "via which media form would you prefer to receive an offer on your mobile phone?" This measure explores the media-form retailers should use within the world of mobile device technologies. This independent variable posits consumers are likely to respond to text message-based offers, testing Hypothesis 3, that retailers should use promotional offers in the form of text media in order to increase consumer response. Again, a dummy measure is used, where 0 is no and 1 is yes. The construct has a mean equal to 0.147 and a standard deviation of 0.35.

6.2.4 EmailMedia

A fourth independent variable, email media, also addresses the question, "via which media form would you prefer to receive an offer on your mobile phone?" This variable tests Hypothesis 4, also relating to media form preferences; H4 asserts retailers tests if using promotional offers in the form of email media increases consumer response. As above, a dummy variable is used, where 0 is no and 1 is yes. The construct has a mean equal to 0.529 and a standard deviation of 0.507.

6.2.5 SocialMedia

A fifth independent variable, social media, also explores the question, "via which media form would you prefer to receive an offer on your mobile phone?" This measure is used to test Hypothesis 5, which asserts retailers should use promotional offers in the form of social media in order to increase consumer response. Another dummy measure is used, where 0 is no and 1 is yes. The construct has a mean equal to 0.147 and a standard deviation of 0.359.

6.2.6 ProvidePersonalInfo

A sixth independent variable, ProvidePersonalInfo, answers the question, "Would you be willing to provide personal information to particular retailers in order to receive promotional offers suitable to your purchasing habits, needs, and desires?" This measure tests Hypothesis 6, that consumers are more likely to respond to mobile device technology promotional offers if they are willing to provide personal information. As above, a dummy measure is used, where 0 is no and 1 is yes. The construct has a mean equal to 0.265 and a standard deviation of 0.448.

6.2.7 PrivacyConcerns

A seventh independent variable, PrivacyConcerns, answers the question, "How concerned are you with privacy issues surrounding your purchasing information?" This variable is used to test Hypothesis 7: consumers who are more concerned with privacy issues are less likely to respond to mobile device technology promotional offers. A 4-point Likert-type scale with a range of 0-3 is used, where 0 is not at all, 1 is barely, 2 is

somewhat, and 3 is very concerned. The construct has a mean equal to 2.294 and a standard deviation of 0.871.

6.2.8 SocialNetworking

An eighth independent variable, SocialNetworking, answers the question, "What is the degree to which you are involved in social media activities?" This independent variable explores how degree of involvement in social media affects the response to promotional offers (independent of willingness to receive offers via social media). This variable is used to test Hypothesis 8: consumers who are more actively involved in social networking are more likely to respond to mobile device-based promotional offers. The measure runs from 0-2, and increases with intensity of social media use. The construct has a mean equal to 1.176 and a standard deviation of 0.626.

6.2.9 OfferLength

A ninth independent variable, offer length, answers the question, "Upon receiving an offer, what length of time would be most effective for you to make a purchase?" This independent variable attempts to understand effects of timing on promotional offer response. This measure is used to test Hypothesis 9: consumers who receive promotional offers valid for shorter periods are more likely to respond to offers. A 4-point Likert-type scale with a range of 0-3 was used, where 0 is valid two hours or less,

1 is valid one day only, 2 is valid one-two days only and 3 is valid two or more days. The construct has a mean equal to 2.485 and a standard deviation of 0.870.

Table I: Summary of Construction of Variables	
Construction of Variables	
Dependent Variable	
<i>TendencyToRespond</i>	Indicates degree of tendency to respond to mobile offers.
Independent Variables	
<i>SuitableOffers</i> (H1)	Importance of fit of offers to individual tastes, needs, preferences.
<i>StoreProximity</i> (H2)	Store proximity's effect on tendency to respond.
<i>TextMedia</i> (H3)	Degree of preference to receive offers via text messages.
<i>EmailMedia</i> (H4)	Degree of preference to receive offers via email.
<i>SocialMedia</i> (H5)	Degree of preference to receive offers via social network media.
<i>ProvidePersonalInfo</i> (H6)	Extent of willingness to provide personal information for retailer use.
<i>PrivacyConcerns</i> (H7)	Extent of concern regarding individual privacy.
<i>SocialNetworking</i> (H8)	Extent of involvement with online communities/network media (e.g., facebook)..
<i>OfferLength</i> (H9)	Indicates extent of preference for increasingly longer duration offers.

7. Sample and Descriptive Statistics

Table I presents a summary of our measures by hypothesis.

Table II presents summary statistics for our measures. There appears to be sufficient variation in the data for a regression analysis.

Table II. Summary statistics for dependent and independent variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>TendencyToRespondTo</i> (DV)	34	1.000	0.953	0	2
<i>SuitableOffers</i> (H1)	34	0.735	0.448	0	1
<i>StoreProximity</i> (H2)	34	0.500	0.508	0	1
<i>TextMedia</i> (H3)	34	0.147	0.359	0	1
<i>EmailMedia</i> (H4)	34	0.529	0.507	0	1
<i>SocialMedia</i> (H5)	34	0.147	0.359	0	1
<i>ProvidePersonalInfo</i> (H6)	34	0.265	0.448	0	1
<i>PrivacyConcerns</i> (H7)	34	2.294	0.871	0	3
<i>SocialNetworking</i> (H8)	34	1.176	0.626	0	2
<i>OfferLength</i> (H9)	33	2.485	0.870	0	3

Table III (the correlation matrix) shows the highest absolute magnitude of all correlation coefficients is 0.554 between heavy use of social media and social media as a preferred way to receive offers. This suggests the data are not problematically correlated. From the descriptive analysis, the data appears suitable for further analysis.

Table III—Correlation matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>TendencyToRespondTo</i> (1)	1								
<i>SuitableOffers</i> (2)	0.355	1.000							
<i>StoreProximity</i> (3)	0.376	0.467	1.000						
<i>TextMedia</i> (4)	0.442	0.061	0.083	1.000					
<i>EmailMedia</i> (5)	0.314	0.236	0.236	-0.440	1.000				
<i>SocialMedia</i> (6)	-0.177	0.061	0.083	-0.172	0.059	1.000			
<i>ProvidePersonalInfo</i> (7)	0.071	0.209	0.067	-0.061	0.165	0.316	1.000		
<i>PrivacyConcerns</i> (8)	0.219	0.050	0.069	0.051	-0.089	-0.046	-0.516	1.000	
<i>SocialNetworking</i> (9)	-0.102	-0.045	-0.191	-0.119	0.079	0.554	0.045	0.124	1.000
<i>OfferLength</i> (10)	0.095	-0.010	-0.229	-0.042	0.232	-0.140	0.130	-0.038	-0.051

8. Regression Analysis

Table IV shows the results of ordinary least squares regression analysis for our sample data. The F-Statistic for the model indicates that our model predicts outcomes substantially better than a model consisting solely of a constant ($p < 0.005$). The adjusted R-square statistic indicates our model explains 57% of the variation in the data, a substantial fraction (unadjusted R-square = 0.688).

Hypotheses 3, 4, and 7 are strongly supported at a significance level of $p < 0.005$. Hypothesis 6 is also supported at a level of $p < 0.05$. Our findings for Hypotheses 3 and 4 suggest that consumers who use text and email media are most likely to respond to mobile device promotional offers. Hypothesis 5 is not supported (no apparent effects on consumers who heavily use social media on tendency to respond to mobile device-based offers). Hypothesis 6 is supported and predicts that consumers who are willing to provide personal information to retailers are more likely to respond to mobile device promotional offers. Hypothesis 7 has a significant coefficient, but the coefficient's sign was opposite that expected. It shows that consumers who are more concerned about privacy issues surrounding purchasing information are more likely to respond to mobile device promotional offers. Hypotheses 1, 2, 5, 8 and 9 were not supported.

Consumers most likely to respond to mobile phone promotional offers 1) use text media on their mobile device, 2) use email media on their mobile device, 3) are more likely to provide personal information, and 4) are very concerned about privacy issues surrounding their purchasing information.

Table IV. Regression analysis results

Dependent Variable:	<i>TendencyToRespondTo</i>
n	33
F (dfmodel, dfresid.)	5.64 (9, 23) ***
R-squared	0.6881
Adj. R-squared	0.5661
	Coefficient (standard error)
<i>SuitableOffers</i>	0.234 (0.292)
<i>StoreProximity</i>	0.206 (0.279)
<i>TextMedia</i>	1.825 *** (0.365)
<i>EmailMedia</i>	1.196 *** (0.287)
<i>SocialMedia</i>	-0.456 (0.413)
<i>ProvidePersonalInfo</i>	0.755 * (0.352)
<i>PrivacyConcerns</i>	0.599 *** (0.195)
<i>SocialNetworking</i>	-0.030 (0.229)
<i>OfferLength</i>	-0.056 (0.143)
constant	-1.562 * (0.658)
	* $p < 0.05$
	** $p < 0.01$
	*** $p < 0.005$

9. Concluding Remarks

The purpose of this paper has been to test a first-ever quantitative model that predicts the tendency to respond to mobile device-based offers, based on data obtained from leading-edge "extreme" smart mobile device users. The independent variables were selected to reflect different potential marketing insights for retailers (offer and consumer attributes). Analysis reveals that multiple (but not all) approaches are highly effective. Those approaches are use of text media and/or email media (offer attributes), privacy concerns, and willingness to provide personal information (consumer attributes). Text media marketing has the greatest impact on tendency to respond, followed by use of email media. The highest degree of privacy concern, however, has an impact similar to that of text media use. Willingness to provide personal information has the least (but nonetheless substantive) impact on tendency to respond to offers.

9.1 Issues

As noted, making offers to people who are concerned about privacy has a highly significant positive impact on mobile device response. We speculate this result may be owing to (1) people who are concerned about privacy issues are the customers that are the most "tech savvy." These are the people with a strong awareness of security issues; or (2) people who are concerned about privacy issues are well-informed and aware of risks and safety measures. They search for and through credible, reputable offers and loyalty club membership details in order to avoid identity theft mishaps they have heard about. When consumers understand the implications of new concepts and processes, they are more likely to be open to them and less likely to resist them (Garry, 2009). The more retailers focus on this target market, the more likely customers will respond. Strategically, this finding suggests if one sets out to educate consumers about security, more people might be interested in responding to mobile-based offers.

Additionally, our analysis reveals a "personal information" strategy is effective. The ability of consumers to provide personal information in order to ensure suitable promotions has a significant positive impact on tendency to respond to mobile device-based offers. The more retailers are able to collect volunteered consumer information, the more likely customers will respond. The more people perceive that they cooperate with stores (e.g., by supplying information about themselves), the more they are likely to respond to offers because they work with the stores. For example, "between 15% and 30% of shoppers who select an offer on their phone go on to redeem it at the store," and more than half redeemed additional offers (Garry, 2009), an important spillover effect. Again, we posit this may be a result of consumers trying to avoid cognitive dissonance—one one wants to believe that they just provided their personal information to a non-credible, unsecure store.

This study identifies prospective marketing insights that might be expected to work effectively for retailers in order to increase consumer response through mobile device promotional offers. There are limitations, however, to our findings. First, the

sample size of 34 users was relatively small, especially considering that we tested nine possible factors on tendency to respond; a larger sample in a future confirmatory study is appropriate (though testing smaller numbers of factors in smaller models consistently yielded the same substantive results—we presented only one model herein in order to avoid communication diseconomies). Second, the survey was comprised of a convenience sample of colleagues in a California-based Executive MBA program. The sample was composed of individuals from the same geographic area and with similar education levels, potentially introducing bias. Though this allowed us to hold a number of factors constant in the sample, a larger, more diverse sample would allow for the use of control measures. Third, the survey did not explore attitudes towards any particular retailer. Results may differ when specifics are involved—particularly in the world of competitive store branding. Finally, although a rigorous regression was conducted, a Cronbach's Alpha (or factor analysis) component was absent because all measures of variables were made using only one survey item—possibly affecting reliability—this was owing to the busy nature of respondents, and their limited time-availability. Future work might test a larger survey sample, using a survey suitable for reliability checking of constructs; respondents should come from a wider variety of education levels and various locations nation-wide. Further exploration might be done including questions mentioning specific retailers, and retail areas.

9.2 “Heavy” vs. “Light” Sophisticated Users—Contrast Study

As noted, our sample is comprised of sophisticated or expert users, but there exists variation within the category “expert.” Seeking additional insights, we conducted contrast studies where we held all factors constant and varied one statistically significant ($p \leq 0.05$) test factor at a time for two different stylized user profiles: “light” and “heavy” sophisticated users. For the first base case, light user, all non-significant consumer-attribute test factors, StoreProximity and SocialMedia are set to 0; SocialNetworking (a measure of social media use intensity) is set to 0, its minimum. All significant test factors (TextMedia, EmailMedia, ProvidePersonalInfo, and PrivacyConcerns) are also set to 0. For the second base case, heavy user, StoreProximity and SocialMedia are set to 1 and SocialNetworking is set to 2, its maximum. For each contrast study, the % change in TendencyToRespond vs. the base case was calculated in order to show effects of one factor at a time.

For light users, each contrast shows substantial effects on TendencyToRespond (a range of 48.34% to 116.8% increase) suggesting benefits to retailers for exploring these drivers of consumer response. The most impact for light users come from Textmedia (+116.84%) and PrivacyConcerns (+115.04%). These were followed by EmailMedia (+76.569%) and ProvidePersonalInfo (+48.335%). For the heavy user contrast, the range of % change vs. base case is similar to the light user case, though generally less impact is detected (a range of 40.33% - 97.49% increase). The strength of the effects are in the same order as for the light user: the factors with the most impact for heavy users are Textmedia (+97.49%) and PrivacyConcerns (+95.99%), followed by EmailMedia (+63.89%) and

ProvidePersonalInfo (+40.33%). We speculate that the % change in outcome for each significant factor contrasted, when comparing a light user to a heavy user of mobile device technologies, means both user types experience a substantial impact on their tendency to respond to an offer, but there is generally a greater effect on light users than on heavy users. This may be explained by a speculative logic: light users probably elect to receive fewer offers than heavy users. Heavy users, then, become more habituated to the stimulus of receiving an offer, and are *ceteris paribus* less likely to respond to any given offer than a light user who receives few offers and pays more attention to each one.

9.3 Insights for Retailers

From a retail perspective, this study explores nine possible determinants of consumer tendency to respond to mobile-based offers, offering insight on increasing customer engagement. This study retailer emphasis on (1) use of text media, (2) use of email media, (3) collecting personal information and (4) targeting privacy-concerned consumers lead to an increased tendency to respond to offers. We speculate that retailers can increase mobile device response by educating consumers about their promotional offers so they know what to expect from the promotions, which ultimately become a routinized part of consumers' days. Education about security and privacy of personal information may increase consumer response because the consumer would be knowledgeable about the high degree of security sophistication deployed by retailers to ensure consumer safety. Knowledge of consumer security allows the retailer to be viewed as responsible and credible, and gives consumers comfort that their personal information will remain secure. Using multiple strategies may allow retailers to gain competitive advantage in the deployment of this novel selling tool.

9.4 Insights for Scholars

This study has offered preliminary insights on the determinants of consumer response to mobile device promotional offers. From a scholarly perspective, there have been very few studies that explore consumer response to mobile device-based promotional offers and even fewer among these studies that involve quantitative analysis. The existing literature focuses on developing mobile shopping technologies and Japan's consumers' successes using mobile devices to make purchases. Our study scrutinizes several assertions through straightforward, rigorous statistical analysis of an original dataset of extreme, sophisticated users. For future study of consumer response to mobile device promotional offers, data from particular retailers may be useful to provide a more micro-analytical look at strategies for action.

Further work seems justified, using (1) a larger, more educationally- and geographically-diverse demographic sample, (2) control factors, and (3) employing a survey suitable for Cronbach's Alpha (and/or factor) analysis for reliability checking. These refinements would admittedly allow for a more definitive, focused analysis, but our findings and their implications for managers designing service interactions, though based on a limited convenience sample, are conservative, provocative, and they point the way forward for further efforts.

Our findings suggest the best areas for return on retailer investment in use of proximity-based marketing are offers using text messages and email. Also, people willing to provide personal information are likely to respond, and perhaps non-intuitively, respondents expressing concerns over privacy of their personal information are also likely to respond. This may be owing to the notion that well-informed consumers are more likely to feel secure enough to respond to offers. One strategic implication is that retailers need to be very credibly and professionally asking and gathering personal information from their customers as part of preparing customers to accept information about promotions. This approach provides an opportunity for educating consumers about company privacy policies—our results suggest informing people about privacy should be taken seriously for commercial as well as legal reasons. Our analysis suggests customers will openly respond without feeling they are being bombarded with doubt and surprise when they are feeling well-informed. This may well-prepare retailers to respectfully deliver each text and email messages, the promotional forms we identify as possessing the greatest potential for proximity-based offers. This study's primary contribution is that it investigates promotional offers in terms of both consumer and offer attributes, finding specific types of both approaches work to increase responses.

Using a quantitative method not normally employed by ethnographic researchers in design thinking processes (Heiman and Burnett, 2009), we have demonstrated that our approach allows substantial insight into extreme users in an effective manner. Our approach also mitigates observer/participant bias in ethnographic analysis (interpretation of data) often used with extreme users. Additionally, we have used this method to show how two classes of extreme user may exist (light and heavy users) and through simple contrast studies that there is a measurable difference in the impact of our test factors on outcomes. Design thinking practitioners may add this potentially powerful and relatively simple-to-implement tool to their arsenal of tools for user-centric research.

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11. Appendices

A. Interview Questions (Subject Matter Experts)

1. Describe the experiences you have had with the mobile device technology industry and consumers.
2. What advantages do you feel the mobile device technology industry can offer consumers?
3. Are these advantages significantly NOW enhancing revenues and profitability for retailers? If not now,

how about the future? How significantly? Numbers on per customer sales?

4. Consider all the potential the mobile device technology industry can offer: personalized customer loyalty programs, location based service accessibility, and sales programs based on social networking sites. Why does it seem like this innovation is being held up? Almost no one uses these services now. Why?
5. What will be the most critical components in order to ensure increased customer adoption and subsequent routine use?
6. Where do you see these mobile device technologies leading into the future? Please feel free to speculate wildly here.

C. B. Survey Questions (Mobile Device Sophisticated Users)

1. Would you respond to a promotional offer you receive on your mobile phone?
 - a. yes
 - b. no
 - c. maybe, depends on the retailer or product factors
 - d. maybe, depends on how busy I am
2. Which form would you prefer to receive the offer via your mobile phone?
 - a. email
 - b. text message
 - c. social networking site
 - d. not at all
3. Would you more likely respond if you only received promotional offers suitable to your purchasing habits, needs, and desires?
 - a. yes
 - b. no
4. If you received a promotional offer via your mobile phone while in the proximity of the store would you be more likely to purchase the item?
 - a. yes
 - b. no
5. Upon receiving an offer, what length of time would be most effective for you to make the purchase?
 - a. valid 2 hrs or less
 - b. valid one day only
 - c. valid one to two days only
 - d. valid two or more days
6. Would you be willing to provide personal information to particular retailers in order to receive promotional offers suitable to your purchasing habits, needs and desires?
 - a. yes
 - b. no
7. How concerned are you with privacy issues surrounding your purchasing information?
 - a. very

- b. somewhat
- c. barely
- d. not at all

8. How often do you use your mobile device for comparison-shopping?

- a. all the time
- b. somewhat
- c. barely
- d. not at all

9. Do you currently belong to any social networking sites?

- a. yes, including retail communities
- b. no, not at all
- c. yes, only with friends
- d. yes, with friends and other organizations

10. Explain how you currently use your mobile device to shop and how you would like to use it in the future to improve your shopping experience.

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