Individualization and Information Quality of Location-Based Mobile Messages: An Application of Elaboration Likelihood Model

by

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Abstract

Location-based mobile technologies fulfilling consumers' personalized needs during in-store shopping have gained significant attention in the retail world, as many brick-and-mortar stores and retailers had to adapt to the omnichannel presence in recent years. However, without sufficient knowledge about how to tailor location-based mobile messages (LBMM), retailers and marketers have been challenged by consumers' perceptions of intrusiveness of receiving a LBMM and a lack of personal relevance of the LBMM, both of which can lead to suboptimal advertising effectiveness. This study empirically examined how varying levels of consumers' task involvement in the generation of an LBMM, which is referred to in this study as LBMM individualization strategies, affect consumers' perceptions of relevance and intrusiveness of an LBMM, which in turn impact the consumers' elaboration (careful cognitive processing) of the LBMM content and attitude toward the LBMM.

Data were collected employing a 3 (LBMM individualization strategies: randomization vs. personalization vs. customization) × 2 (information quality: strong vs. weak) experimental design. A U.S. national sample of 455 consumers participated in the online experiment. Results of the study indicate that consumers perceive an LBMM more relevant and less intrusive when it is more highly individualized or when they are more involved in the message generation process (i.e., customization > personalized > randomized). This finding is alarming in that a rushed LBMM sent based on only the consumer's locational data (i.e., a randomization strategy) can lead to consumers' perceiving it to be intrusive and irrelevant and thus may result in their avoidance behavior. In addition, this study revealed that a more individualized LBMM promotes consumers' greater amount of cognitive processing (i.e., elaboration) of the message, which in

turn promotes their positive attitude toward the LBMM, and this effect was found stable regardless of the quality of information (strong vs. weak) contained in the LBMM. These findings imply that consumers do not consider the content of a LBMM as a critical determinant to evaluate an LBMM when they receive a highly individualized LBMM. Due to the heightened personal relevance, a highly individualized LBMM motivates consumers to invest their time in processing the message more carefully and like the LBMM more. The findings of the study provide valuable theoretical and managerial implications.

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A long time ago, when I took an education philosophy course during my college education, the professor said to the class, “To produce a scholar, there must be many people’s commitments, sacrifice, supports, and trusts, regardless of how the scholar is smart or knowledgeable. This is why scholars are respected throughout our history.” These impressive words have constantly reminded me how lucky I am and how many people support me to grow during my education time. Without their devotion, I wouldn’t have grown until this moment. I’d like to send my sincere thanks to everyone who has been with me during my doctoral years.

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CHAPTER I: INTRODUCTION

Background

The mobility and interactivity of mobile devices have reshaped the landscape of the retail industry by tightening channel integrations between online stores and physical brick-and-mortar stores as well as enhancing consumer experiences. Today's consumers are experiencing the convenient features of mobile technologies that fulfill their personalized needs during in-store shopping, while retailers send out tailored messages to consumers' mobile devices based on data collected through the consumers' online/mobile activities (e.g., purchase history, search history, wish lists, demographics) (Andrews et al., 2016; Fong et al., 2015). The mobility and location-sensing ability of mobile devices have provided retailers with a key advantage by enabling them to communicate real-time information (e.g., price differentiation, stock availability) and services with their customers instantly, enhancing consumers' experiential values and in-store experiences (Dutot, 2015). In addition, this interactivity and location-sensing ability of mobile devices allow both push and pull communications that encourage consumers to become involved in the Consumer-To-Business (C2B) communication, unlike traditional methods of marketing communications (e.g., newspapers, magazines, TV ads, banners, billboards, poster displays, radio) which utilize push marketing messages to consumers while limiting consumer participation (Bruner & Kumar, 2007; Gana & Thomas, 2016; Gazley et al., 2015; Keller, 2009, 2016).

Arguably, location-based mobile advertising is now the fastest growing and most influential communication method (Bender et al., 2013; Berman, 2016; Kaplan, 2016), by delivering tailored messages to customers at the right time and at the right location to increase point-of-purchase sales, unplanned purchases, and mobile coupon redemptions (Andrews et al.,

2016; Danaher et al., 2015; Gazley et al., 2015). According to Ratcliff (2016), retailers have experienced the impact of location-based mobile marketing on consumer decision-making, such as increases in customer engagement in stores, sales, and offer redemptions. Also, location-based mobile marketing has facilitated retailers in tracking customer movements and understanding customer patterns. The global business spending on location-based advertising is expected to increase to $82.26 billion in 2025 with an annual growth rate of 17.8%, accounting for 33% of the market shared by North America (Technavio, 2021). Given the rapid growth of location-based marketing, it is now critical that retailers understand its potential in providing both quality service and experiential consumer values.

Location-based mobile ad messages (LBMMs) refer to promotional messages (e.g., coupons, sales alerts, rewards) or informational messages (e.g., product information, brand information, event information) sent to customers' mobile devices which are within a certain radius. A retailer/brand generates LBMMs by detecting geographic locations of customers' mobile devices using location-sensing technologies. LBMM services are possible because of the unique features of mobile devices, including 1) connections to technology that detects location of personal mobile devices (e.g., Wi-Fi, Bluetooth, Global Positioning System (GPS), Global System for Mobile Communications (GSM), Near Field Communication (NFC), radio-frequency identification (RFID), cellular tower, or Beacon technology); 2) personal possession of the mobile device owned and managed by individuals; 3) interactivity between the message sender and the receiver; and 4) the general mobility of the device (Andrews et al., 2016; Berman, 2016; Grewal et al., 2016). Because of these features, retailers can individualize mobile messages according to potential consumers' real-time location and personal identity with increased message content relevance to the consumers using their search history, purchase history, online

cart, social media usage, or demographic information linked to the consumers' identity or mobile devices (Berman, 2016).

In this study, we conceptualize three levels of *LBMM individualization strategies*: randomization, personalization, and customization. *Randomized LBMMs* are defined as mobile messages generated and sent by retailers merely based on consumers' mobile device locations, without using any of consumers' personal data. On the other hand, *personalized LBMMs* are mobile messages generated and sent by retailers based not only on consumers' mobile device location but also their personal data collected from prior encounters (e.g., search history, demographic information) without the consumers' explicit knowledge that the data will be specifically used for LBMMs (Arora et al., 2008; Lee et al., 2015; Sundar & Marathe, 2010). Finally, *customized LBMMs* represent the highest level of individualization and refer to location-based mobile messages associated with a specified location-based mobile service, which are generated and sent by a retailer based not only on general data collected through prior encounters but also additional personal data (e.g., wishlist, account, and payment information) that the consumers actively and voluntarily provide to enable the retailer to provide them with LBMM-based services better customized to their own needs (Arora et al., 2008; Lee et al., 2015; Sundar & Marathe, 2010). Customized LBMMs are distinguished from personalized mobile messages according to the source of the data used to individualize the message content: customers for the former versus retailers for the latter (Lee et al., 2015). As the level of message individualization increases (from randomization to personalization to customization) for LBMMs, the relevance of the LBMMs to consumer interests and needs is likely to increase with greater consumer data and inputs with which the LBMMs are generated (Bacile et al., 2014). Individualized message contents with personal relevance may make customized LBMMs particularly powerful in

maximally promoting customer involvement and creating positive consumer attitudes toward delivered messages (Bacile & Goldsmith, 2011; Berman, 2016).

Problem Statement

The benefits of applying LBMMs cannot be emphasized enough in the new era of digital and omni-channel retail for both consumers and retailers. Consumers can receive personally and geographically relevant content via their mobile devices for improved shopping convenience, while retailers can communicate with consumers, provide real-time information, and enhance consumer experiences. Despite the significance of LBMMs, studies on LBMMs are still lacking, making it difficult for retailers and scholars to gauge the potential of LBMM applications in enhancing consumer experiences and retailers' synergic effects in omni-channel integration and data analytics. Several research gaps have been identified for this study in terms of marketing strategy, theories, and contexts.

First, few studies have examined different levels of message individualization strategies in the LBMM context. Lee et al. (2015) investigated the effects of customized and personalized LBMMs on consumers' attitudes toward the LBMMs and found that the better attitude and less perceived intrusiveness generated from customized LBMMs might have induced by a greater perceived relevance, sense of control, and involvement. However, examining different levels of message individualization strategies on consumers' cognitive and behavioral responses is relatively new in the LBMM context except for a few in advertising literature (Arora et al., 2008; Sundar & Marathe, 2010). In addition, many studies in advertising context that examined message individualization strategies have not clearly defined different levels of message individualization strategies (Doorn & Hoekstra, 2013), or utilized the terms, customization or personalization, interchangeably in their study (Doorn & Hoekstra, 2013; Gazley et al., 2015; Yu

& Cude, 2009). Moreover, no studies have simultaneously compared the three levels of message individualization strategies (customization vs. personalization vs. randomization), with the majority having compared only two of them (e.g., customization vs. personalization). As advertising message contents become more deliberate these days, it is critical to distinguish the three different levels of message individualization strategies and understand the extent to which they affect consumers' information processing, perceptions, and attitudes.

Second, research into LBMM individualization strategies utilizing a concrete theoretical framework is still in its infancy. Lee et al. (2015) found that a customized LBMM generates a greater positive attitude toward the LBMM and intention to visit a store than a personalized LBMM, especially when they are exposed to a high involvement product since consumers' greater personal interests encourage them to engage in information in the LBMM. Similarly, Sundar and Marathe (2010) argued that perceived relevance and involvement are greater when consumers receive user-initiated content (customized messages) than system-initiated content (personalized messages), demonstrating that greater user control on message initiation leads to higher perceived relevance and involvement. Although a number of studies in LBMM or online advertising contexts have examined the effectiveness of customized messages over personalized messages on consumers' attitudinal and behavioral responses (Lee et al., 2015; Sundar & Marathe, 2010), little research has delved into the effects of message individualization utilizing theoretical lenses or variables with an attempt to understand consumers' information processing. Message individualization levels may influence consumers' ability (e.g., control) and motivation (e.g., relevance) to process information in the message, which can potentially impact the depth of consumers' information processing. The Elaboration Likelihood Model of Persuasion (ELM) lends a plausible theoretical perspective to explain this phenomenon. ELM is a persuasion theory

that has been built on the basis of what extent of the change in one's attitude direction or degree is affected by the argument quality of a message and one's elaboration (thoughtful processing) of it (Petty & Cacioppo, 1986). Ho and Bodoff (2014) have demonstrated that the depth of information processed through a personalized book webpage influences attitude persistence because the personalization process demands higher cognitive schema. Tam and Ho (2005) have also found that a web personalization process can increase the level of the cognitive process because a content that matches the user's preference increases cognitive schema. Extending these ELM-based findings from web personalization studies to the context of LBMM can help address an essential theoretical gap in the LBMM literature.

Third, many previous studies in the LBMM context have operationalized the involvement construct as the location congruence or localization (Feng et al., 2016; Lee et al., 2015; Riet et al., 2016) or time-relevance (Gazley et al., 2015; Lee et al., 2015) without the consideration of multifaceted aspects of involvement. For example, researchers have assumed that location congruence predicts an increased level of consumers' perceived relevance (Bruner & Kumar, 2007; Gazley et al., 2015). Further, Bacile and Goldsmith (2011) viewed the mobile coupon customization strategy as referring to the delivery time of the message matching the situational context of consumers. According to Zaichkowsky (1986), multiple facets of involvement exist concerning what has caused the involvement (e.g., personal, object, and situational factors) and which contexts consumers involve in (e.g.. advertisement, products, and purchase decision). Therefore, the existing literature focusing on the localization or message timing of a LBMM does not completely explain consumer involvement in the LBMM (Lee et al., 2015), leaving little understanding on consumers' personal involvement in the LBMM due to differences in the degree of personal input; a gap addressed by this study.

Fourth, a clear understanding of consumers' perceptual responses and cognitive responses (elaboration level) to an individualized LBMM that alter consumers' attitudes toward the LBMM is still lacking. In this study, we identify two critical perceptual variables in the advertising literature, perceived relevance and perceived intrusiveness, in order to understand the mechanism of consumers' cognitive response and attitude toward a LBMM. Perceived relevance is the degree to which one perceives an ad message content is relevant to his or her needs (Varnali, 2014). The perceived relevance of a LBMM may positively predict consumers' elaboration on and attitude toward the LBMM because the more relevant the LBMM is perceived to be to the consumers, the higher their level of elaboration on the LBMM (Zaichkowsky, 1986) and the greater their attitude change (Varnali, 2014). On the other hand, perceived intrusiveness is one's negative perception that an ad hinders his or her cognitive process, which may lead to ad avoidance behavior or irritational emotions (Li et al., 2002; Wehmeyer, 2007). As compared to traditional advertising media, mobile ads have been known to be more intrusive because of the personalization and mobility features of mobile devices (Bauer et al., 2005; Wehmeyer, 2007). White et al. (2008) also found that highly personalized ads can generate greater perceived intrusiveness and more willingness to avoid an ad. Contrary to their findings, Lee et al. (2015) argued that elaborately generated mobile ads (e.g., high level of message individualization, location-congruence of the message, a high involvement product) could produce a positive attitude toward the ad and the brand and increase purchase intentions because consumers feel less intrusiveness from the messages. Given these conflicting findings, an investigation is needed to understand consumers' mental trade-off between perceived relevance and perceived intrusiveness for the different levels of LBMM individualization strategies to disentangle consumers' perceptual process to cognitive and attitudinal responses. Moreover, the cognitive

responses (i.e., elaboration level) that plays a critical role in leading to consumers' attitudinal response in the ELM have not directly been studied; a gap that will be addressed by this study to draw a clearer blueprint of the ELM framework in contexts of the diverse levels of LBMM individualization strategies.

Purpose Statement

In an attempt to address the aforementioned gaps in the LBMM literature, the overall purpose of the present study is to investigate the effects of the three levels of LBMM individualization strategies on consumers' elaboration (i.e., thoughtful information processing) and perceptions of a LBMM as well as their attitude toward the LBMM within the theoretical framework of the ELM (Petty & Cacioppo, 1986). In particular, in this study, LBMM individualization strategies will be manipulated using scenarios consisting of visual and text stimuli to test how consumers' perceptions and attitudes change as the individualization level increases (from randomization to personalization to customization) in the scenarios. The study also examines how the LBMM individualization strategies interact with the argument quality (strong vs. weak) of the message to produce increasing effectiveness of the argument quality as the level of LBMM individualization increases. To provide an agenda and a guideline, the study addresses the following specific research objectives:

1. To examine the effect of LBMM individualization strategy levels (randomization vs. personalization vs. customization) on consumers' elaboration of, perceptions (perceived relevance and intrusiveness) of, and attitude towards a LBMM.
2. To examine whether perceived relevance and intrusiveness of a LBMM mediate the effect of LBMM individualization strategies on consumers' level of elaboration of the LBMM.

3. To examine the influence of perceived relevance and intrusiveness of a LBMM on consumers' attitude towards the LBMM.
4. To examine the effects of information quality (strong vs. weak) of a LBMM on consumers' attitude toward the LBMM.
5. To examine how LMBB individualization strategies moderate the effect of LBMM information quality on consumers' attitudes towards the LBMM.
6. To examine the mediating role of consumers' level of elaboration of a LBMM for the interaction effect of LBMM information quality and individualization strategies on the consumers' attitude towards the LBMM.

Definitions of Terms

- **Argument Quality (or Information Quality):** The strength of persuasiveness of the argument (or information) in a LBMM that requires consumers' cognitive efforts to process (Bhattacherjee & Sanford, 2006). In this study, argument quality (information quality) in a LBMM is manipulated at two levels, strong versus weak argument, which is operated through LBMM message content that is described in a precise, relevant, and detailed manner (strong) versus an ambiguous, irrelevant, and general manner (weak).
- **Level of Elaboration:** The extent of thoughtful processing of information, which corresponds to the extent to which an individual engages in the central route of information processing, according to the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986).
- **Location-Based Mobile Ad Message (LBMM):** A promotional (e.g., coupons, sales alerts, rewards) or informational (e.g., product information, brand information, event information) message that a retailer/brand sends to customers via their mobile devices detected to be located within a certain radius.
- **Location-Based Mobile Ad Message (LBMM) Individualization Strategy:** The strategy used by a retailer/brand to tailor its LBMM to be relevant to individual customers. In this study, three levels of LBMM individualization strategies, which we refer to as randomization, personalization, and customization, are distinguished based on the extent to which customers' personal data are integrated to make the LBMM content relevant to them and how the customer data are obtained. Each of the three individualization strategies is further defined as follows:

- ***Randomized LBMM***: A LBMM that is generated by retailers based solely on consumers' mobile device location with little consideration of other data on the consumers' interests and needs (Bacile et al., 2014).
- ***Personalized LBMM***: A LBMM that is generated by a retailer based on a consumer's mobile device location as well as personal data that have been collected by the retailer via the consumer's online or mobile activities without the consumer's explicit agreement on the retailer's use of the data for individualizing its LBMMs to the consumer (e.g., search history, demographic information) (Arora et al., 2008; Lee et al., 2015).
- ***Customized LBMM***: A LBMM that is generated by a retailer based on a consumer' mobile device location and data the consumer voluntarily provided to the retailer with an explicit knowledge of their being used by the retailer for individualizing its LBMMs to the consumer (e.g., wish list on the retailer's mobile app) (Arora et al., 2008; Lee et al., 2015)

- **Location-Based Mobile Technologies:** Technologies, such as Wi-Fi, Bluetooth, Global Positioning System (GPS), Global System for Mobile Communications (GSM), Near Field Communication (NFC), radio-frequency identification (RFID), cellular tower, or Beacon technology, that are implemented in individuals' mobile devices to enable detection of the device location and real-time communication in the geographically targeted location based on the detected location.
- **Attitudes toward a Location-Based Mobile Ad Message (LBMM):** Consumers' favorable or unfavorable inclination toward a LBMM (Ajzen & Fishbein, 1980).

- **Perceived Intrusiveness:** The level of psychological irritation or disturbance perceived by a consumer about an overwhelming marketing communication message (Edwards et al., 2002).
- **Perceived Relevance:** The degree to which a consumer perceives that a marketing communication content is related to him- or herself (Bhattacherjee & Sanford, 2006).

CHAPTER II: LITERATURE REVIEW

In this chapter, literature surrounding the purpose of this study is discussed, and specific hypotheses to be tested in this study are introduced. Specifically, in the first section, location-based mobile ad messages (LBMMs) are defined, their use cases currently applied in retail industries are introduced, and different levels of LBMM individualization strategies (i.e., randomization, personalization, customization) are reviewed. In the second section, the Elaboration Likelihood Model of Persuasion (ELM) (Petty & Cacioppo, 1986) is reviewed with the critical postulates of the ELM, such as central and peripheral routes of information processing, along with the applications of the critical variables of ELM in this study. The last section provides a conceptual framework with hypotheses. In the section, literature on major variables, including task involvement (i.e., LBMM individualization level), issue involvement (i.e., perceived relevance), perceived intrusiveness, the level of elaboration, and attitudes toward a LBMM is reviewed, and literature that suggests the relationships between these variables is discussed. Finally, the moderating role of LBMM individualization strategies for the effect of the argument quality on consumers' attitudes toward the LBMM is further proposed along with its supporting literature.

LBMM Individualization Strategies

With the innovation of mobile devices and technologies associated with mobile devices for the last decade, retailers have attained various transitions in retail formats—from offline store to online and mobile formats, or integration of all of these. This volatile retail environment has challenged retailers to adapt themselves in retail format integration, data analytics, marketing methods, interactive communications with customers, and so on. As the retail environment has evolved with mobile devices, the location-sensing ability, mobility, interactivity, connectedness,

and personalization of mobile devices allow retailers to send tailored mobile ad messages to consumers' mobile devices using their location data (Andrews et al., 2016; Berman, 2016; Fang et al., 2015; Grewal et al., 2016). Now, the retail world is paying close attention to this location-based marketing because many global companies (approximately 97% in the North America as of 2020) are currently using the location-based marketing, and have experienced increased sales, foot traffics, and return-on-investment (ROI) while using location-based marketing (The LBMA, 2020).

Location-based mobile ad messaging refers to companies' sending out mobile ad messages to potential customers by detecting the location of the potential customers' mobile devices through Wi-Fi, Bluetooth, Global Positioning System (GPS), Global System for Mobile Communications (GSM), Near Field Communication (NFC), radio-frequency identification (RFID), cellular tower, or Beacon technology within a broad range of geographic areas (up to 50,000 meters) (Ravindran, 2019). By using this method, retailers can send mobile ad messages to attract customers who are in-store or passing near the store (Henriksveen, 2016). For instance, a national supermarket chain, Wholefoods Market, sends mobile ad messages about current promotions to potential customers who are within a certain radius from a store or near a border of a competitor's store to bring the potential customers to their store (Girish, 2017). As a type of location-based mobile ad messaging, proximity marketing is a more elaborate and precise form of location-based marketing, which sends out mobile ad messages to geographically targeted customers who are within a narrowly focused area (e.g., by a certain aisle or shelf in the store) (Girish, 2017; Henriksveen, 2016). For example, customers who install a mobile app of the retailer, Target, turn on Bluetooth on their mobile devices to opt in to receive mobile messages from Target, and complete a wish list on the app with relevant products may receive mobile

coupons, sales alerts, and product recommendations when they are nearby an aisle in the store where the relevant products are located (Tode, 2018). Bluetooth is a predominant method to send tailored messages to customers' mobile devices, while NFC is occasionally employed with proximity marketing when the higher security level is required as customers use their mobile devices to self-checkout in-store (e.g., SelfPay) (Lucas, 2015). In this study, LBMMs encompass mobile ad messages sent to customers' mobile devices by identifying customers' locational data with increased relevance of the message content to the customers' situational contexts, regardless of ranges of distance.

The effectiveness of LBMMs has been discussed in previous studies in regard to increased point-of-sales, impulsive purchases, and positive consumer attitude (Fang et al., 2015; Feng et al., 2016; Fong et al., 2015; Gazley et al., 2015; Lee et al., 2015). Fang et al. (2015) argued that a geofenced, which is another term for location-based, mobile ad message has a stronger impact on both same-day purchases and delayed purchases from the day of receiving the LBMM, as compared to a non-geofenced (i.e., non-location based) mobile ad message, emphasizing the importance of geographically targeted marketing strategies. Feng et al. (2016) found significant influences of consumers' extrinsic (i.e, timeliness, localization, personalization) and intrinsic (i.e., consumer innovativeness, perceived involvement) motivations to accept mobile ads and demonstrated that these intrinsic and extrinsic motivations significantly influenced customers' attitude toward the mobile ads. Gazley et al. (2015) studied the effects of message types, customization, permission, intrusiveness, and involvement on attitudes toward mobile ad messages experimentally and demonstrated that consumers' attitude is more favorable toward mobile ad messages that are customized, opted-in, and sent at proper timing than toward mobile ad messages uncustomized, not opted-in, and sent at non-proper timing, respectively,

which highlights the importance of message individualization to the consumer's situational contexts.

Lee et al. (2015) identified two types of mobile ad message individualization strategies—personalization and customization, depending on the level of the consumer's input on a LBMM. They demonstrated that the more the customer's input on a LBMM (message customization), the higher the customer's attitude toward the LBMM and intention to visit the store, as compared to a LBMM with less customer input (message personalization). Lee et al. (2015) also found an interaction effect of product involvement and the mobile ad individualization strategies in driving positive consumer responses in that consumers' attitude toward a LBMM and intention to visit a store were greater for a customized LBMM than a personalized LBMM particularly when the consumers were highly involved with the product. There was no significant difference in consumers' attitudes toward a LBMM or intention to visit a store between customized and personalized LBMMs for a low-involvement product. Although Lee et al. (2015) provided novel findings from the study, there was no attempt to understand to what extent LBMM individualization strategies (i.e., customization, personalization) are more effective over non-message individualization strategy for which little consumer input is applied.

In this study, three types of LBMM individualization strategies are identified: randomization, personalization, and customization. For *LBMM randomization,* retailers initiate LBMMs merely based on customers' location, and thus the LBMM content is only geographically targeted but not tailored to the customers' personal interests. Therefore, consumers receive LBMMs regardless of their situational or personal relevance. For example, many retailers these days send out sales alerts or promotional coupons to geographically targeted

consumers who are within a particular area, not considering customers' interests, demographics, or situational factors.

On the other hand, for *LBMM personalization*, the retailer sends out messages to the consumers' mobile devices based on their location data as well as other personal data the retailer has collected about the consumers through previous interactions (e.g., purchase history, search history, demographics, residential location information) (Gazley et al., 2015; Lee et al., 2015). In this process, consumers end up participating in the message generation unknowingly by granting the retailer access to their data without explicit knowledge that their data will be used by the retailer to individualize its LBMMs. Retailers use this type of data to understand consumer behavioral patterns, through data mining and big data analytics, to be used for message individualization (Gazley et al., 2015; Lee et al., 2015). For example, Macy's offers deals or recommendations for particular items based on consumers' online or mobile search history when they walk around near an area of the relevant items (Schiff, 2016).

Finally, *LBMM customization* is a strategy based on the customer's voluntary input with an explicit intent to receive tailored mobile ad messages from a retailer (Arora et al., 2008; Gazley et al., 2015; Lee et al., 2015). For LBMM customization, consumers actively and voluntarily participate in the generation of LBMMs by opting in LBMMs, choosing what content they will receive, and when they will receive it. For example, consumers who save a list of their shopping items in Target's mobile app and opt in to receive Target LBMMs can automatically receive mobile coupons and deals from the retailer when they browse near an area where the items are located in Target stores (Jaekel, 2017).

Although LBMM customization and personalization benefit both retailers and consumers, a customized LBMM has been demonstrated to affect consumer perceptions more positively than

does a personalized LBMM (Lee et al., 2015). Gazley et al. (2015), Peters et al. (2007), and Ström et al. (2014) argued that the more customized the mobile messages, the higher the perceived interactivity, content relevance, convenience value, and attitude toward mobile messages. Similarly, Unni and Harmon (2007) demonstrated that perceived benefits, perceived value, and intention to sign up were more favorable for pulled location-based advertising (initiated by consumers to receive certain types of mobile messages by their request; permission-based) than for pushed location-based advertising (initiated by retailers or marketers with their estimation of consumers' product preferences or locational data; no permission-based). However, a few studies suggested that highly individualized advertising with personal information can be perceived to be intrusive (White et al., 2008). The inconsistency and lack of findings prevent our understanding of to what extent should marketers strategically individualize LBMMs because different levels of individualization strategies may have different impacts on consumer value perceptions such as relevance and intrusiveness.

Theoretical Background: Elaboration Likelihood Model of Persuasion

This study adopts the ELM (Petty & Cacioppo, 1986) to understand consumers' responses to LBMMs created employing the three different individualization strategies. This section provides an overview of the concepts of central and peripheral routes of information processing postulated by the ELM and the primary constructs of the ELM. Then, how the ELM constructs are applied as variables in this study is introduced.

Central and Peripheral Routes of Information Processing

According to the ELM (Petty & Cacioppo, 1986), individuals incline to retain their attitude. However, when individuals possess motivation or ability to process new information on an object, they are likely to *elaborate* or scrutinize information about the object with more

cognitive effort, leading to a greater and more lasting attitude change in the direction of the given information. The level of elaboration is considered as the depth of one's cognitive processing of the information. Individuals' elaboration on information becomes deeper as they are more able or motivated to scrutinize the information. Individuals with higher motivation and ability to involve in the message make a more significant amount of cognitive efforts through the issue-relevant thinking process. As the level of elaboration increases during the information processing, attitude changes are more likely to occur in the direction of issue-relevant information (i.e., central cues). Therefore, the level of elaboration is a critical factor that affects individuals' attitude changes (Petty & Cacioppo, 1986). Researchers have attempted to assess the level of elaboration using various methods (Petty & Cacioppo, 1986). Some of the most widely adopted techniques to measure the level of elaboration include direct assessment methods, such as thought listing (e.g., Karson & Korgaonkar, 2001) or self-reported cognitive efforts (e.g., Cacioppo et al., 1985; Peltier & Schibrowsky, 1994), as well as indirect assessment methods through argument recall (e.g., Cacioppo et al., 1985; Kalyanaraman & Sundar, 2006) or effects of argument quality on attitude changes (e.g., Bhattacherjee & Sanford, 2006). In addition, some have employed unique methods of assessing elaboration levels by measuring muscle or cardiac activity and reactance time for recalling memory via the electromyographic method (e.g., Cacioppo & Petty, 1981; Cacioppo et al., 1985; Kounios, 1996).

Depending on the level of elaboration and the types of informational cues mainly utilized, information processing can occur through the central route or the peripheral route of information processing. During *the central route of information processing*, the level of elaboration is relatively high, wherein the individual has the ability and motivation to exert a great amount of cognitive efforts to scrutinize the information. For example, a situation where individuals process

information about an issue which they feel is personally relevant (i.e., an issue with a high level of *involvement*) or on which they have the *expertise* (i.e., an issue with a high level of *knowledge*), the situation enhances the individuals' motivation or ability to elaborate, respectively, which in turn induces the individuals' issue-relevant thinking, facilitating them to approach, infer from, and evaluate relevant information (Bhattacherjee & Sanford, 2006; Petty & Cacioppo, 1986). During the central route of information processing, the quality of information is especially a significant factor in persuading individuals (Petty & Cacioppo, 1986). *Argument quality* is a degree of persuasiveness of an argument in a message or information (Bhattacherjee & Sanford, 2006). The stronger the argument in a message to which individuals are exposed, the more favorable their responses toward the argument in the message (Bhattacherjee, 2001). When individuals are engaged in the central route of information processing with a greater ability and motivation to elaborate, they are more likely to utilize argument (e.g., messages and verbal contents) as informational cues and thoroughly process the argument with a more considerable amount of cognitive efforts (Bhattacherjee & Sanford, 2006; Petty & Cacioppo, 1986). Thus, the individuals' attitude changes are greater when the argument in the message is strong as compared to the argument is weak (Bhattacherjee & Sanford, 2006). In other words, argument quality in given information plays a critical role during the central route of the information process; the stronger the argument, the more persuasive the message, and thus the greater the attitude change.

In *the peripheral route of information processing*, on the other hand, individuals are less likely to process information carefully due to their lack of motivation or ability to process it (Bhattacherjee & Sanford, 2006). A situation/issue that an individual perceives to have little relevance to him- or herself (i.e., low *involvement*) or to have little *knowledge* about tends to make the individual avoid effortful thinking of information; therefore, the individual may simply

view the situation/object based on peripheral cues (e.g., non-verbal and affective signals) that are emotionally appealing and arousing while ignoring the argument quality of the information (Bhattacherjee & Sanford, 2006; Petty & Cacioppo, 1986). Peripheral cues may bring out an attitude change; however, the attitude change is not as dramatic as that based on argument quality during the central route of information processing, and the attitude change is less stable or consistent over time (Petty & Cacioppo, 1986).

It should be noted that the central and peripheral routes of information processing are neither inherent personal traits nor individual differences that are mutually exclusive processes. Instead, they occur in one's mind but can alternate by circumstances or timings (Bhattacherjee & Sanford, 2006). The degree of one's elaboration on a situation/object and the types of informational cues (i.e., argument quality vs. peripheral cues) that are actively utilized by the individual to form an attitude (i.e., to be persuaded) determine which information processing route has taken place.

Application of the Elaboration Likelihood Model to This Study

Various ELM constructs, such as task and issue involvement, elaboration, argument quality, and attitude, are applied as variables in this study to predict the persuasive effects of LBMM individualization strategies. First, in this study, the construct of task involvement is applied as LBMM individualization strategies (i.e., randomization, personalization, customization) which will be manipulated as stimuli that address different levels of consumer involvement with the LBMM generation task. Second, the issue involvement, elaboration, and attitude constructs from the ELM are applied in this study as consumer response variables, such as perceived relevance of a LBMM, the level of elaboration of a LBMM, and attitudes toward a LBMM, respectively. Third, this study employs the argument quality construct of the ELM in the

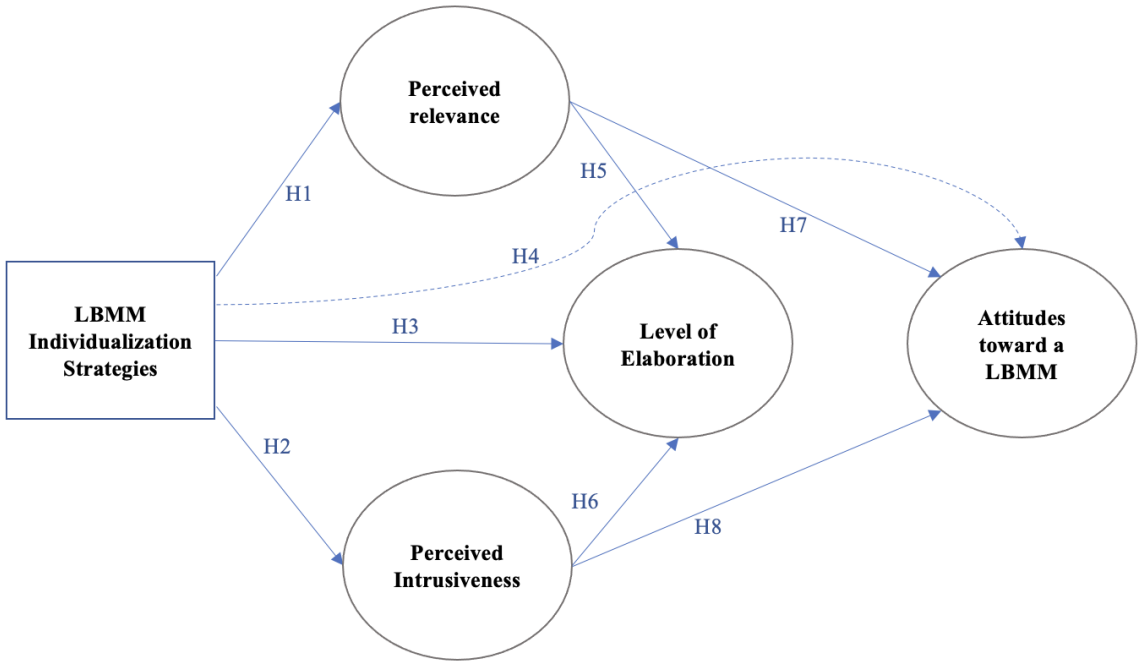
variable of information quality of a LBMM. In addition, perceived intrusiveness of a LBMM is explored as an additional variable that is not directly from the ELM but is related to such ELM constructs as the level of elaboration and attitude in response to a LBMM. Detailed discussions on the variables and their relationships are found in next sections.

Effects of LBMM Individualization Strategies

In this section, a conceptual framework (see Figure 2.1) and hypotheses that delineate the effects of LBMM individualization strategies on various ELM-based response variables and relationships among the response variables are explained, along with a review of supporting literature for each hypothesis.

Figure 2.1

Conceptual Framework of Effects of LBMM Individualization Strategies



Involvement

Involvement refers to the extent a message is relevant to consumers (Cho, 2003; Zaichkowsky, 1986). Involvement has been operationalized in diverse methods in online and mobile ad contexts, such as task involvement (Cho, 1999), situational involvement (Wehmeyer, 2007), location-congruence (Fang et al., 2015; Fong et al., 2015; Lee et al., 2015), message timing (Fong et al., 2015; Ho et al., 2011), issue involvement (Segev et al., 2015), product involvement (Cho, 1999; Lee et al., 2015; Wehmeyer, 2007), and message content involvement (K. Y. Tam & S. Y. Ho, 2005). Particularly relevant to this study among these are two specific concepts of involvement, task involvement and issue involvement. Task involvement refers to the degree of one's commitment to a task (Laczniak & Muehling, 1993; Zaichkowsky, 1986). On the other hand, issue involvement more inherently addresses how much one relates the message content to their personal needs, interests, or values (Segev et al., 2015; Zaichkowsky, 1986).

Task Involvement: LBMM Individualization Strategies

In this study, task involvement explicitly addresses the degree to which consumers engage in the task of the production of a LBMM, as reflected in the three levels of LBMM individualization strategies. As explained earlier, the three LBMM individualization strategies vary in the degrees and types of consumer input, which are used to generate the LBMM content. Randomization, a LBMM individualization strategy, whereby retailers merely send LBMMs on the basis of consumers' mobile device location, does not use consumers' personal data and thus requires little task involvement from consumers. Personalization, on the other hand, is a LBMM individualization strategy established based on consumers' personal data collected from prior encounters (e.g., search history, demographic information) in addition to their location data. Since consumers passively provide personal data knowingly or unknowingly without thinking

that they will be utilized for LBMMs, personalization entails a medium level of task involvement. Customization is to send out LBMMs that are generated based on consumers' data that consumers actively and voluntarily specified (e.g., wishlist, account, and payment information), in addition to their location data and personal data collected through prior encounters; therefore, customization requires the highest level of consumers' task involvement. In summary, randomized LBMMs, in this study, are considered to reflect the lowest level of task involvement, personalized LBMMs a moderate level of task involvement, and customized LBMMs the highest level of task involvement.

Literature shows evidence for effects of task involvement through message individualization strategies (Gazley et al., 2015; Kalyanaraman & Sundar, 2006; Lee et al., 2015; Sundar & Marathe, 2010; K. Y. Tam & S. Y. Ho, 2005). For example, Gazley et al. (2015) found that degree of consumers' attitudes toward a LBMM and purchase intention are affected by the types of individualization strategy (i.e., customized vs. non customized ads) and opt-in permission (i.e., opt-in permission vs. without opt-in permission). Lee et al. (2015) manipulated the individualization level of LBMM using a system-initiated LBMM (i.e., personalization) and a user-initiated LBMM (i.e., customization). Besides, the study investigated how consumers' attitudes toward the LBMM and intention to visit the store are affected by the task involvement that was operationalized with LBMM individualization strategies (Lee et al., 2015). In online contexts, K. Y. Tam and S. Y. Ho (2005) investigated how much consumers are persuaded by a personalized web page versus a non-personalized web page, in which the task involvement is operationalized with the two levels of consumers' engagement on initiating a personalized recommendation on the web page (i.e., participation in choosing one's preferable rhythm and singers for downloading a ring-tone from the web page versus no task). Sundar and Marathe

(2010) also operationalized the task involvement at two levels (i.e., system-initiated personalization (SIP), user-initiated customization (UIC)) on a web page and showed that the UIC was more effective in generating a positive attitude toward the web page content for power-users (who spend extensive time on using electronic gadgets and spending time on Internet browsing); on the other hand, SIP is more effective on the attitude for non-power users (Sundar & Marathe, 2010). Kalyanaraman and Sundar (2006) also experimented the effects of three levels of customization (e.g., low, medium, high) on a web portal (i.e., MyYahoo!) on consumers' perceived relevance, interactivity, involvement, community, and novelty, which were in turn significant indicators for attitude toward the web portal.

Issue Involvement: Perceived Relevance

In this study, the concept of issue involvement is operationalized as the variable named perceived relevance of a LBMM. Perceived relevance is the degree of individuals' subjective feelings associated with the marketing communication context as they feel the context is related to their personal interests (Bhattacherjee & Sanford, 2006). Perceived relevance of a message is greater when information in the message is related to the target consumer's personal interests or needs (Sundar & Marathe, 2010; Varnali, 2014). In this study, perceived relevance indicates the degree to which consumers feel the message content is related to themselves timely, locally, and personally. In online and mobile advertising contexts, perceived relevance has been widely believed as a critical predictor of consumers' cognitive, affective, and behavioral responses, such as attitudes toward a message (Campbell & Wright, 2008; Rau et al., 2011; Varnali, 2014), attitudes toward a brand (Rau et al., 2011; Varnali, 2014), behavioral intentions (Rau et al., 2011; Rettie et al., 2005), and perceived intrusiveness of personalized mobile ad messages (Patel, 2001; Riet et al., 2016; Varnali, 2014; Wehmeyer, 2007), and mobile ad acceptance (Patel, 2001).

Celsi and Olson (1988) posited that personal relevance is derived from two types of sources—situational or intrinsic. Situational sources are physical or social circumstances (e.g., time, location, social pressure), while intrinsic sources are individuals' personal experience or knowledge.

Linkage Between Task Involvement (LBMM Individualization Strategies) and Issue Involvement (Perceived Relevance)

As previously mentioned, involvement is a complex and multi-dimensional construct that can be established on the basis of personal factors, stimulus factors, and/or situational factors (Zaichkowsky, 1986). The relationship between diverse types of involvement and its role in the level of elaboration have been demonstrated by Petty and Cacioppo (1986) who note that the level of commitment to a certain situation (i.e., task involvement) is naturally associated with the perceived relevance of the information presented related to the situation (i.e., issue involvement) and that the increased perceived relevance encourages individuals' elaboration on the message. Petty and Cacioppo (1986) and Lutz et al. (1983) also found that people who are engaged in more highly relevant tasks or social groups are more likely to perceive the issue as more familiar and topic-relevant.

Likewise, many studies in online and mobile contexts have demonstrated that individualized media contents (e.g., web portals, online ads, mobile ads) generate a higher level of perceived relevance than do non-individualized media contents (Kalyanaraman & Sundar, 2006; Kim & Sundar, 2012; Kreuter & Wray, 2003; Wehmeyer, 2007). For example, Kreuter and Wray (2003) suggested that consumers are more likely to perceive message contents as relevant to themselves with a high level of message customization, emphasizing the importance of customization of health communication. Kalyanaraman and Sundar (2006) also showed that

individuals who were guided to manage a web portal with the significant number of personalized features perceived the web portal site to be more personally relevant as compared to individuals who were guided to manage a web portal with a minimum number of personalizing features or individuals with no inputs on a web portal.

In the mobile ad context, more successful personalization of mobile ad messages are considered to generate greater perceived relevance of the message to the consumer (Wehmeyer, 2007). Varnali (2014) argued that mobile ad personalization could be done by individualizing incentives, message sources, or language used in the message to be relevant to recipients. These types of mobile ad personalization could strengthen the effectiveness of the location-congruence of messages by boosting consumers' perceived relevance of the messages (Varnali, 2014). Lee et al. (2015) also stated that customized mobile ad messages engage consumers more mentally and emotionally than do personalized mobile ad messages. Similarly, the effectiveness of mobile ad message customization over personalized mobile ad messages on content relevance has been epistemologically assumed because a higher level of message individualization strategies derives consumers' elaboration on the messages, naturally resonated from perceived content relevance (Arora et al., 2008; Gazley et al., 2015; Peters et al., 2007; Ström et al., 2014).

Given the aforementioned literature conceptually and empirically suggesting the linkage between task involvement and issue involvement or between LBMM individualization strategies and consumers' perceived relevance of a LBMM, the following hypothesis is proposed:

H1: Consumers' perceived relevance increases as LBMM individualization strategy levels increase from randomization to personalization to customization.

Perceived Intrusiveness

Perceived intrusiveness refers to cognitive evaluations associated with psychological irritation or disturbance resulting from overwhelming marketing communication messages (Edwards et al., 2002; Lee et al., 2015). Perceived intrusiveness has been shown to increase consumers' feelings of irritation (Edwards et al., 2002) and advertising avoidance (Edwards et al., 2002), while negatively influencing consumers' attitude toward an ad (Gazley et al., 2015; Lee et al., 2015), intention to visit the store (Lee et al., 2015), and intention to purchase (Doorn & Hoekstra, 2013). The level of perceived intrusiveness varies by the type of marketing communication media used (Truong & Simmons, 2010; Varnali, 2014). For example, traditional advertising media, such as television ads or print ads, have been perceived as more intrusive than online and mobile advertising due to the nature of the non-permitted and pushing method of the traditional advertising media (Truong & Simmons, 2010). Further, non-permission based digital marketing communications, such as push-type mobile ads, online pop-up ads, and online banner ads, can also be perceived to be intrusive in the long-term, generating negative perceptions (Chatterjee, 2008; Li et al., 2002; Truong & Simmons, 2010; Varnali, 2014). Varnali (2014) and Patel (2001) point out that marketers should take as much care in generating mobile ad messages as they do for traditional ad messages because mobile ad messages that are delivered to individuals' personally possessed mobile devices can increase perceived intrusiveness if the messages are not properly individualized. Varnali (2014) and Gazley et al. (2015) suggested that a greater level of message individualization can be a double-edged sword because consumers' personal information utilized in generating mobile ads can increase perceived relevance as well as consumers' privacy and spamming concerns, which increase perceived intrusiveness. According to Doorn and Hoekstra (2013), highly customized messages in online advertising,

such as ad messages with consumers' names or information about the transaction, may increase the perceived intrusiveness of the messages due to consumers' privacy concerns. Truong and Simmons (2010) also argued that push messages that are not consented by consumers, although established based on consumer data such as search history or demographics, can increase consumers' perceived intrusiveness, suggesting a permission-based approach.

However, several studies have shown that deliberately tailored LBMMs with a greater amount of consumers' inputs and commitments are less likely to be perceived as intrusive (Riet et al., 2016; Sundar & Marathe, 2010; Truong & Simmons, 2010). For example, Lee et al. (2015) suggested that carefully found mobile ad messages with a high level of message individualization strategy (i.e., customization) displaying a product with high involvement led to favorable attitudes toward the ad and the brand and a higher intention to visit stores through a reduced level of perceived intrusiveness. Through a qualitative study, Truong and Simmons (2010) concluded that obtaining consumers' permission to opt in to receive mobile ad messages is critical for both a non-personalized and personalized mobile ads, due to the privacy concerns and mistrust toward third parties misusing personal information. Sundar and Marathe (2010) argued that disturbing cues, such as system-initiated message tailoring (i.e., personalization) and the ad with low-involvement products triggered consumers to perceive digital marketing communications (e.g., animations, pop-ups) as unsolicited and interrupting. Given the aforementioned empirical findings that suggest a negative relationship between perceived intrusiveness of a marketing message and consumers' task involvement, it is expected that a higher-level LBMM individualization strategy might be linked to lower perceived intrusiveness of the LBMM, as reflected in the following hypothesis:

H2: Consumers' perceived intrusiveness decreases as LBMM individualization strategy levels increase from randomization to personalization to customization.

Elaboration

The level of elaboration refers to the depth of one's cognitive process. According to the ELM, consumers are more likely to scrutinize information in a message when the message context is personally relevant to them, whereas consumers are likely to process message information with little cognitive effort when the message context is irrelevant to them (Bhattacherjee & Sanford, 2006; Petty & Cacioppo, 1984, 1986). The level of elaboration has long been believed as an outcome of the level of involvement with ad messages, a critical antecedent for consumers' attitude changes, and a determinant of information processing routes in the ELM (Petty & Cacioppo, 1984, 1986). In online and mobile advertising contexts, many studies considered product attribute beliefs (Mitra et al., 2008); attitudes towards the ad, the ad claim, and the brand (Chu & Kamal, 2008; Karson & Korgaonkar, 2001); purchase intention (Yang, 2015); and behavior (K. Y. Tam & S. Y. Ho, 2005) as consequences of the level of elaboration. In these studies, the level of elaboration has been operationalized (i.e., measured) in various methods, such as the number of thoughts listed (Chu & Kamal, 2008; Karson & Korgaonkar, 2001; Mitra et al., 2008), the fixation duration of eye movement (Yang, 2015), and the number of trial listening to a personalized ring-tone from a ring-town download website (K. Y. Tam & S. Y. Ho, 2005). K. Y. Tam and S. Y. Ho (2005) argued that consumers' information processing on the website would be deeper as the number of trial listening increased, and experimentally found that the higher the preference-matching recommendations offered from the website (i.e., personalized recommendation vs. randomized recommendation for a ringtone download), the more the consumers' elaboration made on the recommended contexts (i.g, the

number of trial listening of the ringtone). This finding suggests that a higher level of message individualization in a website or mobile ads induces a greater amount of cognitive processing, fostering one's motivation and ability to scrutinize the information. Therefore, it is plausible that consumers who receive a customized LBMM may exert a greater amount of cognitive effort in scrutinizing information given in the message, as compared to consumers who receive a personalized LBMM, while a randomized LBMM may encourage the least amount of elaboration on the information. Therefore, the following hypothesis is proposed:

H3: Consumers' level of elaboration increases as LBMM individualization strategy levels increase from randomization to personalization to customization.

Attitudes Toward a LBMM

Attitudes are consumers' favorable or unfavorable propensity obtained from values and beliefs (Ajzen & Fishbein, 1980). According to the ELM, attitude changes are an outcome of elaboration or individuals' cognitive involvement in a particular context (Bhattacherjee & Sanford, 2006; Petty & Cacioppo, 1986). Many researchers have studied how consumers' attitude toward an ad message changes based on consumer involvement. Gazley et al. (2015) studied the effects of different facets of the consumer involvement construct, including message individualization level (customized vs. non-customized), permission (opt-in vs. opt-out), and perceived involvement, on consumers' attitude toward mobile ad messages. They found that customized mobile ad messages generate more positive attitudes toward the messages than uncustomized mobile ad messages. Lee et al. (2015) demonstrated that consumers' attitude was more favorable toward customized LBMMs than toward personalized LBMMs, and this effect was greater especially when the consumers' product involvement was higher. Kalyanaraman and Sundar (2006) also found a significant effect of the web portal customization (high vs. medium

vs. low) on attitude toward the web portal, while Sundar and Marathe (2010) demonstrated that attitude toward a web portal was affected by the level of message individualization (i.e., control, system-initiated-personalization vs. user-initiated customization) especially among power users. Moreover, Kim and Sundar (2012) found significant interaction effects of website personalization and ad-media contextual relevance on attitude toward the website, in which consumers' attitude toward the website was significantly different between contextually relevant and irrelevant ads when the website was not personalized. On the other hand, attitude toward the website was not significantly different by the context relevance types of ad-media when the website is personalized. Lastly, Xu (2006) found the significant influence of perceived personalization of mobile ads on the attitude toward the mobile ad. All of these findings from previous empirical studies suggest that the attitude toward the LBMM is an undeniably vital variable to be discussed for its relation to the LBMM individualization strategies. Thus, the following hypothesis is generated:

> H4: Consumers' attitude toward the LBMM increases as LBMM individualization strategy levels increase from randomization to personalization to customization.

Perceived Relevance and Elaboration

According to Bhattacherjee and Sanford (2006), individuals' goal-driven motivation or ability, such as personal relevance or prior expertise, play significant roles in an individual's cognitive efforts to process information based on its argument quality. When there are little personal relevance and prior expertise, individuals are more likely to process the information based on peripheral cues avoiding making cognitive efforts (Bhattacherjee & Sanford, 2006; Cho, 1999). Perceived relevance of an ad is positively related to consumers' attention and comprehension process (Celsi & Olson, 1988; Jung, 2017). Celsi and Olson (1988) measured

consumers' elaboration level with the attention level, the amount of comprehension effort, the number of product-related thoughts, and the number of product-related inferences. This study found consumers who felt playing tennis to be personally relevant make a greater amount of elaboration on the tennis racquet ad. Jung (2017) also demonstrated that perceived ad relevance increases the attention level on an ad on social media, using the four attention level scales. These findings suggest a potential relationship between consumers' perceived relevance of a LBMM and their level of elaboration of the LBMM. Given this suggested relationship between perceived relevance and elaboration level along with the earlier hypothesis (H1) on the effect of the level of ad individualization strategies on perceived relevance, it is natural to predict that the effect of the level of LBMM individualization strategies on consumers' level of elaboration on the LBMM, which was predicted in H3, may occur through the perceived relevance toward the LBMM. In other words, consumers may engage themselves in more thorough cognitive processes for LBMMs created with a higher level of individualization strategy because they perceive greater relevance of the messages to themselves. Therefore, the following hypothesis is provided:

H5: The effect of the LBMM individualization strategies on the level of elaboration is mediated by perceived relevance.

Perceived Intrusiveness and Elaboration

Perceived intrusiveness is a degree to which consumers think that their tasks (i.e., what they are doing just when they receive the ad messages) are hindered or interrupted by the ad messages (Edwards et al., 2002). Perceived intrusiveness of an ad message negatively affects its effectiveness, leading to ad avoidance (Edwards et al., 2002). Because of this, increased perceived intrusiveness toward online or mobile ad messages results in a lower level of elaboration of the ad messages and a greater reliance on peripheral cues to evaluate the ad

messages (Edwards et al., 2002; Lee et al., 2015; Wehmeyer, 2007). Chatterjee (2008) also pointed out that the cognitive ad avoidance (e.g., delaying mental process automatically, avoiding to engage in the information in-depth, delaying to make conscious decisions) occur more frequently than physical ad avoidance (e.g., zipping TV ads, dismissing LBMM, opting out to receive LBMM), in accordance with consumers' intrusiveness perception. Truong and Simmons (2010) specifically mentioned risks of intrusiveness perception in mobile advertising because mobile ad messages that are delivered during consumers' mobile activities can increase consumers' feelings of irritation and disturbance and mistrust toward the ad provider, which in turn can decrease their attention and elaboration on the ad messages.

Given the aforementioned findings in regards to the relationship between perceived intrusiveness and elaboration of an ad message along with the earlier hypothesis (H2) on the effect of LBMM message individualization strategies on perceived intrusiveness, it can be speculated that different LBMM individualization strategies may lead to varying levels of elaboration due to their differential effects on consumers' perceived intrusiveness of the LBMM. This speculation is reflected in the following hypothesis:

H6: The effect of the LBMM individualization strategy on the level of elaboration is mediated by perceived intrusiveness.

Perceived Relevance and Attitude

It is widely known that a greater ad relevance to consumers induces a favorable attitude toward the ad message directly or indirectly. According to Campbell and Wright (2008) and Xu (2006), in online and mobile advertising contexts, respectively, ad messages perceived as personally relevant via message individualization with increased-user control are essential marketing tools, producing positive attitudes toward the ad, product, and website. A plethora of

empirical evidence exists for the relationship between perceived relevance of a communication and consumer attitudes. For example, Rau et al. (2011) found that consumers' attitudes toward the short-message services (SMS) ads were more positive when the SMS content was more relevant to the consumer. Varnali (2014) also demonstrated a statistically significant influence of perceived relevance of the message content on attitude toward the brand, while Kalyanaraman and Sundar (2006) showed a significant relationship between perceived relevance of a web portal and attitude toward the web portal. Applying these findings to this study context, it is highly plausible that perceived relevance is a critical predictor of the attitude toward the LBMM. Therefore, the following hypothesis is proposed:

H7: The perceived relevance of the LBMM positively influences consumers' attitude towards a LBMM

Perceived Intrusiveness and Attitude

Empirical studies that examined a negative relationship between perceived intrusiveness and attitude toward online and mobile ad messages are not uncommon. Gazley et al. (2015) demonstrated that consumers' perceived intrusiveness toward a LBMM attenuates attitude toward a mobile message. Varnali (2014) also confirmed the negative influence of perceived intrusiveness of short-message-services (SMS) ads on attitude toward the messages. Given these previous findings, it can be expected that the less the consumers perceive the LBMM to be intrusive, the more favorable the attitude toward the LBMM. Therefore, the following hypothesis is provided:

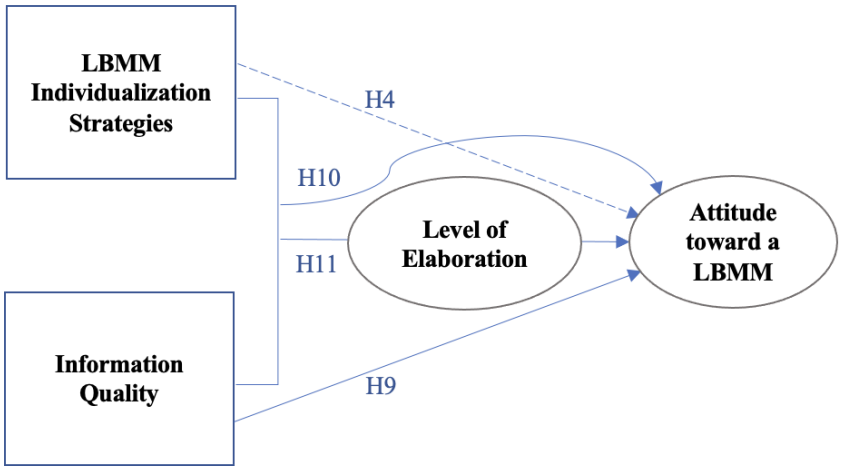
H8: Consumers' attitude towards a LBMM is negatively influenced by the perceived intrusiveness of the LBMM.

A Model and Hypotheses: Interplay of LBMM Information Quality and Individualization Strategies

In the prior sections, hypotheses were proposed with regard to the process by which LBMM individualization strategies produce differential persuasive effects (i.e., changing consumers' attitudes toward the LBMM to varying degrees) by affecting the consumers' level of elaboration in processing the LBMM, and the role of consumer perceptions of relevance and intrusiveness in this process. This section delves into the elaboration-likelihood-based persuasive effects of a LBMM by proposing another set of a conceptual model (see Figure 2.2) and hypotheses predicting the interplay between LBMM information quality and LMBB individualization strategies that drive consumers' attitude toward the LBMM.

Figure 2.2

A Conceptual Model of the Interplay of LBMM Information Quality and LBMM Individualization Strategies



LBMM Information Quality as Argument Quality

As a type of informational cues, argument quality refers to the persuasive strength of information in vocative or textual contents. Petty and Cacioppo (1986) posited that the level of argument quality could be determined in terms of favorability, believability, comprehensibility, complexity, and familiarity of the argument. For example, a strong argument in a message carries more favorable, believable, comprehensible, and/or realistic thoughts than does a weak argument. On the other hand, McKinney et al. (2002) argued that understandability, reliability, and usefulness are vital components of argument quality.

Some studies measured argument quality as a unidimensional construct using three to four measurement items, such as "the information provided in the ad was informative," "the information provided in the ad was helpful," the information provided in the ad was persuasive," and "the information provided in the ad was valuable" (Bhattacherjee & Sanford, 2006; Chang et al., 2015; Li, 2013). Other studied used multidimensional measurements to capture argument quality, consisting of dimensions such as perceived informativeness and perceived persuasiveness (Zhang et al., 2014) or perceived completeness, consistency, accuracy, and adequacy of information (Zhang & Whatts, 2008). Cheung et al. (2008) also observed that argument quality could be operationalized as the "accuracy, relevance, understandability, completeness, currency, dynamism, personalization, and variety" (p. 232). Specifically, they found the more the content-relevant, time-specific, and comprehensive the information given in the message was, the stronger the quality of argument (Cheung et al., 2008).

Studies also have operationalized argument quality through experimental manipulations. For example, Chu and Kamal (2008) manipulated argument quality in online and mobile ad contexts, using brand-related information with five attributes (technology, component, material,

screen, and battery) of a laptop computer, by which a strong argument would generate positive thoughts while a weak argument would generate negative thoughts (Chu & Kamal, 2008). Shin et al. (2017) similarly operated the argument quality with the quality of consumer reviews on social media at two levels, strong versus weak, and they confirmed the success of their manipulations by assessing participants' perceptions of the strength, persuasiveness, and convincing levels of the consumer reviews between the two levels. Some studies operationalized argument quality with appeal types (e.g., rational, emotional) of an SMS ad, displaying rational product-related attributes for rational appeal and less rational product-related attributes for emotional appeal (Drossos et al., 2007; Drossos et al., 2013).

In this study, argument quality is conceptualized as the persuasive strengths of information quality in LBMMs at two levels—strong versus weak information quality. For the *strong* information quality condition, a LBMM including a visual of an item with text describing five product-related attributes (size, color, fabric components, care instruction, stock availability) in a precise and detailed manner will be used, whereas in the *weak* information quality condition, a LBMM showing the same item with a description of the same five product-related attributes written in ambiguous and general manner will be utilized.

The ELM postulates that a stronger argument produces a more positive attitude toward a message, primarily when individuals are engaged in the central route of information processing (Bhattacherjee & Sanford, 2006; Petty & Cacioppo, 1986). When consumers' cognitive processing of information is elaborate (i.e., central route of information processing), argument quality plays a critical role by significantly affecting attitudinal changes, while peripheral cues have a marginal and unstable effect on consumers' attitude change (Petty & Cacioppo, 1986). On the other hand, during the peripheral route of information processing, argument quality is less

effective while peripheral cues affect attitudinal changes (Petty & Cacioppo, 1986). Since this study specifically focuses on consumers' information processing on the LBMM with persuasion through elaboration (cognitive thinking) that is affected by the different levels of LBMM individualization strategies (e.g., randomization, personalization, and customization), this study utilizes the information quality of the LBMM as a central cue that may affects one's elaboration level on the LBMM and consumers' attitude toward the LBMM, ultimately.

Argument Quality and Attitude Toward a LBMM

Argument quality on consumers' attitude changes during the central route of information processing has long been known in both traditional and digital media contexts (Bhattacherjee & Sanford, 2006; Petty & Cacioppo, 1984, 1986; Stephenson et al., 2001). In the traditional ad contexts, Priester and Petty (2003) demonstrated that the strong argument plays a more significant role in affecting consumers' attitude changes toward an ad especially when the ad is endorsed by a less trustworthy spokesperson. Priester et al. (2004) also examined the strong argument becomes more critical to establish attitude toward a brand when the comparison brand in the ad is incongruent with the advertised brand. In the online and mobile ad contexts, Bhattacherjee and Sanford (2006) found that perceived argument quality of informational messages influences consumers' attitude changes through perceived usefulness of IT acceptance. Shin et al. (2017) examined the effect of review quality on the consumer's attitude toward the product from online reviews and demonstrated that a high-quality review produces a more favorable product attitude than a low-quality review. Chu and Kamal (2008) also found the main effect of argument quality of a brand-related information displayed in an online blog on the reader's attitudes toward the blog and the advertised brand. Drossos et al. (2013), similarly, found that the perceived argument quality increases consumers' attitude toward the ad.

Based on the aforementioned theoretical reasoning based on ELM and empirical evidence supporting the relationship between argument quality and perceiver attitude, this study proposes that a strong LBMM information quality will generate a more positive attitude toward the LBMM than a low LBMM information quality, as presented in the following hypothesis:

H9: Consumers' attitude towards a LBMM is more favorable when the information quality of the LBMM is strong (vs. weak).

The Moderating Role of LBMM Individualization Strategies

The moderating role of involvement for the effect of argument quality has long been examined by many cognitive psychologists employing diverse operationalizing methods of involvement (e.g., issue involvement, response involvement, personal relevance, personal responsibility, product involvement) and argument quality, demonstrating the interaction between the involvement and argument quality constructs leading to individuals' attitudinal changes (Cho, 2003; Drossos et al., 2007; Petty & Cacioppo, 1986). Specifically, in the traditional ELM, Petty and Cacioppo (1986) found that individuals were more likely to be motivated to scrutinize the information with issue-relevant arguments (argument quality) as personal relevance of a message (i.e., issue involvement) increases. In online and mobile ad contexts, Shin et al. (2017) examined the interaction effects of types of goals, the similarity of the user group to the reviewer, and the argument quality of an online review for the consumer's attitude toward the product from the online review. This study demonstrated that the quality of the review had a greater effect on consumers' attitude toward the product when the similarity of online reviewers to the user group was high. Kerr et al. (2015) also found that consumers who were highly involved in a situation had a more positive attitude toward a strong argument, while consumers involved less in a situation did not show any differences in their attitudes between

strong and weak arguments. Bhattacherjee and Sanford (2006) found that the influence of the perceived quality of information provided during a document management training session on attitudes toward a new IT was moderated by participants' perceived task relevance and prior knowledge about the task. All of these study findings suggest the critical role of perceiver involvement that moderates the effect of argument quality on the perceiver's attitude toward a communication.

Given the aforementioned literature, as compared to weak LBMM information quality, strong information quality of a LBMM is expected to produce a more positive attitude toward the LBMM when consumers see a customized (i.e., most consumer-involved) LBMM, followed by a personalized LBMM and then a randomized (i.e., least consumer-involved) LBMM. Therefore, the study proposes a hypothesis below:

> H10: The effect of LBMM information quality on consumers' attitudes towards the LBMM increases as the LBMM individualization strategy levels increase from randomization to personalization to customization.

The Mediation of Elaboration

Many previous studies have assessed the level of elaboration by measuring indirectly through individuals' attitudinal changes or post-involvement behavior (e.g., the number of clicking the banner as a result of information processing) affected by the involvement levels and/or argument strengths. Although the ELM postulates the elaboration level as a construct that addresses one's cognitive efforts made in processing information, very few studies have, in fact, directly examined how the elaboration level plays a role in consumers' attitudinal changes as a consequence of consumers' motivation, ability, argument quality, and/or peripheral cues. Nevertheless, according to the theoretical presumption, it is very obvious that perceivers'

cognitive response (e.g., elaboration level) plays a mediating role for the effect of argument quality on attitude especially when individuals are motivated to process carefully the argument quality of the message (Stephenson et al., 2001). In other words, stronger argument quality leads to a greater attitude change for individuals who are more involved because they are more motivated (or even able in some situations) to scrutinize the argument in the given information. Furthermore, Kerr et al. (2015) pointed out the major drawback of the ELM, which is that the elaboration level is actually a continuum, which makes it difficult for researchers to analyze holistically the model, which seemingly illustrates two disparate elaboration-level-based information processing routes. Stephenson et al. (2001) argued that despite a few attempts to investigate indirectly the cognitive responses via a path regression or covariance modeling, there was no attempt to investigate directly the role of consumers' cognitive responses in the ELM. Because few studies have been conducted with the mediation effect of elaboration level on a message or applied the theoretical concept holistically, this study approaches the level of elaboration from diverse angles (as a dependent variable of the involvement and a moderated-mediator for the information processing process), which may allow for testing the ELM more precisely.

As proposed earlier in H10, the effect of the information quality of a LBMM on the attitude toward the LBMM is expected to be moderated by the LBMM individualization strategies. We also hypothesized earlier that LBMM individualization strategies would directly affect the level of elaboration on the LBMM (H3) as well as the attitude toward the LBMM (H4). Integrating these relationships, we propose that the moderating effect of LBMM individualization strategies for the relationship between the LBMM argument quality on the attitude toward the LBMM is indirect, mediated by the level of elaboration. In other words, the

interaction effect predicted by H10 between LBM argument quality and LBMM individualization strategies affects consumers' level of elaboration, which in turn impacts their LBMM attitude. Therefore, the study provides the hypothesis:

> H11: The interaction effect of LBMM information quality and individualization strategies on consumers' attitude towards the LBMM is mediated by the consumers' level of elaboration of the LBMM.

CHAPTER III: PRETESTS

This chapter describes the methods employed in the pretests for stimulus development and results obtained from the pretests. The following sub-sections describe: 1) Pretest 1 for product selection; 2) Pretest 2 for calibration of the LBMM individualization strategies; and 3) Pretest 3 for calibration of the information quality. Stimuli, sampling, instruments, procedure, preliminary analysis, results were discussed in each pretest section.

Pretest 1: Product Selection

The first pretest was conducted to choose a product with a moderate level of product involvement used in the experimental stimuli. Product involvement is considered important in this study context due to its potential confounding effect on the level of elaboration (Petty & Cacioppo, 1986). Using a product with which consumers tend to be extremely involved or uninvolved may threaten the internal validity of the study because they may motivate participants too much or too little to be engaged in the experimental stimuli regardless of the LBMM individualization conditions. Choosing a product with a moderate level of product involvement may help generate intended levels of task involvement according to the LBMM individualization stimuli while controlling participants' product involvement. As Zaichkowsky (1986) addressed earlier, individuals can be involved in various contexts, such as an advertisement, product, or purchase decision, based on how they are affected by the personal, stimulus, and situational factors. In this study, product involvement refers to one's relative importance of or preference to a particular product category. Thus, the product involvement is viewed as distinct from the involvement in the content of the LBMM (i.e., perceived relevance of the LBMM) or in the task of generating the LBMM (i.e., LBMM individualization level). The first pretest employed an online survey method to examine consumers' involvement with diverse

product categories, from which a product category with a mid-level involvement was identified to be used in the main experiment. The detailed methods used in this pretest are explained below.

Sampling

A sample of 50 U.S. adult consumers (19 or older) was recruited for this pretest after approval from the Institutional Review Board (IRB) at Auburn University. Almost even numbers of male (n = 24) and female (n = 26) participants were recruited using a quota sampling method through Amazon Mechanical Turk (MTurk). An MTurk recruitment page was created with brief explanations of the study purpose, procedure, and incentives (50 cents). All participations were voluntary. Demographic information for the sample is presented in Table 3.1.

Table 3.1

Demographic Information of Pretest 1 Participants

	Demographic groups	*f*	%
Age	19 to 24 years old	7	14.0%
	25 to 34 years old	14	28.0%
	35 to 44 years old	11	22.0%
	45 to 54 years old	9	18.0%
	55 to 64 years old	7	14.0%
	65 years old or older	2	4.0%
Gender	Male	24	48.0%
	Female	26	52.0%
Ethnicity	White, non-Hispanic	36	72.0%
	Black, non-Hispanic	7	14.0%
	Asian/Pacific Islander	4	8.0%
	Hispanic	2	4.0%
	American Indian/Alaskan native	0	0.0%
	Others	1	2.0%
Education level	No schooling completed	0	0.0%
	Some high school, no diploma	0	0.0%
	High school graduate, diploma or the equivalent	6	12.0%
	Some college credit, no degree	5	10.0%
	Associate degree in college (2 years)	6	12.0%
	Bachelor's degree in college (4 years)	28	56.0%
	Master's degree	5	10.0%

	Doctorate degree	0	0.0%
	Professional degree (JD, MD)	0	0.0%
Marital status	Single, never married	16	32.00%
	Married or domestic partnership	32	64.00%
	Widowed	1	2.00%
	Divorced or separated	1	2.00%
Employment status	Working (paid employee)	38	76.00%
	Working (self-employee)	8	16.00%
	Not working (retired)	2	4.00%
	Not working (disabled)	1	2.00%
	Not working (temporary layoff from a job)	0	0.0%
	Not working (looking for work)	0	0.0%
	Others	1	2.00%
Income level	Under $20,000	6	12.00%
	$20,000 to $39,999	6	12.00%
	$40,000 to $59,999	18	36.00%
	$60,000 to $79,999	5	10.00%
	$80,000 to $99,999	1	2.00%
	$100,000 to $119,999	7	14.00%
	$120,000 to $139,999	0	0.00%
	$140,000 to $159,999	2	4.00%
	$160,000 to $179,999	1	2.00%
	$180,000 to $199,999	1	2.00%
	$200,000 and above	3	6.00%
Regions	Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)	8	16.00%
	Northeast (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)	6	12.00%
	Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)	15	30.00%
	Southwest (AZ, NM, OK, TX)	10	20.00%
	West (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY)	11	22.00%
	TOTAL	50	100.00%

Instruments

The questionnaire for this pretest first included screening/quota questions asking participants' age and gender in order to verify their age eligibility (i.e., 19 or above) and gender and age quota applicability. Next, the three product involvement scale items, adapted from Gazley et al. (2015) ($\alpha = .96$), including "I am particularly interested in [product name]" (PIS1), "Given my personal interests, [product name] are relevant to me" (PIS2) and "Overall, I am quite

involved when I am purchasing [product name] for personal use" (PIS3) followed. Each item was accompanied with a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The product involvement scale was repeatedly used for each of 12 product categories (i.e., laptops, tablet PCs, smartwatches, coffee machines, Bluetooth speakers, dumbbells, training/running shoes, sports sunglasses, vacuum insulated tumblers, coffee beans, deodorants, toothpaste), all of which were purposefully selected to be gender-neutral. Finally, a set of demographic questions (age, gender, education, ethnicity, and annual income) were asked.

Procedure

The participants, who decided to participate in the pretest after reading the Amazon Mturk announcement page, were instructed to click a URL to an information letter page. Once participants read and consented to participate, they were led to the screening and quota questions (i.e., age, gender). If participants met the age and gender eligibility, they were directed to a page where they completed the product involvement scale for each of the twelve product categories as well as the demographic items and were thanked for their participation. Each participant was given 50 cents as compensation for the pretest participation.

Results

Measurement Properties

Exploratory factor analysis (EFA), using the principal components analysis (PCA) with varimax rotation method and a reliability test with Cronbach's α were performed on the product involvement scale for each product category in order to check the dimensionality and reliability of the scale. The results of EFA with data for each of the 12 product categories (see Table 3.2) showed a single-component solution with all loadings exceeding .80. The variance explained of the single component ranged between 78.63% and 94.46% for all products, and the eigenvalues

for the component was greater than 1 for all products. Cronbach's α exceeded the threshold level of .70 for all products. All of these results demonstrate the uni-dimensionality and adequate reliability of the product involvement scale.

Table 3.2

Results of EFA and Reliability Tests of the Product Involvement Scale by Product Categories

	Loading[a]			Eigenvalues	Variance % Explained (% of Variance)	α
	PIS1	PIS2	PIS3			
Laptop	.94	.94	.88	2.54	84.67%	.91
Tablet PC	.97	.96	.95	2.75	91.66%	.95
Smartwatches	.97	.96	.95	2.78	92.51%	.96
Coffee Machine	.98	.96	.95	2.77	92.47%	.96
Bluetooth Speakers	.96	.96	.90	2.65	88.46%	.93
Dumbbells	.97	.96	.93	2.72	90.77%	.95
Training/running shoes	.95	.94	.88	2.54	84.79%	.91
Sports sunglasses	.96	.94	.91	2.64	88.10%	.93
Tumblers	.98	.97	.97	2.83	94.46%	.97
Coffee Beans	.97	.97	.93	2.74	91.28%	.95
Deodorants	.94	.93	.92	2.60	86.77%	.92
Toothpaste	.91	.91	.84	2.36	78.63%	.86

[a] The loading values represent the loading of each of PIS1, PIS2, and PIS3 on the single component extracted in the EFA.

Pretest Results

After calculating composite scores of the product involvement scale for each product category, a series of independent sample *t*-tests were performed to compare male and female consumers' product involvement scores and to make sure that both genders have similar product involvement levels within each product category. The results of the independent sample *t*-tests showed that product involvement in dumbbells had a significant gender difference (M_{female} =

2.29, *S.D.* = 1.18; M_{male} = 3.26, *S.D.* = 1.24; t (48) = 2.83, $p < .01$) (see Table 3.3); thus, dumbbells were excluded from the product selection.

Table 3.3

Gender Comparison via Independent Sample t-Test

	Gender	*M*	*S.D.*	*t*	*df*	*p*
Laptop	Male	4.32	.70	-.28	48	.78
	Female	4.37	.64			
Tablet PC	Male	3.60	1.27	-.22	48	.83
	Female	3.67	1.00			
Smartwatches	Male	3.26	1.26	-.54	48	.59
	Female	3.47	1.49			
Coffee Machine	Male	3.58	1.13	-1.53	48	.13
	Female	4.08	1.15			
Bluetooth Speakers	Male	3.44	1.15	-.09	48	.93
	Female	3.47	1.24			
Dumbbells	Male	**3.26**	**1.24**	**2.83**	**48**	**.01**
	Female	**2.29**	**1.18**			
Training/running shoes	Male	3.97	.72	1.18	48	.24
	Female	3.64	1.18			
Sports sunglasses	Male	3.13	1.20	1.29	48	.20
	Female	2.65	1.36			
Tumblers	Male	2.71	1.24	-.72	48	.47
	Female	2.97	1.35			
Coffee Beans	Male	3.50	1.28	-.14	48	.89
	Female	3.55	1.35			
Deodorants	Male	3.81	1.01	.76	48	.45
	Female	3.58	1.11			
Toothpaste	Male	3.93	.85	.70	48	.49
	Female	3.73	1.13			

n_{male} = 24, n_{female} = 26

Next, an independent sample *t*-tests were run to compare younger and older consumers' product involvement scores and to make sure regardless of their age groups they have similar product involvement levels with the product categories. The younger and older consumer groups were divided using median-split (*Mdn* = 36). The results of the independent sample *t*-test showed that product involvement scores for smartwatches (M_{young} = 3.85, *S.D.* = 1.13; M_{old} = 2.89, *S.D.* = 1.45; *t* (48) = 2.61, $p < .05$) and running/training shoes (M_{young} = 4.21, *S.D.* = .64; M_{old} = 3.39, *S.D.* = 1.12; *t* (48) = 3.21, $p < .01$) significantly differed by age groups (see Table 3.4); therefore, these products were excluded from the product selection.

Table 3.4

Age Group Comparison via Independent Sample t-Tests

	Age Group (*Mdn* = 36)	*M*	*S.D.*	*t*	*df*	*p*
Laptop	Young	4.35	.70	.00	48	1.00
	Old	4.35	.64			
Tablet PC	Young	3.52	1.11	-.71	48	.48
	Old	3.75	1.16			
Smartwatches	Young	**3.85**	**1.13**	**2.61**	**48**	**.01**
	Old	**2.89**	**1.45**			
Coffee Machine	Young	3.95	1.08	.65	48	.52
	Old	3.73	1.25			
Bluetooth Speakers	Young	3.63	1.14	.99	48	.33
	Old	3.29	1.23			
Dumbbells	Young	2.81	1.24	.29	48	.77
	Old	2.71	1.37			
Training/Running Shoes	Young	**4.21**	**.64**	**3.21**	**48**	**.00**
	Old	**3.39**	**1.12**			
Sports Sunglasses	Young	3.13	1.11	1.39	48	.17
	Old	2.63	1.44			

Tumblers	Young	3.11	1.24	1.43	48	.16
	Old	2.59	1.32			
Coffee Beans	Young	3.57	1.17	.25	48	.80
	Old	3.48	1.44			
Deodorants	Male	3.59	.99	-.66	48	.51
	Female	3.79	1.14			
Toothpaste	Male	3.85	1.07	.19	48	.85
	Female	3.80	.94			

n_{young} = 25, n_{old} = 25

Next, a cross-tabulation was performed to explore the overall distribution of product involvement scores by product categories and identify abnormally distributed product categories. Among the product categories, the majority of product involvement scores for laptop were distributed in high value (4.0 – 5.0); therefore, laptop was removed from the product selection. Product involvement scores of sports sunglasses were frequently distributed in low values (= 1.00), while the scores of tumblers and coffee beans were somewhat polarized in both low (= 1.00) and high scale (= 4.00). Therefore, these three product categories also were removed from the product selection (see Table 3.5).

Table 3.5

Product Involvement Score by Product Categories in Cross-tabulation

Product Involvement Scores	Laptop	Tablet PC	Smartw-atches	Coffee Machine	Blueto-oth-Speake-rs	Dumbb-ells	Trainin-g/ Runnin-g Shoes	Sports Sungla-sses	Tumble-rs	Coffee Beans	Deodor-ants	Toothp-aste
1.00	0	4	4	3	4	8	1	**10**	**9**	**5**	2	2
1.33	0	0	2	1	1	2	1	0	2	1	1	0
1.67	0	0	2	0	1	2	0	1	1	1	1	2
2.00	0	2	7	2	4	12	4	5	6	3	2	0
2.33	0	2	2	1	1	2	0	4	4	4	1	0
2.67	1	1	1	2	0	0	2	4	1	0	2	2
3.00	4	7	4	3	7	4	2	5	5	2	5	5
3.33	1	2	0	1	2	1	3	2	3	1	1	2
3.67	1	1	1	3	3	3	7	5	3	3	6	5
4.00	**14**	17	8	13	15	8	12	5	**10**	**13**	13	17

4.33	5	4	7	5	4	2	7	3	1	4	4	2
4.67	6	1	2	3	1	5	2	2	1	5	6	3
5.00	**18**	9	10	13	7	1	9	4	4	**8**	6	10
Total	50	50	50	50	50	50	50	50	50	50	50	50

In addition, a series of one-sample *t*-tests were run to identify product categories whose product involvement mean scores were not significantly different from the neutral point (3) in the scale. This step was to sort out product categories of which involvement scores were considerably lower or higher the neutral point (3.0) of the scale. The product involvement mean score of Bluetooth speakers (M = 3.46) did not significantly differ from the neutral point with a smallest difference from the neutral point (see Table 3.6); therefore, Bluetooth speakers were selected as the product to be used in stimuli of the main experiment.

Table 3.6

Mean Differences in Product Involvement Score in One-Sample t-Tests

	M	*S.D.*	*t*	*df*	*p*	Mean Differences (Test value = 3)	95% C.I.	
							Lower	Upper
Laptop	4.35	.66	14.36	49	.00	1.35	1.16	1.54
Tablet PC	3.63	1.13	3.97	49	.00	.63	.31	.95
Smartwatches	3.37	1.37	1.92	49	.06	.37	-.02	.76
Coffee Machine	3.84	1.16	5.12	49	.00	.84	.51	1.17
Bluetooth Speakers	3.46	1.19	2.74	49	.01	**.46**	**.12**	**.80**
Dumbbells	2.76	1.29	-1.31	49	.20	-.24	-.61	.13
Training/running shoes	3.80	.99	5.69	49	.00	.80	.52	1.08
Sports sunglasses	2.88	1.30	-.65	49	.52	-.12	-.49	.25
Tumblers	2.84	1.30	-.84	49	.41	-.15	-.52	.21
Coffee Beans	3.53	1.30	2.86	49	.01	.53	.16	.90
Deodorants	3.69	1.06	4.58	49	.00	.69	.39	.99
Toothpaste	3.83	.99	5.85	49	.00	.83	.54	1.11

Pretest 2: Calibration of LBMM Information Quality Stimuli

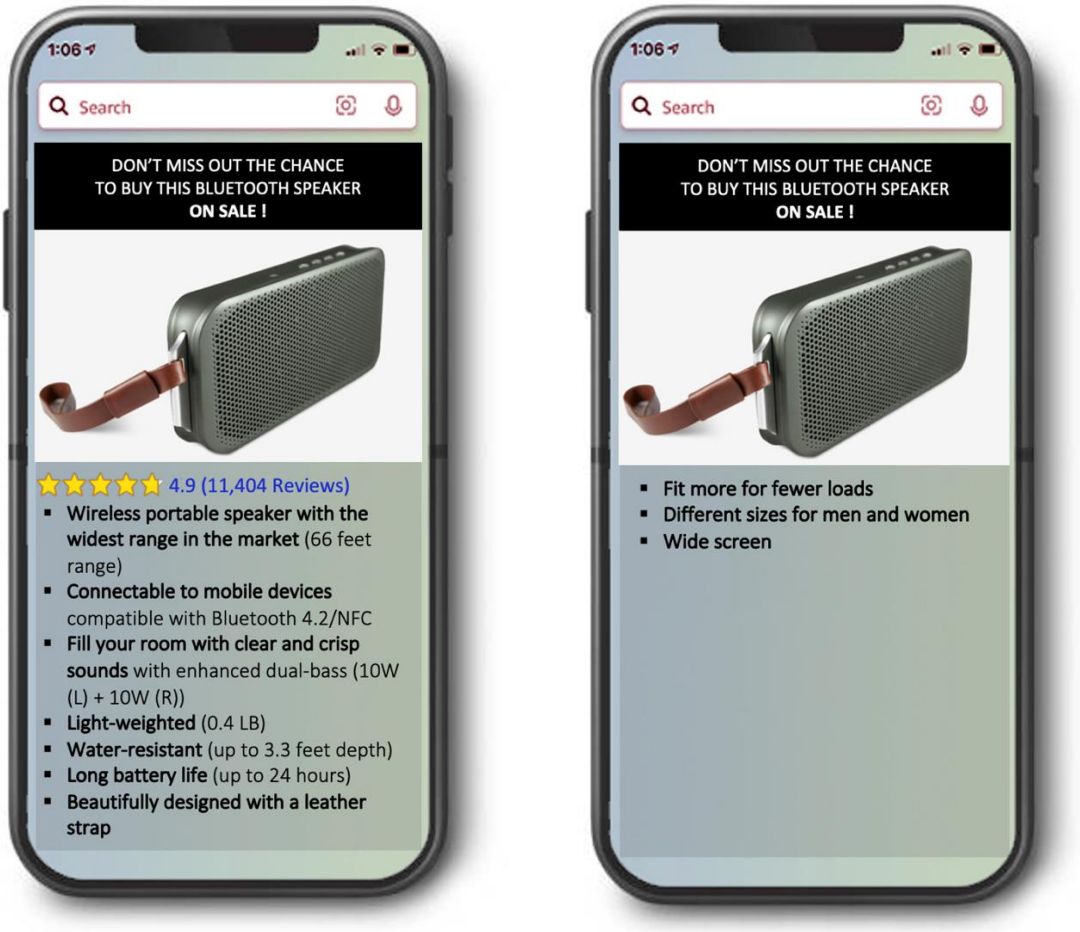
In order to calibrate the stimuli used to manipulate the LBMM information quality factor at two levels (strong vs. weak), a second pretest was conducted. The following sections describe the stimuli, sampling, instruments, procedure, preliminary analysis, and results for this pretest.

Stimuli

The second pretest assessed consumers evaluation of the visual stimuli used to manipulate the two levels of information quality (i.e., strong, weak) accordingly. The strong and weak LBMM information quality conditions were manipulated using fictitious LBMM visual stimuli posed as screen captures of a LBMM containing a product image (i.e., Bluetooth speaker). A strong argument has been often referred to as useful, detailed, relevant, accurate, believable, comprehensible, and realistic product information (Bhattacherjee & Sanford, 2006; Cheung et al., 2008; McKinney et al., 2002), while a weak argument is considered to be ambiguous and general (Bhattacherjee & Sanford, 2006). In the study, for the *strong information quality* condition, product information on the fictitious LBMM was described with detailed attributes of a Bluetooth speaker, such as portability, Bluetooth technology specifications, sound quality, weight, battery life, and water resistance, along with a customer rating with the number of customers who reviewed the product. For the *weak information quality* condition, product information on the fictitious LBMM contained irrelevant product attributes (i.e., “fit more for fewer loads, different sizes for men and women, wide screen”) (see Figure 3.1 for example of the visual stimuli). On both strong and weak information quality stimuli, an identical image of a Bluetooth speaker was included.

Figure 3.1

Example of Visual Stimuli with Strong (Left) and Weak (Right) Product Information



Sampling

One hundred seventeen U.S. consumers (aged between 19 and 34 years) were recruited through Amazon Mturk. A study announcement briefly addressed study information, eligibility, procedure, and incentives via the Amazon MTurk recruiting page. The sample size of 117 was deemed to provide a sufficient power in the analysis to detect a difference between two levels of information quality in the manipulation check measure (perceived information quality). A quota

sampling method was embedded to recruit an even number of males and females and age groups that would proportionately mimic those of young U.S. mobile consumers (i.e., 32.9% of 19 - 24 years old, 67.1% of 25 - 34 years old). The age groups were selected because they were considered to be the most tech-savvy consumers. In addition, participants were required to be smartphone users and U.S. residents to be eligible to the study criteria. People who read the MTurk recruitment page and desired to participate in the study first were asked screening and quota questions to ensure their eligibility (i.e., age, gender, smartphone users, U.S. residents). If participants met the eligibility criteria and belonged to a group with an unmet quota, they were led to the pretest page; otherwise, thanked and terminated. Demographic information for the participants is presented in Table 3.7.

Table 3.7

Demographic Information of Pretest 3 Participants

	Demographic groups	*f*	%
Age	19 to 24 years old	37	31.6%
	25 to 34 years old	80	68.4%
Gender	Male	57	48.7%
	Female	60	51.3%
Ethnicity	White, non-Hispanic	66	56.4%
	Black, non-Hispanic	17	14.5%
	Asian/Pacific Islander	9	7.7%
	Hispanic	8	6.8%
	American Indian/Alaskan native	5	4.3%
	Others	0	0.0%
	Missing	12	10.3%
Education level	No schooling completed	0	0.0%
	Some high school, no diploma	0	0.0%
	High school graduate, diploma, or the equivalent	2	1.7%
	Some college credit, no degree	6	5.1%
	Associate degree in college (2 years)	3	2.6%
	Bachelor's degree in college (4 years)	75	64.1%
	Master's degree	16	13.7%
	Doctorate degree	0	0.0%

	Professional degree (JD, MD)	0	0.0%
	Missing	15	12.8%
Marital status	Single, never married	33	28.2%
	Married or domestic partnership	67	57.3%
	Widowed	0	0.0%
	Divorced or separated	2	1.7%
	Missing	15	12.8%
Employment status	Working (paid employee)	78	66.7%
	Working (self-employee)	17	14.5%
	Not working (retired)	0	0.0%
	Not working (disabled)	0	0.0%
	Not working (temporary layoff from a job)	0	0.0%
	Not working (looking for work)	5	4.3%
	Others	2	1.7%
	Missing	15	12.8%
Income level	Under $20,000	5	4.3%
	$20,000 to $39,999	17	14.5%
	$40,000 to $59,999	26	22.2%
	$60,000 to $79,999	19	16.2%
	$80,000 to $99,999	18	15.4%
	$100,000 to $119,999	5	4.3%
	$120,000 to $139,999	3	2.6%
	$140,000 to $159,999	2	1.7%
	$160,000 to $179,999	1	0.9%
	$180,000 to $199,999	2	1.7%
	$200,000 and above	4	3.4%
	Missing	15	12.8%
Regions	Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)	16	13.7%
	Northeast (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)	21	17.9%
	Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)	29	24.8%
	Southwest (AZ, NM, OK, TX)	16	13.7%
	West (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY)	20	17.1%
	Missing	15	12.8%
	TOTAL	117	100.00%

Instruments

This pretest used an online questionnaire including the screening and quota questions, an either strong or weak information quality stimulus randomly assigned, perceived information quality scales for the manipulation check, and demographic questions. Four screening questions

asking participants' age and gender, smartphone usage, and countries of residency were utilized to screen out participants who did not meet age, smartphone use, and country of residence eligibility or the quota limit of the gender and age groups. Five perceived information quality scale items adapted from Bhattacherjee and Sanford (2006) ($\alpha = .97$) were used to check the manipulation of strong and weak information quality of the fictitious LBMM stimuli. The measurement scale items used seven-point semantic differential scale formats responded with five bi-polar adjective pairs— "unpersuasive: persuasive," "uninformative: informative," "weak: strong," "not convincing: convincing," and "unhelpful: helpful"— to complete the sentence "the Bluetooth speaker information in the mobile message is ____." The higher the score, the more persuasive, informative, strong, convincing, and helpful the stimulus was perceived to be (e.g., 1 = unpersuasive, 7 = persuasive). Finally, a set of demographic questions, such as participants' gender, age, ethnicity, education levels, and income levels, followed.

Procedure

Participants who decided to participate in the pretest after reading an announcement page on MTurk were directed to an information letter page. Participants who previously participated in Pretest 1 were blocked for subsequent study participation on Amazon Mturk recruitment page. Upon participants' agreement to participate in the study after reading the information letter, participants were asked the screening questions. Participants who met the eligibility and quota criteria were randomly assigned to either of the two information quality conditions and instructed to examine the visual stimulus displaying the fictitious LBMM assigned to them. A timer was embedded in the stimulus page of the online questionnaire so that participants would need to spend at least 20 seconds in processing the fictitious LBMM stimulus before they were allowed

to move to the next pages where they completed the perceived information quality scale and demographic items. Each participant was compensated with 50 cents.

Results

Measurement Properties

EFA and Cronbach's α were run to reassure the dimensionality and internal consistency, respectively, of the perceived information quality scale. The results of EFA run with PCA and varimax rotation (eigenvalue > 1) showed that all five items composed a single component with factor loadings exceeding .80 and total variance explained of 79.51%. Cronbach's α for the scale was .97 exceeding the threshold level of .7. Therefore, the uni-dimensionality and reliability of the scale were fulfilled (see Table 3.8).

Table 3.8

EFA Results of the Perceived Information Quality Scale

Factor	Items	*Loading*
Information Quality	Unpersuasive --- persuasive	.91
	Uninformative --- Informative	.90
	Weak --- strong	.90
	Not convincing --- convincing	.88
	Unhelpful --- helpful	.87
Eigenvalue		3.98
Total Variance Explained (% of Variance)		79.51%
Cronbach's α		.94

Pretest Results

After calculating the composite score of the perceived information quality scale, the manipulation of the stimuli was checked through an independent-sample *t*-test in SPSS 27.0. The results showed that participants exposed to the strong information quality LBMM stimulus (*M* =

5.70, *S.D.* = 0.87, *n* = 59) perceived the message significantly higher in quality than those exposed to the weak information quality LBMM stimulus (*M* = 4.77, *S.D.* = 1.72, *n* = 58; t_{115} = -3.72, $p < .001$). Therefore, the LBMM information quality manipulation was successful.

Pretest 3: Calibration of LBMM Individualization Strategy Scenarios

In this round of pretests, the scenarios that were employed to operationalize the three LBMM individualization levels (randomization, personalization, and customization) were calibrated through a series of three pretests (Pretests 3-1, 3-2, and 3-3). The following three additional sections explain each of the three pretests in terms of the stimuli, instruments, sample and data collection procedure used in each pretest as well as results from it.

Pretest 3-1

Stimuli

In this initial Pretest 3, LBMM individualization levels were operationalized with scenarios that were developed using mixed modes (i.e., text, video, image). Participants were instructed to imagine a situation in which they received a LBMM. In the *randomization* scenario, participants were given an *in-store LBMM delivery scenario* in which they were asked to imagine that they would be passing by a Bluetooth speaker section of a store when they received a LBMM about a promotional item offered by the store in the text. Below the scenario, an image of a LBMM was displayed to reinforce participants imagination of a realistic shopping situation (see Table 3.9 and Figure 3.2). A timer was implemented on this page's setting to require participants to stay on this page at least for 15 seconds before they were able to proceed the next page.

On the other hand, participants in the *personalization* condition were first given a *web-browsing scenario* in which they were told to imagine browsing Bluetooth speakers from a

retailer's website. Along with this text scenario, participants in the personalization condition were also asked to watch a 34-second simulation video of a computer screen capture in which a shopper browsed five styles of Bluetooth speakers on a mock website (see https://www.youtube.com/watch?v=V82K7dBGvkg), imagining themselves as the shopper. A timer was implemented on this page's setting to require participants to spend at least 45 seconds on this page before they could proceed the next page. On the next page, an *in-store LBMM delivery scenario* was presented in which participants were instructed to imagine passing by a Bluetooth speaker section of a retail store and receive an LBMM about a Bluetooth speaker item. This text scenario was presented with an image of a LBMM that is identical to the image used in the randomization condition (see Table 3.9 and Figure 3.2). A 15-second timer was installed on this page.

Finally, participants in the *customization* condition were first given a *web-browsing scenario* in which they were asked to imagine that they had searched for products on a retailer's website, put items into their shopping cart, and set to permit the retailer to send notifications on promotional offers on these items. This text scenario was accompanied by a 70-second simulation video of a computer screen capture in which a shopper: 1) opted in to receive a LBMM, 2) browsed five styles of Bluetooth speakers, and 3) saved one of the browsed items in the shopping cart on a mock retail website (see https://www.youtube.com/watch?v=PupxQBHcs7U). An 80-second timer was installed in this page to ensure participants spent sufficient time to read the text scenario and watch the video. On the next page, participants were asked to read an *in-store LBMM delivery scenario* in which they would be passing by a Bluetooth speaker section of a retail store and receive the LBMM given as an image (see Table 3.9 and Figure 3.2). A 15-second timer was set for this page.

Table 3.9

Pretest 3-1: Shopping Scenarios by LBMM Individualization Levels

Condition	Scenario
Randomization	In-store LBMM delivery scenario: You are shopping in your favorite retail store. As you approach the store's Bluetooth speaker section, you are receiving the mobile message below, which is about a Bluetooth speaker on sale! Please carefully review the mobile message image below and click the "Next" button to answer questions about your thoughts about this message. (The LBMM image for the randomization condition is shown here.)
Personalization	Web-browsing scenario: Imagine that you recently have become interested in buying a Bluetooth speaker. You have browsed several Bluetooth speaker models on your favorite retailer's website. Please watch the video below imagining yourself in the situation described above. (The simulation video for the personalization condition is shown here.) In-store LBMM delivery scenario: Now, continue to imagine: A few days later, you are shopping in the favorite retailer's offline store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is about **a Bluetooth speaker on sale**! Please carefully review the mobile message image below and click the "Next" button to answer questions about your thoughts about this message. (The LBMM image for the personalization condition is shown here.)
Customization	Web-browsing scenario: Imagine that you recently have become interested in buying a Bluetooth speaker. You have browsed several Bluetooth speaker models on your favorite retailer's website and put a model that you really liked in the shopping cart. You also have opted in to receive mobile notifications about this item. Please watch the video below imagining yourself in the situation described above (The simulation video for the customization condition is shown here.) In-store LBMM delivery scenario:

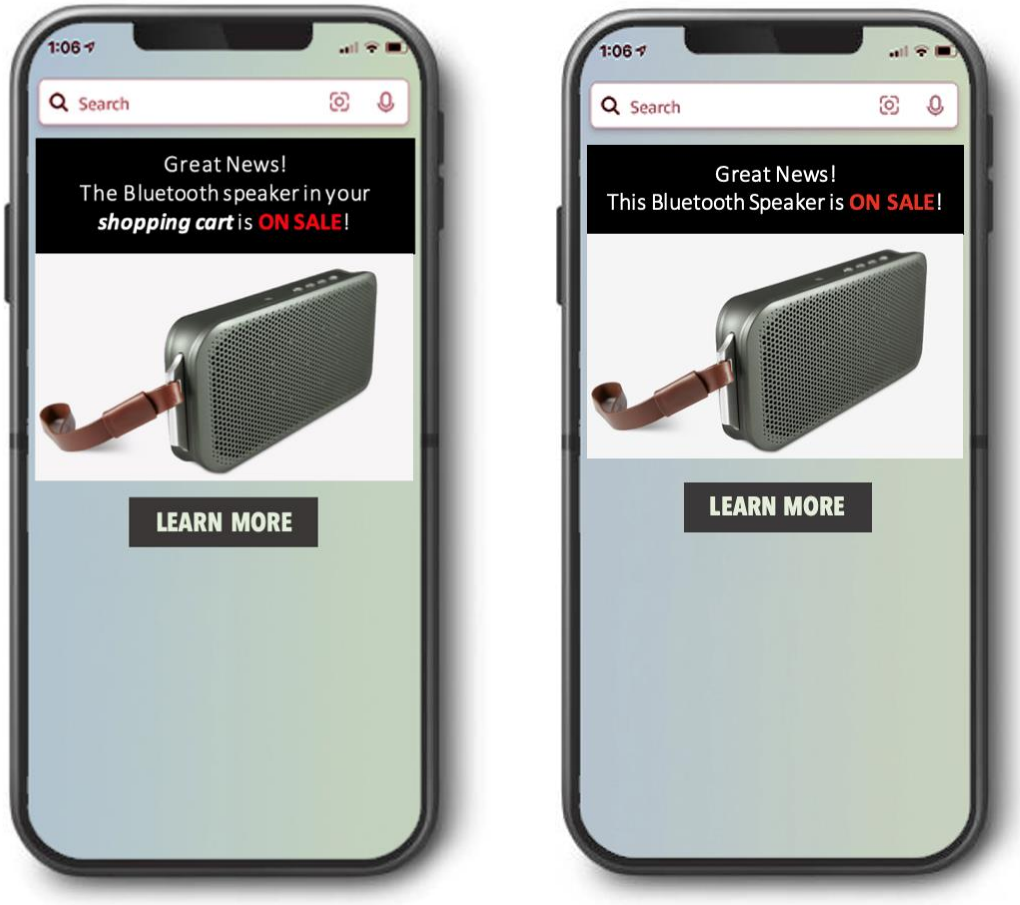
Now, continue to imagine: A few days later, you are shopping in the favorite retailer's offline store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is **about the Bluetooth speaker that you put in the online shopping cart a few days ago being on sale**!

Please carefully review the mobile message image below and click the "Next" button to answer questions about your thoughts about this message.

(The LBMM image for the customization condition is shown here.)

Figure 3.2

LBMM Images Used in the Customization (Left) and Personalization and Randomization (Right) Conditions



Instruments

Participants' age, gender, smartphone usage, and country of residency were used as screening/quota questions. For manipulation checks, two sets of measures were asked. First, four items, adapted from Gazley et al. (2015)'s perceived customization scale, were used to assess pretest participants' perceived level of LBMM individualization in their assigned scenario. The four perceived level of LBMM individualization scale items included "The message matches my needs," "Information in the message was tailored to my situation," "The message targeted me as a unique customer," and "The message was customized to my own preferences," and were rated using a seven-point Likert-scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

The second set of manipulation check measures utilized three questions directly assuring whether participants understood the LBMM individualization mechanisms described in their assigned scenario correctly as the researcher intended. The three questions included "In that scenario, the mobile message was about a product I kept in my mobile shopping cart" (Question 1), "In that scenario, the mobile message was about a product that I browsed for recently" (Question 2), and "In that scenario, the mobile message was delivered when I got close to the Bluetooth speaker section" (Question 3) and were answered with three response options: “true,” “false,” and “not sure.” Finally, demographic questions were also asked with regard to participants' gender, age, ethnicity, education level, and income level.

Sample

A sample of 163 U.S. consumers was recruited through Amazon Mturk and randomly assigned to one of the three LBMM individualization scenarios. A study announcement containing brief study information, eligibility, procedure, and incentives was displayed on the Amazon MTurk recruiting page. Age groups between 19 and 34 years old were selected for the

pretest sample because younger age groups, such as Generation Z or Millenials, are considered to be promptly adjusted to new technologies and seek efficient and easy lives using technologies and thus may possibly enhance the effect size. Those who did not meet the age criteria, non-smartphone users, or non-U.S. residents were all screened out. Additionally, in order to recruit an even number of male and female groups and age groups that proportionately mimic U.S. mobile consumers' age groups (approximately 32.9% of 19-24 years old, and 67.1% of 25-34 years old), gender and age questions were utilized as quota questions. When the quota number was fulfilled in each age and gender group, participants within the fulfilled group were thanked and then directed to the termination page. The study participants were voluntary. Demographic information about the sample is presented in Table 3.10.

Table 3.10

Demographic Information of Pretest 3-1 Participants

	Demographic groups	*f*	%
Age	19 to 24 years old	45	27.6%
	25 to 34 years old	118	72.4%
Gender	Male	90	55.2%
	Female	73	44.8%
Ethnicity	White, non-Hispanic	116	71.2%
	Black, non-Hispanic	22	12.9%
	Hispanic	10	6.1%
	Asian/Pacific Islander	10	6.1%
	American Indian/Alaskan native	4	2.5%
	Others	0	0.0%
	Missing	1	0.6%
Education level	No schooling completed	0	0.0%
	Some high school, no diploma	2	1.2%
	High school graduate, diploma or the equivalent	7	4.3%
	Some college credit, no degree	14	8.6%
	Associate degree in college (2 years)	10	6.1%
	Bachelor's degree in college (4 years)	106	65.0%
	Master's degree	17	10.4%
	Doctorate degree	2	1.2%

	Professional degree (JD, MD)	1	0.6%
	Missing	4	2.5%
Marital status	Single, never married	62	38.0%
	Married or domestic partnership	94	57.7%
	Widowed	1	0.6%
	Divorced or separated	2	1.2%
	Missing	4	2.5%
Employment status	Working (paid employee)	119	73.0%
	Working (self-employee)	21	12.9%
	Not working (retired)	1	0.6%
	Not working (disabled)	2	1.2%
	Not working (temporary layoff from a job)	1	0.6%
	Not working (looking for work)	11	6.7%
	Others	4	2.5%
	Missing	4	2.5%
Income level	Under $20,000	17	10.4%
	$20,000 to $39,999	15	9.2%
	$40,000 to $59,999	34	20.9%
	$60,000 to $79,999	42	25.8%
	$80,000 to $99,999	25	15.3%
	$100,000 to $119,999	17	10.4%
	$120,000 to $139,999	3	1.8%
	$140,000 to $159,999	2	1.2%
	$160,000 to $179,999	1	0.6%
	$180,000 to $199,999	3	1.8%
	$200,000 and above	0	0.0%
	Missing	4	2.5%
Regions	Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)	23	14.1%
	Northeast (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)	54	33.1%
	Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)	40	24.5%
	Southwest (AZ, NM, OK, TX)	12	7.4%
	West (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY)	30	18.4%
	Missing	4	2.5%
	TOTAL	163	100.00%

Procedure

Participants, who read the announcement page on the Amazon Mturk and decided to participate in the pretest, clicked on the URL directed to an information letter page. Those who already participated in Pretests 1 and 2 were blocked from viewing the study announcement page

on Mturk, so that they would not be able to participate in Pretest 3-1. The screening and quota questions (i.e., age, gender, smartphone use, countries) followed participants' agreement to participate on the information letter page to assure their age eligibility, gender quota availability, and qualification to participate in the study. Participants whose age was under 19 or above 34 years old were screened out. Once gender and age quotas were met, further participants in that gender group were directed to the termination page with a brief explanation about the quota limit and thanked. Each participant who passed the screening and quota checks was randomly assigned to one of the LBMM individualization scenarios (i.e., randomization, personalization, customization) and instructed to read the assigned scenario displayed on the screen. Based on the reinforcement video length and average scenario reading times, timers were installed in each randomization, personalization, and customization condition, respectively, to prevent participants proceed to the next page without sufficient exposure to their assigned experimental manipulation. On the next pages, the manipulation check items and demographic questions were administered. Each participant was given 50 cents as an incentive.

Results

For the three manipulation check items directly asking participants understanding of the scenario, all scores (true = 1, false = 2, not sure = 3) were recoded into correct (=1) or incorrect (= 0) format, based on whether participants chose correct answers based on their assigned LBMM individualization scenarios (e.g., for randomization scenarios, "false" was a correct answer for the item, "In that scenario, the mobile message was about a product that I browsed for recently," while "true" or "not sure" were incorrect answers; however, for personalization and customization conditions, "true" was correct answer for the same question while "false" and "not

sure" were coded as incorrect answers) (see Table 3.11). The cross-tabulation was examined for the ratio of correct and incorrect answers across the three individualization scenarios.

Table 3.11

Recoding of the Scenario Understanding Manipulation Check Questions

Questions	Randomization			Personalization			Customization		
	True	False	Not sure	True	False	Not sure	True	False	Not sure
In that scenario, the mobile message was about a product I kept in my mobile shopping cart (Question 1)	IC	C	IC	IC	C	IC	C	IC	IC
In that scenario, the mobile message was about a product that I browsed for recently (Question 2)	IC	C	IC	C	IC	IC	C	IC	IC
In that scenario, the mobile message was delivered when I got close to the Bluetooth speaker section (Question 3)	C	IC	IC	C	IC	IC	C	IC	IC

IC = incorrect, C = correct

The results (see Table 3.12) revealed very unbalanced success of the scenarios. For example, for Question 1 (“In this scenario, the mobile message was about a product I kept in my online shopping cart"), only 47.3% of randomization participants and 45.8% of personalization answered correctly, whereas 83.7% of customization participants answered correctly. Further, participants who answered all three questions correctly were only 25.5% in the randomization condition, 33.9% in the personalization condition, and 46.9% in the customization condition. These results indicate needs for revising the scenarios and procedures to make the manipulation successful.

Manipulation success was also checked with the data from the perceived individualization scale. First, the reliability and dimensionality of the scale were checked with Cronbach's α and EFA, respectively. A single factor was identified with 67.33% of Total Variance Explained and all items' factor loadings exceeded the threshold level of .70. Cronbach's

α exceeded the threshold level of .70. Therefore, the internal consistency reliability and uni-dimensionality of the perceived individualization scale were assured (see Table 3.13).

Table 3.12

Pretest 3-1: Manipulation Check with Cross-tabulations

	Scenario Understanding Questions[a]								
LBMM Individualization Level	Question 1		Question 2		Question 3		All		Total
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	
Randomization	47.3% (26)	52.7% (29)	40.0% (22)	60.0% (33)	75.5% (41)	25.5% (14)	25.5% (14)	74.5% (41)	100.0% (55)
Personalization	45.8% (27)	54.2% (32)	81.4% (48)	18.6% (11)	76.3% (45)	23.7% (14)	33.9% (20)	66.1% (39)	100.0% (59)
Customization	83.7% (41)	16.3% (8)	71.4% (35)	28.6% (14)	67.3% (33)	32.7% (16)	46.9% (23)	53.1% (26)	100.0% (49)
Total	-	-	-	-	-	-	35.0% (57)	65.0% (106)	100.0% (163)

[a] The question wording can be found in Table 3.11.

Table 3.13

Pretest 3-1: Dimensionality and Reliability of Perceived Individualization Level Scale

Factor	Items	α	*Loadings*
Perceived Individualization Level	The message matches my needs.	.84	.78
	Information in the message was tailored to my situation.		.80
	The message targeted me as a unique customer.		.85
	The message was customized to my own preferences.		.85
Eigenvalue			2.69
Total Variance Explained (% of Variance)			67.33%

One-way ANOVA was performed with post-hoc comparisons using Tukey's procedure to test whether the composite score of perceived individualization (calculated by averaging the four scale items) differed among the three individualization conditions. The results showed no significant differences among the randomization (M = 5.09, $S.D.$ = 1.38), personalization (M =

5.36, *S.D.* = 1.11), and customization (*M* = 5.32, *S.D.* = 1.03) groups ($F_{2, 160}$ = .82, p = .44; $M_{r\text{-}p}$ = -.27, *p* = .46; $M_{r\text{-}c}$ = -.23, *p* = .59; $M_{p\text{-}c}$ = .03, *p* = .99). These results again indicate the lack of success in the LBMM individualization manipulation in Pretest 3-1.

Pretest 3-2

Due to the unsuccessful manipulation of LBMM individualization levels in Pretest 3-1, scenarios that operationalize the LBMM individualization levels (i.e., randomization, personalization, customization) were refined and subjected to another pretest (Pretest 3-2).

Stimuli and Instruments

While the web-browsing and in-store LBMM delivery scenarios and the LBMM images used in each condition remained the same as Pretest 3-1 (see Table 3.9 and Figure 3.2), the videos used to simulate the web-browsing scenarios used in the personalization and customization conditions were shortened to 29 and 56 seconds, respectively. Further, in the web-browsing simulation video of the customization condition, the order of events in the video was revised so that opting in to receive a LBMM performs appeared at the last step, instead of the first step as done in Pretest 3-1. The updated videos used in Pretest 3-2 can be accessed online: personalization (see https://www.youtube.com/watch?v=L7u86z_TPCo) and customization (see https://www.youtube.com/watch?v=Ge4NoEsxctA).

In addition to updating the stimuli, the questionnaire flow also was revised so that the entire manipulation stimuli, including the web-browsing scenario (for only the personalization and customization conditions), the simulation video (for only the personalization and customization conditions), the in-store LBMM delivery scenario, and the LBMM image, were all displayed on the same page along with the three scenario understanding check questions so that participants were allowed to review the stimuli again at any time while answering the scenario

understanding check questions. The timers installed on this page were 30 seconds for the randomization condition, 70 seconds for the personalization condition, and 100 seconds for the customization condition. The order of the scenario understanding check questions was changed so that Question 3 ("In that scenario, the mobile message was delivered when I got close to the Bluetooth speaker section") was shown first, and Question 1 ("In that scenario, the mobile message was about a product I kept in my mobile shopping cart") was shown last. Also, "not sure" was dropped from the response options, leaving only the "true" and "false" options.

Sample and Procedure

A sample of 164 U.S. consumers was recruited through Amazon Mturk. The age groups between 19 years and 34 years old were chosen for the Pretest 3-2 since they were considered to be the most tech-savvy consumer groups and were most likely to adopt the new technologies. A study announcement page that briefly addresses study information, eligibility (i.e., age, gender, smartphone use, U.S. residency), procedure, and incentives was posted on the Amazon MTurk recruiting page. Those who already participated in the earlier pretest were blocked from viewing the study announcement page on Mturk, so that they would not be able to participate in Pretest 3-2. Those who decided to participate after reading the announcement page on Amazon Mturk were directed to an information letter page. Upon participants' agreement to participate on the information letter page, the screening and quota questions were asked on the next page so that the sample consisted of the U.S. smartphone users, similar numbers of male and female who were proportionate to U.S. mobile consumers' age distribution within the 19-34 group. Demographic information about the sample is presented in Table 3.14.

Participants whose age was under 19 or above 34 years old or who were from a gender/age quota group that had been already fulfilled were directed to the termination page with

a brief explanation about the quota limit and a thank you message. The qualified participants were randomly assigned to one of the three LBMM individualization stimuli. After reading/viewing their assigned stimuli, participants completed the three scenario understanding check questions. On the next page, the perceived individualization scale items followed. Then, demographic questions were asked. Each participant was given 50 cents for the participation.

Table 3.14

Demographic Information of Pretest 3-2 Participants

	Demographic groups	*f*	%
Age	19 to 24 years old	55	32.3%
	25 to 34 years old	111	67.7%
Gender	Male	80	48.8%
	Female	84	51.2%
Ethnicity	White, non-Hispanic	84	51.2%
	Black, non-Hispanic	47	28.7%
	Hispanic	6	3.7%
	Asian/Pacific Islander	5	3.0%
	American Indian/Alaskan native	6	3.7%
	Others	0	0.0%
	Missing	16	9.8%
Education level	No schooling completed	0	0.0%
	Some high school, no diploma	1	0.6%
	High school graduate, diploma or the equivalent	7	4.3%
	Some college credit, no degree	9	5.5%
	Associate degree in college (2 years)	4	2.4%
	Bachelor's degree in college (4 years)	89	54.3%
	Master's degree	35	21.3%
	Doctorate degree	0	0.0%
	Professional degree (JD, MD)	0	0.0%
	Missing	19	11.6%
Marital status	Single, never married	39	23.8%
	Married or domestic partnership	104	63.4%
	Widowed	0	0.0%
	Divorced or separated	2	1.2%
	Missing	19	11.6%
Employment status	Working (paid employee)	117	71.3%
	Working (self-employee)	23	14.0%
	Not working (retired)	0	0.0%

	Not working (disabled)	1	0.6%
	Not working (temporary layoff from a job)	1	0.6%
	Not working (looking for work)	3	1.8%
	Others	0	0.0%
	Missing	19	11.6%
Income level	Under $20,000	11	6.7%
	$20,000 to $39,999	27	16.5%
	$40,000 to $59,999	31	18.9%
	$60,000 to $79,999	50	30.5%
	$80,000 to $99,999	15	9.1%
	$100,000 to $119,999	5	3.0%
	$120,000 to $139,999	3	1.8%
	$140,000 to $159,999	2	1.2%
	$160,000 to $179,999	1	0.6%
	$180,000 to $199,999	0	0.0%
	$200,000 and above	0	0.0%
	Missing	19	11.6%
Regions	Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)	23	14.0%
	Northeast (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)	37	22.6%
	Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)	38	23.2%
	Southwest (AZ, NM, OK, TX)	13	7.9%
	West (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY)	34	20.7%
	Missing	19	11.6%
	TOTAL	164	100.00%

Results

First, the three scenario understanding check items (true = 1, false = 2) were recoded as either correct (= 1) or incorrect (= 0) based on whether the response matched their assigned LBMM individualization scenarios. Next, the reliability and uni-dimensionality of the perceived individualization scale was checked with Cronbach's α and EFA, respectively. All items loaded on a single factor with the factor loadings exceeding the threshold level of .70. Cronbach's α also exceeded the threshold level of .70, indicating the high reliability of the perceived individualization scale (see Table 3.15).

Table 3.15

Pretest 3-2: Results from EFA and Reliability Check for the Perceived Individualization Scale

Factor	Items	α	*Loadings*
Perceived Individualization Level	The message matches my needs.	.82	.83
	Information in the message was tailored to my situation.		.81
	The message targeted me as a unique customer.		.80
	The message was customized to my own preferences.		.80
Eigenvalue			2.62
Total Variance Explained (% of Variance)			65.45%

Results from cross-tabulation (see Table 3.16) show that participants in the customization condition had a relatively high level of accuracy in responding to all three scenario understanding check questions (89.3%, 83.9%, and 92.3% from Questions 1, 2, and 3, respectively). However, those in the randomization condition showed fairly inaccurate responses to Questions 1 and 2 and those in the personalization condition to Question 1. Participants who answered all three questions correctly were only 33.3% of the randomization, 29.9% of the personalization, and 69.6% of the customization groups.

One-way ANOVA with Tukey's post-hoc tests were performed for perceived individualization composite scores. The results showed that perceived individualization was not significantly different among the three groups: randomization (M = 5.38, *S.D.* = 1.18), personalization (M = 5.53, *S.D.* = .94), customization (M = 5.52, *S.D.* = 1.06); $F_{2, 158}$ = .36, p = .70; $M_{r\text{-}c}$ = -.15, p = .75; $M_{r\text{-}p}$ = -.15, p = .74; $M_{p\text{-}c}$ = .01, p = 1.00).

Table 3.16

Pretest 3-2: Manipulation check with Cross-tabulations

	Scenario Understanding Questions[a]								
LBMM Individualization Level	Questions 1		Questions 2		Questions 3		All		Total
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	
Randomization	48.1%	51.9%	48.1%	51.9%	96.3%	3.7%	33.3%	66.7%	100.0%
	(26)	(28)	(26)	(28)	(52)	(2)	(18)	(36)	(54)
Personalization	44.4%	55.6%	81.5%	18.5%	83.3%	16.7%	29.6%	70.4%	100.0%
	(24)	(30)	(44)	(10)	(45)	(4)	(16)	(38)	(54)
Customization	89.3%	10.7%	83.9%	16.1%	92.9%	7.1%	69.6%	30.4%	100.0%
	(50)	(6)	(47)	(9)	(52)	(4)	(39)	(17)	(56)
Total	-	-	-	-	-	-	44.5%	55.5%	100.0%
							(73)	(91)	(164)

[a] Question 1 = "In that scenario, the mobile message was about a product I kept in my mobile shopping cart," Question 2 = "In that scenario, the mobile message was about a product that I browsed for recently," and Question 3 = "In that scenario, the mobile message was delivered when I got close to the Bluetooth speaker section."

The aforementioned results combined indicate the manipulation of three LBMM individualization conditions was still unsuccessful. The inaccuracy occurred particularly because participants in the personalization condition mistakenly thought that in their scenario, they put the Bluetooth product in the LBMM message in the shopping cart during their prior web-browsing session, while participants in the randomization condition thought that in their scenario, they browsed for Bluetooth speakers and put the product in the LBMM message in the shopping cart during their web-browsing the product. Therefore, another pretest (Pretest 3-3) was conducted with revisions in the stimuli addressing these inaccuracies.

Pretest 3-3

Stimuli and Instruments

The LBMM individualization scenarios were re-calibrated to address the issues identified from Pretests 3-1 and 3-2. First, in the text scenario for the randomization condition, participants were additionally told to imagine that they had not been interested in buying Bluetooth speakers,

nor had browsed online for Bluetooth speakers recently. Further, the personalization simulation video was eliminated and the web-browsing scenario provided only text in an attempt to increase the gap between the personalization and customization conditions.

Second, in addition to all measurements used in Pretest 3-2, three reinforcement questions were added immediately following the web-browsing scenario in the personalization and customization conditions, which directly asked information from the web-browsing scenario. It was intended that being asked these questions would make participants pay more attention to the information in the scenario that they must clearly understand and remember for the manipulation to be successful. The same set of reinforcement questions was also asked in the randomization condition but they came after the in-store LBMM delivery scenario because no web-browsing scenario was used in this condition. The three reinforcement questions were "In this scenario, I have been interested in buying a Bluetooth speaker," "In this scenario, I have browsed online for Bluetooth speakers recently," and "In this scenario, I found online a Bluetooth speaker I liked, put it in the online shopping cart, and opted in to receive a mobile message about it." The questions were answered using a true/false scale. Below the questions, the in-store shopping scenario followed.

As was in Pretest 3-2, in Pretest 3-3, again, all of the text scenarios and scenario understanding check questions along with the additional reinforcement questions were presented on a single screen in the structure presented in Table 3.17. The timers of 52, 58, and 110 seconds were implemented for the randomization, personalization, and customization conditions, respectively.

Table 3.17

Pretest 3-3: Scenarios Used for LBMM Individualization Manipulations

Condition	Text-based scenarios with reinforcement items
Customization scenario	Imagine that you recently have become interested in buying a Bluetooth speaker. You have browsed several Bluetooth speaker models on your favorite retailer's website and put a model that you really liked in the shopping cart. You also have opted in to receive mobile notifications about this item. Please watch the video below imagining yourself in the situation described above. (Reinforcement video) (Reinforcement questions) Now, continue to imagine: A few days later, you are shopping in the favorite retailer's offline store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is **about the Bluetooth speaker that you put in the online shopping cart a few days ago being on sale.** Please carefully review the mobile message image below and answer questions that follow. (Reinforcement image of a LBMM) (Manipulation check items)
Personalization scenario	Imagine that you recently have become interested in buying a Bluetooth speaker. You have browsed several Bluetooth speaker models online, but could not find any models that you really liked online. (Reinforcement questions) Now, continue to imagine: A few days later, you are shopping in the favorite retailer's offline store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is about **a Bluetooth speaker on sale**. Please carefully review the mobile message image below and answer questions that follow. (Reinforcement image of a LBMM) (Manipulation check items)
Randomization scenario	You are shopping in your favorite retail store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is about **a Bluetooth speaker on sale**. You have **not** been interested in buying Bluetooth speakers, **nor** have browsed online for Bluetooth speakers recently.

Please carefully review the mobile message image below and answer questions that follow.

(Reinforcement image of a LBMM)
(Reinforcement questions)
(Manipulation check items)

Sample and Procedure

A sample of 155 U.S. consumers was recruited through Amazon Mturk. A study announcement containing brief study information, eligibility, procedure, and incentives was displayed on the Amazon MTurk recruiting page. Those who already participated in Pretests 1 and 2 were blocked from viewing the study announcement page on Mturk, so that they would not be able to participate in Pretest 3-3. Participants who are 19 to 34 years old, smartphone users, and U.S. residents were eligible to participate in the study and those who did not meet the eligibility criteria were screened out. The quota sample method was employed to recruit an even number of gender groups and the age groups that proportionately mimic young U.S. mobile users. From the recruitment announcement page on Mturk, participants were directed to the screening and quota check pages followed by stimulus page setups. More specifically, the sequence of stimulus setups was as follows: web-browsing text scenarios (utilized in personalization and customization conditions), the web-browsing simulation video (utilized only customization condition), reinforcement questions, LBMM receiving text scenarios, and scenario understanding check questions. Since there was no web-browsing scenario or reinforcement video for the randomization condition, the reinforcement questions and scenario understanding check questions followed the LBMM receiving text scenario in the randomization condition. All the stimulus page setups were displayed on a single page for each condition. Dependent

measures and demographic questions were provided in the following pages. Demographic information about the sample is presented in Table 3.18.

Table 3.18

Demographic Information of Pretest 3-3 Participants

	Demographic groups	*N*	%
Age	19 to 24 years old	47	30.3%
	25 to 34 years old	108	69.7%
Gender	Male	80	51.6%
	Female	75	48.4%
Ethnicity	White, non-Hispanic	109	70.3%
	Black, non-Hispanic	22	14.2%
	Hispanic	7	4.5%
	Asian/Pacific Islander	3	1.9%
	American Indian/Alaskan native	2	1.3%
	Others	0	0.0%
	Missing	12	7.8%
Education level	No schooling completed	0	0.0%
	Some high school, no diploma	1	0.6%
	High school graduate, diploma or the equivalent	3	1.9%
	Some college credit, no degree	11	7.1%
	Associate degree in college (2 years)	5	3.2%
	Bachelor's degree in college (4 years)	86	55.5%
	Master's degree	35	22.6%
	Doctorate degree	0	0.0%
	Professional degree (JD, MD)	1	0.6%
	Missing	13	8.4%
Marital status	Single, never married	41	26.5%
	Married or domestic partnership	99	63.9%
	Widowed	1	0.6%
	Divorced or separated	1	0.6%
	Missing	13	8.4%
Employment status	Working (paid employee)	111	71.6%
	Working (self-employee)	25	16.1%
	Not working (retired)	1	0.6%
	Not working (disabled)	2	1.3%
	Not working (temporary layoff from a job)	0	0.0%
	Not working (looking for work)	0	0.0%
	Others	3	1.9%
	Missing	13	8.4%
Income level	Under $20,000	7	4.5%

	$20,000 to $39,999	19	12.3%
	$40,000 to $59,999	32	20.6%
	$60,000 to $79,999	40	25.8%
	$80,000 to $99,999	24	15.5%
	$100,000 to $119,999	6	3.9%
	$120,000 to $139,999	6	3.9%
	$140,000 to $159,999	6	3.9%
	$160,000 to $179,999	1	0.6%
	$180,000 to $199,999	1	0.6%
	$200,000 and above	0	0.0%
	Missing	13	8.4%
Regions	Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)	36	23.2%
	Northeast (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)	33	21.3%
	Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)	33	21.3%
	Southwest (AZ, NM, OK, TX)	17	11.0%
	West (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY)	23	14.8%
	Missing	13	8.4%
	TOTAL	155	100.00%

Results

Both the three scenario understanding check items and the three reinforcement items were recoded as correct (= 1) or incorrect (= 0) depending on whether the participant provided a response that matches their assigned LBMM individualization scenario. The reliability and uni-dimensionality of the perceived individualization scale were checked with Cronbach's α and EFA, respectively (see Table 3.19). In the EFA, an item with low factor loading (below .70) (i.e., The message targeted me as a unique customer) was removed and the EFA was reassessed. Factor loadings of the final three items and Cronbach's α exceeded the threshold level of .70. Therefore, the reliability and uni-dimensionality of the perceived individualization scale were assured.

Table 3.19

Pretest 3-3: Dimensionality and Reliability of Perceived Individualization Level Scale

Factor	Items	α	*Loadings*
Perceived Individualization Level	The message matches my needs.	.80	.85
	Information in the message was tailored to my situation		.79
	The message was customized to my own preferences		.89
Eigenvalue			2.14
Total Variance Explained (% of Variance)			71.52%

The cross-tabulation in Table 3.20 shows the percentages of correct and incorrect answers on the reinforcement items by the LBMM individualization conditions. The accuracy of responses to scenario understanding check question in the three LBMM individualization conditions is also presented on cross-tabulation in Table 3.21. Throughout the two cross-tabulation analyses, it was found that participants in the customization condition tended to answer all reinforcement and understanding check questions correctly. However, as the level of individualization decreased, participants tended to answer all the questions less correctly. For example, participants who answered all three scenario understanding check questions correctly were 22.2% randomization, 35.3% personalization, and 68.0% customization participants within their condition groups.

The findings impose the majority of participants in all three conditions tend to check "True" inattentively, irrespective of the level of LBMM individualization in the assigned condition. In other words, regardless of the length or complexity of the scenarios in each LBMM individualization condition, participants were critically inattentive to the assigned stimuli condition, which may have resulted in a significant number of incorrect answers. Therefore, a set

of reinforcement questions were utilized as screening questions in the main study to increase participants' attention level in each condition.

Table 3.20

Pretest 3-3: Reinforcement Questions with Cross-tabulations

	Reinforcement Questions[a]								
LBMM Individualization Level	Questions 1		Questions 2		Questions 3		All		Total
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	
Randomization	37.0%	63.0%	33.3%	66.7%	37.0%	63.0%	24.1%	75.9%	100.0%
	(20)	(34)	(18)	(36)	(20)	(34)	(13)	(41)	(54)
Personalization	92.2%	7.8%	86.3%	13.7%	47.1%	52.9%	41.2%	58.8%	100.0%
	(47)	(4)	(44)	(7)	(24)	(27)	(21)	(30)	(51)
Customization	98.0%	2.0%	98.0%	2.0%	88.0%	12.0%	86.0%	14.0%	100.0%
	(49)	(1)	(49)	(1)	(44)	(6)	(43)	(7)	(50)
Total	74.8%	25.2%	71.6%	28.4%	56.8%	43.2%	49.7%	50.3%	100.0%
	(116)	(39)	(111)	(44)	(88)	(67)	(77)	(78)	(155)

[a] Question 1 = "In this scenario, I have been interested in buying a Bluetooth speaker," Question 2 = "In this scenario, I have browsed online for Bluetooth speakers recently," and Question 3 = "In this scenario, I found online a Bluetooth speaker I liked, put it in the online shopping cart, and opted in to receive a mobile message about it."

Table 3.21

Pretest 3-3: Crosstab of Scenario Understanding Check Questions

	Scenario Understanding Questions[a]								
LBMM Individualization Level	Questions 1		Questions 2		Questions 3		All		Total
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	
Randomization	37.0%	63.0%	40.7%	59.3%	92.6%	7.4%	22.2%	77.8%	100.0%
	(20)	(34)	(22)	(32)	(50)	(4)	(12)	(42)	(54)
Personalization	47.1%	52.9%	74.5%	25.5%	94.1%	5.9%	35.3%	64.7%	100.0%
	(24)	(27)	(38)	(13)	(48)	(3)	(18)	(33)	(51)
Customization	94.0%	6.0%	82.0%	18.0%	82.0%	18.0%	68.0%	32.0%	100.0%
	(47)	(3)	(41)	(9)	(41)	(9)	(34)	(16)	(50)
Total	-	-	-	-	-	-	41.3%	58.7%	100.0%
							(64)	(91)	(155)

[a] Question 1 = "In that scenario, the mobile message was about a product I kept in my mobile shopping cart," Question 2 = "In that scenario, the mobile message was about a product that I browsed for recently," and Question 3 = "In that scenario, the mobile message was delivered when I got close to the Bluetooth speaker section."

The composite score of perceived individualization was calculated using three items and one-way ANOVA with a post-hoc comparison using Tukey's was conducted. The results showed that perceived individualization was greatest for customization (M = 5.82, $S.D.$ = .65), followed by personalization (M = 5.76, $S.D.$ = .79) and randomization (M = 5.18, $S.D.$ = 1.54). Although there was a difference of perceived individualization among three groups, the difference between personalization and customization was not significant ($F_{2, 152}$ = 5.69, $p < .01$; $M_{r\text{-}p}$ = -.59, $p < .05$; $M_{r\text{-}c}$ = -.64, $p < .01$; $M_{p\text{-}c}$ = -.06, p = .96). Therefore, the cross-tabulations and one-way ANOVA with post-hoc comparison found that the manipulation of three LBMM individualization conditions was not successful.

CHAPTER IV: MAIN EXPERIMENT

The proposed hypotheses were tested through a 3 (LBMM individualization strategies [IS]) × 2 (LBMM information quality [IQ]) between-subjects online experiment with a national sample of American consumers. The following sub-sections discuss methods used in the main experiment including stimuli, measures, sample and procedures, and the data analysis and results of the main experiment.

Methods

Stimuli

The three IS levels (i.e., randomization vs. personalization vs. customization) were manipulated with shopping scenarios using both text and video stimuli, whereas the two levels (i.e., strong vs. weak) of IQ were manipulated using visual stimuli which showed a fictitious LBMM containing an ad message with an image of a Bluetooth speaker. The stimuli were put together using similar structures to those used in Pretest 3-3 by combining the IS and IQ stimuli that correspond to each of the six IS × IQ conditions.

IS Stimuli

Due to the unsuccessful manipulation check results from Pretests 3-3 regarding the IS stimuli, further revisions were made to improve these stimuli for the main experiment. The manipulation check failure of the IS scenarios in Pretests 3-1, 3-2, and 3-3 was primarily attributed to the lack of attention the pretest participants paid to the text scenarios, as indicated by the fact that a large proportion of the pretest samples inaccurately answered the three reinforcement questions directly asking their reading of the phrases/sentences from the scenarios (i.e., "In this scenario, I was interested in buying a Bluetooth speaker," "In this scenario, I browsed online for Bluetooth speakers," and "In this scenario, I found online a Bluetooth speaker

I liked, put it in the online shopping cart, and opted in to receive a mobile message about it"). In addition, some of the pretest participants, particularly those in the randomization and personalization conditions, appeared to have made guesses that the shopper in the scenario probably had done some web-browsing before the in-store shopping based on their own personal web-browsing habits, rather than based on the description in the scenario. Given the difficulty in completely preventing these types of inaccurate guesses or lack of attention of participants, a decision was made that the three reinforcement questions used in Pretest 3-3 would be again used in the main experiment, but this time, as attention check questions. This means, participants who failed to answer these three attention check questions correctly according to their assigned IS scenario would be terminated from the study.

Specifically, for the *randomization stimuli*, participants were given an *in-store LBMM delivery scenario* in which they were asked to imagine that they had neither been interested in buying a Bluetooth speaker nor had browsed a retailer's website for Bluetooth speakers recently; however, they received a mobile message about a promotional Bluetooth speaker while passing by the Bluetooth speaker section in the retailer's store. Although the scenario contents remained the same as Pretest 3-3, a few minor editorial revisions were made on the randomization scenario along with emphasizing some key words with bolded fonts (see Table 4.1 for the scenario wording).

For the *personalization stimuli*, a w*eb-browsing scenario* was given to participants where they were told to imagine they had recently been interested in buying a Bluetooth speaker and browsed around a retailer's website for a Bluetooth speaker; however, they had not found anything they really liked. In addition, participants were given an *in-store LBMM delivery scenario*, which asked them to imagine that they received a mobile message about a Bluetooth

speaker while approaching the Bluetooth speaker section in the retailer's store. While delivering the same meanings that were used in the Pretest 3-3 scenario, a few minor wording changes were made from the Pretest 3-3 scenario in order to highlight that the shopper depicted in the scenario did not like any products they saw online (see Table 4.1 for the scenario wording).

For the *customization stimuli*, participants read a *web-browsing scenario*, which directed them to imagine the situation that they have recently been interested in buying a Bluetooth speaker, browsed around a retailer's website for a Bluetooth speaker, saved a Bluetooth speaker that they mostly liked from the retailer's website in the shopping cart, and then opted in to receive LBMMs. In order to simulate this web-browsing situation, the video of a screen capture simulating browsing around the retailer's website, selecting an item, saving the item in the shopping cart, and opting in to receive LBMMs, which was used in Pretest 3-3, was again presented below the text scenario. Next, the *in-store LBMM delivery scenario* used in the customization condition directed participants to imagine that they received a mobile message about the item they saved in the shopping cart during the earlier web-browsing as they were getting close to the Bluetooth speaker section in the retailer's store. The majority of the scenario remained the same as Pretest 3-3. The updated scenarios used in the three IS conditions are displayed in Table 4.1.

Table 4.1

Shopping Scenarios by LBMM Individualization Levels

	Text-based scenarios with reinforcement items
Customization scenario	Imagine that you recently have become interested in buying a Bluetooth speaker. You have browsed your favorite retailer's website for Bluetooth speakers and put a model that you really liked in the shopping cart. You also have opted in to receive mobile notifications about this item.

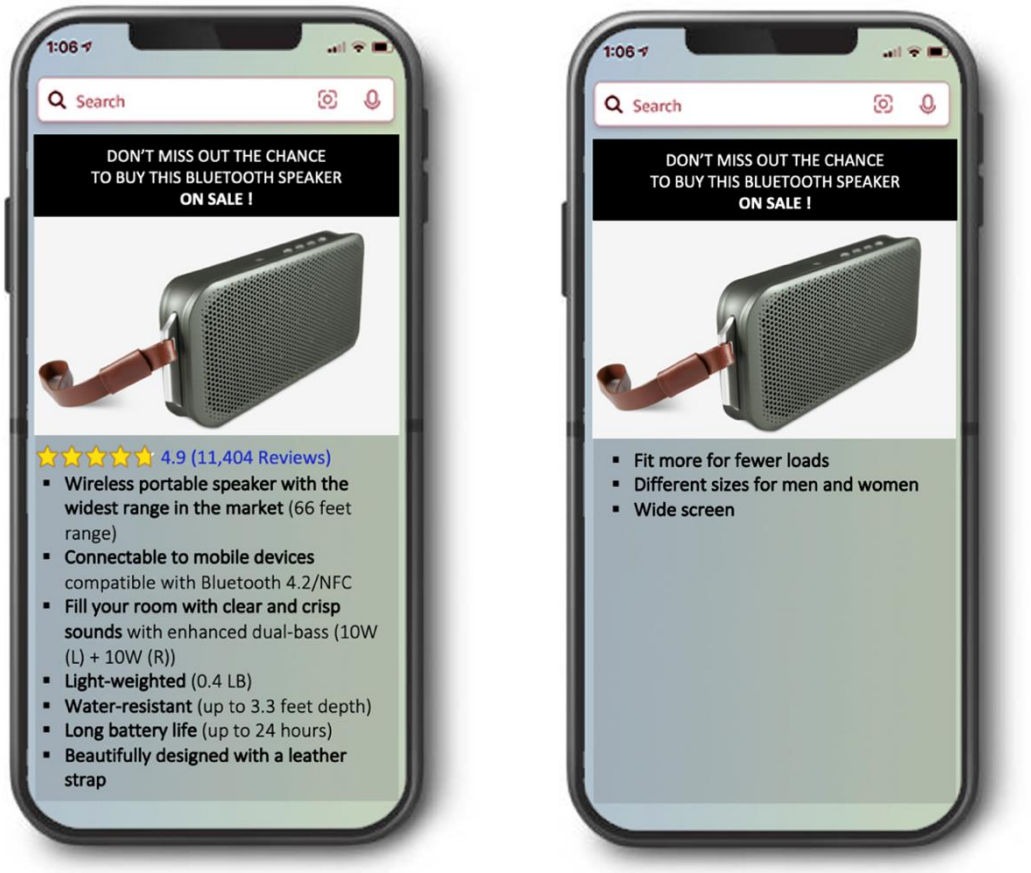
	Please watch the video below imagining yourself in the situation described above. (Reinforcement video) (Attention check questions) Now, continue to imagine: A few days later, you are shopping in the favorite retailer's offline store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is **about the Bluetooth speaker that you put in the online shopping cart a few days ago being on sale.** Please carefully review the mobile message image below and answer the questions that follow. (a fictitious LBMM with information quality manipulation) (Manipulation check items)
Personalization scenario	Imagine that you recently have become interested in buying a Bluetooth speaker. You have browsed online for Bluetooth speakers, but **did not like any models that you saw online.** (Attention check questions) Now, continue to imagine: A few days later, you are shopping in the favorite retailer's offline store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is about **a Bluetooth speaker on sale**. Please carefully review the mobile message image below and answer the questions that follow. (a fictitious LBMM with information quality manipulation) (Manipulation check items)
Randomization scenario	You are shopping in your favorite retail store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is about **a Bluetooth speaker on sale**. **You have NEITHER been interested in buying Bluetooth speakers, NOR have browsed online for Bluetooth speakers recently.** Please carefully review the mobile message image below and answer the questions that follow. (a fictitious LBMM with information quality manipulation) (Reinforcement questions) (Manipulation check items)

IQ Stimuli

The weak and strong IQ conditions were manipulated by using the fictitious LBMM images which were confirmed to successfully manipulate the weak and strong IQ conditions in Pretest 2 (see Figure 4.1). Specifically, as were the pretest stimuli, the *strong-IQ* LBMM image showed detailed product information, such as attributes with the latest technologies (e.g., Bluetooth detecting range, weights, battery life, sounds), a customer review rating, and the number of reviews. On the other hand, the *weak-IQ* LBMM image displayed product attributes that were irrelevant to Bluetooth speakers and did not contain the review information.

Figure 4.1

Manipulation of Strong (Left) and Weak (Right) IQ of a Bluetooth Speaker in the Fictitious LBMM Images



Measures

This section describes measures that were taken during the main experiment, including: 1) the eligibility and quota screening measures; 2) attention check measures; 3) manipulation check measures; 4) dependent measures such as measures for perceived relevance, perceived intrusiveness, the level of elaboration, and attitudes toward a LBMM; and 5) demographic information.

Eligibility and Quota Screening Measures

Participants' age eligibility was assured through an age screening question with ordinally-scaled response options for different ranges of age. Questions asking participants' smartphone use and countries of residency were included to ensure participants' qualification of the study (i.e., U.S. mobile phone users). In addition, to assure that the sample has even gender proportions and age group sizes that are proportionate to those of the 19-34-year-old U.S. population, an age- and gender-based quota sampling method was employed. Table 4.2 presents the eligibility and quota item wording.

Attention Check Measures

As previously mentioned, the lack of attention of participants in Pretests 3-1, 3-2, and 3-3 hurt the success of manipulation of IS. Therefore, three questions utilized in Pretest 3-3 as reinforcement questions were utilized again in the main experiment as attention check measures to screen out participants who failed to answer these three attention check questions correctly. These attention check items were responded using a true/false scale. Further, three additional attention check items, such as "It is important that you pay attention to this study. Please select "strongly agree," were interspersed among manipulation check and dependent measures to

screen out participants who did not carefully read the items. Table 4.3 presents the attention check measure wording.

Table 4.2

Eligibility and Quota Screening Measures for Main Study

	Questions
Gender	What is your gender? ▪ Male ▪ Female
Age	To which of the age group do you belong? ▪ Under 19 years old ▪ 19 to 24 years old ▪ 25 to 34 years old ▪ 35 to 44 years old ▪ 45 to 54 years old ▪ 55 to 64 years old ▪ 65 years old or older
Smartphone Use	Are you a smartphone user? ▪ Yes ▪ No
Countries	In which of the following countries do you currently live? ▪ Brazil ▪ Canada ▪ France ▪ Germany ▪ India ▪ Italy ▪ Pakistan ▪ Philippines ▪ United Kingdom ▪ United States ▪ Others

Table 4.3

Attention Check Measures for the Main Study

	Questions
Scenario Understanding Attention Check Measures	In this scenario, I have been interested in buying a Bluetooth speaker. In this scenario, I have browsed online for Bluetooth speakers recently. In this scenario, I found online a Bluetooth speaker I liked, put it in the online shopping cart, and opted in to receive a mobile message about it.
Attention Questions among Manipulation Check and Dependent Measures	It is important that you pay attention to this study. Please select "Disagree." It is important that you pay attention to this study. Please select "Strongly Agree."

Manipulation Check Measures

Success of the manipulation of the IQ factor was checked using the same perceived information quality measures used in Pretests 2. For the manipulation check of the IS factor, the three scenario understanding check questions, used in Pretest 3-3 were again used in the main experiment. Further, eight perceived individualization scale items, which consisted of the four items used in Pretest 3-3 as well as additional four items, developed in the study to capture how involved the shopper in the scenario was in the individualized LBMM creation process (e.g., "I was involved in the retailer's production of this mobile message"), were utilized to check whether IS levels were successfully manipulated. The wording of all manipulation check items is presented in Table 4.4.

Table 4.4

Manipulation Check Measures for Main Study

Scale	Measures
Perceived information quality for IQ manipulation check	The Bluetooth speaker information in the mobile message is_____. ▪ Unpersuasive ------- Persuasive ▪ Uninformative ------- Informative ▪ Weak ------- Strong ▪ Not convincing ------- Convincing ▪ Unhelpful ------- Helpful
Perceived Individualization for IS manipulation check	This message matched my needs. Information in the message was tailored to my situation. The message targeted me as a unique customer. The message was customized to my own preferences. (+) I was involved in the retailer's production of this mobile message. (+) My input played a role when the retailer sent me this mobile message. (+) I took part in the retailer's generation of this mobile message. (+) I was committed to receiving this mobile message. (+)
Scenario Understanding Manipulation Check Measures for IS manipulation check	*In this scenario*, the mobile message was delivered when I approached the Bluetooth speaker section of the store. In this scenario, the mobile message was about a product that I recently browsed for online. *In this scenario*, the mobile message was about a product I kept in my mobile shopping cart.

Notes. Items with (+) signs are added in the main study.

Dependent Measures

Dependent measures in the main experiment include perceived relevance, perceived intrusiveness, level of elaboration, and attitudes toward the LBMM. All measurement items were selected from existing validated scales and slightly adapted to the study context.

Perceived Relevance. Perceived relevance in this study refers to the extent to which individuals feel a given LBMM context as personally related to their needs or interests. To measure the perceived relevance toward an LBMM, the study adapted three reverse-coded personal relevance scale items of Bures et al. (2002) to the study context, by converting them to positively worded items (see Table 4.5 for the item wording). For example, one of the original scales from Bures et al. (2002), "The assignment in this course will be useless to me," was modified to "Receiving this message during shopping is useful to me." All items were measured using a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

Perceived Intrusiveness. Perceived intrusiveness is the degree to which a consumer feels interrupted by a marketing communication. The perceived intrusiveness of a LBMM was measured by seven items (see Table 4.5 for item wording) adapted from Li et al.'s (2002) ad intrusiveness scale, which was developed to capture the overall mechanism of negative responses associated with the interactive marketing communication tools including consumers' feelings of irritation as well as their cognitive and behavioral ad avoidance. The original scale (Li et al., 2002) includes seven items, "interfering," "invasive," "intrusive," "forced," "obtrusive," "distracting," and "disturbing." In the study, the scale items were modified in declarative statements to fit the study context; for instance, the item "distracting" was modified as "Receiving this message during shopping would be distracting." All items were rated using a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

Level of Elaboration. Level of elaboration refers to the amount of one's cognitive efforts made on marketing communication (Petty & Cacioppo, 1986). This study operationalized the elaboration level by adapting the elaboration level scale from Oh and Jasper (2006). Oh and Jasper's (2006) scale consists of three items that measure consumers' cognitive involvement in

Table 4.5

Constructs and Scale Items

Construct	Item Abbre-viation	Scale Items	Source
Perceived Relevance	PR1	Receiving this message during shopping would be useful to me.	Bures et al. (2002)
	PR2	This message would be relevant to me.	(α = N/A)
	PR2	The content in this message would be personally important to me.	
Perceived Intrusiveness	PI1	Receiving this message during shopping would be distracting.	Li et al. (2002)
	PI2	Receiving this message during shopping would be disturbing.	(α = .90)
	PI3	Receiving this message during shopping would feel forced.	
	PI4	Receiving this message during shopping would be interfering.	
	PI5	Receiving this message during shopping would be intrusive.	
	PI6	Receiving this message during shopping would be invasive.	
	PI7	Receiving this message during shopping would be obtrusive.	
Elaboration Level	EL1	While I look at this message, I would try to make an accurate judgment of the Bluetooth speaker in the message.	Oh and Jasper (2006)
	EL2	While I look at this message, I would use a lot of mental effort to evaluate the possible value of the Bluetooth speaker for me.	(α = .88, .92)
	EL3	While I look at this message, I would use the message content to evaluate the Bluetooth speaker.	
	EL4	While I look at this message, I would carefully consider the information that the message made about the Bluetooth speaker.	
	EL5	While I look at this message, I would give a lot of thought to the text in the message in order to judge whether the Bluetooth speaker would be suitable for me.	
Attitude toward a LBMM	ATT1	Overall, I would like this message if I received it.	Tseng and Teng (2016)
	ATT2	Overall, I would find this message pleasant.	(α = .93)
	ATT3	Overall, this message would be favorable to me.	

copy-focused (i.e., text-based) information and three items that measure product picture-focused information. In the study, five out of the six items from Oh and Jasper's (2006) scale were adapted to this study context. For example, the original scale item, "I carefully considered the

claims that the copy made about the jacket," was modified as "While I look at this message, I would carefully consider the information that the message gave about the Bluetooth speaker." The remaining item from Oh and Jasper (2006) which specifically asks about the visual information on an ad (i.e., "I paid a lot of attention to the picture of the jacket"), was dropped. A seven-point Likert scale response format (1 = strongly disagree, 7 = strongly agree) was used for all five items. Table 4.5 presents the item wording.

Attitude Toward the LBMM. Attitudes refer to one's inclination toward an object/subject as a consequence of values and beliefs established on the object/subject (Ajzen & Fishbein, 1980). In this study, the participant's attitude toward their assigned LBMM was measured with three items adapted from Tseng and Teng's (2016) attitude toward the received SMS ad scale (see Table 4.5 for the item wording). For example, the original item "Overall, I like the SMS ad I received" was modified to "Overall, I would like this message if I received it." All items were measured using a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree).

Demographic Questions

A set of questions asking participants' age, gender, ethnicity, education level, marital status, employment status, income levels, and region of residency in the U.S. was utilized to understand participants' demographic characteristics. Table 4.6 for the item wording for demographic questions.

Table 4.6

Demographic Questions

	Questions
Gender	What is your gender? ▪ Male ▪ Female
Age	What is your age? ( ) Years Old
Ethnicity	Which of the following ethnic groups do you consider yourself to be a member of? ▪ American Indian/Alaskan Native ▪ Asian/Pacific Islander ▪ Hispanic ▪ Black, Non-Hispanic ▪ White, Non-Hispanic ▪ Others
Education Level	What is the **highest education level you have completed**? If currently enrolled, highest degree achieved? ▪ Some high school, no diploma ▪ High school graduate, diploma or the equivalent ▪ Some college credit, no degree ▪ Associate degree in college (2 Years) ▪ Bachelor's degree in college (4 Years) ▪ Master's degree ▪ Doctorate degree ▪ Professional degree (JD, MD)
Marital Status	What is your marital status? ▪ Single, never married ▪ Married or domestic partnership ▪ Widowed ▪ Divorced or separated
Employment Status	Which statement best describes your current employment status? ▪ Working (paid employee) ▪ Working (self-employed) ▪ Not working (retired) ▪ Not working (disabled) ▪ Not working (temporary layoff from a job) ▪ Not working (looking for work) ▪ Others

Income Level	What is your annual household income? ▪ Under $20,000 ▪ $20,000 to $39,999 ▪ $40,000 to $59,999 ▪ $60,000 to $79,999 ▪ $80,000 to $99,999 ▪ $100,000 to $119,999 ▪ $120,000 to $139,999 ▪ $140,000 to $159,999 ▪ $160,000 to $179,999 ▪ $180,000 to $199,000 ▪ $200,000 and above
Regions	Which region of the country do you live in? ▪ Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI) ▪ Northeast (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT) ▪ Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV ▪ Southwest (AZ, NM, OK, TX) ▪ West (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY)

Sample and Procedure

After approval from the Institutional Review Board (IRB) at Auburn University, a national sample of consumers was recruited from Amazon Mturk. To be eligible to participate in the study, participants were required to be between 19 and 34 years old, smartphone users, and U.S. residents. Age-based quotas were set calculated based on the U.S. population by age groups (U.S. Census Bureau, 2020) and the percentages of potential mobile shoppers among the overall mobile phone users in each age group (Kats, 2020); 32.87% of 19-24 years old group and 67.13% of 25-34 years old group with even gender distribution. Further, gender quotas were employed to recruit even gender ratios. A study announcement that briefly informed about the study purpose, procedure, and incentives was posted on the Amazon MTurk recruiting page. Participants who previously participated in the pretests were all blocked from taking part in the

main experiment. Potential participants who decided to participate in the experiment clicked on a URL on the announcement, which directed them to an information letter page. Those who agreed to participate after reading the information letter clicked on the Next button at the bottom of the letter page to be taken to the screening and quota page where their age, smartphone use, and the U.S. residency eligibility and age and gender quota membership were checked. Participants who were determined to be not eligible (i.e., not in the age groups of 19-34 years, non-smartphone users, non-U.S. residents, never received an LBMM) or whose age and gender fit an already fulfilled quota group were directed to the termination page; whereas those who passed the eligibility and quota screening were randomly assigned to one of the six experimental conditions.

On the experiment web page, first, participants in the personalization and customization conditions were instructed to review their assigned web-browsing scenario (i.e., text scenario for personalization; text scenario + reinforcement video for customization), complete the three attention check items on the same page, and then, another text scenario followed on the same page, which instructed to imagine themselves in the situation receiving a LBMM during in-store shopping. Then, on the same page, participants in the personalization and customization conditions continued to view an image of a mock LBMM manipulating their assigned IQ condition and complete the perceived information quality scale for IQ manipulation check and three scenario understanding check items for IS manipulation check. To prevent participants from skipping reading the assigned condition, timers of 117 and 60 seconds were on this page for the customization and personalization conditions, respectively. On the other hand, participants in the randomization condition were instructed to review the LBMM receiving situation in the text scenario without a web-browsing scenario, and answered the attention check measures, the perceived information quality scale for IQ manipulation check, and three scenario understanding

manipulation check items for IS manipulation check. For randomization, a timer of 53 seconds was installed to ensure participants spent sufficient time on the page before moving onto the next page. Participants who did not answer correctly the attention-check questions regarding their IS stimuli were terminated.

Participants who passed the IS stimuli attention-check measures were then taken to the next pages where they completed the remaining manipulation check items for the IS factor (i.e., the eight perceived individualization scale items), dependent measures, and demographic items. Participants who completed the questionnaire were provided randomly generated number codes and asked to enter the code to their Mturk page for compensation. Participants, then, were compensated with 50 cents upon their submission of the code, and thanked.

Analyses and Results

This section addresses the data analysis procedure used in the main experiment along with results obtained from each analysis. First, this section discusses the attention check results and sample characteristics, followed by measurement validity and reliability check procedure and results. Then, the manipulation check procedure and results are described, followed by the hypotheses testing procedure and results.

Attention Check and Sample Characteristics

After reading the assigned scenario and passing all the attention check measures, the participants who understood their assigned IS scenario proceeded to the further survey questionnaire page. In other words, 100% of the participants of each IS condition answered correctly for all three attention check questions. If one or more than one of the questions were incorrectly answered, the participants were screened out. Participants who incorrectly answered the additional attention check questions interspersed throughout the manipulation check and

dependent measures were also screened out, which, in turn, resulted in the usable sample size of 455 (out of 1420 originally entered the experiment website).

The usable sample consisted of 49.7% of male (n = 226) and 50.3% of female (n = 229) participants. The age group included 27.3% of the 19-24-year-old group (n = 124) and 72.7% of the 25-34-year-old group (n = 331). The discrepancy between the age quotas set and the actual sample age proportions resulted from non-equivalent numbers of participants from the varying age groups being screened out during the attention check procedure after having passed the quota screening. The median age of the sample was 28 years old, while the mean age was 28.41 (SD = 5.283). Furthermore, the cell sizes of each IS condition within the strong-IQ group were slightly uneven ($n_{randomization}$ = 56 [23.5%]; $n_{personalization}$ = 84 [38.0%]; $n_{customization}$ = 81 [36.7%]), while the cell sizes of each IS condition within the weak-IQ group was fairly even ($n_{randomization}$ = 77 [32.9%]; $n_{personalization}$ = 73 [31.2%]; $n_{customization}$ = 84 [35.9%]). The uneven cell sizes across the IS conditions within the strong-IQ group were also a result of uneven numbers of participants from the different conditions being screened out due to their incorrect answers to the attention check questions. Participants in the randomization and personalization conditions were more likely to make inaccurate guesses, probably biased by their own previous website browsing experiences; thus, the lack of attention resulted in more participants screened out from the randomization and personalization conditions than from the customization condition. However, the smaller cell size of the randomization condition within the strong-IQ group did not deem problematic in the hypotheses tests.

The ethnic groups of participants comprise White, non-Hispanic (69.2%), Black, non-Hispanic (16.4%), Hispanic (7.9%), Asian/Pacific Islander (6.4%), American Indian/Alaskan Native (2.2%), and others (0.9%). Also, 52.5% of participants have completed a bachelor's

degree in college (4 years), while 14.9% completed a master's degree, 13.8% completed some college credit (no degree), and 8.4% completed an associate degree in college (2 years). The majority of participants were either single, never married (43.3%), or married or domestic partnership (52.3%), while a few participants were widowed (.4%) or divorced or separated (2.2%). The employment status of the sample includes 72.7% of the paid employee group, 14.9% of the self-employed group, while 9.0% were unemployed with various reasons (e.g., retired, disabled, temporary layoff, currently looking for a job) and 1.8% answered to others. The most frequently answered income level was $20,000 to $39,999 (24.0%), followed by $40,000 to $59,999 (21.8%), $60,000 to $79,999 (21.1%), $80,000 to $99,999 (11.4%), Under $20,000 (7.0%). The participants were located Midwestern (16.0%), Northeast (26.2%), Southeast (25.7%), Southwest (12.3%), and West (18.0%). Lastly, 26.6% of participants answered that they have received a LBMM "more than ten times," followed by "two to three times" (22.9%), "four to five times" (20.7%), "six to ten times" (11.4%), and "once" (4.0%), while 11.0% of participants answered they have "never" received a LBMM for the past year, and 3.5% answered, "I don't remember." The demographics of the sample are presented in Table 4.7.

Table 4.7

Sample Characteristics Descriptive Statistics

		Strong			*Weak*			*Total*	
	Demographic groups	*Rand*	*Pers*	*Cust*	*Rand*	*Pers*	*Cust*	*N*	%
Age	19 to 24 years old	13	30	21	21	20	19	124	27.3%
	25 to 34 years old	43	54	60	56	53	65	331	72.7%
Gender	Male	26	44	38	39	37	42	226	49.7%
	Female	30	40	43	38	36	42	229	50.3%
Ethnicity	White, non-Hispanic	34	58	56	56	51	60	315	69.2%
	Black, non-Hispanic	13	13	17	10	9	14	76	16.4%
	Hispanic	5	5	5	9	6	6	36	7.9%
	Asian/Pacific Islander	5	8	2	6	7	1	29	6.4%
	American Indian/Alaskan native	1	2	2	1	3	1	10	2.2%
	Others	1	0	0	0	2	1	4	0.9%
	Missing	0	2	3	0	1	2	8	1.8%
Education level	No schooling completed	0	0	0	0	0	0	0	0.0%

	Some high school, no diploma	1	0	0	0	1	1	3	0.7%
	High school graduate, diploma, or the equivalent	2	2	3	9	6	1	23	5.1%
	Some college credit, no degree	11	15	4	12	13	8	63	13.8%
	Associate degree in college (2 years)	4	12	4	7	5	6	38	8.4%
	Bachelor's degree in college (4 years)	33	42	46	32	36	50	239	52.5%
	Master's degree	4	8	19	13	9	15	68	14.9%
	Doctorate degree	0	2	1	2	1	1	7	1.5%
	Professional degree (JD, MD)	1	1	1	2	1	0	6	1.3%
	Missing	0	2	3	0	1	2	8	1.8%
Marital status	Single, never married	32	44	26	38	32	25	197	43.3%
	Married or domestic partnership	22	37	51	36	38	54	238	52.3%
	Widowed	1	0	0	0	1	0	2	0.4%
	Divorced or separated	1	1	1	3	1	3	10	2.2%
	Missing	0	2	3	0	1	2	8	1.8%
Employment status	Working (paid employee)	40	59	58	61	53	60	331	72.7%
	Working (self-employee)	8	14	14	5	11	16	68	14.9%
	Not working (retired)	0	1	0	0	1	0	2	0.4%
	Not working (disabled)	0	0	0	1	1	1	3	0.7%
	Not working (temporary layoff from a job)	2	0	0	0	0	2	4	0.9%
	Not working (looking for work)	5	6	6	7	6	1	31	6.8%
	Others	1	2	0	3	0	2	8	1.8%
	Missing	0	2	3	0	1	2	8	1.8%
Income level	Under $20,000	6	5	4	6	4	7	32	7.0%
	$20,000 to $39,999	18	19	18	23	15	16	109	24.0%
	$40,000 to $59,999	10	16	18	20	16	19	99	21.8%
	$60,000 to $79,999	11	20	17	12	14	22	96	21.1%
	$80,000 to $99,999	4	12	10	6	12	8	52	11.4%
	$100,000 to $119,999	0	4	8	5	2	3	22	4.8%
	$120,000 to $139,999	1	4	1	1	5	2	14	3.1%
	$140,000 to $159,999	2	0	1	1	1	3	8	1.8%
	$160,000 to $179,999	2	0	0	0	1	1	4	0.9%
	$180,000 to $199,999	0	1	0	0	0	1	2	0.4%
	$200,000 and above	2	1	1	3	2	0	9	2.0%
	Missing	0	2	3	0	1	2	8	1.8%
Regions	Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)	10	8	10	12	14	19	73	16.0%
	Northeast (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)	10	25	28	21	16	19	119	26.2%
	Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)	16	20	18	24	21	18	117	25.7%
	Southwest (AZ, NM, OK, TX)	9	6	11	7	11	12	56	12.3%
	West (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY)	11	23	11	13	10	14	82	18.0%
	Missing	0	2	3	0	1	2	8	1.8%
LBMM reception frequency	Never	7	8	8	9	10	8	50	11.0%
	Once	1	4	3	3	3	4	18	4.0%
	Two to three times	9	20	22	14	19	20	104	22.9%
	Four to five times	7	19	18	17	13	20	94	20.7%
	Six to ten times	11	5	6	10	8	12	52	11.4%
	More than ten times	18	23	23	21	17	19	121	26.6%
	I don’t remember	3	5	1	3	3	1	16	3.5%
	TOTAL	56	84	81	77	73	84	455	100.00%

Measurement Validity and Reliability

Confirmatory factor analysis (CFA) was performed on AMOS 27.0 to check the validity of the measurements and the overall fit of the measurement model with the maximum likelihood estimation method. The initial CFA showed a good model fit ($\chi^2 = 278.82$, $df = 129$, $p < .001$; CFI =.98, TLI = .98, RMSEA = .05) with all factor loadings exceeding .70. Convergent and discriminant validity checks with average variance extracted (AVE) and shared variance (SV) followed (Fornell & Larcker, 1981). AVEs of all scales exceeded the threshold of .70, assuring convergent validity; however, discriminant validity between perceived relevance, elaboration level, and attitudes toward a LBMM was not fulfilled. The SVs between elaboration level and perceived relevance (.92), and attitudes toward a LBMM and perceived relevance (.94) exceeded AVEs of perceived relevance (.85), elaboration level (.84), and attitudes toward a LBMM (.92); whereas the SVs of elaboration level and attitudes (.85) also exceeded the AVE of attitudes (.92). A bivariate correlational test was performed to explore correlations across the items of these scales. Then, one perceived relevance item, "Receiving this message during shopping would be useful to me," was deleted since the item was highly correlated to other items of elaboration level and attitudes toward a LBMM. Discriminant validity was slightly improved after removing this perceived relevance item, but the SV of perceived relevance and elaboration level (.90) and relevance and attitudes (.88) were still greater than AVE of relevance (.86) and elaboration (.84), while the SV of attitudes and elaboration (.85) was greater than AVE of elaboration level (.84). AVEs and SVs before and after the item removal are listed in Table 4.8.

Table 4.8

Average Variance Extracted (AVE) and Shared Variance (SV) Results

Variables	AVE and SV[a] (Initial)				AVE and SV[a] (After an item removal)			
	R	I	E	A	R	I	E	A
Relevance (R)	.85				.86			
Intrusiveness (I)	-.37	.82			-.32	.82		
Elaboration (E)	**.92**	-.29	.84		**.90**	-.29	.84	
Attitude (A)	**.94**	-.38	**.85**	.92	**.88**	-.38	**.85**	.92

[a]AVEs are presented in diagonal cells, and SVs are in off-diagonal cells.

Given that the AVE-SV method is the most conservative approach of discriminant validity checking, two alternative approaches were further employed to check the discriminant validity of the factors found to have a high SV. First, chi-square difference tests were performed to compare the unconstrained CFA model and the constrained models, each by specifying each of the factor correlations in question to be 1. The chi-square difference tests revealed significant differences between the unconstrained and the constrained models with 1 for the correlation between perceived relevance and elaboration ($\Delta\chi2 = 63.85$, $\Delta df = 1$, $p < .001$), between perceived relevance and attitude toward a LBMM ($\Delta\chi2 = 122.38$, $\Delta df = 1$, $p < .001$), and between elaboration and attitude toward a LBMM ($\Delta\chi2 = 93.60$, $\Delta df = 1$, $p < .001$); indicating the superiority of the unconstrained models, which suggests that the factors are discriminant (Anderson & Gerbing, 1988). Second, the discriminant validity was also assessed using the factor correlation confidential interval method by calculating the confidential interval of each factor correlation by subtracting/adding its 2 × standard error from the factor correlation coefficient. The results showed that the confidential interval of the factor correlation between perceived relevance and elaboration level (.864 – .932), that between perceived relevance and attitude toward a LBMM (.844 – .916), and that between elaboration level and attitude toward a

BLMM (.830 – .898) all did not contain 1, which suggests the discriminant validity of the correlated factors. Based on the successful discriminant validity check results from the chi-square difference test and factor correlation confidence interval methods, the CFA model with all items but one perceived relevance item removed became finalized as the measurement model. This finalized measurement model showed a good fit (χ^2=221.45, *df* = 113, p < .001, CFI =.98, TLI = .98, RMSEA = .05) with all factor loadings exceeding .70. Cronbach's α of each factor exceeded .70 (see Table 4.9), indicating a high internal consistency reliability of each factor. Factor correlations between factors are displayed in Figure 4.2 and Table 4.10.

Table 4.9

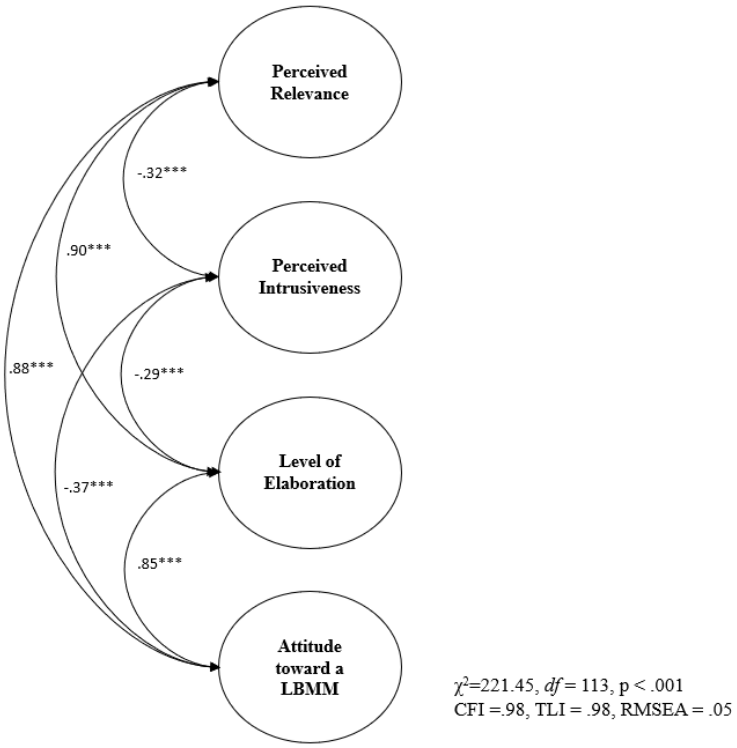
Factor Loadings and Internal Consistency in the Final CFA

Factor	Items	Loadings	S.E.	*t*	α
Perceived Relevance	PR 2	.84	.09	54.41***	.84
	PR 3	.87	.09	49.74***	
Perceived Intrusiveness	PI 1	.80	.08	62.06***	.93
	PI 2	.80	. 08	59.47***	
	PI 3	.80	. 08	67.88***	
	PI 4	.82	. 08	65.67***	
	PI 5	.87	. 08	68.40***	
	PI 6	.84	. 08	64.77***	
	PI 7	.83	. 08	63.21***	
Elaboration Level	EL 1	.84	. 08	58.20***	.92
	EL 2	.76	.09	49.18***	
	EL 3	.87	.08	57.24***	
	EL 4	.86	.08	54.40***	
	EL 5	.86	.09	52.01***	
Attitude toward a LBMM	ATT 1	.92	.09	43.65***	.94
	ATT 2	.90	.09	43.76***	
	ATT 3	.93	.09	45.73***	

Note. See Table 4.5 for the item wording.

Figure 4.2

Factor Correlations in the Final CFA



***$p < .001$

Table 4.10

Factor Correlations and Standardized Errors in Final CFA

Factor Pairs	Factor Correlations	S.E.	*t*
Perceived Relevance ←→ Perceived Intrusiveness	-.32	.12	-5.64***
Perceived Relevance ←→ Elaboration Level	.90	.17	11.82***
Perceived Relevance ←→ Attitude toward a LBMM	.88	.21	12.24***
Perceived Intrusiveness ←→ Elaboration Level	-.29	. 10	-5.32***
Perceived Intrusiveness ←→ Attitude toward a LBMM	-.38	. 14	-6.82***
Elaboration Level ←→ Attitude toward a LBMM	.85	. 18	12.09***

***$p < .001$

Manipulation Check Results

Information Quality

Success of the manipulation of the IQ factor was checked using the scores of the perceived information quality scale. The uni-dimensionality and internal consistency reliability of the perceived information quality scale were established through EFA and Cronbach's α, respectively. EFA loadings of all items exceeded .70 onto a single factor with the Total Variance Explained 83.60% and Cronbach's α .95 (see Table 4.11).

Table 4.11

Dimensionality and Reliability of the Perceived Information Quality Scale

Factor	Items	α	*Loadings*
Information Quality	Unpersuasive --- persuasive	.95	.83
	Uninformative --- Informative		.77
	Weak --- strong		.87
	Not convincing --- convincing		.86
	Unhelpful --- helpful		.85
Eigenvalue			4.18
Total Variance Explained (% of Variance)			83.60%

The perceived information quality composite score was calculated by averaging the five items' scores, and a one-way ANOVA was performed. The results showed that the strong information quality LBMM stimulus (n = 221, M = 5.41, *S.D.* = 1.18) was perceived significantly more persuasive than the weak information quality LBMM stimulus (n = 234, M = 4.16, *S.D.* = 1.96) ($F_{1, 453}$ = 67.20, $p < .001$, partial η^2 = 129). Therefore, the manipulation for the information quality in the LBMM was successful.

LBMM Individualization Strategy Levels

To check the manipulation success of the IS factor, the accuracy of participants' responses to the three scenario understanding check items were first checked. Results showed that 85.4 – 96.2% of the participants chose the response that matched their assigned LBMM individualization strategy conditions for each of the three questions (see Table 4.12). Participants who answered all three questions correctly were 79.3% of all participants (84.2% in the randomization condition, 73.2% in the personalization condition, and 81.2% in the customization condition) (see Table 4.12).

Table 4.12

Manipulation Check with Cross-tabulations

LBMM Individualization Level	Question 1		Question 2		Question 3		All		Total
	True	False	True	False	True	False	Correct	Incorrect	
Randomization	90.2% (120)	9.8% (13)	6.8% (9)	93.2% (124)	3.7% (5)	96.2% (128)	84.2% (112)	15.8% (21)	100.0% (133)
Personalization	93.0% (146)	7.0% (11)	85.4% (134)	14.6% (26)	13.4% (21)	86.6% (136)	73.2% (115)	26.8% (31)	100.0% (157)
Customization	93.3% (154)	6.7% (11)	95.2% (157)	4.8% (8)	90.9% (150)	9.1% (15)	81.2% (134)	18.8% (31)	100.0% (165)
Total	-	-	-	-	-	-	79.3% (361)	20.7% (94)	100.0% (455)

Next, the eight-item perceived individualization scale composite score was used for additional manipulation check for the IS factor. First, the uni-dimensionality and reliability of the scale was checked using EFA and Cronbach's α, respectively. In the EFA, all factor loadings of the eight items exceeded the cutoff point of .70, and Cronbach's α exceeded .70 (see Table 4.13).

Table 4.13

Dimensionality and Reliability of Perceived Individualization Level Scale

Factor	Items	α	*Loadings*
Perceived Individualization	The message matches my needs.	.93	.86
	Information in the message was tailored to my situation.		.75
	The message targeted me as a unique customer.		.75
	The message was customized to my own preferences.		.87
	I was involved in the retailer's production of this mobile message.		.83
	My input played a role when the retailer sent me this mobile message.		.81
	I took part in the retailer's generation of this mobile message.		.80
	I was committed to receiving this mobile message.		.82
Eigenvalue			5.28
Total Variance Explained (% of Variance)			66.02%

A one-way ANOVA ($F_{2, 452}$ = 202.47, p < .001, partial η^2 = 473) with a post-hoc comparison using Tukey's was tested for perceived individualization composite scores. Results revealed that participants in the randomization condition (n = 133, M = 3.04, *S.D.* = 1.42) perceived a significantly lower level of individualization than participants in the personalization condition (n = 157, M = 4.94, *S.D.* = 1.00) ($M_{r\text{-}p}$ = -1.90, p < .001) and participants in the customization condition (n = 165, M = 5.54, *S.D.* = .86) ($M_{r\text{-}c}$ = -2.50, p < .001). The difference of perceived individualization between the personalization and customization conditions was also significant ($M_{p\text{-}c}$ = -.60, p < .001), which indicate the manipulation of three LBMM individualization strategy conditions was successful.

Hypotheses Testing

Table 4.14 restates all hypotheses tested in this study. Hypotheses were tested through a series of structural equation modeling (SEM) analyses using AMOS 27.0, along with

supplemental analyses of variance using SPSS 27.0. The following sub-sections discuss the results from them.

Table 4.14

Hypotheses

	Hypotheses
H1	*Consumers' perceived relevance increases as LBMM individualization strategy levels increase from randomization to personalization to customization*.
H2	Consumers' perceived intrusiveness decreases as LBMM individualization strategy levels increase from randomization to personalization to customization.
H3	Consumers' level of elaboration increases as LBMM individualization strategy levels increase from randomization to personalization to customization.
H4	Consumers' attitude toward the LBMM increases as LBMM individualization strategy levels increase from randomization to personalization to customization.
H5	The effect of the LBMM individualization strategies on the level of elaboration is mediated by perceived relevance.
H6	The effect of the LBMM individualization strategy on the level of elaboration is mediated by perceived intrusiveness
H7	The perceived relevance of the LBMM positively influences consumers' attitude towards a LBMM
H8	Consumers' attitude towards a LBMM is negatively influenced by the perceived intrusiveness of the LBMM.
H9	Consumers' attitude towards a LBMM is more favorable when the information quality of the LBMM is strong (vs. weak).
H10	The effect of LBMM information quality on consumers' attitudes towards the LBMM increases as the LBMM individualization strategy levels increase from randomization to personalization to customization.
H11	The interaction effect of LBMM information quality and individualization strategies on consumers' attitude towards the LBMM is mediated by the consumers' level of elaboration of the LBMM.

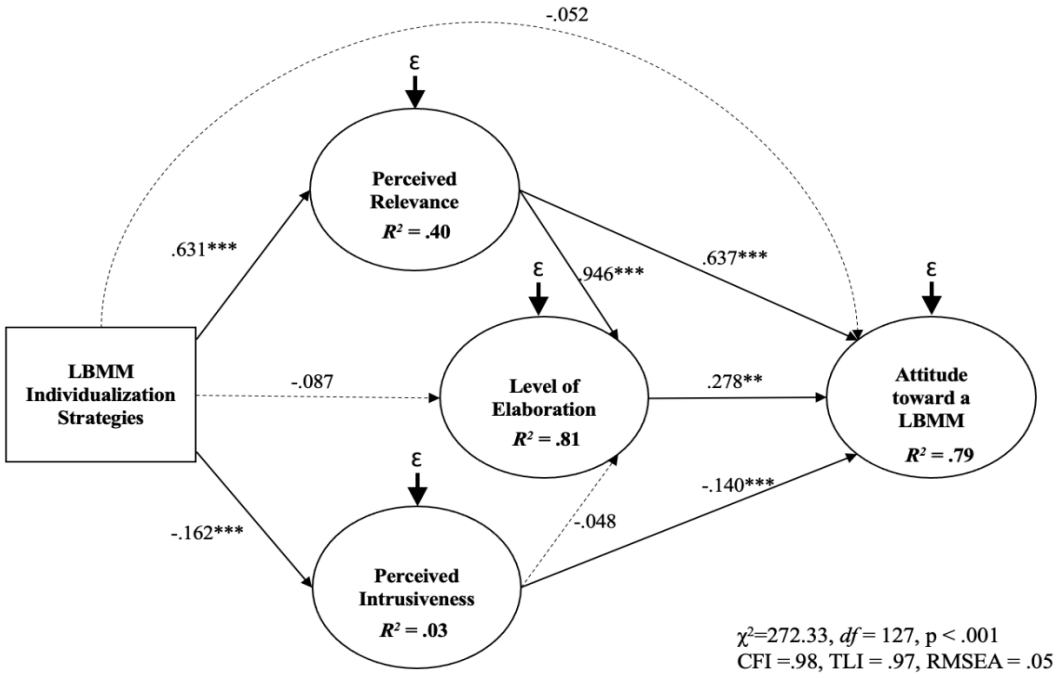
Structural Equation Modeling for H1-H8

The first SEM model (Model 1) was specified to test H1 to H8 as presented in Figure 4.3. The three IS conditions were coded as an interval scale using 1 (randomization), 2

(personalization), and 3 (customization), and set as an exogenous observed variable of the model. Next, the four dependent variables, including perceived relevance, perceived intrusiveness, elaboration level, and attitude toward a LBMM were specified as endogenous latent variables in the model. Perceived relevance, perceived intrusiveness, and elaboration level were designated as predictors of attitude toward a LBMM, while perceived relevance and perceived intrusiveness were set as mediators between IS and elaboration level in the SEM. This SEM model (Model 1) was run using the maximum likelihood estimation method with 5000 bootstrap samples. Model 1 showed a good fit (χ^2=272.33, *df* = 127, p < .001; CFI =.98, TLI = .97; RMSEA = .05).

Figure 4.3

The First SEM Model for Testing H1 -H8 (Model 1) with Standardized Coefficients



** *p* < .01, ***p* < .001

Notes. The measurement model is omitted from the figure. Solid paths were statistically significant, while dashed paths were non-significant.

Direct Effects. The direct path coefficients from Model 1 (see Table 4.15 and Figure 4.3) indicated that perceived relevance was significantly influenced by IS (β = .63, $p < .001$); the higher the IS level, the higher the perceived relevance, and thus H1 was supported. Perceived intrusiveness was negatively influenced by IS (β = -.16, $p < .001$); H2 was supported. On the other hand, the results showed the direct effect of the IS level on elaboration level was not significant (β = -.09, $p = .06$); thus, H3 was not supported. Moreover, the IS level did not have a significant direct effect on participants' attitude toward a LBMM (β = -.05, $p = .23$); therefore, H4 was also not supported. The positive influence of perceived relevance (β = .64, $p < .001$) and the negative influence of perceived intrusiveness (β = -.14, $p < .001$) on attitude toward a LBMM were both significant; therefore, H7 and H8 were supported, respectively.

Table 4.15

Direct Effects Path Coefficients from Model 1

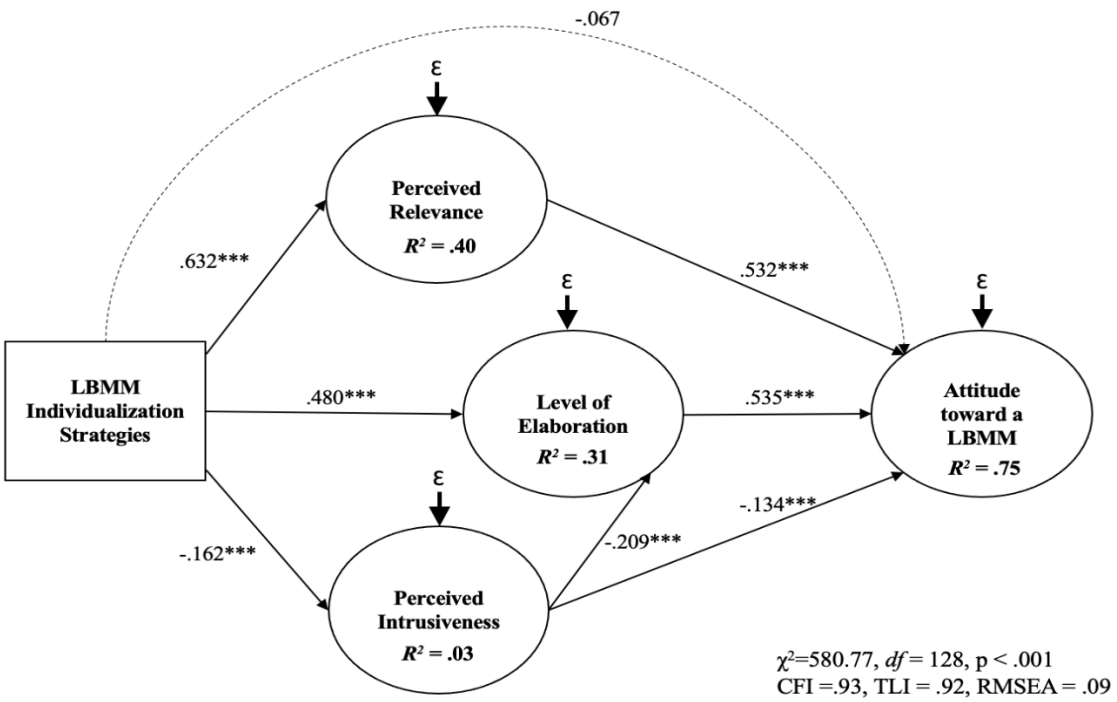
Hypothesis and Path		Unstd. β	Std. β	S.E.	*t*
H1	IS → Perceived Relevance	1.23	.63	.09	14.33***
H2	IS → Perceived Intrusiveness	-.28	-.16	.08	-3.36***
H3	IS → Elaboration Level	-.15	-.09	.08	-1.92
H4	IS → Attitude toward a LBMM	-.12	-.05	.10	-1.20
-	Perceived Relevance → Elaboration Level	.86	.95	. 06	15.25***
-	Perceived Intrusiveness → Elaboration Level	-.05	-.05	. 03	-1.56
-	Elaboration Level → Attitude toward a LBMM	.35	.28	. 14	2.60**
H7	Perceived Relevance → Attitude toward a LBMM	.73	.64	. 15	5.04***
H8	Perceived Intrusiveness → Attitude toward a LBMM	-.18	-.14	. 04	-4.76***

Given the previously-reported high correlations of perceived relevance with elaboration level and attitude toward a LBMM, it was deemed worthwhile to run additional analyses to further examine whether the direct effects of IS on elaboration level (H3) and attitude toward the LBMM (H4) would stay non-significant when perceived relevance is not included as a predictor.

Therefore, first, for re-examining H3, another SEM model (Model 2; see Figure 4.4) was specified after deleting the path from perceived relevance, the strongest predictor, to elaboration level (χ^2=580.77, *df* = 128, p < .001, CFI =.93, TLI = .92, RMSEA = .09), which revealed a significant effect of IS on elaboration level (β = .48, *p* < .001), offering supporting evidence for H3. Next, another alternative model (Model 3; see Figure 4.5) was specified by deleting the path between perceived relevance and attitude toward a LBMM from the original model (Model 1). Model 3 (χ^2=303.31, *df* = 128, p < .001, CFI =.97, TLI = .97, RMSEA = .06) showed a statistically significant effect of IS on attitude toward a LBMM (β = .08, *p* < .05), though the effect size was very small; this result offered support for H4.

Figure 4.4

Model 2 for Additional Analyses for H3 and H6

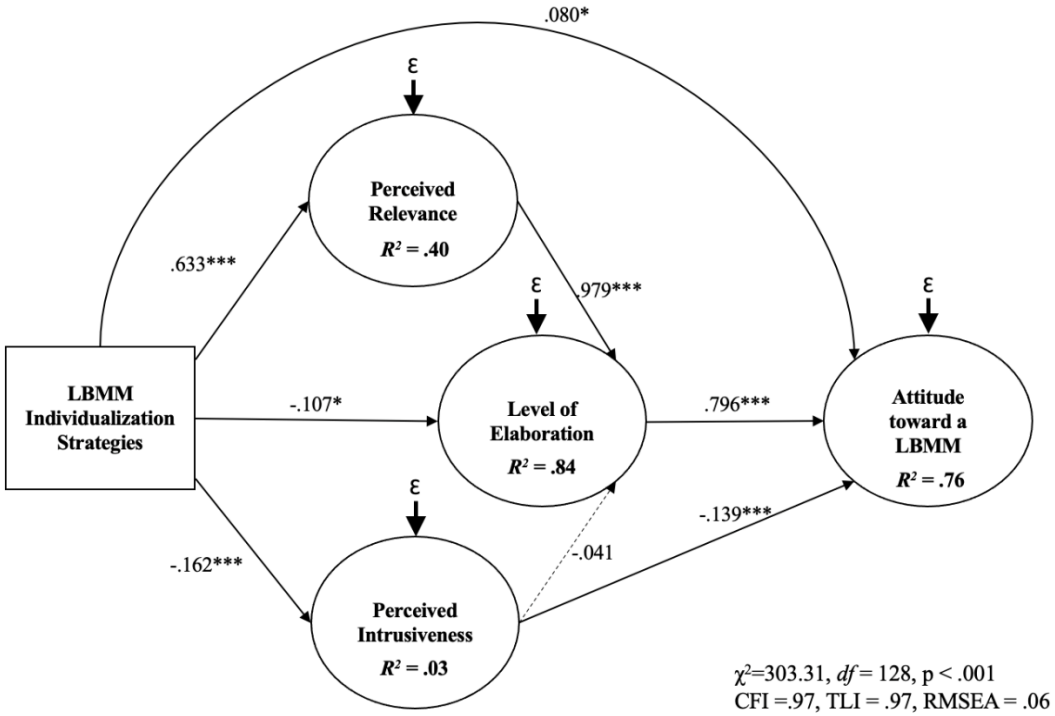


***p < .001

Notes. The measurement model is omitted from the figure. Solid paths were statistically significant, while dashed paths were non-significant.

Figure 4.5

Model 3 for Additional Analysis for H4



*p < .05, ***p < .001

Notes. The measurement model is omitted from the figure. Solid paths were statistically significant, while dashed paths were non-significant.

Supplemental Analysis for the IS Effects. In addition to the SEM analyses, the hypotheses on the effects of IS on the four dependent variables (H1-H4) were further examined using multivariate analysis of variance (MANOVA) with pairwise post-hoc comparisons. The MANOVA results showed a significant effect of IS (Wilk's $\lambda = .585$, $F_{8, 898} = 34.46$, $p < .001$, partial $\eta^2 = .235$). Follow-up univariate ANOVA results (see Table 4.16) further showed that the IS main effects were significant for all four dependent variables. Pairwise post-hoc comparisons

using Tukey's method resulted that as the LBMM individualization strategy levels went up, participants' perceived relevance of the LBMM increased ($M_{r\text{-}p}$ = -1.92, p < .001; $M_{r\text{-}c}$ = -2.48, p < .001; $M_{p\text{-}c}$ = -.56, p < .001) supporting H1, while their perceived intrusiveness of the LBMM decreased ($M_{r\text{-}p}$ = .58, p < 01; $M_{r\text{-}c}$ = .58, p < .01; $M_{p\text{-}c}$ = .00, p = 1.00), providing further evidence that there is no significant difference between personalization and customization conditions, partially supporting H2. Likewise, with as the LBMM individualization strategy level increased, participants engaged in a significantly higher level of elaboration ($M_{r\text{-}p}$ = -1.92, p < .001; $M_{r\text{-}c}$ = -2.48, p < .001; $M_{p\text{-}c}$ = -.56, p < .01) and formed a significantly more positive attitude toward the LBMM ($M_{r\text{-}p}$ = -1.29, p < .001; $M_{r\text{-}c}$ = -2.30, p < .001; $M_{p\text{-}c}$ = -1.01, p < .001), supporting H3 and H4, respectively. The descriptive statistics with mean and standard deviation by each condition are presented in Appendix F.

Table 4.16

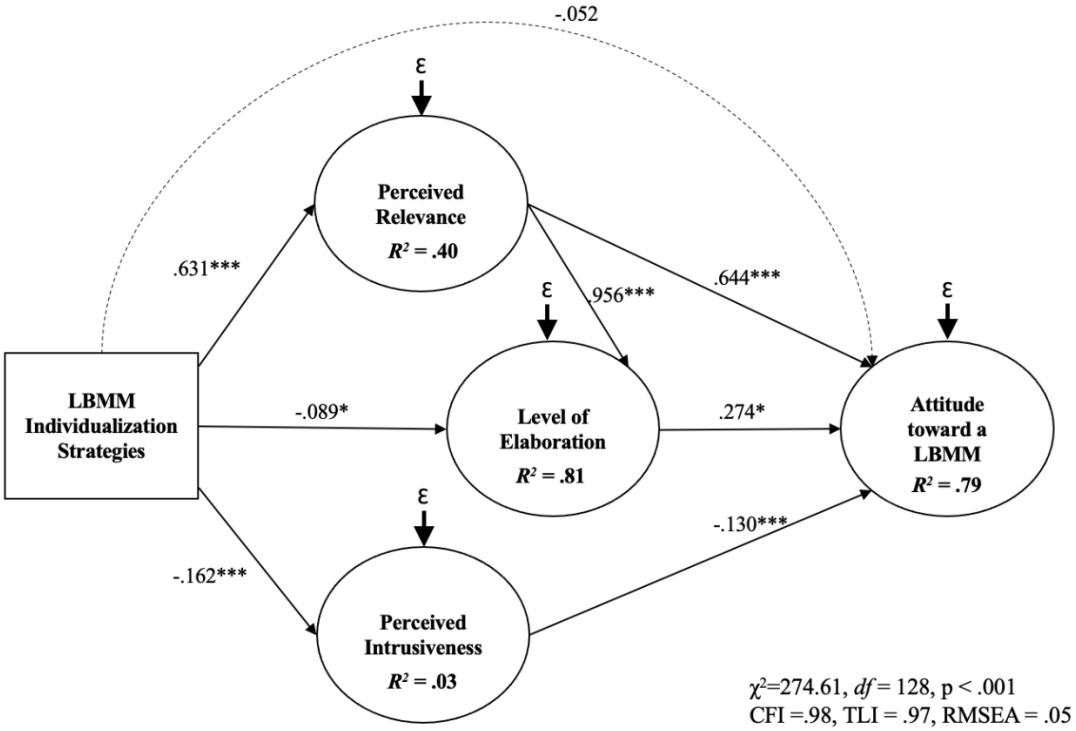
ANOVA Results

Dependent Variables	LBMM Individualization Strategies	*n*	*M*	*S.D.*	*F*	*df*	*p*
Perceived Relevance	Randomization	133	2.93	1.72	132.57	2, 452	<.001
	Personalization	157	4.86	1.31			
	Customization	165	5.42	1.01			
Perceived Intrusiveness	Randomization	133	5.46	1.31	8.08	2, 452	<.001
	Personalization	157	4.88	1.44			
	Customization	165	4.88	1.42			
Elaboration Level	Randomization	133	3.35	1.64	80.72	2, 452	<.001
	Personalization	157	4.78	1.38			
	Customization	165	5.30	1.00			
Attitude toward a LBMM	Randomization	133	2.86	1.77	72.07	2, 452	<.001
	Personalization	157	4.14	1.73			
	Customization	165	5.15	1.44			

Indirect Effects. The mediating roles of perceived relevance and perceived intrusiveness for the IS effect on elaboration level were examined using SEM results. When both perceived relevance and intrusiveness were set as mediators simultaneously in Model 1 previously reported (see Figure 4.3), a significant indirect effect of IS on elaboration level was revealed (indirect effect [IE] = .61 [.503 - .711], $p < .001$). In order to further examine which of the two hypothesized mediators was responsible for this indirect effect, two additional SEM models were examined. First, Model 4 (see Figure 4.6), a new model with a path from perceived intrusiveness to elaboration level removed from Model 1, revealed a significant indirect effect of IS on elaboration level via perceived relevance as a mediator (IE = .60, [.504 - .710], $p < .001$); thus, H5 was supported. Next, the same procedure was applied to test the indirect effect of IS on elaboration model via perceived intrusiveness as a mediator. For this analysis, the previously reported Model 2 (see figure 4.4) was reviewed, which showed a significant indirect effect of IS on elaboration level through perceived intrusiveness (IE = .03, [.014 - .062], $p < .001$); therefore, H6 was supported but with a very small effect size. These results indicate that although both perceived relevance and perceived intrusiveness mediate the effect of LBMM individualization strategies on the consumer's elaboration level, it is mainly through the perceived relevance that this indirect effect occurs.

Figure 4.6

Model 4: SEM Model for Testing H5



*p < .05, ***p < .001

Notes. The measurement model is omitted from the figure. Solid paths were statistically significant, while dashed paths were non-significant.

Structural Equation Modeling for H9-H11

Subsequent to hypotheses testing on H1 to H8, the remaining hypotheses (H9-H11) were tested through another SEM model (Model 5), which was specified with IS (1 = randomization, 2 = personalization, 3 = customization), IQ (0 = weak, 1 = strong), and the IS × IQ interaction term as three observed exogenous variables, and elaboration level and attitude toward a LBMM as two latent endogenous variables (see Figure 4.7). This model included structural paths from each

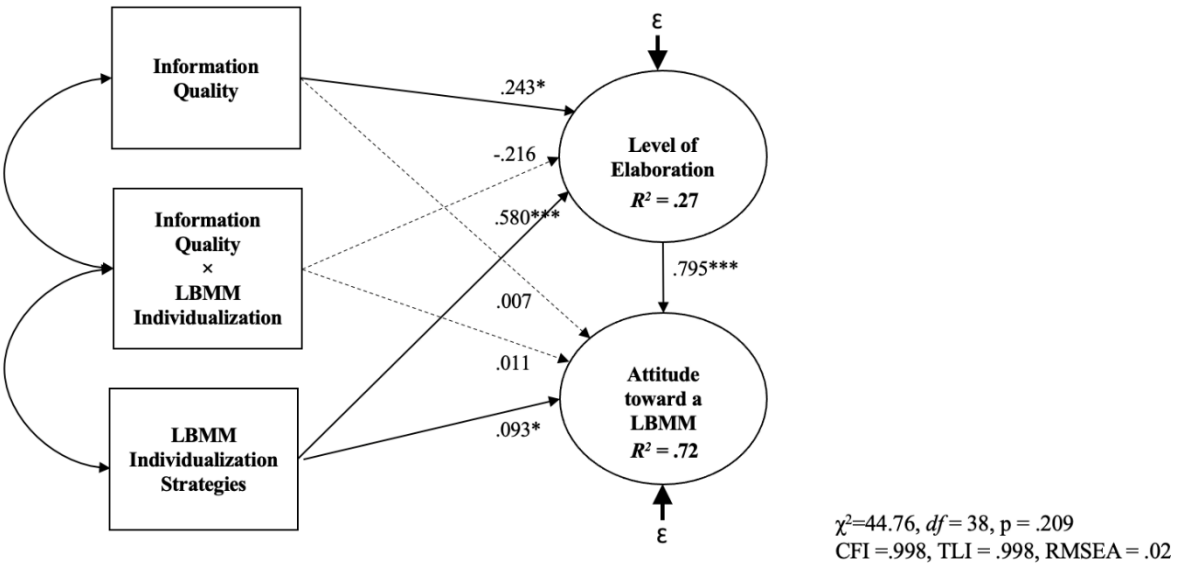
of the three exogenous variables to each of the two endogenous variables as well as a path from elaboration level to attitude toward a LBMM. This model was run using the maximum likelihood estimation method with 5000 bootstrap samples. The model showed a good fit (χ^2=44.76, *df* = 38, *p* = .209; CFI =.998, TLI = .998; RMSEA = .02).

Direct Effects. The path coefficients from this model (see Table 4.17) showed significant positive IS effects on elaboration level (β = .58, *p* < .001) and LBMM attitude (β = .09, *p* < .05), confirming support for H3 and H4 as previously found in Models 2 and 3, respectively. However, unlike the expectation, IQ did not have a significant direct effect on LBMM attitude (β = .01, *p* = .94); therefore, H9 was not supported. Further, the IS × IQ interaction effect on LBMM attitude was also non-significant (β = .01, *p* = .90); thus, H10 was also not supported. However, the non-hypothesized paths for the IQ effects on elaboration level (β = .24, *p* < .05) and the relationship between elaboration level and LBMM attitude (β = .80, *p* < .001) were significant, while the IS × IQ interaction effect on elaboration level was not significant (β = -.22, *p* = .08).

Indirect Effects. The indirect effects in Model 5 were examined for mediation effects. First, the indirect effect of IS × IQ on LBMM attitude mediated by elaboration level was not significant (IE = -.17, [-.377 - .021], *p* = .081), which fails to support H11 which predicted the mediated moderation effect. On the other hand, other non-hypothesized indirect effects specified in the model were also examined; results revealed that IS had an indirect effect on LBMM attitude mediated by elaboration level (β = .46, [.375 - .557], *p* < .001), whereas the indirect effect of IQ on LBMM attitude was not significant (IE = .19, [-.016 - .411], *p* = .064).

Figure 4.7

SEM Model 5 for Testing H9-H11



*$p < .05$, ***$p < .001$

Notes. The measurement model is omitted from the figure. Solid paths were statistically significant, while dashed paths were non-significant.

Table 4.17

Direct Effects Path Coefficients from Model 5

Hypothesis and Path		Unstd. β	Std. β	S.E.	*t*
H3	IS → Elaboration Level	1.03	.58	.11	9.72***
-	IQ → Elaboration Level	.69	.24	.34	2.07*
-	IS × IQ → Elaboration Level	-.26	-.22	.15	-1.75
H4	IS → Attitude toward a LBMM	.21	.09	.10	2.07*
H9	IQ → Attitude toward a LBMM	.02	.01	.30	.08
H10	IS × IQ → Attitude toward a LBMM	.02	.01	.14	.12
-	Elaboration Level → Attitude toward a LBMM	1.02	.80	.06	17.68***

*$p < .05$, ***$p < .001$

CHAPTER V: DISCUSSION AND CONCLUSIONS

This section discusses the meaningful findings from the two structural equation modeling and additional tests in the previous chapter. Further, the theoretical and managerial implications, limitations, and future suggestions are discussed.

Discussion

The Effects of LBMM Individualization Strategies on Perceived Relevance, Perceived Intrusiveness, Elaboration Level, and Attitude

Findings of this study indicate that consumers' perceived relevance, perceived intrusiveness, elaboration level, and attitude toward a LBMM are significantly affected by LBMM individualization strategies. First, the individualization strategy effect on perceived relevance is found to be positive and strong in this study. LBMM individualization strategies and perceived relevance are conceptualized in this study to represent two types of involvement, task involvement and issue involvement, respectively. The three levels of LBMM individualization strategies (i.e., randomization, personalization, customization) represent varying degrees of consumer participation and commitment during the LBMM creation process, generating different levels of involvement in the LBMM generation task (i.e., task involvement). On the other hand, the concept of issue involvement is represented in the perceived relevance variable in the study as a degree of perceived personal relevance of the LBMM content. This study provides evidence for the relationship between the task involvement and issue involvement constructs by findings a significant positive effect of the LBMM individualization strategies on perceived relevance. Although not many studies have empirically tested the relationships between task involvement and issue involvement, it has widely been assumed that consumers' perceived relevance is naturally derived from their involvement in the situation, goal, or an object (Celsi & Olson,

1988; Petty & Cacioppo, 1986; Zaichkowsky, 1986). Situational involvement comprising stimuli, cues, or contingencies were considered situational sources of the felt or response involvement (i.e., perceived relevance) (Celsi & Olson, 1988; Laczniak & Muehling, 1993; Zaichkowsky, 1986). In other words, consumers feel more personally relevant if they are highly engaged in a particular situation, source, or task. In this study, the three LBMM individualization strategies operationalized the participants' task involvement levels based on the degree of their engagement during the message initiation, which created varying levels of situational involvement. Therefore, the significant effect of LBMM individualization strategies on perceived relevance of an LBMM found in this study confirms these theoretical perspectives on the connections among different facets of the involvement construct.

Next, findings of this study also demonstrate that the LBMM individualization level negatively affects perceived intrusiveness. In other words, consumers perceive a LBMM message as less intrusive when consumers receive an LBMM more individualized based on their input (e.g., a customized LBMM). In contrast, consumers may feel irritated and interruptive when they receive non-tailored messages, such as a randomized LBMM. This finding is similar to previous findings in traditional advertising contexts. For example, non-permitted advertisements, such as push-type or pop-up ads, tend to be perceived to be intrusive, while carefully developed individualization messages with consumers' permission to opt-in to receive the message may generate positive feelings toward the ads (Lee et al., 2015; Sundar & Marathe, 2010; Truong & Simmons, 2010). Therefore, the current study finding extends previous findings from the traditional advertising context to the mobile advertising context, suggesting the importance of generating individualized LBMMs with consumers' permission and their input carefully integrated into the LBMM.

Third, this study also demonstrates a significant effect of LBMM individualization strategies on consumers' elaboration of the LBMM. More specifically, consumers elaborate (i.e., apply more cognitive effort in processing) a LBMM as the LBMM individualization level increases from randomization to personalization to customization. This finding affirms that elaboration level is significantly affected by the amount of inputs consumers make on the LBMM initiation (i.e., browsing, choosing a product, saving in a shopping cart, and opting in to receive a LBMM). As briefly mentioned above, the effect of task involvement on elaboration level has widely been examined in the ad contexts (Celsi & Olson, 1988; Muehling et al., 1993; Petty & Cacioppo, 1984, 1986). For example, Celsi and Olson (1988) empirically demonstrated that consumers' ad evaluation task with a chance of winning the lottery (i.e., situational source of involvement) generates a more significant amount of cognitive efforts (e.g., attention, comprehension effort, elaboration) on the ad content as compared to consumers who did not have a chance to win the lottery. Regarding consumers' co-creation of a personalized feature on the website, Tam and Ho (2005) also demonstrated that the preference-matching recommendation generates higher elaboration on the recommended contexts. Along with these previous findings, the finding of this study on the significant positive effect of LBMM individualization strategy levels on consumers' level of elaboration of the LBMM provides support for one of the postulates of ELM that proposes individuals' situational factors, such as involvement, are significant determinants of motivations and ability to engage in a message with the issue-relevant thoughts (Petty & Cacioppo, 1986).

Finally, results of this study reveal that LBMM individualization strategies significantly affect consumers' attitude toward the LBMM. This finding is consistent with the findings from various empirical studies, which found consumers' positive attitude toward a message is more

likely to be generated when the message was individualized, controlled and initiated by consumers, or permitted to be sent (Gazley et al., 2015; Kalyanaraman & Sundar, 2006; Lee et al., 2015; Sundar & Marathe, 2010). The significant effect of LBMM individualization strategies on LBMM attitude found in this study confirms the theoretical postulate of ELM by Petty and Cacioppo (1986) who suggest attitudinal changes occur as a consequence of information processing of an issue-relevant message (i.e., perceived relevance), formed by various situational factors (i.e., task involvement).

The Influences of Perceived Relevance and Intrusiveness on Attitude

This study demonstrates that perceived relevance is a significant positive predictor of consumers' positive attitude toward a LBMM, while perceived intrusiveness is a significant negative predictor of the LBMM attitude. This means consumers who perceive a LBMM relevant to themselves and find it less intrusive are more likely to have a positive attitude toward a LBMM. These findings comply with the previous studies which reported that consumers formed a more positive attitude toward a message or a brand when the message content in a web portal (Kalyanaraman & Sundar, 2006) or a short-message-service (SMS) (Rau et al., 2011) was perceived to be relevant to their personal interests and that perceived intrusiveness in a LBMM or a SMS negatively influenced the consumer attitude toward the messages (Gazley et al., 2015); Varnali (2014). When a message is perceived to be less intrusive and more personally relevant, it is likely to motivate consumers to process the message in a more positive light. The relationship between perceived relevance and attitude toward a message is often mentioned in ELM (Bhattacherjee & Sanford, 2006; Petty & Cacioppo, 1986), who emphasized the issue involvement (i.e., perceived relevance) plays a significant role in forming consumers' attitudes

as consumers become more engaged in the issue-relevant thoughts (i.e., elaboration). The finding of the study supports this theoretical reasoning.

Mediation Roles of Perceived Relevance and Intrusiveness

This study demonstrates that perceived relevance and perceived intrusiveness play mediator roles for the effect of LBMM individualization strategies on elaboration level. Between these two mediators, perceived relevance plays a more dominant role in explaining the indirect effect of LBMM individualization strategies on elaboration level. This finding provides strong support for the ELM perspective. As addressed earlier, the level of LBMM individualization strategies represents consumers' degree of engagement in the LBMM development (i.e., task involvement) and impacts the consumers' perception that the LBMM is personally relevant (i.e., issue involvement). This personal relevance causes the consumers to pay a greater amount of cognitive effort to process the LBMM (i.e., higher elaboration of the message). Many previous studies demonstrated that perceived relevance was a significant antecedent of consumers' cognitive efforts (e.g., attention level, comprehension effort, number of thoughts listed, and the number of inferences) (Bhattacherjee & Sanford, 2006; Celsi & Olson, 1988; Cho, 1999; Jung, 2017). Similarly, some previous studies, who demonstrated the higher the level of message individualization strategy, the greater the amount of cognitive efforts made on the messages, have suggested the effect is presumably resonated from consumers' perceived personal relevance toward the stimuli (Gazley et al., 2015; Lee et al., 2015; Varnali, 2014). However, few studies have examined the role of perceived relevance that mediates between task involvement and elaboration. This study shows that consumers who receive a customized LBMM elaborate on the LBMM the most because they find the LBMM relevant to them, whereas consumers receiving a randomized LBMM least carefully process the LBMM (i.e., the least amount of elaboration on

the LBMM) because they find it irrelevant to them. By showing a higher level of LBMM individualization facilitates a greater level of elaboration on the message by enhancing perceived personal relevance, this study provided empirical evidence for the mediating role of perceived relevance between task involvement and elaboration and validate the ELM postulates that consumers produce more issue-relevant thoughts (i.e., central route of information processing) in a situation with higher situational engagement (i.e., task involvement) as their motivation to elaborate on the message increases (Petty & Cacioppo, 1986).

Furthermore, this study demonstrates a significant mediating role of perceived intrusiveness for the indirect effect of LBMM individualization strategies on elaboration level, though not as strong as that of perceived relevance. Consumers' elaboration increases as the LBMM individualization strategies level increases from randomization to personalization to customization because consumers perceive the LBMM as less intrusive. This study finding is in line with Edwards et al. (2002), Wehmeyer (2007), and Chatterjee (2008), who demonstrated the negative relationship between perceived intrusiveness and consumers' cognitive efforts made in processing a message.

The Effect of Information Quality on Attitude

Findings of this study indicate that LBMM information quality (strong vs. weak) does not impact consumers' attitude toward the LBMM and this lack of information quality effect persists across all three levels of LBMM individualization strategies. Coupled with the significant direct and indirect effects of LBMM individualization strategies on LBMM attitude, these findings suggest that consumers' attitude toward a LBMM is mainly affected by how involved they were with the generation of the LBMM, which drives the LBMM's perceived personal relevance, not by how objective or informative the LBMM content is nor even by how accurate or relevant the

content is for the product advertised in the LBMM. These unexpected non-significant information quality effects negate the widely accepted postulates of ELM that emphasizes strong information (vs. weak information) plays a significant role in consumers' attitudinal changes, especially during the central route of information processing when the individuals elaborate on the information (Bhattacherjee & Sanford, 2006; Petty & Cacioppo, 1986).

Implications

Theoretical Implications

This study provides various implications for the literature. First, the application of the ELM to the LBMM context renders valuable insights on consumers' cognitive processing (elaboration) in response to diverse levels of LBMM individualization strategies and its resultant effect on the consumers' attitude toward the LBMM. Previously, the lack of theoretical applications to the LBMM context has made it challenging to draw a holistic theoretical framework to predict consumers' responses to an LBMM and identify linkages between consumers' perceptual, cognitive, and attitudinal responses towards the LBMM. This study conceptualizes two perceptual variables (perceived relevance and intrusiveness) through which consumers' cognitive (elaboration level) and attitudinal (LBMM attitude) responses to an LBMM are formed and identifies a LBMM characteristic variable, LBMM individualization strategies, that affects these variables by applying the ELM (Petty & Cacioppo, 1986) as a theoretical framework.

Second, the study revealed a new perspective on the role of argument strength (information quality) in the formation of consumers' attitudes in situations with varying levels of consumer involvement. The ELM (Petty & Cacioppo, 1986) originally postulated that argument quality has a separate effect from that of involvement in driving consumers' elaboration and

attitude changes. Traditionally, it was believed that a strong message generates more attitudinal changes through a greater amount of elaboration on the message, as compared to a weak message. Various empirical evidence shows that persuasiveness of argument (e.g., product reviews, brand-related information) or perceived information quality affects consumers' attitudes toward an ad (Chu & Kamal, 2008; Drossos et al., 2013; Shin et al., 2017). However, the ELM became adjusted in the previous advertising literature where argument quality and involvement have shown to have a significant interaction effect on the consumer's attitude change as involvement moderates the effect of argument quality on the attitude change (Kerr et al., 2015; Petty & Cacioppo, 1986; Shin et al., 2017). For example, Bhattacherjee and Sanford (2006), Kerr et al. (2015), and Shin et al. (2017) showed when individuals are highly involved in a situation or perceived to be involved in the situation (i.e., task involvement), a strong message (vs. weak message) generate a more positive attitude toward because the individuals paying a greater amount of cognitive efforts to process the message. However, in the current study, even in the customization condition with the highest level of task involvement (i.e., highest motivation to elaborate or the highest likelihood to engage in the central route of processing), the information quality of the message did not significantly affect the participants' LBMM attitude in spite of the highest level of self-reported elaboration level. The non-significant interaction effect of information quality and LBMM individualization strategies on attitude demonstrates support for the view of the traditional ELM which postulated an independent effect of (task) involvement directly driving the level of elaboration and then attitude change, without moderating or being moderated by the influence of information quality.

Third, this study revealed a strong positive relationship between participants' elaboration level and LBMM attitude. In other words, the more carefully the consumer process the LBMM,

the more positive their attitude toward the message. Further, findings of this study revealed that elaboration does not mediate the main effect of information quality or the information quality × LBMM individualization strategies interaction effect on LBMM attitude. These findings suggest that even during a central route of processing with high task involvement, individuals' elaboration of a message may not always enhance the effect of issue-relevant arguments of the message (i.e., argument strength or information quality) on attitude, as believed in recent ELM-applied literature. In other words, elaboration (the amount of cognitive processing) may not always produce an attitude change in the direction consistent with the argument in the message. Instead, the elaboration itself may act as a direct catalyst for the individual's positive attitude toward the message; that is, the fact that an individual scrutinizes a message itself may predispose the individual to form a positive attitude toward the message, even when the argument in the message is very weak (e.g., irrelevant product information shown in a LBMM). These observations again support the traditional ELM which postulated an independent effect of (task) involvement directly driving the level of elaboration and then attitude change, without necessarily moderating or being moderated by the influence of information quality.

Fourth, this study not only will assist researchers in understanding consumers' cognitive responses (i.e., elaboration level) to the LBMM but also provide an overview of consumers' mental trade-off via their perceptions (i.e., perceived relevance, perceived intrusiveness) about the LBMM that mediates the effects of the LBMM individualization strategies on the elaboration level. Perceptions of the relevance and intrusiveness of a message are two critical perceptual predictors influencing consumers' motivation and/or ability to cognitively process (i.e., elaborate on) the message (Gazley et al., 2015; Varnali, 2014). Understanding consumers' mental trade-off between perceived relevance and perceived intrusiveness, which influences their elaboration

level, expands our understanding of the ELM theoretical framework as an explanation of consumers' responses to the LBMM.

Managerial Implications

Findings from the study may generate knowledge with which marketers tailor their LBMMs to be more personally relevant to consumers so that the LBMMs can help retailers establish relationships with customers and enhance their in-store experiences. The complex retail environment has challenged brick-and-mortar stores to compete with emerging online or mobile markets. Furthermore, a complete channel integration via omni-channel retailing is known to be the key to success in the volatile retail environment. Now, the era of using traditional one-way communication tools, such as push-type ads, has long been gone and the advent of using dynamic and interactive communication tools has become a critical method to maximize consumers' online and offline experiences and utmost conveniences in the emerging omni-channel retailing era. Notably, LBMM is a deliberate and sophisticated method of delivering personally relevant ads to consumers' mobile devices. If individualized properly, LBMMs can grasp attention of current and potential customers, who have been exposed by a massive amount of information daily. By providing an understanding of consumers' cognitive, perceptual, and attitudinal responses toward the diverse levels of LBMM individualization strategies and the effect of information quality on the attitude, this study could be expected to help retailers and marketers build a LBMM that is personally-, timely-, and locally-relevant to customers. The proper use of LBMM individualization strategies with increased personal relevance and reduced intrusiveness is a way to differentiate the retailers from the explosive advertising environment.

Furthermore, the findings of the study alerts retailer managers and marketers to individualize the LBMM deliberately with a proper permission to opt-in to receive LBMMs. Due

to the large volume of mobile ad messages sent to consumers' mobile devices daily, the mobile ads are not only ignored frequently via mental habituations but also avoided due to the irritation and intrusive feelings. To make it worse, the mobile ad optimizations that are available through retailers' undiscerning use of consumer data or machine learning augment consumers' privacy concerns nowadays, which, in turn, lead to their message avoidance behavior. The avoidance behavior is a step beyond ignoring the messages. Because the irrelevant and intrusive feelings associated with the avoidance behaviors damage the brand image and loyalty, this could lead to many undesirable consequences for the brand. Living in the era of big data and the data optimization, retailers who properly use consumer data after obtaining permission to opt in to receive the LBMM with deliberately individualized message content will be able to succeed while maintaining a long-run relationship with customers.

In addition, the aforementioned study findings showed the role of information quality in the LBMM is not critical in consumers' positive attitude formation. Throughout the findings, we can infer consumers take more accounts of whether the LBMM is relevant to themselves rather than what the information of the message content is. Consumers, who were engaged in the message initiation through the web or mobile browsing, choosing and saving an item in the cart, and opting in to receive a LBMM, might have willingly and voluntarily provided their consumer data to retailers because they have already had fondness toward the product in the LBMM. This suggests that consumers' positive attitude toward a product or a LBMM medium may pre-exist the involvement in the task of participating in the LBMM initiation, especially in the context of customization; therefore, consumers who receive a LBMM as a result of high task involvement like the message regardless of the quality of the information in the LBMM. This discussion suggests that streamlining the LBMM individualization mechanisms in accordance with the

individual customer's needs and wants is more important than creating quality information for a LBMM.

Lastly, findings of this study may indirectly help retailers in integrating mobile, online, and offline channels. Considerate LBMM applications with increased personal relevance not only enhance consumers' in-store shopping experiences and conveniences but also enrich retailers' consumer database. The more the consumers use LBMMs and provide feedback on the LBMMs, the higher the amount and quality of data will be accumulated from the consumers, which, in turn, allows retailers to: (1) establish better consumer services, (2) build positive brands/retailers' images, (3) tighten channel integrations, and (4) deliver personally tailored and consistent messages throughout entire channels. Moreover, the richness of data may enable artificial intelligence (AI) in the online or mobile shopping venues or virtual reality (VR) shopping experience. Through the complete channel integration and increased personal relevance of the data, retailers and marketers could be able to produce better retailers/brands' images and enhanced consumer services.

Limitations and Recommendations for Future Research

Despite the significance of the study addressed above, this study contains a few limitations. First, this study may possess internal validity issues that are often accompanied with scenario-based experimental study design. We manipulated the levels of LBMM individualization strategies (i.e., randomization, personalization, and customization) through a combination of text scenarios, visual stimuli, and video stimuli (for customization only). Due to a financial limitation and technical difficulties in manipulating individualized LBMMs in a field setting (e.g., mock stores, actual off-line stores, shopping malls), the study employed a scenario-

based setting that required participants to imagine a shopping situation receiving one of three LBMM individualization strategies.

Second, results obtained from an experiment using imagined shopping scenarios may not be generalizable to real-world situations where consumers received a LBMM and thus a limitation exists regarding the external validity of the findings. Future research is recommended using real-world field work. For example, as analysis of big market data that contains information regarding the individualization approaches the retailer used (e.g., whether or not the consumer's web browsing history, purchase history, and/or items in the consumer's online shopping carts are utilized to generate the LBMM) and response variables, such as the conversion rate (i.e., a proportion of the consumers receiving the LBMM who make a purchase after receiving the LBMM) and click-through rate (i.e., a proportion of the consumers receiving the LBMM who clicked on the ad in the LBMM to check out more details of the offer), would allow an opportunity to confirm the ecological validity of the findings of this study.

Third, confounding effects associated with consumers' characteristics may be possible threats to internal and external validity. Specifically, product involvement is occasionally accompanied with task involvement (i.e., LBMM individualization strategies) and issue involvement (i.e., perceived relevance) (Laczniak & Muehling, 1993; Zaichkowsky, 1986). The product involvement is considered as a personal factor that precedes other types of involvement that are associated with the situation or ad context; thus, the product type involvement, task involvement, and issue involvement are not mutually exclusive (Laczniak & Muehling, 1993; Zaichkowsky, 1986). To minimize the confounding effect of the product level involvement, a pretest was conducted to choose a product that has a medium level of product level involvement. Nevertheless, individual differences are likely to exist among participants, potentially

confounding the results. Further, this study has limited generalizability due to the sample characteristics. All phases of this study used samples of young consumers. Although young consumers constitute a large portion of location-based mobile app users, they do not encompass all users; hence, the generalizability of the findings from this study to consumers from other age groups is limited. Further, due to the fact that LBMMs are relatively new at market and some consumers in the U.S. might not have experienced receiving LBMMs yet, the study limited the scope to U.S. consumers who have prior experience of receiving an LBMM. This purposeful selection of the sample limits the generalizability of this study's findings. Hence, future research is recommended to conduct similar studies as this study with samples from a larger population with varying characteristics.

Fourth, the measurements used in this study pose some limitations. Earlier in the study findings, highly correlated factors among perceived relevance, elaboration level, and attitude toward a LBMM failed to confirm the discriminant validity using the most stringent method (Fornell & Larcker, 1981) and render us to re-assess discriminant validity among the factors using robust methods -- the confidential interval methods and the chi-square difference tests between constrained and unconstrained models. Although the alternative tests validated the discriminant validity among three factors, multicollinearity issues that might have been caused by highly correlated factors led to the Haywood case (Rindskopf, 1984) in the SEM, nullifying the effect of LBMM individualization strategies on elaboration level and attitude toward the LBMM. Considering the effects of LBMM individualization strategies on elaboration level and attitude toward a LBMM were significant in the subsequent series of SEM analysis by removing a path between perceived relevance and elaboration, or perceived relevance and attitude toward the LBMM, this Haywood case (Rindskopf, 1984) has a substantial limitation of the study.

Therefore, this study suggests future studies will use more valid measurements to resolve the multicollinearity issues.

Lastly, the study has a conceptual limitation. This study employed the ELM as a theoretical framework. The ELM postulates two routes of information processing, central and peripheral routes. This study mainly focused on the role of the LBMM individualization strategies in the consumer's central route of LBMM processing, largely ignoring the peripheral route of processing. A LBMM contains not only information about an offering (i.e., central cue) but also peripheral cues, such as visual design cues, which also may impact consumers' perceptual, cognitive, and attitudinal responses. According to the original propositions by ELM, although the role of peripheral cues is inconsistent and relatively less effective in affecting consumers' cognitive responses, the peripheral cues still play minor to significant roles when consumers are engaged in low involvement situations (Petty & Cacioppo, 1986). Further, since the peripheral cues are associated with emotional responses, the current study does not adopt peripheral cues from the ELM, limiting the scope to consumers' rational and cognitive aspects. Therefore, future studies examining consumers' affective and emotional responses associated with peripheral cues in LBMMs are needed, especially given the lack of significant effects of the central cue (i.e., information quality) found in the current study.

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Appendix A. Information Letter

INFORMATION LETTER

For a Research Study entitled
"Consumer Perceptions on Location-Based Mobile Advertising"

You are invited to participate in a research study seeking to investigate how consumers perceive location-based mobile advertising. The study is being conducted by Jinhee Han, a doctoral student, under the direction of Dr. Wi-Suk Kwon, Professor in the Department of Consumer and Design Sciences at Auburn University. You are selected as a possible participant because you are 19 or older, use a smartphone and live in the U.S.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to complete an online survey which asks your thoughts about location-based mobile advertising messages. Your total time commitment will be approximately 15 minutes.

Are there any risks or discomforts? We assure that participation in this study would put you in no physical or psychological risks other than the minimal inconvenience of completing the questionnaire. The information collected through this survey will remain completely anonymous. No identifiers will be used to link your responses to your identity.

Are there any benefits to yourself or others? There are no direct benefits to yourself by participating. However, your responses may contribute to generating scholarly knowledge that helps businesses better serve consumers.

Will you receive compensation for participating? If you meet the aforementioned participant qualifications, complete the provided online survey, and correctly answer all of the attention check questions interspersed among the survey questions, you will be offered a certain amount of compensation determined and provided by The Sample Network.

Are there any costs? There is no monetary cost for participation. The only cost will be your time spent in answering the questions.

If you change your mind about participating, you can withdraw at any time during this survey. If you choose to withdraw, your data can be withdrawn 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.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by not collecting any identifiable information from you. A random participant ID number will be generated by The Sample Network for each participant to record with their survey data. However, the investigators will not have access to the identifying information linked to these random participant ID numbers, while The Sample Network will not have access to the survey data. Therefore, your survey data and your identity will never be linked together. Information obtained through your participation may be used for publication in a professional journal or presented at professional meetings.

If you have questions about this study, please ask them now or contact Jinhee Han at jzh0036@auburn.edu or Dr. Wi-Suk Kwon at kwonwis@auburn.edu.

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

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY.
IF YOU DECIDE TO PARTICIPATE, PLEASE CLICK ON THE "NEXT" LINK BELOW.
YOU MAY PRINT A COPY OF THIS LETTER TO KEEP.

Jinhee Han 5/6/2021
Investigator Date

Wi-Suk Kwon 5/6/2021
Co-investigator Date

The Auburn University Institutional Review Board has approved this document for use from _____ to _____. Protocol #_____

Appendix B. Recruitment Announcement Page

STUDY INFORMATION

"Consumer Perceptions on Location-Based Mobile Advertising**"**

Researchers from Auburn University are seeking participants in a survey to identify consumers' perceptions on location-based mobile advertising. If you participate in this study, you will be asked to complete an online survey which will ask about your general thoughts about location-based mobile ads and your characteristics as a consumer.

Your responses to the survey questionnaire will be completely anonymous, and **no identifiable information about you (e.g., name, email address) will be collected from the researchers**.

To thank you for your time, a certain amount of compensation will be determined and provided by The Sample Network, when you complete the survey and correctly answer all attention-check questions included in the survey.

You must be at least 19 years of age, live in the U.S., and be a smartphone user to be eligible for the study participation. To check your eligibility, please click the link below. You will be directed to the survey page if you are eligible for the study participation.

LINK TO THE SCREENING/QUOTA PAGE

If you have any questions about completing the survey or this study, please contact the researchers listed below. Thank you.

Jinhee Han
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Appendix C. Main Study Questionnaire

Location-Based Mobile Ad Messages are mobile messages that a retailer sends to customers who are in close distance to their stores based on the customers' mobile device locations. Retailers may use location-based mobile ad messages to let customers know about their promotions, products, events, and other information.

Have you ever felt that you received a mobile ad message because of your location?

- YES
- NO

How many times have you received location-based mobile ad messages for the past year?

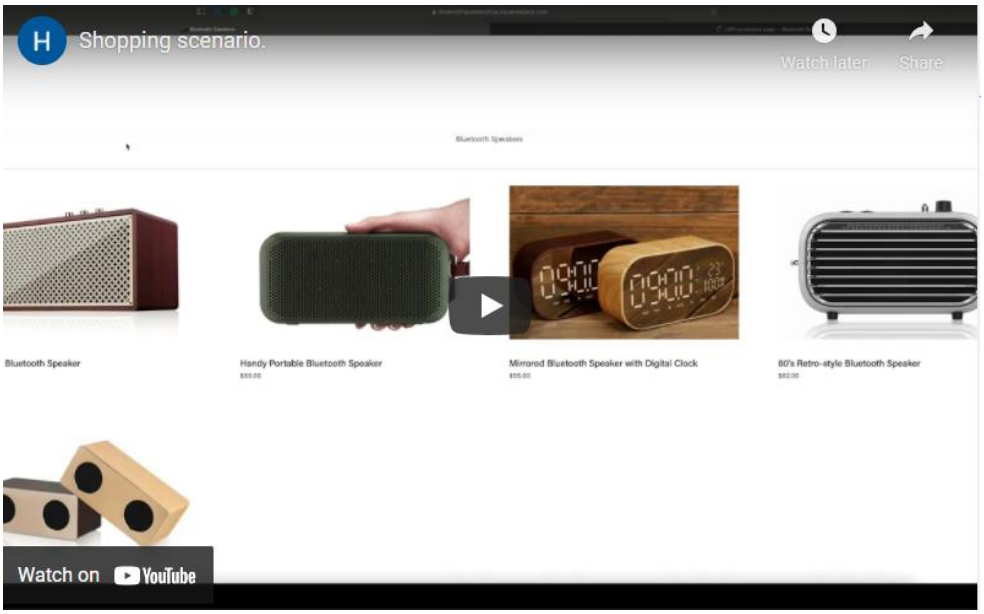
- ONCE
- TWO TO THREE TIMES
- FOUR TO FIVE TIMES
- SIX TO TEM TIMES
- MORE THAN TEN TIMES
- I DON'T REMEMBER

Customization Condition Page

Please ***carefully read the description in the box below and watch the video below it.***

Imagine that you recently have become interested in buying a Bluetooth speaker. You have browsed your favorite retailer's website for Bluetooth speakers and put a model that you really liked in the shopping cart. You also have opted in to receive mobile notifications about this item.

Please watch the video below imagining yourself in the situation described above.



(Video)

Please ***indicate whether each of the following is TRUE about the scenario*** you were asked to imagine and watch in the video above.

In this scenario, I was interested in buying a Bluetooth speaker.

- ☐ TRUE
- ☐ FALSE

In this scenario, I browsed online for Bluetooth speakers.

- ☐ TRUE
- ☐ FALSE

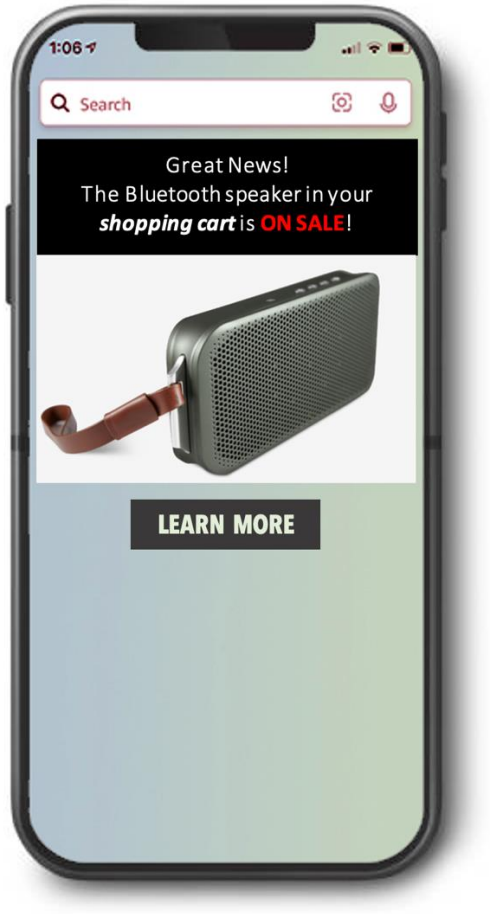
In this scenario, I liked a Bluetooth speaker that I found online, put it in the online shopping cart, and opted in to receive a mobile message about it.

- ☐ TRUE
- ☐ FALSE

Now, continue to imagine: A few days after the online browsing, you are shopping in the favorite retailer's offline store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is **about the Bluetooth speaker that you put in the online shopping cart a few days ago being on sale.**

Please carefully review the mobile message image below and answer questions that follow.

(One of Strong or Weak Information Quality in a LBMM were displayed)



Please rate how you would think about the mobile message shown above.

The Bluetooth speaker information in the mobile message is _____.

Unpersuasive --------Persuasive
Uninformative -------- Informative
Weak -------- Strong
Not convincing -------- Convincing
Unhelpful -------- Helpful

Please ***indicate whether each of the following is TRUE about the scenario*** you were asked to imagine above.

In this scenario, the mobile message was delivered when I approached the Bluetooth speaker section of the store.

- ☐ TRUE
- ☐ FALSE

In this scenario, the mobile message was about a product that I recently browsed for online.

- ☐ TRUE
- ☐ FALSE

In this scenario, the mobile message was about a product I kept in my mobile shopping cart.

- ☐ TRUE
- ☐ FALSE

---------- 117 Timer ----------

Personalization Condition Page

Please ***carefully read the description in the box below and answer the following questions.***

Imagine that you recently have become interested in buying a Bluetooth speaker. You have browsed online for Bluetooth speakers, but **did not like any models that you saw online.**

Please ***indicate whether each of the following is TRUE about the situation*** you were asked to imagine above.

In this scenario, I was interested in buying a Bluetooth speaker.

- ☐ TRUE
- ☐ FALSE

In this scenario, I browsed online for Bluetooth speakers.

- ☐ TRUE
- ☐ FALSE

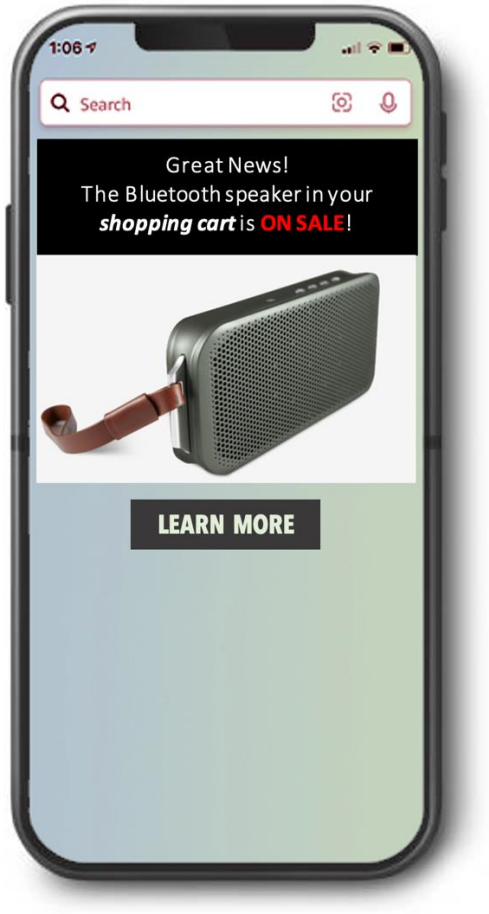
In this scenario, I liked a Bluetooth speaker that I found online, put it in the online shopping cart, and opted in to receive a mobile message about it.

- ☐ TRUE
- ☐ FALSE

Now, continue to imagine: A few days after the online browsing, you are shopping in the favorite retailer's offline store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is **about the Bluetooth speaker on sale.**

Please carefully review the mobile message image below and answer questions that follow.

(One of Strong or Weak Information Quality in a LBMM were displayed)



Please rate how you would think about the mobile message shown above.

The Bluetooth speaker information in the mobile message is _____.

Unpersuasive --------Persuasive
Uninformative -------- Informative
Weak -------- Strong
Not convincing -------- Convincing
Unhelpful -------- Helpful

Please ***indicate whether each of the following is TRUE about the scenario*** you were asked to imagine above.

In this scenario, the mobile message was delivered when I approached the Bluetooth speaker section of the store.

- ☐ TRUE
- ☐ FALSE

In this scenario, the mobile message was about a product that I recently browsed for online.

- ☐ TRUE
- ☐ FALSE

In this scenario, the mobile message was about a product I kept in my mobile shopping cart.

- ☐ TRUE
- ☐ FALSE

---------- 60 Timer ----------

Randomization Condition Page

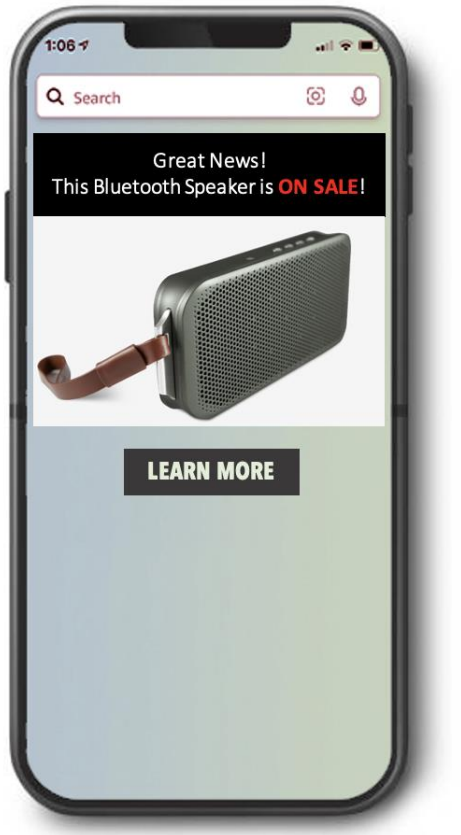
Please ***carefully read the description in the box below and answer the following questions.***

You are shopping in your favorite retail store. As you approach the store's Bluetooth speaker section, you are receiving the **mobile message** below, which is about **a Bluetooth speaker on sale**.

You have **NEITHER** been interested in buying Bluetooth speakers **NOR** browsed online for Bluetooth speakers recently.

Please carefully review the mobile message image below and answer questions that follow.

(One of Strong or Weak Information Quality in a LBMM were displayed)



Please rate how you would think about the mobile message shown above.

The Bluetooth speaker information in the mobile message is _____.

Unpersuasive --------Persuasive
Uninformative -------- Informative
Weak -------- Strong
Not convincing -------- Convincing
Unhelpful -------- Helpful

Please ***indicate whether each of the following is TRUE about the scenario*** you were asked to imagine above.

In this scenario, I was interested in buying a Bluetooth speaker.

- ☐ TRUE
- ☐ FALSE

In this scenario, I browsed online for Bluetooth speakers.

- ☐ TRUE
- ☐ FALSE

In this scenario, I liked a Bluetooth speaker that I found online, put it in the online shopping cart, and opted in to receive a mobile message about it.

- ☐ TRUE
- ☐ FALSE

In this scenario, the mobile message was delivered when I approached the Bluetooth speaker section of the store.

- ☐ TRUE
- ☐ FALSE

In this scenario, the mobile message was about a product that I recently browsed for online.

- ☐ TRUE
- ☐ FALSE

In this scenario, the mobile message was about a product I kept in my mobile shopping cart.

- TRUE
- FALSE

---------- 53 Timer----------

What would you think about the MOBILE MESSAGE if you received it in the situation you were asked to imagine on the previous page? For each statement below, please select an option from "Strongly Disagree" to "Strongly Agree" that matches your response.

	Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I was involved in the retailer's production of this mobile message.	1	2	3	4	5	6	7
My input played a role when the retailer sent me this mobile message.	1	2	3	4	5	6	7
I took part in the retailer's generation of this mobile message.	1	2	3	4	5	6	7
I was committed to receiving this mobile message.	1	2	3	4	5	6	7
It is important that you pay attention to this study. Please select "Disagree."	1	2	3	4	5	6	7
This message matched my needs.	1	2	3	4	5	6	7
Information in the message was tailored to my situation.	1	2	3	4	5	6	7
The message targeted me as a unique customer.	1	2	3	4	5	6	7
The message was customized to my own preferences.	1	2	3	4	5	6	7

What would you think about the MOBILE MESSAGE <u>if you received it in the situation</u> you were asked to imagine on the previous page? The following set of statements below, please select an answer, from STRONGLY DISAGREE to STRONGLY AGREE, that best represents how you would think.

I would think that _____.

	Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
Receiving this message during shopping would be useful to me.	1	2	3	4	5	6	7
This message would be relevant to me.	1	2	3	4	5	6	7
The content in this message would be personally important to me.	1	2	3	4	5	6	7
Receiving this message during shopping would be distracting.	1	2	3	4	5	6	7
Receiving this message during shopping would disturbing.	1	2	3	4	5	6	7
Receiving this message during shopping would feel forced.	1	2	3	4	5	6	7
Receiving this message during shopping would be interfering.	1	2	3	4	5	6	7
Receiving this message during shopping would be intrusive.	1	2	3	4	5	6	7
Receiving this message during shopping would be invasive.	1	2	3	4	5	6	7
Receiving this message during shopping would be obtrusive.	1	2	3	4	5	6	7
While I look at this message, I would try to make an accurate judgment of the Bluetooth speakers in the message.	1	2	3	4	5	6	7
While I look at this message, I would use a lot of mental effort to evaluate the possible value of the Bluetooth speakers for me.	1	2	3	4	5	6	7
While I look at this message, I would use the message content to evaluate the Bluetooth speakers.	1	2	3	4	5	6	7
While I look at this message, I would carefully consider the product information on the message,	1	2	3	4	5	6	7
While I look at this message, I would give a lot of thoughts to the text in the message in order to judge whether the Bluetooth speakers would be suitable for me.	1	2	3	4	5	6	7
Overall, I would like this message if I received it.	1	2	3	4	5	6	7
Overall, I would find this message pleasant.	1	2	3	4	5	6	7

Overall, this message would be favorable to me.	1	2	3	4	5	6	7

How **likely** would you be to buy the Bluetooth speaker on the mobile message?

Highly unlikely -------- Highly Likely

How ***probable*** is it that you would purchase the Bluetooth speaker on the mobile message?

Highly improbable -------- Highly probable

How ***certain*** is it that you would purchase the Bluetooth speaker on the mobile message?

Highly uncertain -------- Highly certain

What chance is there that you would buy the Bluetooth speaker on the mobile message?

Not chance at all -------- Very good chance

Please select an answer from STRONGLY DISAGREE to STRONGLY AGREE for each of the following statements regarding **your general thoughts about BLUETOOTH SPEAKER**.

	Strongly Disagree	Disagree	Somewhat disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
I am particularly interested in Bluetooth speakers.	1	2	3	4	5	6	7
Given my personal interests, Bluetooth speakers are relevant to me.	1	2	3	4	5	6	7
Overall, I am quite involved when I am purchasing Bluetooth speakers for personal use.	1	2	3	4	5	6	7

[Demographic Questions]

1. What is your **gender?**

    - MALE
    - FEMALE

2. What is your **age?** _____ YEARS OLD

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

    - AMERICAN INDIAN/ALASKAN NATIVE
    - ASIAN/PACIFIC ISLANDER
    - HISPANIC
    - BLACK, NON-HISPANIC
    - WHITE, NON-HISPANIC
    - OTHER (Please specify: _____)

4. What is the **highest education level you have completed**? If currently enrolled, highest degree achieved.

    - NO SCHOOLING COMPLETED
    - SOME HIGH SCHOOL, NO DIPLOMA
    - HIGH SCHOOL GRADUATE, DIPLOMA OR THE EQUIVALENT
    - SOME COLLEGE CREDIT, NO DEGREE
    - ASSOCIATAE DEGREE IN COLLEGE (2 YEARS)
    - BACHELOR'S DEGREE IN COLLEGE (4 YEARS)
    - MASTER'S DEGREE
    - DOCTORATE DEGREE
    - PROFESIONAL DEGREE (JD, MD)

5. What is your **marital status**?

- ☐ SINGLE, NEVER MARRIED
- ☐ MARRIED OR DOMESTIC PARTNERSHIP
- ☐ WIDOWED
- ☐ DIVORCED/ SEPARATED

6. Which statement best describes your current employment status?

- ☐ WORKING (PAID EMPLOYEE)
- ☐ WORKING (SELF-EMPLOYED)
- ☐ NOT WORKING (RETIRED)
- ☐ NOT WORKING (DISABLED)
- ☐ NOT WORKING (TEMPORARY LAYOFF FROM A JOB)
- ☐ NOT WORKING (LOOKING FOR WORK)
- ☐ OTHER (Please specify: _____)

7. What is your **annual household income**?

- ☐ UNDER $20,000
- ☐ $20,000 TO $39,999
- ☐ $40,000 TO $59,999
- ☐ $60,000 TO $79,999
- ☐ $80,000 TO $ 99,999
- ☐ $100,000 TO $119,999
- ☐ $120,000 TO $139,999
- ☐ $140,000 TO $159,999
- ☐ $160,000 TO $179,999
- ☐ $180,000 TO $199,999
- ☐ $200,000 AND ABOVE

8. Which **region of the country** do you live in?

- ☐ Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)
- ☐ Northeast (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)
- ☐ Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV)
- ☐ Southwest (AZ, NM, OK, TX)
- ☐ West (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY)

Thank you for your participation

Appendix D. Screening Page

Screening Page

Direction: Please answer the following questions by checking the appropriate selection or filling in the blanks.

1. What is your **gender?**

    - MALE
    - FEMALE

2. To which of this **age group** do you belong**?**

    - Under 19 years old
    - 19 – 24 years old
    - 25 – 34 years old
    - 35 – 44 years old
    - 45 – 54 years old
    - 55 – 64 years old
    - 65 years old or older

3. Are you **a smartphone user**?

    - YES
    - NO

4. In which of the following **countries** do you currently live?

    - Brazil
    - Canada
    - France
    - Germany
    - India
    - Italy
    - Pakistan
    - Philippines
    - United Kingdom
    - United States
    - Others (Specify :)

----------Directed to Termination Page or Next Question ----------

Appendix E. Termination Page

Termination Page

Thank you for your interest in our study. Unfortunately, you are not eligible to participate at this time because either you do not meet our participant criteria or our maximum allowable number of participants for your age/gender group has been already met. Thank you for your understanding.

Appendix F. Mean (Standard Deviation) of Dependent Variables

Dependent Variables	*M* (*S.D.*)						
	Strong			Weak			Total
	Random-ization	Personal-ization	Custom-ization	Random-ization	Personal-ization	Custom-ization	
Perceived Relevance	3.13 (1.75)	5.04 (1.14)	5.33 (1.10)	2.79 (1.69)	4.64 (1.49)	5.50 (.91)	4.50 (1.70)
Perceived Intrusiveness	5.44 (1.33)	4.92 (1.46)	5.11 (1.28)	5.48 (1.30)	4.84 (1.43)	4.67 (1.52)	5.05 (1.42)
Elaboration Level	3.50 (1.62)	4.95 (1.39)	5.21 (1.07)	3.24 (1.65)	4.59 (1.36)	5.38 (.94)	4.55 (1.56)
Attitude toward a LBMM	3.05 (1.81)	4.34 (1.70)	5.09 (1.47)	2.71 (1.73)	3.92 (1.74)	5.21 (1.42)	4.13 (1.88)