The Distinct Psychology of Smartphone Use: Smartphone-Generated Content As Emotional Expression

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We investigate the impact of smartphone usage on user-generated content. We find that smartphone-generated content contains more emotional language (vs. PC), which is driven by the physical experience of using the device. Further, regardless of originating device knowledge, consumers react more favorably to smartphone-generated content because of its heightened emotionality.

Advances in Mobile Consumer Behavior: Effects on Content Generation, Social Persuasion, Mobile Targeting and Shopping Behavior

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Paper #1: The Distinct Psychology of Smartphone Use: Smartphone-Generated Content as Emotional Expression

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Paper #2: In Mobile We Trust: How Mobile Reviews Can Overcome Consumer Distrust of User-Generated Reviews

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Paper #3: Social and Location Effects in Mobile Advertising

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Paper #4: Smart Phones, Bad Calls? In-store Mobile Technology Use and Consumer Purchase Behavior

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SESSION OVERVIEW

In 2014, consumers spent a greater proportion of time on their smartphone than on any of their other technological devices (Millward Brown 2014). Although smartphones have become an integral part of consumers' everyday lives, there is currently little research examining the consequences of using this technology for consumer behavior. The objective of this session is to shed light on some of the implications of smartphone use for both consumers and marketers. As a group, the papers address the following question: How does smartphone use impact consumer psychology and decision-making in both online and offline consumption contexts?

The first two papers converge on a similar finding – that consumers react more favorably to smartphone-generated content than PC-generated content – and provide distinct but complementary accounts for this phenomenon. Across four studies, Melumad, Inman and Pham show that content generated on one's smartphone (vs. PC) contains more emotional language, and that this effect is driven in part by the physical experience of writing on each device. The authors also show that consumers react more favorably towards smartphone-generated content because of its heightened emotionality, which holds *regardless* of whether consumers are aware of the originating device. The findings suggest that smartphone use drives the creation of more emotional, and thus more influential, user-generated content.

Stephen and Grewal examine consumers' beliefs about online reviews generated on smartphones. Consistent with the results of Melumad et al., three studies demonstrated that consumers were more trusting of reviews that they *knew* had been written on smartphones (vs. PCs), and expressed greater purchase intention in response to the reviews. These effects were driven by consumers' belief that smartphone-written reviews are more accurate/thoughtful because reviewers are presumed to willingly exert greater effort to write on the device.

The second pair of papers examines the relationship between smartphone use and offline consumption contexts. Zubcsek, Katona and Sarvary examine whether consumers' offline location history can predict their responsiveness to mobile advertising efforts. While many targeting methods for mobile advertising are based on consumers' proximity to a retailer, the authors find that targeting mobile ads based on consumers' location history enhances consumer response rates to promotions. Their results demonstrate that offline location history can be effectively used to reveal consumer preferences.

Sciandra and Inman examine whether decision-making in offline shopping settings is impacted by smartphone use. Across three studies, including two field studies, they find that smartphone use can distract consumers during a shopping experience resulting in greater omission of planned items and more unplanned purchases, but only when consumers use their smartphone in a manner unrelated to the shopping task. In contrast, using one's smartphone in a manner related to the shopping experience attenuates these errors.

Together, these papers employ a variety of methodologies and demonstrate that smartphone usage poses unique consequences for consumers in online as well as offline contexts. Overall, this special topic session should be of great interest to researchers and firms concerned with the implications of consumer smartphone usage, and for smartphone users in general.

The Distinct Psychology of Smartphone Use: Smartphone-Generated Content as Emotional Expression

EXTENDED ABSTRACT

Given the ubiquity of smartphone devices and the importance of word of mouth for consumer opinion and sales, it has become critical for firms to understand the impact of using one's smartphone to generate online content. One important consideration for firms is the emotionality of user-generated content, since increasing levels of emotional language in online reviews has been shown to increase customer conversion rates (Ludwig et al. 2013), and simply reading a text with affective content can influence consumers' opinions (Lau-Gesk and Meyers-Levy 2009). We predict that content generated on smartphones contains more emotional language than PC-generated content, and that consumers therefore respond more favorably to smartphone-generated word of mouth.

We examine one possible explanation for the increased emotionality of smartphone-generated content. Specifically, using one's smartphone is more cognitively taxing than using one's PC because of its smaller features (e.g., smaller screen and keyboard; Ghose, Goldfarb and Han 2013), which leads consumers to engage in more emotional processing when using their smartphone (e.g., Shiv and Fedorikhin 1999). We therefore propose that an increased reliance on emotional processing during smartphone use can carry over to the content generated on the device, resulting in the generation of more emotional content (vs. PC-generated content). Moreover, since people find emotional content to be more diagnostic and persuasive (e.g., Damasio 1994), we predict that consumers will respond more favorably to smartphone-generated content (vs. PC-generated content).

Study 1 tested the prediction that content generated on smartphones (vs. PCs) contains more emotional language. We conducted a text analysis on field data from UrbanSpoon.com, a popular online restaurant review forum, analyzing nearly 40,000 reviews of New York City-based restaurants. To control for region-specific characteristics that might confound the results, we also conducted a robustness check using over 20,000 reviews of Portland-based restaurants. Further, an alternative explanation for differences in content emotionality is that unlike PC-users, smartphone-users tend to write during their restaurant experience so that their feelings are simply more "hot" or salient to them. To test the alternative explanation that increased emotionality is due to the time of review creation, we conducted an additional robustness check controlling for the temporal proximity between the experience and the creation of the review. As predicted, reviews written on smartphones contained more emotional language than PC-generated reviews, and this effect held across the two robustness checks. These results provide evidence that smartphone use increases the emotionality of online word of mouth.

The first objective of study 2 was to test the causal impact of smartphone use on content emotionality. As such, participants (N=367) were asked to write a review of a recent restaurant experience using either their smartphone or PC (randomly assigned). The second objective was to test the proposed mechanism underlying the effect: that users rely on more emotional processing – and thus create more emotional content – because using a smartphone is more cognitively taxing than using a PC. To test for the mediating role of ease-of-use, we asked participants to indicate how easy it was to write the review using their assigned device.

Smartphone-generated reviews were again found to contain more emotional language than reviews written on PCs. Moreover, a mediation analysis revealed that ease-of-use partially mediated the effect of the device on the amount of emotional language, which supports our proposition that the physical experience of using one's smartphone (vs. PC) partly accounts for the increased emotionality of smartphone-generated content.

The main purpose of the next two studies was to explore users' *reactions* to smartphone-generated word of mouth. In study 3 we conducted a content analysis on field data from the online social network of a large community of start-ups. Importantly, one of the features available on the network allows users to "vote" for posts on the newsfeed, which enabled us to test whether users respond more favorably to smartphone-generated content (vs. PC-generated content). Since the prior studies examined restaurant reviews, study 3 also tested whether the effects generalize to another type of user-generated content.

The results reveal that content generated on smartphones again contained more emotional language than content written on PCs, demonstrating that the effect holds not only for restaurant reviews but also for other forms of user-generated content (i.e. social media content). Importantly, smartphone-generated posts also received more votes relative to PC-generated posts, and this effect was mediated by the amount of emotional language in the content. These results suggest that smartphone-generated content is more emotional, and thus more appealing, to consumers.

The final study directly tested consumers' reactions to smartphone-generated content vs. PC-generated content in an experimental setting, and examined the role of device knowledge on consumer opinion. Participants (N=135) were asked to rate a random selection of reviews (written by participants in study 2), half of which had been written on smartphones and half of which had been written on PCs. Further, while users of the social network in study 3 could *not* tell whether content had been posted from mobile devices, in study 4 we manipulated whether participants were informed about the device on which the reviews were written. In one condition, reviews were presented with labels indicating "via mobile" or "via PC," while in the other condition no labels were presented. This allowed us to test whether knowledge of the originating device impacts consumers' reactions to user-generated content.

We find that participants were more interested in trying restaurants that had been reviewed on smartphones (vs. PCs) *regardless* of whether they were aware of the originating device. Moreover, as predicted, a mediation analysis reveals that smartphone-generated content is more persuasive (vs. PC-generated content) because of its greater perceived emotionality.

Our findings identify a unique consequence of smartphone use with important implications for firms concerned with online word of mouth. First, given its more emotional nature, smartphone-generated content might help firms more accurately gauge consumer opinion. Second, users respond more favorably to smartphone-generated content as a result of its increased emotionality (regardless of originating device knowledge), suggesting that smartphone use drives the creation of more impactful online word of mouth.

In Mobile We Trust: How Mobile Reviews Can Overcome Consumer Distrust of User-Generated Reviews

EXTENDED ABSTRACT

The use of mobile is ubiquitous with over half of the world using mobile devices. One common use of mobile devices is people reporting on their consumption experiences (e.g., posting a hotel review). The rising use of mobile has prompted a stream of research that attempts to understand the relationship between mobile and consumer behavior (Shankar et al. 2010; Bart et al. 2014). Here we consider how consumers perceive and respond to consumer-generated reviews when they are posted from mobile versus non-mobile devices. Consumers increasingly know this distinction because a trend among popular review sites (e.g., TripAdvisor) is to add labels to reviews from mobile devices (e.g., "via mobile"). We examine how this subtle additional information affects consumers' perceptions of the review and purchase intentions.

We hypothesize that the extra effort that is required when writing reviews from mobile leads consumers to believe that, compared to reviews from non-mobile devices, reviews posted from mobile devices are more reflective of a reviewer's true consumption experience. We posit this is because consumers think that to write a thoughtful review on a mobile device, more effort is physically needed, and once more effort has occurred, a review is perceived as more trustworthy (Ghose et al. 2013; Walther et al. 2005). Once a review has been seen as more trustworthy, we hypothesize that consumers will perceive higher accuracy. This higher accuracy is then expected to lead to higher purchase intentions or a greater consideration of the reviewed product or service provider. This is only expected to occur, however, when reviews are generally positive and, critically, when consumers are doubtful about the review or skeptical of the credibility of consumer-generated reviews in general. Thus, we propose that mobile reviews help consumers overcome skepticism that would otherwise lead them to discount a reviewer's opinion, thereby allowing the review to have a stronger impact on a consumer's attitudes. In three studies, participants were shown an actual consumer-generated hotel review from TripAdvisor where we manipulated aspects of the review (e.g., mobile vs. non-mobile) while holding constant the review itself.

Study 1 (N = 67) tested the effect of mobile vs. non-mobile reviews on purchase consideration with a 2(mobile, non-mobile) x 2(positive rating, negative rating) between-subjects design. To manipulate mobile versus non-mobile, a label said "via mobile" or "via desktop," in line with TripAdvisor. To manipulate rating valence, the reviewer's rating was either 4 (positive) or 2 (negative). After reading the review, participants indicated their interest in booking a stay at the reviewed hotel if they were visiting that location (1 =definitely not, 5=definitely yes). Results supported our prediction that mobile reviews are associated with higher purchase intention, but only for favorable reviews. In the positive rating conditions there was a significant difference between mobile (M = 3.60) and non-mobile (M = 2.86) reviews (contrast $F(1, 63) = 6.96$, $p = .01$). There was no significant difference in the negative rating conditions ($M_{mobile} = 2.79$ vs. $M_{nonmobile} = 2.74$, contrast $F(1, 63) < 1$, $p = .83$).

Study 2 (N = 56) tested the proposed accuracy-mediated process with a 2(mobile, non-mobile) between-subjects design. The reviews in the positive rating condition from study 1 were used. We again measured purchase consideration and additionally measured perceived accuracy of the review with six items on seven-point Likert scales (e.g., "The information in this review was accurate," **α** = .90). These items were averaged to form a measure of the hypothesized mediator, perceived review accuracy. We also measured general skepticism, which was expected to moderate the hypothesized mediated process, with nine items measured on seven-point Likert scales (e.g., "I am skeptical of online user-generated reviews," **α** = .93). These items were averaged to form a general measure of skepticism of online consumer-generated reviews. We tested our predictions using conditional indirect effects analysis (Hayes 2013 model 15). The results confirmed our hypotheses. Specifically, the indirect effect of mobile versus non-mobile review on purchase intention through perceived review accuracy was positive and significant but only at higher (+1SD) levels of skepticism (indirect effect = .08, SE = .06, 95% CI = [.01, .26]). When skepticism was lower (-1SD) the indirect effect was not significant.

Additionally, we asked participants to indicate the extent to which they believed that mobile reviews are more likely to be written "in the moment" (1 = definitely not, 5 = definitely yes). This was intended to capture a lay belief that mobile reviews are more temporally proximate to the reviewed consumption experience. Participants held this belief, with 75% of participants selecting 4 or 5 on this scale. This suggests that mobile reviews are assumed less temporally distant from the reviewed experiences, which is a plausible explanation as to why mobile reviews lead to higher perceptions of review accuracy.

Study 3 (N = 80) examined perceived accuracy more closely. Participants read the same mobile review from the previous study and indicated their perception of review accuracy on the same six-item scale used previously. Additionally, perceived review-writing effort was measured with six items (e.g., "The reviewer put a lot of effort into writing this review" **α** = .88), and perceived trust in the reviewer with six items (e.g., "The reviewer can be trusted" **α** = .85). Results from a conditional indirect effects analysis (Hayes 2013 model 4) indicate that higher perceived review-writing effort leads to enhanced perceptions of reviewer trust, which in turn predicts higher perceived review accuracy (indirect effect = .29, SE = .06, 95% CI = [.18, .43]).

This research contributes to the literature on consumer-generated reviews and word of mouth referrals by showing how the context in which a review is written—mobile or non-mobile—affects consumers' attitudes and purchase intentions. We show that consumers, particularly skeptical ones, perceive mobile reviews as more accurate and therefore have higher purchase intentions, and that this accuracy is associated with greater perceived effort in review writing and reviewer trust. Future research will examine this process in greater detail, and identify conditions under which mobile review writing is associated with higher effort.

Social and Location Effects in Mobile Advertising

Early research on location-based mobile advertising effectiveness focused on geo-fencing – sending consumers promotional offers when they enter the vicinity of the retailer (Jagoe 2003, Schiller and Voisard 2004). Yet, while targeting based on store distance has been demonstrated to be quite effective in certain contexts (Ghose et al. 2012, Molitor et al. 2013), consumers' location history may also be useful to marketers as it may hide rich information about their shopping behaviors and preferences (Hui et al. 2009, Shankar et al. 2010). In this paper, we explore whether targeting ads not based on the current location of prospects but their location history may enhance their response rates to promotions. We present a method that is able to demonstrate the link between the location history of consumers and their purchase behavior even in the absence of information on retailers' exact locations (or other points-of-interest, POI). We discuss the implications of these findings for behavioral research.

Our data come from a pilot program of a mobile operator in a Pacific country. Participants installed a new app on their smartphone and were then regularly provided (independently from their current location) with digital coupons ("*offers*") in four product categories. Information in coupons included the participating brand(s) and – if applicable – product(s), the discount value of the coupon (*M=$4.58*) and the "when-you-spend" amount (*M=$17.44*). After viewing these details, participants could receive the *in-store* discount after making the required purchase and showing the accepted coupon anytime during the validity of the offer (*M=4.82 days*). (The exact time of response was not recorded.)

Our panel contains a total of 15,353 observations on 217 participants and 96 offers (registration was open throughout the duration of the pilot so some consumers did not see some offers). During the period studied, participants on average received less than two offers per day. To increase their engagement with the mobile app, they were also invited to participate in quizzes (brief surveys with questions) pertaining to a broad range of topics including personality traits, interests, lifestyle, work, and also preferences in certain product categories. Responding to quizzes was entirely optional and participants did not receive any reward for their answers.

Participants also agreed to have their GPS location information transmitted to the mobile operator every hour by the app (when both the location services were enabled and the device was able to detect the necessary satellite signals). For each hour during which there was no successful transmission, there is no location observation in the dataset. On average, we have 11.29 hourly location observations per day per participant in our panel. However, for about 40% of all observations, there is no location information on the participant. Further, we do not possess information about potential Points-of-Interest (POI) in the country where the study was conducted. Finally, we have data on referrals wherein a participant invited another to the program.

Our model builds on the idea that consumers' location choices (albeit weakly) reflect their underlying preferences and that individuals who often attend the same venues have some commonalities in their taste. We construct a dynamically evolving network of co-location events – events when two or more participants were at the same place (a ca. 700-ft square on the map) during the same hour. Effects of network position in the so-derived co-location network are then simultaneously estimated with demographic and referral network effects on advertising response in a logit model with offer fixed and participant random effects (cf. Goel and Goldstein (2014)).

We capture both networks (co-location and referral) by 1. Including the average prior response rate of network neighbors in the category of the offer, and 2. Controlling for the number of network neighbors. Further, we control for participants' *GPS activity* (the number of nonzero location observations available to us during the day preceding the launch of each offer).

The results (robust to a series of validity tests) show a significant positive link between the prior within-category response rate of co-located participants and their subsequent response to coupon-based promotions (β=3.918, p<0.01). This suggests that consumers who frequent the same locations indeed have correlated preferences. Whereas consumer-level demographic or psychographic variables may also be used to uncover such correlations in preferences, we find that the joint use of referral and location network variables is more effective than relying on traditional variables in predicting consumers' purchase behavior.

These are important results indicating that location history can be effectively used to reveal consumer preferences. Therefore, our method may provide a fruitful approach to complement current location-based advertising methods, which are mostly based on the geo-fencing approach.

Further, our findings pose new questions for behavioral research. Do the behavioral antecedents of location choices exhibit systematic patterns? Do certain environments affect consumer behavior (by causing consumers to converge to certain attitudes or brand preferences)? While the mobile behavioral platforms aiming to help testing these questions are still not commonly available, we have no doubt that in the coming years, controlled experiments will contribute more and more to our understanding of the mobile consumer.

Smart Phones, Bad Calls? In-store Mobile Technology Use and Consumer Purchase Behavior

EXTENDED ABSTRACT

One understudied factor impacting consumer decisions are mobile technologies such as cellphones and smartphones. As mobile devices continue to grow in popularity, the need is high for research explicating the impact of these devices on consumer decision-making. Recently, mobile technologies have been praised for helping consumers make better decisions (Shapiro 2012). However, research acknowledges unintended visual and cognitive impairments associated with these devices (e.g., Strayer et al. 2003; Strayer and Johnston 2001). Consequently, the use of mobile technologies in shopping environments may act as a double-edged sword with both positive and negative implications for shoppers.

We argue that the nature of mobile use (shopping-related vs. shopping-unrelated) will differentially impact consumer outcomes. When used in an unrelated manner (e.g., talking, texting, surfing the web), we predict that multi-tasking exhausts attentional resources and results in negative outcomes such as purchasing more unplanned products or failing to purchase planned items. When used in a related manner (e.g., checking prices, using shopping applications), we predict that mobile technologies can help consumers make better decisions and stay on track during the shopping trip.

In Study 1, we begin our investigation into in-store mobile device use by examining consumers' ability to accurately recall and complete an online shopping task while utilizing mobile technologies. In particular, we manipulate the duration (short vs. long) and intensity (low intensity use vs. high intensity use vs. no use) of device use to investigate recall of in-store displays and number of omitted planned items. We find that participants in the high (M = 11.2%; F (1, 193) = 4.69, $p < .05$) and low (M = 11.8%; F (1, 193) = 4.79, $p < .05$) intensity mobile use conditions exhibited lower recall of products on display compared to participants in the no mobile use condition (M = 15.8%). Furthermore, we find that participants using their device for a long duration and high intensity demonstrated a higher percentage of omitted planned items (M = 11.4%) than participants in both the low intensity mobile use condition (M = 5.4%; F (1, 193) = 4.04, $p < .05$), and the no mobile use condition (M = 3.9%; F (1, 193) = 6.76, $p < .05$).

Study 2 and Study 3 use field data from Point of Purchase Advertising International to investigate in-store device use. In Study 2, data was collected in grocery stores while in Study 3 data was collected in mass merchandisers. In both studies, shoppers across the U.S. were interviewed before and after their shopping trip. In the exit interview, shoppers were asked to indicate if and how they used mobile technology during their trip. This information allowed us to partition consumers into three focal mobile usage categories: 1) no phone use, 2) shopping-related use (related), and 3) shopping-unrelated use (unrelated).

We find that in-store mobile technology use significantly alters the number of unplanned purchases and the number of omitted planned items. First, looking at unplanned purchases, we find that using mobile technology in an unrelated manner is associated with significantly more unplanned purchases (β_{Study2} = 0.104, p <.05; β_{Study3} = 0.120, p <.01) when compared to consumers not using phones. Furthermore, in Study 3 we find that shoppers using their phones for private conversation (β_{Talk} = 0.111, p <.10) and private text messaging (β_{Text} = 0.151, p <.01) are the main types of unrelated use that are contributing to the increase in unplanned purchasing. In comparison to shoppers not using a mobile device, individuals using a device in a related manner showed no difference in number of unplanned purchases (β_{Study2} = 0.027, *n.s.;* β_{Study3} = 0.049, *n.s*) when compared to shoppers not using a device.

While related device use did not exhibit a main effect on number of unplanned purchases, we do find that related device use can help mitigate unplanned purchasing, particularly, as shoppers basket size increases. We find a positive relationship between basket size and the number of unplanned purchases (β_{Study2} = 0.082, p <.01; β_{Study3} = 0.116, p <.01). Importantly, we find that using a mobile device in related manner attenuates this positive relationship (β_{Study2} = -0.013, p <.05; β_{Study3} = -0.014, p <.05). Furthermore, in Study 3 we find that shoppers using their phones to access a retailer's shopping application ($\beta_{Retailer\ App}$ = -0.044, p <.01), access a digital list ($\beta_{Digital\ List}$ = -0.042, p <.01), and use a calculator ($\beta_{Calculator}$ = -0.026, p <.05), all contribute to this attenuation.

Next, looking at the number of omitted planned items, when compared to shoppers not using mobile devices, shoppers using their phones in an unrelated manner showed more omitted planned items (β_{Study2} = 0.269, p <.05; β_{Study3} = 0.291, p <.01). In Study 3, we find engaging in personal conversation to be the main driver of omitted planned items (β_{Talk} = 0.204, p <.05). This is consistent with our theorization that unrelated device use can distract consumers from the focal shopping task. Similarly, compared to shoppers not using mobile devices, shoppers using their phones in a related manner exhibited more omitted planned items (β_{Study2} = 0.178, p <.10; β_{Study3} = 0.212, p <.01). In Study 3, we see that shoppers using their device to access a calculator ($\beta_{calculator\ =}$ 0.373, p <.01) to be the major contributor to this difference. This highlights a more conscious process in which the shopper passes over a planned item that might be too expensive or may cause the individual to exceed their acceptable budget.

In summary, we find that mobile device use can exert a distracting influence on consumers and interfere with shopping goals. Depending on use, mobile technology is associated with more unplanned purchases, more omitted planned items, and impaired recall of in-store stimuli. Further, based upon an exploratory study, it appears that consumers do not anticipate these effects. While consumers understand the positive implications of in-store mobile technology use, they are unaware or overlook some of the negative implications of using mobile devices in stores.

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