

The Role and Impact of Personalization Technology on Customer Acceptance of
Advertising via Short Message Service (SMS)

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มีความเชื่อทั่วไปที่ว่ายิ่งถ้าข้อความที่ได้รับการปรับแต่งเฉพาะบุคคลมากเท่าไร ลูกค้าก็จะมีความรู้สึก
ร่วมกับข้อความที่ได้รับมากขึ้นเท่านั้น รวมถึงยังได้รับความไว้วางใจจากลูกค้ามากขึ้น ซึ่งจะนำไปสู่การเสริมสร้าง
ความสัมพันธ์ของลูกค้ากับบริษัทให้แข็งแกร่งยิ่งขึ้น อย่างไรก็ตามความรู้ความเข้าใจถึงผลสัมฤทธิ์และ
ผลกระทบที่มีต่อการยอมรับโฆษณาของลูกค้าผ่านบริการสื่อสารข้อความสั้นหรือเอสเอ็มเอส (SMS) นั้นยังมีน้อย
การศึกษานี้ได้ทำการรวมแบบจำลอง Elaboration Likelihood Model (ELM) และทฤษฎี Information
Processing เข้าด้วยกันเพื่อทำการค้นคว้าเข้าใจถึงกลไกการทำงานและผลกระทบของเทคโนโลยีปรับแต่งเฉพาะ
บุคคลแบบ Context-driven และ Self-reference รวมไปถึงปฏิสัมพันธ์ระหว่างเทคโนโลยีทั้งสองและยังรวมไป
ถึงปัจจัยเฉพาะบุคคลคือ Need for Cognition ที่มีต่อการคิดวิเคราะห์และทัศนคติที่มีต่อโฆษณา การทดลอง
ภาคสนามที่ได้รับความร่วมมือจากบริษัทจัดการบัตรเครดิตโดยการเก็บข้อมูลผ่านทางโทรศัพท์และการใช้เทคนิค
การวัดความคิดวิเคราะห์แบบ Verbalization Thought-listing ผลจากการทดลองพร้อมกลุ่มตัวอย่างจำนวน
420 คน แสดงให้เห็นว่าเทคโนโลยีปรับแต่งเฉพาะบุคคลแบบ Context-driven มีผลกระทบต่อการจูงใจลูกค้า
อย่างมีนัยสำคัญ ขณะที่ผลจาก Self-reference และปฏิสัมพันธ์ระหว่าง Need for Cognition นั้นไม่มี
นัยสำคัญชัดเจน ผลลัพธ์จากงานวิจัยนี้ช่วยให้ผู้บริหารองค์กรเข้าใจในตัวลูกค้าอย่างลึกซึ้งซึ่งถึงการรับรู้โฆษณาที่ได้รับ
การปรับแต่งเฉพาะบุคคล ขณะที่จะเปิดโอกาสใหม่ๆให้กับแวดวงวิชาการในการค้นคว้าศึกษาเพิ่มเติมเกี่ยวกับ
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There exists the common belief that the more personalized the message, the greater the relevance to the customer, including enhancing the trust between customer and firm and thereby leading to a stronger customer relationship. Yet little is known about the effectiveness and impact on customer acceptance specifically in advertising of Short Message Service (SMS), by combining the elaboration likelihood model (ELM) and information processing theory, this study investigated how context-driven and self-referent personalization technology works, their interactions and the need for cognition on elaboration and attitudes toward advertising. A field experiment was conducted incorporated with a credit card service firm using phone interview with verbalization thought-listing technique. The results from 420 participants show that context-driven personalization technology exhibits a strong influence on persuasion process, while there is no significant of self-reference effect and interaction of need for cognition. The result of this research will help practitioners to gain more insight into how the customer perceives personalized advertising, while, academically, this will lead to further study of other personalization technologies.

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Student's Signature

Advisor's Signature

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Chapter I Introduction

Mobile penetration rate has increased tremendously over the past five years, reaching 96% penetration (6.8 billion subscriptions) globally by the end of 2013 (International Telecommunication Union [ITU], 2013). The ubiquity and unique characteristics of the mobile phone—highly personal, reachability and timeliness (Beneke, Cumming, Stevens, & Versfeld, 2010)—make it a very attractive choice of medium for delivering marketing messages or advertisements. While Short Message Service (SMS) or text messaging is now the most dominant form of communication with over eight trillion messages exchanged worldwide in 2011 (Mobile Marketing Association, 2012), in part due to its highly interoperability, ubiquity and ease of use. Hence, the mobile advertising market size is forecast to grow rapidly by 400% between 2011 and 2016 with US\$9.6 billion in 2012 and reaching US\$24.5 billion in 2016 (Baghdassarian & Frank 2012). Firms have been using Short Message Service (SMS) to communicate and persuade consumers through customer service information, advertisements, and sales promotions (Bamba & Barnes, 2007) with different levels of information technology involvement.

Nowadays, information technology plays a vital role in supporting businesses, ranging from enabling the fundamental business processes, strategic business initiative to business strategy. One of the common differentiation strategies across different businesses is the ability of the firms to personalize their products or services for each individual customer. As previously mentioned, there are various levels and

alternatives of the complexity of information technology involved in order to enable firms to achieve the personalization strategy. Cascade of personalization strategy has been passed down and across different business units in the organization, particularly applied and assisted in marketing strategy formulation and enablement. The adoptions of personalization in marketing are varied from one firm to another; however, the predominant focus is in marketing communication.

As previously discussed, SMS has been one of the primary marketing communication channels, especially; by financial services firms, owing to the combined uniqueness of both mobile phone and SMS. Different information technologies have been deployed to support the personalization strategy in creating and differentiating marketing offers or advertising messages to specific targeted customers. Numerous choices of technology or approach are available for firm which can range from simple and basic technology where most already available in the firm to a relatively advance technology. For example, the database technology can help firm achieve the relatively straightforward personalization approach by putting the customers' name in the marketing message whether it is an outgoing marketing promotion email or direct mail. The frequently seen example is on commercial websites where the greeting message is personalized by showing the customer name, e.g. Hello! Mr. John, Welcome back Mr. John. This personalization approach is commonly known as "Self-reference" in psychological domain and has been studied extensively on its effect on human cognitive (Bargh, 1982; Burnkrant & Unnava, 1995). Nevertheless, its effect on customer acceptance of advertising message has not been fully explored yet.

While other more advanced technologies, especially, highly related to mobile phone, for instance, mobile location-based application (Foursquare or Gowalla) or location-based mobile coupons via SMS (usually by mobile operators), are also adopted by some firms. Recently one of the personalization technology known as *Context-driven personalization* or *Event-Based Marketing (EBM)* by marketing practitioners is gaining more attention and adoption. Context-driven personalization is a strategic process and technology designed to enhance the relationship a company has with each of its customers (Twogood, 2003). Further to this, Rau, Zhang, Shang, and Zhou (2011) explained in Accenture Technology Vision 2012 that context-based services—a key technology trends in 2012—is about how a firm can better serve its customers based on critical contextual data (who, what, when and where), and make those products or services more relevant at the point where an action takes place. The ultimate goal is to deliver a personalized message which has been targeted to the “right” consumer (match interest), “right” place (match location) and “right” time (on-time or real-time need).

Additionally, the individual differences can also play a moderating role in the effect of personalization on customer acceptance (Haugtvedt, Petty, & Cacioppo, 1992). Among various personality traits, Need for Cognition (NFC)—a tendency of people to engage in and enjoy thinking (Cacioppo & Petty, 1982, p.119)—is an omnipresent characteristic which has been studied in various researchers, particularly in advertising domain (Sicilia, Ruiz, & Munuera, 2005) to enhance the effectiveness of advertisement.

However, the results of these SMS communications have not been very impressive, as in general, consumers have been found to have a negative attitude towards mobile advertising (Drossos, Giaglis, Lekakos, Kokkinaki, & Stavraki, 2007). Though from the practitioners' perspective, higher personalized marketing has shown a better or higher response rate among consumers (Brow, 2009; Jackson, 2007) it has not been clearly studied or explained how and why academically. In addition, measuring the effectiveness of advertising by evaluating only the end result of the marketing campaign is not sufficient as the high sensitivity of the advertising message affects the purchase-related variable or actual buying (Chattopadhyay & Nedungadi, 1992). This is not to mention the fact that the more personalized the message is, the higher the cost associated to acquiring the related technologies will be (Dewan, Jing, & Seidmann, 2000). While what customers actually think when receive an advertising is like a black box to the practitioner, the success in driving differentiation strategies through personalization depends upon a truly understanding of its effectiveness.

Prior research suggests various definitions and understandings of what personalization is. Fan & Poole (2006) describe how personalization technology has been used and its effectiveness on the web or within the electronic commerce website context (Tam & Ho, 2005). Others have focused on finding the factors that influence consumer acceptance of mobile advertising (Bauer, Reichardt, Barnes, & Neumann, 2005) or studying specific technologies used on mobiles (Xu, Teo, Tan, & Agarwal, 2009). Given the proliferation of web personalization and mobile marketing research from both information systems (IS) and marketing disciplines, relatively few studies have

specifically addressed how personalization technology used in advertising via SMS affects customer acceptance.

Therefore, this study aims at addressing this issue by determining: (1) What are the effects of different personalization technologies or approaches, as well as their interaction on customer acceptance of marketing offers?; (2) Is there an interaction effect between Need for Cognition (NFC) and the effect of context-driven personalization technologies towards customer acceptance?

The rest of the paper proceeds as follows. In the next section, the reviews of literature from diverse domains of knowledge are presented along with an overview of personalization definitions and technologies. Next, the introduction of the Elaboration Likelihood Model (ELM) as the principal theory adopted with information processing theory are discussed and formed into a research model along with the hypotheses. This is then followed by the research field study overview, results and finding, concluding with theoretical and practical implications.

Chapter II Literature Review

In reviewing the rich body of cross-disciplinary literature, two emerging streams are discernible: namely, a personalization technology stream—with focus on definition, conceptual framework and its effectiveness driven mostly by information systems (IS) researchers (Montgomery & Smith, 2009; Tam & Ho, 2005) with some management science (Jackson, 2007; Murthi & Sarkar, 2003) and a few marketing researchers (Fan & Poole, 2006; Vesanen, 2007). The other stream is a marketing stream which is centering around the factors (both individual or situational) affecting mobile advertisement acceptance—primarily led by marketing researchers (Bamba & Barnes, 2007; Bauer et al., 2005) with a few IS researchers (Sheng, Nah, & Siau, 2008; Xu et al., 2009). This chapter will review these two research streams along with their sub streams and their contributions to the study. Then the conceptual framework and model would be presented to show how they have been formulated along with research hypotheses.

2.1. Personalization Technology Research Stream

The interest in personalization technology research can be divided into two sub domains or streams of research; the first stream focuses on the definition and conceptual framework for personalization, while the other centers around the effectiveness of personalization technology in application (see Figure 1).

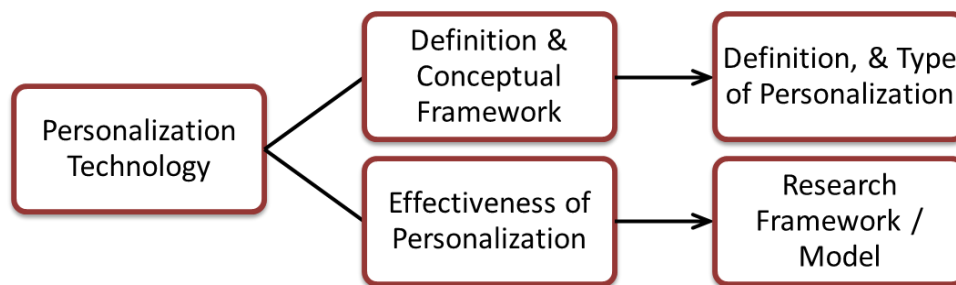


Figure 1 Personalization Technology Research

2.1.1. Definition and Conceptual Framework Sub Stream

The definition and conceptual framework of personalization have been studied by both IS and marketing researchers. Vesanen (2007) suggested that there is no clear and common definition of personalization and there are many facets of it, for example, differences between personalization and customization have been proposed by many researchers, yet they remain controversial and there is a lack of any conclusion or agreement (see Vesanen (2007, p. 3, Table II)). Solely based on a search of personalization of electronic databases, one can see a variety of terms which are highly interrelated such as customization, adaptation, individuation, consumer-centric, and one-to-one relationship with over 300 abstracts and books yielding a total of 142 references, including 86 journal articles, 35 books, 13 conference papers and eight web references (Fan & Poole, 2006). Adapted and selected from Fan and Poole (2006),

Table 1 lists some definitions from diverse disciplines that are related to the current study.

Table 1 Personalization Definition in Different Disciplines

<i>Discipline</i>	<i>Sample Definitions</i>
Marketing / e-Commerce	<p>a. “Personalization is the combined use of technology and customer information to tailor electronic commerce interactions between a business and each individual customer” (Personalization Consortium, 2003).</p> <p>b. “Personalization is about building customer loyalty by building a meaningful one-to-one relationship; by understanding the needs of each individual and helping satisfy a goal that efficiently and knowledgeably addresses each individual’s need in a given context” (Riecken, 2000).</p>
Cognitive Science	<p>c. Personalization is “a system that makes explicit assumptions about users’ goals, interests, preferences and knowledge based on an observation of his or her behavior or a set of rules relating behavior to cognitive elements” (Kobsa, 2000).</p> <p>d. Personalization is the process of providing relevant content based on individual user preferences or behavior (Vignette Corporation, 2002).</p>
Computer Science	<p>e. “Personalization system is any piece of software that applies business rules to profiles of users and content to provide a variable set of user interfaces” (Instone, 2000).</p> <p>f. Presenting customers with services that are relevant to their current</p>

	locations, activities, and surrounding environments (Dey, 2001).
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The definition used in this research is a blend of the personalization definition list suggested by Fan and Poole (2006) and is consistent with current efforts to define personalization: *personalization* is defined as “a combination of strategic marketing planning and technology to customize marketing communication based on customer preference and activity”. Congruent with the research objective and focus, this definition will help more clearly set the scope of study, provide clearer explanations and remain the focus throughout the study.

Conceptual framework (see Vesanen 2007, Figure 2) is proposed to combine different views or topics into a single framework which includes the execution part of personalized marketing, and the output value for both customer and marketer. The key highlight of this research is its portrayal of the benefits and costs of personalization incurred by both customer and marketer in a structured way. To the customer, they will receive a more preferred or relevant product or service with a potential trade off of their privacy, spam and time spent. For the firm, personalization may increase customer satisfaction and loyalty which can translate to better margins, higher price and customer lifetime value. Of course, this will come hand in hand with both monetary and non-monetary investments, such as information technology (hardware, software, and consulting services), investment and internal staff training.

Another key work, Fan and Poole (2006) proposes a classification scheme to frame personalization study and practice as well as a normative framework of four

personalization ideal types. The purpose of the classification scheme is to give a clearer structure of the diverse personalization implementation options which is constructed along three dimensions: what to personalize, whom it is intended to and who initiates it. The first dimension, what to personalize, four attributes can be personalized: 1) content in the message itself, 2) how the information is presented, 3) the media or communication channel and 4) what user can interact with it. The second dimension, whom it is intended to, in other words, how the personalization technology will be targeted to which can be as granular as individual customer, a group or cluster of customers who share the similar attribute. Last dimension, who initiates it, whether the personalization will be performed by firms, customers or both. With these three dimensions, firms have a clearer landscape of the personalization systems implementation choices available as suggested in the classification scheme proposed by Fan and Poole (2006 ,table 2, p. 188). For example, firms might take an implicitly individuated personalization by offering a unique content of the message which is delivered only a certain condition met or based on individual historical data (e.g. items recommendation based on purchase or search history like, www.amazon.com) or rather explicitly personalized message to the individual by showing the recipient's name or other cues (e.g. personalized web portal like My Yahoo!).

While the four perspectives or ideal types of personalization, the architectural, relational, instrumental, and commercial perspectives are postulated to assist in defining as well as identifying relatively consistent tendencies in personalization theory, research, and practice (see details of the four perspectives in Fan and Poole

(2006, table 3, p. 190)). Each perspective portrays a different philosophy or motivation behind and what are the objectives that the personalization tries to achieve which also implies a different strategy or means for accomplishing it. Different organizations and different activities would best fit particular ideal types and so the match between ideal type and the context in which the personalization system.

Among these four ideal types, commercial perspective is the closest to the business or marketing activities, the motivation and objective of personalization are to differentiate product, service, and information to increase revenue and to enhance customer loyalty. To achieve this, the personalization system must be able to effectively segment customers and address each individual or group of customer's needs. Hence, commercial personalization primarily focuses on the content of the system and highly associated with information technology or data-driven system, as a mass customization is a typical example found in many businesses. Key to success in commercial personalization is the rich knowledge and holistic view of the individual, not only the traditional demographic profiles, but also the preferences, historical transactions as well as other contextual information, such as time or location. Effective personalization will successfully anticipate customer needs and better prepare the matched offer to satisfy them. Nevertheless, the ideal type scheme does not suggest one single approach to personalization but rather each ideal type requires different criteria and methods.

2.1.2. Effectiveness of Personalization Sub Stream

While the effectiveness of personalization has been recently explored by IS researchers, with prominent work by Tam and Ho (2005) who developed an approach to measure the effectiveness of personalization and other important variables by making reference and applied the Elaboration Likelihood Model (ELM) combined with the information processing model. They conducted three field experiment studies based on an online mobile ring-tone downloads service were conducted. Three key constructs: 1) preference matching (based on user profile), 2) use of a sorting cue (the personalized ring-tones are highlighted and located at the top of the list) and 3) set size (three versus six personalized offers) are studied. The results across all three studies confirmed that *preference matching* showed significant influence on user cognitive and choice of personalized offers which proved the ELM framework that preference matching was central variable in persuading users to accept the offers. While, surprisingly, that the sorting cue also show significant influence on user attention and elaboration, which suggested that peripheral route might became more salient than the original idea and purpose.

Furthermore, Tam and Ho (2006) incorporated both consumer decision research and social cognition research and proposed that content relevance and self-reference were mediated the effectiveness of personalization. Two distinct studies were conducted, one was lab experiment based on e-commerce website and the other was field study based on mobile ring-tone downloads service. The results from both studies were integrated and interpreted at the same time, both content relevance and self-reference

showed significant on customer attention, cognitive processing, decision or accepting the personalized offers.

Lastly, Ho, Davern, and Tam (2008) considered several personality traits as a key moderator between personalization and choice behavior. Need of cognition, variety seeking and need for uniqueness were selected personality traits which were studied in field experiment based mobile ring-tone downloads service. However, the findings showed mixed results, as regards the moderating effects, need for cognition was the most discernible factors among other personality traits which showed the significant moderating effects.

However, another eminent work from non-IS researcher, Murthi and Sarkar (2003) posit a very interesting framework to understand the role and effect of personalization on various aspects and level of business impact. The framework—derived from Brandenburger and Nalebuff (1995) Value Net—portray the interactions between a firm and related stakeholders which are customers, channel, suppliers, competitors and complementors (see details in Murthi and Sarkar (2003, Figure 1, p. 1345)), and suggests that to truly understand the personalization impact, these interactions must be investigated. The effects of personalization proposed are product differentiation, price discrimination, first-mover advantage and product/service bundling. Besides, the authors conceptualize the personalization process as consisting of three stages: (1) learning about customer profiles, preferences and context, (2) matching and developing the right offers and (3) evaluating the effectiveness of the prior two stages (learning and matching).

2.1.3. Summary of Personalization Technology Research Stream

These research groups primarily focus on the definition of personalization, conceptual framework as well as the effectiveness and implementation. Practitioners will learn about the potential benefits, risk and investment on applying and strategizing personalization into the businesses either at strategic initiative down to business operation. While their works provide an insightful guidance and encourage academics to further study on personalization either at conceptual or its application level. However, the setting and context of study and experiments are all related to e-commerce or internet-based environments. Though both website or internet-based application and SMS on mobile share some common attributes as of communication channel, such as, highly interactive and digitized—hence, easily and quickly customizable as well as updatable and adaptable to change—which makes them a feasible and ideal choice to incorporate personalization and also stand apart from traditional medias.

Nevertheless, there are still some differences among them, for example, as mentioned; SMS on mobile phone is more personal and individualized with high reachability and reliability than web-based application as of communication channel. Most people carry their mobile phone with them virtually all the time, even going to sleep and unlikely to share their mobile phone to others, hence, it permit both practitioner and academics to explore in-depth on the impact of personalization technology. The ubiquity and high penetration rate of mobile device couples with an easy-to-use SMS technology, which required barely minimum knowledge comparing to operating web-based application; will provide us with the broad range possibility and assumption of subject

profiles and technology usage. However, SMS also impose one key challenge to those prior works, which is the limitation of text-only message or communication. As to make the message more appealing or gain attention from the user, when performing a field experiment would be a challenge.

In summary, this group of research primarily focuses on personalization technology, strategy and process in applying personalization to the website or internet context. Almost none have been applied to other contexts or marketing channels, especially in SMS, with the exception being a few works expanding the scope of personalization, for example using broader terms to address business-to-consumer interaction (Ardissono, Goy, Petrone, & Segnan, 2002) or treating personalization as a supplement in Customer Relationship Management (CRM) initiative implementation (Jackson, 2007).

2.2. Mobile Marketing Research Stream

Another group of researchers—mostly from the marketing discipline and a few from IS researches—have studied the use of the mobile as a medium for marketing activities, particularly on customer acceptance and its effectiveness. This stream of research can be divided into two sub domains based on the technologies involved in the research setting and context as well as the relative importance of technology to the study. The first sub domain is concentrate much on studying and exploring key factors which

influence customer acceptance on mobile advertising, while the other sub domain focuses on specific interests, details are discussed as following (see Figure 2).

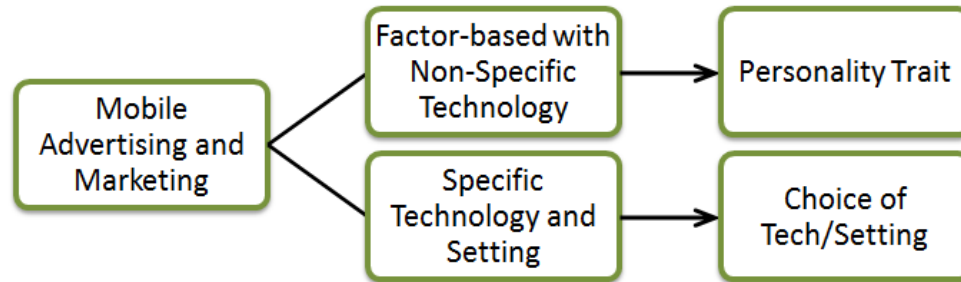


Figure 2 Mobile Marketing Research Stream

2.2.1. Factor-based with Non-Specific Technology Sub Stream

This stream explores the use of the mobile as a medium for marketing and advertising purposes without specifically stating which mobile technology to use but rather stating a variety of choices to be deployed. The core focus in this stream is on finding the factors that can influence the customer in accepting mobile advertising or marketing offer, and they cover many various types of factors. A great variety of types of factors are covered with the commonly studied being personality traits, messages, and technology used. For example, In the study of the antecedents of attitudes toward mobile advertising, Beneke et al. (2010) selected attitude toward advertising in general, innovativeness and knowledge as personality traits, while content, personalization and interactivity comprised the message elements. A field survey and online questionnaire were conducted with youth in South Africa, resulted in 250 responses with Partial Least Squares (PLS) regression as a statistical tools analysis. The authors suggest that in order to be successful in mobile marketing, three most important factors must be achieved

which are the level of consumers' control over the use of their personal information (the higher control, the better attitude toward mobile advertising), the degree of the interesting of the content (useful, informative, creative and entertaining aspects) and how much message have been personalized (based on personal preference, time and location).

Similarly, the work of Bauer et al. (2005) which investigated the factors influence consumers to accept the mobile phone advertising, two sets of factors were studied: personality traits (Consumer-Based and Innovation-Based Acceptance Drivers) and form of advertising. Theory of Reasoned Action (Fishbein & Ajzen, 1975) was applied to form a research model with the online questionnaire promoted through email alert, resulted in 1,028 subjects. The linear structural equation model with LISREL was conducted to analyze the data, the interesting findings were discussed as personality traits did not significantly influence attitudes toward mobile marketing but rather perceived utility (entertaining or informational messages) showed the important impact on developing a positive attitude toward mobile marketing leading to the behavioral intention to use mobile marketing services. Remarkably, researchers suggest that firm should avoid sending an impersonalized mass message, especially, for communicating advertising content to customer. As to customer might perceive the message have no value neither informative nor entertaining, which will lead to negative attitude toward advertising.

Another interesting work by Sunikka and Bragge (2009), who studied how marketing messages were passed on to the customer via different channels and with different personalization messages in different types of message within the on-line

banking context yielded significantly different results. The study was conducted by four computer-mediated focus groups with 53 Finnish financial services firm's customers. The authors summarize, in a two-by-two matrix (see Sunikka and Bragge (2009, figure 1)), that the informative customer service type of message shows positive acceptance regardless of personalization type while, on the contrary, if the message is an advertisement, the personalization does not influence customer mobile marketing acceptance.

2.2.2. Specific Technology and Setting Sub Stream

This research stream—mostly from the marketing field and a few from IS research—has studied the use of the mobile as a medium for marketing activities and some specific mobile technology. Xu et al. (2009) studied location-based services (LBS) enabled through either cellular triangulation techniques or global positioning system (GPS). In their study, the information delivery mechanisms (Push vs. Pull) were a key moderator in the individual's privacy decision-making process based on privacy calculus theory (Dinev & Hart, 2006) and justice theories (Colquitt, Conlon, Wesson, Porter, & Ng, 2001). The research model was empirically tested with scenario-based method, data gathered from 528 subjects through online survey which participants invited via reputable web portals of Singapore. The authors suggest that with push technology, the impact of the provision of justice through compensation and government regulations affecting individual privacy concern in sharing personal information shows a stronger effect compared to pull technology. In other words, LBS with pull technology would create a

communication channel and method where consumer will be more accepted and willing to trade-off their privacy. This indirectly sheds light on the approach of using LBS as one technology of personalization.

Similar research studied by Unni and Harmon (2007) with the focus more on advertising via LBS. The objective was to investigate the perceived benefits comparing to privacy concern by consumers, the push vs. pull mechanism as well as promotional vs. brand advertising were studied in lab experiment with undergrad students. The results were consistent with previous researchers that the permission or opt-in advertising was significantly important to customer on push versus pull. However, with the promotional advertising, customers perceived higher benefit than brand advertising in push LBS.

While Bamba and Barnes (2007) considered the same moderator (push-pull) in a specific channel—that of SMS technology. The study aimed to investigate the consumers' willingness to give permission to receive advertising via SMS. Two categories of factors that would affect permission were proposed: unconscious factors (attitude toward SMS advertising and mobile technology knowledge) and conscious factors (the relevance of SMS ads, the level of permission control and brand familiarity). The research was divided in two phases; firstly, focus group was conducted to validate the initial model which then adjusted it into research model and a set of questions, then followed by the online questionnaire, all subjects were students in UK University. The authors suggest that to appeal to the consumer, marketers must adapt their ads or personalize the content for each customer interest while providing a single opt-in SMS

registration which makes it easier for the customer to grant the firm permission. Also, the research posits that while the relevance of the messages might be important to customer acceptance, the firm must allow the customer to control permission regarding marketing push messages, otherwise it can harm the firm's reputation and reduce marketing communication acceptance.

2.2.3. Summary of Mobile Marketing Research Stream

Mobile ads and marketing research stream provide the understanding of key factors that influence customer on advertising acceptance with various settings and technologies. Push versus pull, privacy concern and content are among most frequent factors studied. Consistency of these researches show that although customers do concern their privacy (especially, in push mechanism), they are willing to trade off in order to gain benefits which can be in different form of utilities, such as, the informative, promotional, and entertaining.

Nevertheless, most of the researches in this stream view mobile marketing from the perspective of the marketing discipline and focus efforts on finding the key factors that drive consumer attitude toward mobile marketing acceptance. Personalization have been treated just as one of many factors in the study, very few have studied, in detail, especially in the SMS context.

2.3. Summary of All Research Streams

Prior research acknowledges and recognizes the importance of personalization technology in the two research streams as outlined above. The personalization technology stream lays out the personalization definition, approach, implementation framework, and particularly the framework for studying the effectiveness of personalization technology, but no research has directly or fully investigated mobile advertising via SMS. In contrast, the marketing stream has focused on identifying the key determinants that influence the consumer in accepting mobile advertising or have specifically studied certain technology. However, personalization technology has not been investigated thoroughly, in fact, it has only been studied as one antecedent (Beneke et al., 2010). Each domain has provided different works and perspectives on how various personalization technologies affect consumer acceptance of marketing communication and in what way, as well as, how and what personality traits strengthen or weaken the influence of personalization technology and consumer acceptance.

All the above research domains discussed so far provide this research with a solid foundation on which to construct its research framework and model. First, the framework and model developed in this research to study how personalization technology is derived from the effectiveness of personalization sub domain is derived specifically from Tam and Ho (2005) because of the similarity of their research and this study (personalization and persuasion in advertising). Second, the exhaustive list of personalization definition, classification scheme and ideal types help us understand and refine the personalization definition and strategy employed in this research. Next only

key personality traits have been examined and chosen in terms of those relevant to this research context and objective from various mobile marketing research. Lastly, the choices of personalization strategy and setting are explored and selected according to research interest. Figure 3 shows how each domain of research contributed to this research.

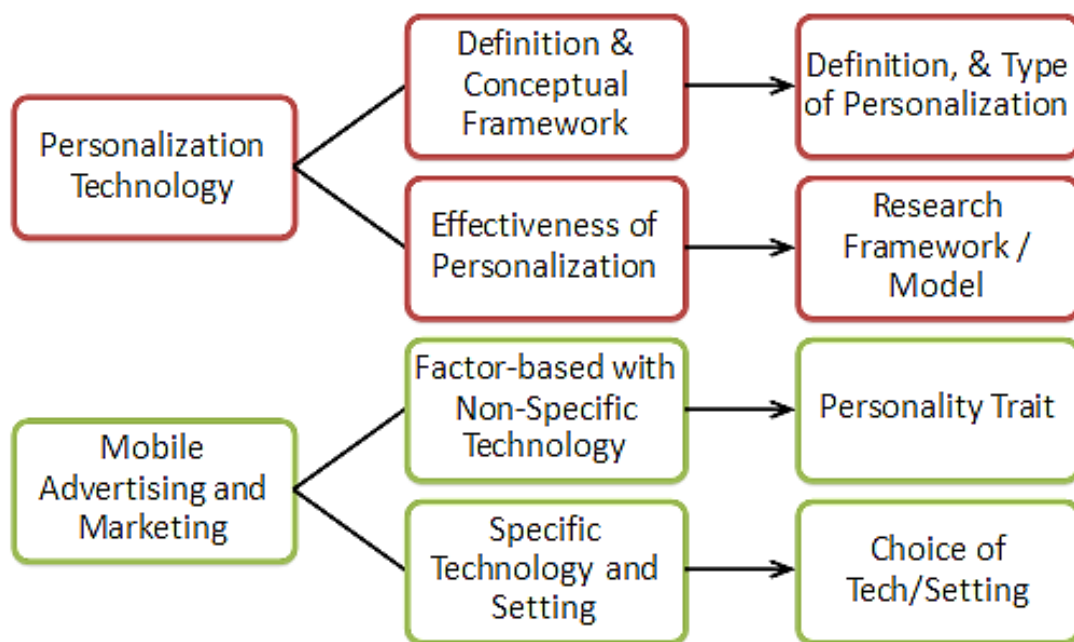


Figure 3 How each research domain contributed to the research

Before discussion of the research framework and model, the outline of the personalization technology will be depicted and explained. Especially, context-driven personalization, the chosen technology, will be discussed in further detail, however, for better clarification, traditional personalization technology or transaction-based personalization technology must be mentioned for comparison. Hence, it will be easier to

understand the differences and distinctive characteristics of each personalization technology.

2.4. Personalization Technology

Transaction-based personalization technology has been utilized by practitioners for years; widely adopted technologies include data warehouse and data mining (DW/DM). They are primary and essential database consolidation technologies which are deployed throughout the entire organization, such as in the areas of accounting/finance, manufacturing and marketing. DW/DM, particularly, help marketers to analyze customer based on historical data (such as customer profile, preference or transactions) contained either in the company's own database or a third-party database. Marketers use these technologies to analyze and segment the customer database for many purposes, such as launching a new marketing campaign and, improving customer services. For example, based on customers' spending history, firm might launch promotion for double bonus point if customers spend up to certain amount within a fix period on dining category. The key distinction is that the data to be analyzed are static, non-volatile, de-normalized and mostly stored in a dedicated server to avoid creating any performance impact on the real-time, on-line business transaction system. In general, for use in mobile marketing, the marketer must prepare the list of customers which are extracted, analyzed and prepared by DW/DM, then load them into the SMS gateway system or submit them to the SMS service provider.

In contrast, Context-driven personalization technology or Event-based marketing (EBM)—as generally referred by practitioners, a relatively new and advance technology, is being increasingly adopted worldwide, particularly in financial service. EBM is defined as a strategic process and technology designed to improve the communication between customer and firm by employing advanced technology to enable real-time and personalized communication to each customer (Twogood, 2003). If effectively implemented, EBM significantly outperforms traditional targeted communications because of the more dynamic, timely and relevant communication. The EBM system workflow is originated by marketers who design how to detect or capture the “event” or customer interaction that flows within the organization from various channels in real-time. These captured transactions then matched with the pre-defined rules of each marketing communication, and then SMS will be sent to those matched customers. Customer event or interaction and pre-defined rules varies across industries and businesses. The following is a standard workflow of EBM in general and its basic use;

1. Create marketing campaign(s) by *Marketer*
2. Design “event(s)” or customer activity to be captured or detected by *Marketer with IT advice.*
3. Design “rule(s) or criteria” of each campaign by *Marketer.*
4. Load campaign information to EBM system by *Marketer and IT.*

5. Once, an event occurs or triggers, EBM system will qualify whether any campaign offers matches by *EBM system*.
6. Matched offer feed to SMS transmit system for sending out the offer via SMS either immediately or with delay by *SMS transmit system*.

For example, in the case of a credit card company, the purchasing of a product or service using the credit card at a certain place (participating department store or retail shop), or promotional items may trigger complementary or cross-sell items, services, upgrades, or up-sell offers. For example, a real-life case would be a customer going shopping and using a credit card to buy a refrigerator in a shopping mall. The location of the customer and product purchased then captured by the system and matched with the pre-set offer. Within a few seconds, the customer might receive an SMS offering him or her additional items to buy in the same store for double the loyalty points or a special discount (see Figure 4).

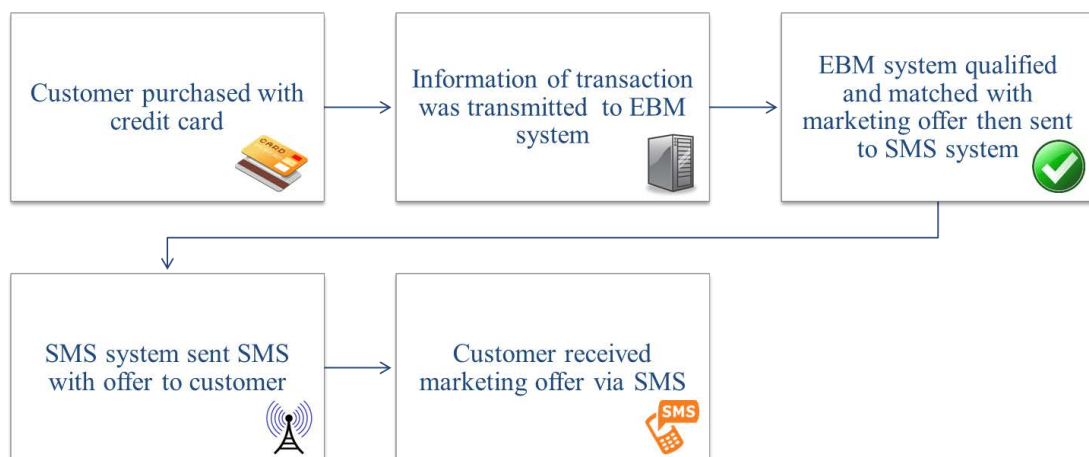


Figure 4 Illustration of how EMB works

Comparisons of these two technologies are given in the Table 2;

Table 2 Comparisons between DW/DM versus EBM

Characteristics	Data Warehouse /Data Mining	Event-based Marketing
Data source	Historical data	Real-time data
Data size for analysis	Typically large size	Typically small size
Data storage / system	Dedicated system	Dedicated system
Size of system & data	Typically large size	Wide range depending upon marketing strategies & plan, from small to large size.
Customer list for sending SMS	Static, pre-loaded. The customer list is prepared and loaded on to the system.	Pre-defined rules prepared by marketers and loaded on to EBM system. The actual customer list generated in real-time based on customer interaction matching with the rules.

As previously mentioned, not all of those personalization-enabling technologies are discussed here but rather a selective focus has been made on the most widely adopted and those that in practice deliver huge business impact. In fact, personalization can be carried out relatively easy with a basic database technology, for example, using a name-greeting on the message which can be achieved by mapping the

data field from the database into the SMS message. The choices of technology vary according to the level of complexity and investment. However, there is a lack of understanding concerning the effectiveness of these technologies on personalization and thus consumer acceptance of marketing communication. This current work attempts to develop such a conceptualization and to understand the effectiveness of each personalization technology.

2.5. Research Model and Hypotheses

Commercial advertisements are distributed via various forms and channels, nowadays; it has become clear that one will encounter more or less one of its form. Marketers have been using short message services (SMS) to communicate and persuade consumers through customer service information, advertisements, and sales promotions (Bamba & Barnes, 2007). The marketing and firm's objectives will determine the context & strategy of the personalization to be deployed; the objective can range from marketing promotion, cross or upselling¹, and customer services. The main purposes are either to increase customer spending or retain customer relationship, hence they can be considered persuasive messages. The numerous choices of personalization technologies available for the firm to deploy directly affect the message's persuasiveness. Especially if the personalized message has been targeted to the "right" consumer (match

¹ Cross or up-selling are the attempts of the firm to persuade existing customer to buy an additional product(s) related to the product from a previous purchase. Cross-selling product refers to a product in a different category while up-selling product refers to a higher price product within the same category.

interest), “right” place (match location) and “right” time (on-time or real-time need). This clearly increases acceptance of the marketing communication.

Thus the questions center around the persuasion of the message; how and what impact do the different personalization technologies or methods have in the message’s persuasion, especially in what stage of the persuasive message processing? Also what are the key drivers that enable the persuasion process and as well as the extent of their relative saliency in each stage of process. The research model was built based on the extant literature and one of the most influential social cognition models (Bargh, 2002) that of the Elaboration Likelihood Model (ELM) (Petty, Cacioppo, & Schumann, 1983). Its important contribution is that of an integrative framework to explain the relationship among the antecedents, processes and consequences of attitude change by which source, message, recipient, channel, and context variables. The ELM also holds that the more thoughtful (central route) the change, the more likely the new attitude is to persist, resist counter-persuasion, and influence behavior (Petty, Heesacker, & Hughes, 1997). In the following discussion, two bodies of theory—Information processing theory and ELM—are described to constructing the research model. In presenting this model, the discussion is organized as follows: First, the information processing theory will be discussed to understand how humans process the information received. Second, ELM, the persuasion theory will be discussed. Third, the integrated model is presented with discussion of the constructs chosen and omitted along with their relationships.

2.5.1. Information Processing Theory

To understand how personalized message will be processed by the customer, we turned to the information processing theory proposed by McGuire (1968). McGuire postulated six steps of information processing. The six-step process is illustrated as a Markov chain, whereby the next step depends on the current state as a necessary but not sufficient condition and not the sequence of events that preceded it. The first step is *communicated* where the persuasive message is actually communicated, followed by the message getting the *attention* of the subject. Step three is *comprehension*, where the subject begins to think about and elaborate upon the arguments and conclusion in the message. Next, step four, the person will be convinced enough to *change attitude*. In step five, the subject will *retain the changed attitude (retention)* and in the last step actually *involve some gross behavior (derivative overt behavior)* such as accepting the offer. Nonetheless, not every message will go through all six steps. Some messages may fail at any step, while some may not even get any attention at all; therefore, it is vital to examine how personalization technology affects each step of information processing. Figure 5 adapted from (McGuire, 1968), shows the six steps of information processing theory—those highlighted in gray are those steps included in this study.

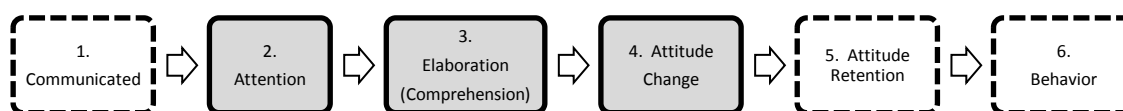


Figure 5 Six-Steps of Information Processing Theory

As the research objective is the study of the impact of personalization technology on accepting marketing offers, some simplifications and selective focus are adopted for the particular steps without intrinsically limiting the theory itself. First, the *communicated* step is not included in the research context (SMS) as one can assume that the SMS will be received by or communicated to the customer. Therefore this study will begin with step two *attention* followed closely by step three. In step three, the term *comprehension*, in order to be aligned with the terminology in ELM, is changed to *elaboration* which is included in the model. Step four *attitude change* is included as it is the interest of this research. Step five *attitude retention* is excluded due to it being irrelevant to the research objective. Lastly, step six *behavior* is also omitted, because the high sensitivity of the advertising message affects purchase-related variables or actual buying (Chattopadhyay & Nedungadi, 1992). Also according to the theory of planned behavior (Icek, 1991), the person's actual behavior depends upon many factors and conditions, such as individual dispositions and situational factors, like financial status, importance of purchase (different degrees of ego-involvement in commitment to different product classes) (Howard & Sheth, 1969).

2.5.2. Elaboration Likelihood Model (ELM)

Due to the main purposes of advertising in SMS being either to increase customer spending or retain customer relationship, they can be considered persuasive messages. People's perception and knowing of the persuasive message are complicated process, not simply given by stimuli, but rather by the perceiver. The role and impact of

the stimuli or persuasive message on the processes in forming human perceptions and behavior have been examined by dual-process theories. Dual-process models of social information processing, which have been developed in various domains of social and cognitive psychology theories for decades (Chaiken & Trope, 1999), their applications in persuasion and attitude change have been conducted extensively in advertising and psychology domains. The dual-process models suggest that social judgments or attitude changes are not necessarily formed based on the relatively effortful processing of the content of the message per se; rather, they may also be based on the relatively low effort processing of other peripheral forms of information. Any dual-process approach tries to identify the cognitive and motivational factors that determine when judgments are likely to be mediated by each of these processing modes. Thus, the two alternative processes of attitude formation (high or more effortful versus less effortful processing of information) form the core of all dual-process theories (Bhattacharjee & Sanford, 2006). Perhaps, among these approaches, the two most similar models are ELM and the heuristic systematic model (HSM) (Chaiken, 1980). Both employ similar concepts and terms, like “central” or “systematic” processing as a process require more effortful while “peripheral” or “heuristic” processing may require less effort. The differences are how those two processing modes interact and the final process output would be. Although these two dual-process theories are recognized as the most influential social cognition models and the predominant paradigm of decision research in an information-processing model (Bargh, 2002). ELM has been selected as the base theory due to its simplicity and

it being parsimonious. More importantly, it has been widely applied and studied in the domain of persuasion, particularly in the advertising field.

The original ELM (Petty & Cacioppo, 1986) zoomed into the third step of information processing theory, with what factors institute person elaboration and in what way. Then ELM explains how these affect changes in attitude and retention. ELM suggests two routes of persuasive influence: the central route and the peripheral route. The central route is the rational procedure of thinking about the persuasive message received; it requires high elaboration and careful analysis of the message as to the true merits of the arguments. Through this route, a person's cognitive responses to the message determine the persuasive outcome (i.e., the direction and magnitude of attitude change). During the peripheral route, a sort of shortcut to making a decision is deployed without considering the argument in the message itself or engaging in extensive thought. The individual may simply make a reference based on simple cues in the message or rely on the secondary characteristics of the message, like the credibility of the source of the message, the quality and attractiveness of presentation or just the catchy slogan containing the message. Attitude changes induced within this route are thus relatively lower, short-term and non-predictive in terms of behavior.

Two key factors that decide whether the message will be processed by the central or peripheral routes are the motivation and ability to process. The motivation factors comprise the relevance of the message to the person, need for cognition (a personality trait showing enjoyment of thinking) and accountability. While ability factors comprise whether the person is in a situation in which they can process information

without distraction, time pressures and whether they possess the relevant knowledge needed to evaluate the message. If the condition meets both factors, message evaluation will take place via the central route. If any one of the factors is missing, it will go along the peripheral route instead. Therefore, the elaboration likelihood construct comprises motivation, ability and personality trait as shown in Figure 6, adapted from Bhattacharjee and Sanford (2006). A person who has high elaboration likelihood will engage in a careful examination and the thoughtful processing of the message and thus more likely to be persuaded by the argument's quality rather than by peripheral cues. While the opposite is true for low elaboration likelihood with the person spending less effort in processing the information of the message and being more likely to be influenced by peripheral cues.

The two different processes do not automatically mean that the people who go through different processes will arrive at different outcomes. Two persons may reach the same result (accept the marketing offer) from different processes or sometimes, even process the same route but reach different ends. In short, the elaboration likelihood construct moderates the effects of argument quality and peripheral cues on perception change.

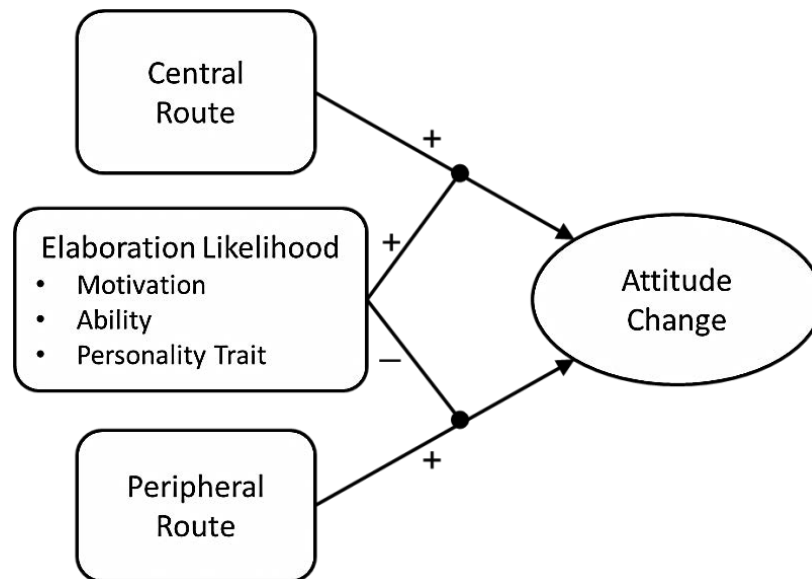


Figure 6 Elaboration Likelihood Model

Petty and Cacioppo, in addition to other ELM researchers, have operationalized motivation as the recipients' personal relevance, and ability as prior knowledge or experience. If the recipients perceive a SMS as being relevant to them, they are more likely to put more effort into examining the content of the message. Adversely, if the recipients view the same SMS but perceive it as being of low relevance or importance, then they will rely more on peripheral cues.

2.6. Conceptual Framework and Research Model

To develop the conceptual framework, this study makes reference to both the information processing theory, as previously discussed, is combined and incorporated with ELM. As early discussed, the ELM process-oriented approach is revised, the process starts with the attention stage (or step two in the six-step information processing theory)

where one's attention is gained from the message, then one will consider and think through the information received as in the elaboration stage. Then in the last stage, change in attitude, within this study context, the attitude toward advertising is represented. This study has adopted and adapted the Tam and Ho (2005) model as a base model because it is more complete and contains all key aspects which make it possible to explain the phenomenon in this study. First, personalization technology is posited that the higher personalized message should induce more elaboration as well as more positive or favorable attitude toward advertising. While the personality trait (Need for Cognition) is repositioned as a moderator between context-driven personalization and elaboration, plus the attitude toward advertising (attitude change). Thus the conceptual framework is shown as below in Figure 7:

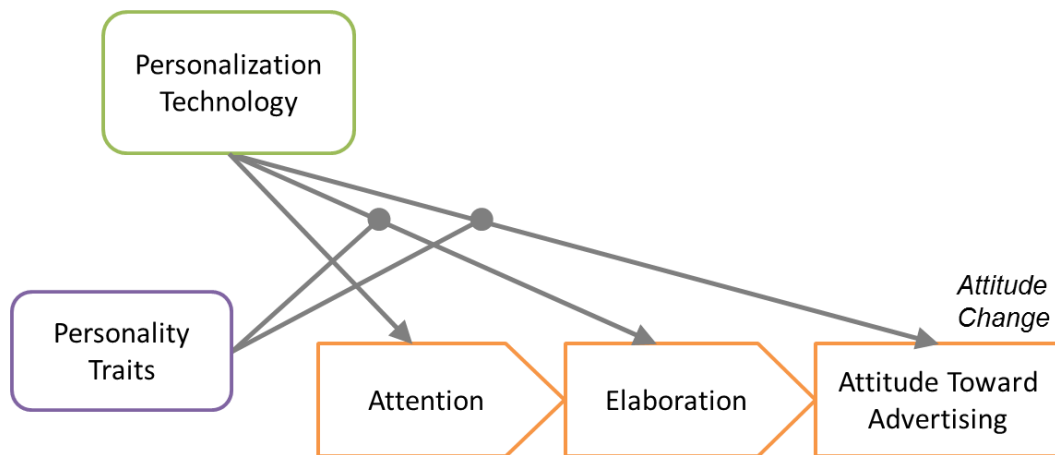


Figure 7 Conceptual Framework

2.6.1. Research Model

There are different methods and technologies on personalization as previously mentioned. Tam and Ho (2006), suggest three types of personalization strategies: 1) user-driven personalization (user specifies in advance what kind of information and presentation is preferred), 2) transaction-driven personalization and 3) context-driven personalization. The pertinent personalization technology in this study is context-driven personalization. The other, self-reference, involves basic and relatively simple personalization technology. Need for cognition, a key personality trait, is chosen, as it is an original trait discussed in ELM. Hence, with all of these, the research model is shown below in Figure 8.

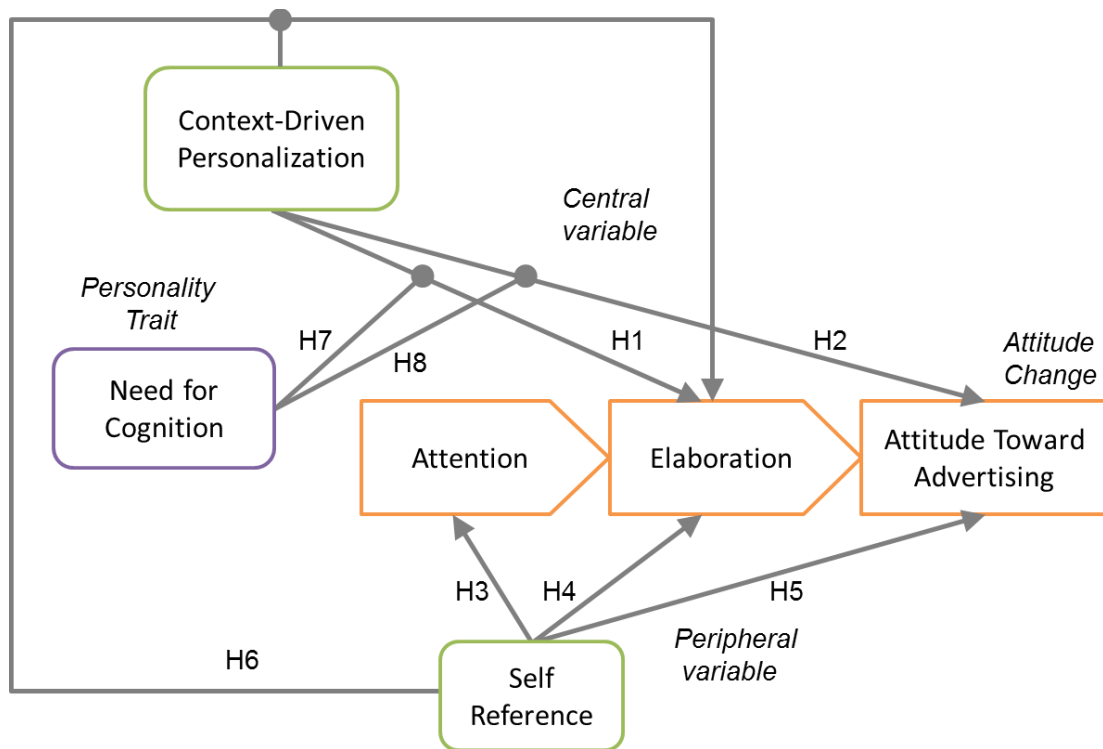


Figure 8 Research Model

Each construct as well as the related research hypotheses are discussed as follows.

2.6.2. Context-driven personalization technology

“Context” in this study is closely related to the definition proposed by Dey (2001, p. 2), that is, for context-aware “a system is context-aware if it uses context to provide relevant information and/or services to the user, where relevancy depends on the user’s task.”. However, the term most widely known and applied interchangeably by technology vendors and the marketing community is Event-Based Marketing (EBM). The term ‘event’ is defined similarly to ‘task’ with a ‘real-time’ aspect concerning the data itself. An example of an event could be a customer’s transaction or interaction, such as credit card spending at particular place, or making the purchase of certain products. An event must be detected or captured in a real-time manner, then the system tries matching those events with pre-defined rules usually determined by the marketer. Next, the system triggers the preset action either instantly or with delay for the appropriate timing. The action can be anything depending upon the requirement, for example, contacting the customer by sending an SMS or email, or passing the action to the call center system or customer service representative.

The goal of context-driven personalization is to maximize “preference matching” by personalizing the marketing offer based on customer data (either existing database or dynamic customer event). The higher the personalized message, the greater the relevance to the customer because the content of the message matches customer preference. According to ELM, if the content of the message is more relevant, it will

increase the motivation to process the message, and thus the elaboration likelihood increases (Petty & Cacioppo, 1986). Therefore, this personalized message is channeled to the *central route* of persuasion.

In addition, the personalized message will require a higher degree of elaboration as the person will think or give greater consideration to the true merit of the content of the message. However, the content of the messages itself must be read first, so that customers will be able to think and perceive that the messages are personalized and relevant to them. Hence the context-driven personalization technology is not relevant to the attention stage, due to the fact that the messages must be read first as prior discussion. Hence, it is hypothesized that a context-driven personalization message which contains a more relevant message will be processed via the central route and this will increase the elaboration level.

Hypothesis 1. *A message generated by context-driven personalization will lead to higher elaboration than a message without context-driven personalization.*

ELM does not specify whether an adequately or highly elaborated message which increases the elaboration likelihood will definitely result in a favorable outcome in attitude change. In other words, ELM acknowledges that high and low elaboration processes can lead to the same attitude change and consequence behavior intention (Bhattacharjee & Sanford, 2006). Still, ELM theorizes that the quality of the argument or the content in the persuasive message will be comprehended through the central route, and the result of any attitude change will be more accessible, resistant,

persistent and less susceptible to a counter persuasive message. More importantly, it is more predictable in leading to behavior change (Petty & Cacioppo, 1986). In Bhattacharjee and Sanford (2006) studied about user acceptance to the newly document management system by administrators and staff personnel at City Hall in Ukraine, the result showed that users with higher elaboration tend to be more influenced by the central route which led to more stable and positive attitude as higher usefulness perceptions of the system.

Similarly, Don (1974) evaluated the attitudes of junior and senior high school students toward non-compliance with various laws, ranged from narcotics to traffic, the study found that there were higher positive attitude as well as attitude-behavior consistency for students who highly expressed their thought than those who little stated.

Thus, the hypothesis is that a higher level of elaboration does have a positive impact on persuasion, as the individual is more likely to be elaborated and persuaded by the message to increase their favorable attitude toward advertising.

Hypothesis 2. The attitude toward advertising via personalized offer is more favorable with a context-driven personalized message than a message without personalization.

2.6.3. Self-reference

Tam and Ho (2006) suggested that self-reference in personalization refers to the created content associated with the customer based on the self or past experience of

the user. For example, by simply including cues (e.g. customer's name in a greeting message or add "personalized offer" or "just for you"), this will make the customer connect to the personally relevant concept. It is quite common to see the marketer in advertising address the audience directly and introduces experiences to which it can relate (Burnkrant & Unnava, 1995).

Self-reference is a highly organized, complex memory structure (Greenwald & Banaji, 1989; Kihlstrom et al., 1988) that contains both semantic and episodic knowledge gained over a lifetime (Burnkrant & Unnava, 1995). Tam & Ho (2006) explained that there is a separate part of our brain processing the self which is different from the other semantic processing part. Hence, the sensory mechanism processing the messages received would be different between the self-reference versus non-self-reference message. One vivid example would be the "cocktail party effect" describing the ability to focus one's listening attention on detecting one's name being mentioned among a mixture of conversations and background noises. In their work, the subjects were tested in lab experiment with instruction to buy products on e-commerce website, the subjects were asked to put their name and later, used in various message during the experiments, such as in greeting message, suggestion and closing statement. The number of clicks on stimulus with self-referent information was measured, and the results showed the users clicked on the self-referent offers more often than they clicked on the non-self-referent offers.

Another study by John (1982) about attention and automaticity in the processing of self-relevant information, subjects (undergraduates students at the

University of Michigan) were tested with dichotic listening task. Subjects were exposed to simultaneously presented word pairs of a noun in one channel and an adjective in the other. Subjects then repeated the word they heard out loud but only a specific channel (noun or adjective) then later must perform the secondary task (pressing a button to stop a timer). The attention was measured by the time elapsed between the primary and secondary tasks. The authors offered another explanation that people developing automatic attention responses to self-reference information, such as one's own name, is one of the rare stimuli able to divert one's attention from ongoing conscious activity. Therefore, the hypothesis is as follows:

Hypothesis 3. *Customers who receive self-reference messages will give the greater attention than those who receive non-self-reference message.*

Evidence supporting the greater elaboration of information under self-referencing has been obtained through the examining recall data as proposed by Burnkrant and Unnava (1995). In their work, the subjects were given a set of printed advertising with description of self-referent information. After that subjects were asked to write down their thoughts during reading the ads. The total number of thoughts was used as measurement of elaboration. The result from the experiment showed that subjects exposed to the self-referent message in ads expressed more thoughts than those in control group.

Other researchers have found similar results that the self-referent message was positively correlated with the higher elaboration of the message. For

example, Klein and Kihlstrom (1986) investigated self-reference in memory recall by conducting lab experiment with undergraduates from Harvard University. Subjects were shown lists of word which were about personality characteristics. Subjects then judged whether words matched their own personal descriptiveness. Later on, a surprise memory recall test was conducted, the results were consistent with others showing that the pattern of recall obtained in self-reference led to significantly better recall than non-self-reference. In addition, the results from this research confirmed the study by Rogers, Kuiper, and Kirker (1977) that self-reference is a rich and powerful encoding process and demonstrate a deep involved in the processing and memory of personal information. Thus, the following hypothesis is proposed;

Hypothesis 4. Customers who receive self-reference messages will have higher elaboration than those who receive non-self-reference messages.

Self-reference is positively associated with the brand preference and purchase intention (Hong & Zinkhan, 1995) and enhance product (in this case, the message) evaluations. Increasing self-referencing when processing an arguments message leads to an increase in favorable cognitive responses and attitude is also consistent with the position that increasing self-referencing increases elaboration which leads to more persuasion when the message's arguments are strong (Burnkrant & Unnava, 1995).

Hong and Zinkhan (1995) posited that the advertising appeals more congruent with viewers' self-concept would be superior to incongruent appeals in increasing advertising effectiveness. The study conducted with college students by first

self-evaluation on introvert/extrovert personality then the set of ads were shown. The preference and buying intentions were measured; the results confirmed that the more congruent ads to the self-concept are the higher positive attitude toward ads and brand as well as purchase intention. The result was also consistent with Burnkrant and Unnava (1995) with testing on different ads pictures with different copy writing, in this test, subjects expressed more positive attitudes toward ads that contained the self-referent message in ads picture than toward the ad that contained the non-self-referent ads picture. Therefore, the hypothesis is as follows:

Hypothesis 5. Customers will have more favorable attitude toward advertising if the message is related with self-reference than those of non-self-reference.

According to ELM (Petty & Cacioppo, 1986), the persuasion from peripheral route may affect the magnitude or direction of the persuasion from central route or message processing. State differently, there is a possibility in which a peripheral variable will interact with the central variable on the processing of the content in the message.

Tam and Ho (2005) investigated this interaction in their research of mobile ring-tone download service, the personalized recommended song (central route) with large recommended set (peripheral route) are studied. Elaboration was operationalized by average number of trial listening, the result confirmed the interaction effects between central and peripheral routes. Likewise, the original study of ELM by Petty and Cacioppo (1984) also explored the effect of both product involvement (central

route) and the quantity of argument in ads (peripheral route). The study was administered with undergraduates from different universities by showing them the faculty proposal in changing tuition fee (either their own university or the distant but comparable university) with supporting arguments (different quantity). The results supported that the manipulation of argument quantity or peripheral route had significant impact under high than low involvement (central route).

Therefore, the higher attention due to the self-reference message allows the person to be more interested in processing the content in the message and, hence, inducing the higher elaboration for the personalized message (Burnkrant & Unnava, 1995). Thus the following hypothesis is proposed:

Hypothesis 6. The difference in the extent of elaboration between personalized and non-personalized message will be larger for messages with a self-reference greeting.

2.6.4. Need for Cognition (NFC)

Mobile marketing research focuses very much on the personality traits which affect the acceptance of the mobile marketing message. Many traits have been proposed and tested with mixed results as to their impact on the attitude and acceptance of the mobile marketing communication. For example, Beneke et al. (2010), in their study on the attitude toward mobile text message advertisement, selected attitude toward advertising in general, innovativeness and knowledge, or (Bauer et al., 2005) which consumer-based and innovation-based acceptance were key drivers included in their

study, and Merisavo et al. (2007) research selected perceived utility of advertising and privacy concern.

Personality trait or individual difference construct is valuable for the research in order to understand how consumers derive their choice of preferences. However, discovering these dispositional factors alone would not help us really gain insight of their developments and more importantly, their impacts on consumer acceptance or preference formation. Additionally, outcome-focused research is theoretically challenge (Haugtvedt et al., 1992) because though individuals might differ in some level of personality traits, they may exhibit similar or identical preferences or behaviors on the basis of different and concealed mediating processes. Therefore, only if those factors are supported by known underlying processes and guided by theoretical explanations, would enrich us to methodically and thoroughly comprehend their impact or influence on consumer preferences.

Taking a pragmatic as well as academic approach and consideration of both the literature from IS and marketing in choosing the personality traits, Need for Cognition (NFC) is selected as a prime personality trait in this study. Individual differences in need for cognition were linked to a theory of persuasion, as in ELM and shown to influence to the individual preference and attitude change processes. NFC has been developed over the past 12 years with sizable (over 100) empirical literatures either as a primary dispositional factors or part of personality traits.

The study of the individual differences among people in their desire to engage in thinking when dealing with their social environment generally and when

formulating their attitudes specifically (Petty & Cacioppo, 1986) has been studied by many researchers with different terms being proposed (Katz, 1960; Murphy, 1947). Of these studies, NFC (Cohen, Stotland, & Wolfe, 1955) was originally conceptualized as “a need to structure relevant situations in meaningful, integrated ways. It is a need to understand and make reasonable the experiential world” (p. 291). Later, Cacioppo and Petty (1982) modified the definition to reflect a more general meaning as the “tendency of people to engage in and enjoy thinking” (p. 119). NFC has been one salient trait studied and suggested by various research domains, particularly in advertising (Sicilia et al., 2005), marketing (Inman, McAlister, & Hoyer, 1990; Mela, Gupta, & Lehmann, 1997) and psychology (Muller, Judd, & Yzerbyt, 2005).

In Cacioppo and Petty (1982) study 4, the authors conducted a laboratory experiment with students of the University of Iowa, subjects were randomly given tasks either simple or complex task followed by self-assessment of task discomfort and frustration along with NFC scales. The authors found that a high-NFC person would tend to search for more information when making decisions, engaged in more effortful processing of the message, more open-minded and enjoyed more effortful cognitive tasks than a low-NFC person. Consistent with previous research based on ELM, NFC shows the moderating effect of elaboration via the central route (Haugtvedt et al., 1992). Through the central route, the person will accept the message based on the true merit of the message. Areni, Ferrell, and Wilcox (2000) suggest that the effect of the quality of the acceptance of a message is moderated by NFC. Because the attention stage does not require much information processing and generally basic categorization judgment is

deployed (MacInnis & Jaworski, 1989), only the latter two stages—elaboration and attitude change—are considered.

According to Haugtvedt et al. (1992), the authors studied need for cognition and advertising in order to understand the role of personality trait in consumer behavior, the subjects—students in an introductory marketing course—were instructed to respond to the NFC scales. Next, the packet of consumer research with calculator advertisement was presented, afterwards, the attitude toward advertising scales were assessed following by thought-listing cognitive assessment. The result suggested that customer with a high need for cognition tends to process the content in the message more extensively than a customer with a low need for cognition. In other words, NFC will enhance the processing of personalized content; thus the hypothesis is as follows:

Hypothesis 7. There is an interaction effect between NFC and the context-driven personalization technology deployed in the elaboration stage, as a high-NFC person will be more affected by context-driven personalization technology than a low-NFC person.

As suggested by ELM, the high NFC persons will rely on attributes or the quality of the message argument; they tend to be influenced by the merit of message and exert greater cognitive effort to comprehend the message. As Petty et al. (1983) suggested that the use of high quality of message led to greater persuasion among subjects high (versus low) in NFC.

As prior mentioned, Haugtvedt et al. (1992) work on NFC and advertising, the attitude toward advertising was also measured along with NFC manipulation. The

authors found that the high NFC person would demonstrate more favorable attitude toward ads of strong argument or message in advertisement, because of the central route of information processing. Consistently with Areni et al. (2000) study on the persuasive impact of NFC, their work was conducted in lab experiment with undergraduates in a study regarding various public-policy issues. The public-policy issue were selected from various social issues (e.g. gun control, recycling) then were presented along with supporting arguments. The NFC along with attitude toward the proposal were measured by subjects. The result was coherent with others that the subject with high NFC were heavily influenced and persuaded for more positive attitude toward advertising based on the quality of the arguments or messages in advertisement.

Thus, this will have a higher probability of changing their attitude and the acceptance of a persuasive message contained in the marketing offer. Thus, the hypothesis is as follows:

Hypothesis 8. There is an interaction effect between NFC and context-driven personalization technology deployed in the attitude changing stage. As a high-NFC person will be more favorably affected by context-driven personalization technology in having a positive attitude toward advertising than a low-NFC person.

Chapter III Research Methods

Regarding to the research model and hypotheses, our research approach is focus on hypothesis testing. An experiment is chosen, as research method for data collection, specifically, in field experiment. Through field experiment, it will allow the researcher to manipulate the independent variables for measuring their effects on the dependent variables. The main advantage of field experiment is mundane realism where the experiment conducted in a real world surrounding and natural setting. Participants won't be contaminated as they will go as normal behavior. Though the disadvantage is there are prone to more confounding variables and less control of the situation as discussed in limitation section. This field experiment is in cooperation with a credit card service firm. The data was collected both through phone interviews by professionally trained staff and actual business transactions undertaken by customers during the experiment. The further details are discussed as follows.

3.1. List of Variables

The following will show the list of variables, scale type and expected values as shown in Table 3.

Table 3 List of Variables and Scale Types

Variable	Scale type	Expected Value	Note
Independent Variables			
Context-Driven Personalization (Tam & Ho, 2006)	Nominal or Categorical	Personalized or Randomized Marketing Offer <i>(Dichotomous Variable)</i>	
Self-reference (Hong & Zinkhan, 1995; Tam & Ho, 2006)	Nominal or Categorical	Self-Reference or Non-Self-Reference Message <i>(Dichotomous Variable)</i>	
Need for Cognition (Cacioppo & Petty, 1982)	Ordinal	High or Low Need for Cognition	Use median split to classify the subjects into a high or low Need for Cognition group
Dependent Variables			
Attention (Kahneman, 1973)	Interval	Summated Likert Scale	2 Items
Elaboration (Petty & Cacioppo, 1986)	Ratio	Can range from zero to any, measured by total number of thoughts.	

Attitude toward Advertising (Briñol, Petty, & Tormala, 2004)	Ratio	Can range from -1 to +1, calculated as an index of favorability of related thoughts.	
Attitude toward Advertising (Mitchell & Olson, 1981)	Interval	Summated Likert Scale	4 Items

3.2. Research Design

For the study of personalization technology, the two-by-two between-subject factorial design was employed. The between-subject factors were self-reference (presence versus absence of self-reference greeting) and personalization technology (personalized offer versus randomized offer). The current system and working procedure of SMS marketing communication by the firm are as follows: the SMS gateway system, which is used to disseminate SMSs to the customer, operated by the SMS gateway provider outside the company. The SMS transmit application, which is managed and maintained by the firm, is used as a data conduit and will be sent to the SMS gateway system either immediately or at a scheduled time. The data preparation is done by a marketer according to predefined format and structure. The recipients' mobile phone numbers are extracted from customer information system while the contents in the SMS

are prepared by the marketer. The senders' names are preset according to each credit card brand name (see Figure 9).

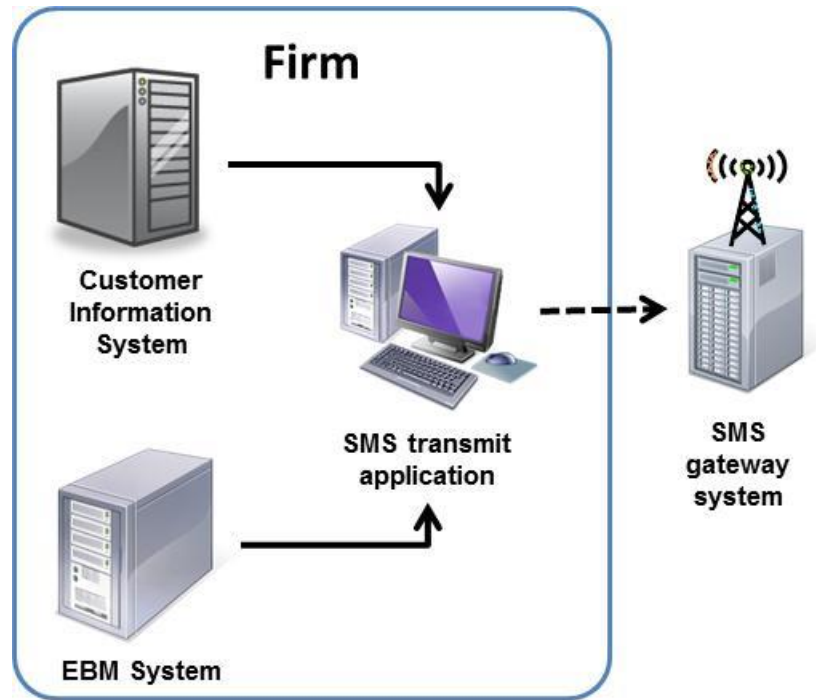


Figure 9 SMS Transmission System

The two factorial design table (see Table 4) shows the details of each group, where group #1 (non-personalized and non-self-reference) acts as a control group.

Table 4 Two Factorial Design

Personalization Self-reference	Non-personalization (Randomized)	Context-driven Personalization
Non-self-reference	Group #1	Group #2
Self-reference	Group #3	Group #4

To show how each hypothesis will be tested and measured, Table 5 shows the details of each group comparison and analysis in answering the corresponding hypothesis.

Table 5 Test Comparison for Hypothesis #1-6

Hypothesis	Group Comparison	Notes
H1: Context-driven personalization will lead to higher elaboration	Group #1 vs. #2	
H2: Attitude toward advertising on personalized offer is more favorable	Group #1 vs. #2	
H3: Higher attention from customer to self-reference message	Group #1 vs. #3	
H4: Higher elaboration from customer to self-reference message	Group #1 vs. #3	
H5: More favorable attitude toward advertising on self-reference message	Group #1 vs. #3	
H6: The difference in the elaboration	All Groups	Interaction effect

between personalized & non-personalized message will be larger with a self-reference greeting.		measurement with Two-way ANOVA analysis
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For the personality trait hypotheses, the separate factorial design table described below is used (see Table 6).

Table 6 Need for Cognition - Two Factorial Design

Personalization Need for Cognition	Non-Personalization (Randomized)	Context-Driven Personalization
Low	1	2
High	3	4

Since hypotheses H7 and H8 are based on the interaction effect or moderating effect of the need for cognition concerning personalization technology. The interest of this research is on NFC affecting the strength of the relationship between personalization technology and the two dependent variables—Elaboration and Attitude toward advertising. Similarly, H6 is based on the interaction effect or moderating effect of self-reference concerning personalization technology. Therefore, H6 to H8 are analyzed using analysis of variance (ANOVA), based on Baron and Kenny (1986) these cases are classified as “Case 1” where both moderator and independent variables are

categorical variables. Thus, the analysis proposed is a 2 x 2 ANOVA and moderation is indicated by an interaction.

Two assumptions of ANOVA—the populations' normality and homogeneity—will be tested before applying ANOVA (Kolmogorov-Smirnov or Shapiro-Wilk test for normality, Normal Q-Q Plot for graphical normality test and Levene's Test for homogeneity of variance). However, ANOVA is robust enough even in heterogeneity of variances (Glass, Peckham, & Sanders, 1972) or deviations from normality assumption (Box & Andersen, 1955; Srivastava, 1959; Tiku, 1971), given an equal number of samples for each group and large number of total sample size.

3.3. Field Experiment Setup

Initially, the researcher contacted and presented the research proposal to one of the business leader who is responsible to one credit card brand within a credit card service company in April 2012. The discussion with business leader and marketing team continued for clarification and expectation. Because of the huge amount of time and effort in data collection (phone interview and transcription), the firm decided to outsource this process to a marketing research firm. The business proposal was prepared by both researcher and marketing team for obtaining an internal budget approval for conducting this study. In addition, the researcher explore, work and present several choices of research firm for company to choose from.

In addition, there were a numerous works which needed to be sought out for setting up the field experiment study. For example, previously, the SMS system did

not support in adding customer name in SMS as required for testing the self-reference personalization technology or another obstacle caused by the current system incapability of exporting the customer names—who received SMS—and transmitting to research firm for data collection. Researcher worked closely with internal marketing and IT teams to overcome these complications and ensure that the system must support these requirements before the field experiment can be conducted. Finally, in November 2012, all relevant parties—IT system team, internal marketing team and outsourced research firm for data collection—were completely arranged and ready.

3.4. Marketing Campaign

In discussion with the credit card leader and marketing team regarding to the campaign selected for this study, the cash-back promotion was chosen. Because this campaign was a nation-wide, it would provide this study with a large amount of eligible customers and various profiles of customers. In addition, this campaign has been previously run before and generated a moderate customers' acceptance (based on total campaign in 2012).

This marketing campaign was a nation-wide, cash-rebate promotion where the amount of rebate progressively varied by credit card spending in a particular month. In other words, rebate was classified as a multi-step based, where the first step received a 1% rebate for an amount spent between 167-500 US dollars, the second step received 3% for an amount spent between 501-1,667 US dollars and the last step received 5% of an amount spent over 1,667 US dollars with maximum total cash rebate of 67 US dollars.

The rebate was credited back to the customer's account within the next two weeks of the following month.

3.5. Subjects

In discussion with the credit card service firm in Thailand, one credit card brand was selected which has the largest customer base, wide range of customer usages both in term of purchasing items and using location. The total population of the credit card holder is over 1 million cards. The eligible criteria for applying credit card are governed by Bank of Thailand, which all card issuers must comply, for example, minimum age or salary. To calculate the total sample size, Cohen (1988)² suggested the concept of statistical power analysis which advises on the sample size determination as the function of effect size (ES), significance criterion (α), and then specifies the amount of power desired (Cohen, 1988, p. 14, 1.5.2).

Effect size is determined based on theoretical considerations and/or based on convention suggestions as small, medium and large. In this research, although theoretically, the effect of an independent variable on a dependent variable is relatively medium to large, conservatively, the medium effect size is selected, as suggested by (Cohen, 1988, p. 284), the effect size conventions for ANOVA test are as follows:

Small $f = 0.10$

Medium $f = 0.25$

² For further information about power analysis, see Jacob Cohen, *Statistical Power Analysis for the Behavioral Sciences*, second edition 1988.

Large $f = 0.40$

Both significance criterion (α) and power of test ($1-\beta$) are based on convention suggestion, generally, $\alpha = 0.05$ and power of test ($1-\beta$) = 0.80 are recommended. The degree of freedom (u) is $k - 1$, where k is the total group, thus $u = 2 - 1 = 1$. The calculation table and formula are described in Cohen (1988, p. 284), however, GPower3, the statistical power analysis program developed by Franz Faul is selected for calculation based on his guideline (Faul, Erdfelder, Lang, & Buchner, 2007). A graph output shown by total sample size versus power of test with effect size = 0.25, $\alpha = 0.05$, power of test = 0.80, degree of freedom = 1, number of groups = 2 as shown in Figure 10.

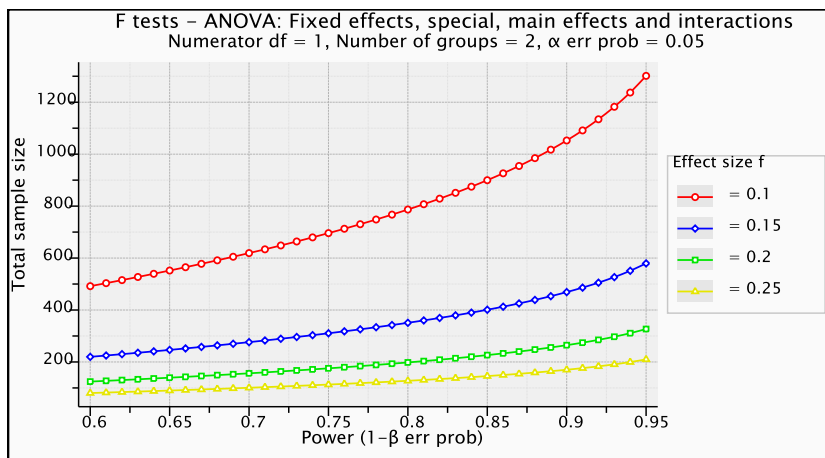


Figure 10 Graph of Total Sample Size varied by Power of Test

The result from the calculation suggested that the sample size for each group is 64, the same result as on Cohen (1988, p. 284). In summary, the minimum

suggested sample size for each group is 64 subjects, based on the research design of two-by-two factorial experiment, four groups require at least total of 256 subjects.

The total sample comprising 422 was collected; one incomplete and one invalid response were removed, resulting in a study sample of 420 participants for analysis. 105 participants for the control group (group #1), 105 participants for context-driven group (group #2), 105 participants for self-reference group (group #3) and 105 participants for both context-driven and self-reference group (group #4). The sample consisted of 170 males (40.5%) and 250 females (59.5%) with an average monthly income of 1,352 US dollars. The field experiment lasted for three weeks from mid-November to early December 2012.

3.6. Manipulation of Independent Variables

There are two manipulations of independent variable in this experiment, one is self-reference, and the other is context-driven personalization technology. As mentioned before, these two independent variables are studied in two factorial design. The details of manipulation of each variable are as follows:

3.6.1. Context-driven Personalization Technology

This experiment is relied on the company's existing system—Event Trigger Marketing (ETM) system—which is the term used by the firm. ETM is introduced to the company in 2009 and fully deployed in 2010, the core feature and function are in fact similar to EBM which is a common term used by both technology

vendors and the marketing community. The marketing offers will be loaded into the ETM server along with customer profiles (only related to the marketing offers) for matching purpose. Once the customer activities are matched, EBM will match customer with marketing offer and send the SMS directly to the SMS gateway provider.

3.6.2. Self-reference

Subjects were shown two kinds of greeting in SMS: self-referent greeting to group #3 and non-self-reference or no greeting for the control group, group #1. For the self-reference message, in the first message the SMS will show the greeting message, Hello! <First Name>, follow by the rest of the marketing offer message. For non-self-reference or no greeting message, there will be no greeting message; the SMS will show only the marketing offer message.

The greeting name is the customer's first name, as residing in the existing customer database in the company. "First name" is contained in the "customer name" field which is the required field for applying for the firm's credit card service. Therefore, it is a straight-forward process in which this field will map with the customer's first name corresponding to the mobile phone number in a self-reference personalized SMS.

3.6.3. Need for Cognition

The short-form 18-item of the NFC scale (see Appendix C)—proposed by Cacioppo, Petty, and Kao (1984) which was adapted from the original 34-item NFC scale in Cacioppo and Petty (1982)—were selected items in this study. As Ho et al. (2008),

Tam and Ho (2005, 2006) have shortened the scale even further to only 5 items, the selection criteria was based on its face validity relevant to their research interest. In this research, item reduction was needed since the primary data collection was phone interview, time and complexity had restraints on the research team as concern the total number of questions asked and the duration.

A separate survey was conducted with a full 18-item NFC scale questionnaire, with a total of 192 subjects being collected. The profiles of subjects are shown as Table 7.

Table 7 Subject Profiles

192 subjects: 108 Female (56.25%), 84 Male (43.75%)

Education Level	No. of Subject	% of Subjects
Undergraduate	84	44
Graduate	99	52
Doctoral	9	4

The top five factor loading items from Cacioppo et al. (1984) study were selected as shown below:

- (1) I prefer complex to simple problems.
- (2) I like to have the responsibility of handling a situation that requires a lot of thinking.
- (3) Thinking is not my idea of fun.**

- (4) I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.**
- (5) I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.**

** Reversed score

Canonical correlation analysis has been an exploratory tool, using primarily for dimension reduction (Avron, Boutsidis, Toledo, & Zouzias, 2013; Wendt, 1979). In this study, canonical correction analysis was similarly conducted to reduce the item or dimension. Canonical correlation analyzes the relationship between the selected five items and the full 18-item NFC scale. Because of the sole objective of the analysis was to lower the number of items, a first pair of canonical variates was considered. The result confirmed that these selected five items could be used to represent a full 18-item NFC scale with canonical correlations = .83.

Thus, these five NFC items were included and collected from the field study. The actual NFC score's median split (median = 2.8) was used to categorize the subjects into a high-NFC group and a low-NFC group. The reliability (Cronbach's alpha) was 0.76 which was over .70 as considered reliable (Cortina, 1993).

3.7. Measurement of Dependent Variables

There are three dependent variables, which are attention, elaboration and attitude toward advertising. These variables, as explained in research model formulation, are adapted from information processing theory (McGuire, 1968), the measurement for

these variables are discussed. In addition, the measurement of a personality trait, as discussed in this study is need for cognition, is also included in this section as follows.

3.7.1. Attention

According to Kahneman (1973), the term "attention" refers to the amount of mental effort or cognitive capacity allocated to a task. Attention, like thought, is conceived as having both directional or selective and intensive aspects. The direction of attention refers to the focus of the mental effort, and the intensity refers to the amount of mental effort focused in a particular direction.

To measure the intensity or amount of attention, many researchers (Celsi & Olson, 1988; Pechmann & Stewart, 1990) suggest considering the time subjects spent on the message. For the directional or selective aspects of attention, we would like to investigate whether the subject has been attracted by the manipulated message or not. Therefore, for this study context, we have adapted the attention measurement suggested by Chattopadhyay and Nedungadi (1992) to align with other variables. A 5-point Likert scale is used for two questions as follows:

- (1) At first glance, when you received the SMS, how much did you rate the attractiveness of it?
- (2) How much attention did you pay to the SMS?"

Subjects were contacted by the research team and will listen to the questions then answer in a 5-point Likert scale anchored by “not attractive/no attention”

and “very attractive/lot of attention”. The results were recorded by the research team. The reliability (Cronbach's alpha) was 0.77 which was over .70 as considered reliable (Cortina, 1993).

3.7.2. Elaboration

Petty & Cacioppo (1986) proposed that elaboration, in the persuasive context, means the extent to which a person thinks or considers about the content in the message, in other words, it is the amount of cognitive processing by an individual. Four methods to measure the elaboration have been suggested: (1) The self-reported cognitive effort is probably the easiest and quickest way, but its validity has been criticized due to highly interrelated questions of the scales. (2) Argument recall is to get a subject within a limited time to list all of the things he or she remembers from the message. Two independent judges blind to the experiment, score the statement recalled. The reason for not adopting this in this research setting, is that the SMS contains a relatively short message (as the name suggest); hence, the subject might easily remember and recall the message without meaning that the subject actually spent much effort thinking about it. Plus the message is on the subject’s device (mobile phone), so the subject may try to look at the message again for the answer. (3) Electrophysiological responses, involving the use of psychophysiological measures, especially the analyses of electromyographic (EMG) activity. Obviously, this measurement is applicable only to a lab experiment which is not the case in this research. The last method suggested is “thought-listing”, which is used extensively by Petty and other researchers (Axsom, Yates, & Chaiken, 1987; Madden,

Allen, & Twible, 1988) in measuring cognitive processing assessment. Originally developed by Brock (1967), Greenwald (1968) and reviewed later by Cacioppo and Petty (1981).

Generally, thought-listing is deployed as a written form where the subject is allowed a limited time to list down all the thoughts going through their minds while they interact with the message. Then the thought is rated and scored by either the subject or the judge by different dimensions or classifications depending upon the research interest. The score can be the total thought, or an index.

In this research, according to the primary data collection method, phone interview, verbalization thought-listing (Wright, 1980) was used as an elaboration measurement. The subjects were instructed to speak out regarding the thoughts on their mind when they process the message. Though there is no general rule of how much timing or delay of verbalization thought listing, the range varies tremendously from immediately after finishing the message exposure to a few minutes or up to 20 minutes (Wright, 1980, table 1). The pragmatic approach and limitation of the system were taken together with a discussion with the marketer and professional marketing research firm. One hour turnaround was finalized, in other words, the system would transmit customer list, who received SMS, to research firm every hour. That customer list would be valid for research firm to call for an interview only one hour. After that, if any customers left in the list must not be used, research firm then moved on to the new list.

The subjects were instructed to verbally express their thoughts about the message with a time limit of 2-3 minutes. The objective of such a short time was to

minimize any making up of thoughts (either due to the interaction or trying to impress to others) not related to the research interest. All conversations between subject and research team, including verbalization thought listing, were recorded in the system.

To code or classify the thoughts, two judges (both are 3rd year Ph.D. Students in IT in Business and are working as IT courses lecturer in University) blind to the research experiment conditions, subjects' group or need for cognition scores as well as objectives, coded the cognitive responses. Using two judges or raters are consistent with similar work in cognitive assessment study (Baker & Petty, 1994; Cacioppo & Petty, 1981), or other works applying ELM (Petty, Briñol, & Tormala, 2002) or studying about attitude toward advertising (Briñol et al., 2004) which will be useful for comparative study. The classifications to put the unit were 'Advertising (Ads)' or 'Not related to Advertising (Non-Ads)' related. Next only 'Ads' related thoughts were rated the direction of the content as positive, neutral or negative as following the coding rating instruction (see Appendix A). Examples of thought are as following

- Positive thought: "Wish there will be good promotion like this forever", "Other credit cards don't have much promotion", "Feel good, it is like a reminder to me that I got cash rebate 1%".
- Neutral thought: "Not so exciting about this promotion, because it is similar to other credit card", "So-so, this is about spending more to get cash rebate, right?", "I read all SMS and response only interesting one, this one is not much".

- Negative thought: “Cash back given is too little compare to other credit cards”, “I prefer the previous promotion to this one”, “I think ABC credit card offered better promotion than this one”.

Sixty sample messages were randomly selected to train the raters, followed by both raters independently rating the same 420 messages, the number of messages for training exceeding 10 percent of the entire messages as suggested by Straus (1997). The overall agreement was 84.2% of the thoughts coded, and disagreements were resolved through discussion (Szymanski & Henard, 2001). The inter-rater reliability was measured by Cohen’s Kappa at .78, indicating considerable agreement (between .6 and .8 is considered substantial agreement as suggested by Landis and Koch (1977)). The total number of thoughts (only advertising-related) generated were used as a measurement of elaboration score.

3.7.3. Attitude toward Advertising

Based on verbalization thought listing technique, the thoughts were further analyzed and classified as favorable, unfavorable, or neutral toward the marketing offer message as previously discussed. An index of the favorability of advertising message-related thoughts is calculated by subtracting the number of unfavorable advertising message-related thoughts from the number of favorable advertising message-related thoughts and dividing this difference by the total number of advertising message-related thoughts (Briñol et al., 2004).

In order to remedy a common method bias, another measurement method of attitude toward advertising was also conducted in the same telephone survey. This measurement approach was more quantitative by adapting the original four items from Mitchell and Olson (1981) from the five-point bipolar scales format to the five-point Likert scale (see items in Appendix B) due to the phone interview constraints. The score was calculated by the averaging of these four items. The reliability (Cronbach's alpha) was 0.81 which was over .70 as considered reliable (Cortina, 1993). The adapted four items are as follows:

- (1) The promotion in SMS that I just received is good
- (2) I like the promotion in SMS
- (3) The promotion in SMS is irritating.
- (4) The promotion in SMS is very interesting.

3.8. Procedures & Tasks

The credit card service firm hired a professional research firm to conduct the phone interview research as prior discussed. The phone interview script was developed; see the full script, both in English translated and original Thai language in Appendix D and E respectively. The script organized as follows:

Step 1: Greeting the customer as normal in a routine introduction.

Step 2: Explain the objective and background of the experiment and inform them that their information and answer will only be used for academic purposes with high privacy protection.

Step 3: The subject will be asked to list their thoughts regarding the SMS, then the rest of the closed-ended questions concerning, attention, attitude toward advertising and need for cognition. For subjects who received self-reference personalized message (greeting message), the first question was the manipulation check for self-reference instead. If the subjects answer “No” for manipulation check, the further questions would be discontinued. Thought verbalization and the entire conversation were recorded by the system while the answers to these closed-ended questions were noted by the research team.

The voice recording system was activated and started recording automatically once the research teams pick up the phone. The system allows real-time or live monitoring as well as reviewing the record later. The examples of the system are shown in Figure 11, Figure 12 and Figure 13.

Connected: 192.168.1.40 | Logged on: administrator | Total Records: 0 | Returned Records: 0 | Search duration: 0m 0.00s

No.	VoiceID	Channel No.	Extension	Channel Name	Status	Reference	Direction	CallerID	CalledID	Start Time	Duration
1	0	0	281	CATL_01							
2	0	1	282	CATL_02	Recording...	D00001201212071...	Call Out			2012-12-07 15:14:38	00:01:20
3	0	2	283	CATL_03	Idle	D00002201212071...				2012-12-07 15:12:46	00:01:30
4	0	3	284	CATL_04	Recording...	D00003201212071...	Call Out			2012-12-07 15:15:00	00:00:58
5	0	4	291								
6	0	5	292								
7	0	6	213	Sup_FW_01							
8	0	7	216	Sup_FW_02							
9	0	8	001		Not Available						
10	0	9	002		Not Available						
11	0	10	003		Not Available						
12	0	11	004		Not Available						
13	0	12	005		Not Available						
14	0	13	006		Not Available						
15	0	14	007		Not Available						
16	0	15	008		Not Available						
17	0	16	009		Not Available						
18	0	17	010		Not Available						
19	0	18	011		Not Available						
20	0	19	321								
21	0	20	322								
22	0	21	323								
23	0	22	324								
24	0	23	325								

Figure 11 Real-time or Live Monitoring Screen

No.	VoiceID	Channel Name	Reference	Extension	Direction	CallerID	CalledID	Duration	Start Time	Stop Time
1542	0	CATL_04	D0000320121130123424	284	Call Out			0:08:51	2012-11-30 12:34:24	2012-11-30 12:43:15
0252	0	CATL_04	D0000320121123180950	284	Call Out			0:08:35	2012-11-23 18:09:50	2012-11-23 18:18:25
0407	0	CATL_04	D0000320121126141334	284	Call Out			0:08:21	2012-11-26 14:13:34	2012-11-26 14:21:56
0774	0	CATL_04	D0000320121128133008	284	Call Out			0:08:14	2012-11-28 13:30:08	2012-11-28 13:38:22
0473	0	CATL_04	D0000320121126161359	284	Call Out			0:08:06	2012-11-26 16:13:59	2012-11-26 16:22:06
0390	0	CATL_04	D0000320121126131605	284	Call Out			0:08:05	2012-11-26 13:16:05	2012-11-26 13:24:11
0361	0	CATL_04	D0000320121126114408	284	Call Out			0:07:58	2012-11-26 11:44:08	2012-11-26 11:52:07
0203	0	CATL_04	D0000320121123143151	284	Call Out			0:07:57	2012-11-23 14:31:51	2012-11-23 14:39:49
1137	0	CATL_03	D0000220121129130727	283	Call Out			0:07:53	2012-11-29 13:07:27	2012-11-29 13:15:20
0969	0	CATL_04	D0000320121128180027	284	Call Out			0:07:50	2012-11-28 18:00:27	2012-11-28 18:08:18
0467	0	CATL_04	D0000320121126152950	284	Call Out			0:07:48	2012-11-26 15:29:50	2012-11-26 15:37:40
1615	0	CATL_04	D0000320121201122200	284	Call Out			0:07:44	2012-12-01 12:22:00	2012-12-01 12:29:45
0532	0	CATL_04	D0000320121126190838	284	Call Out			0:07:43	2012-11-26 19:08:38	2012-11-26 19:16:22
0389	0	CATL_04	D0000320121126130326	284	Call Out			0:07:41	2012-11-26 13:03:26	2012-11-26 13:11:08
0051	0	CATL_03	D0000220121121153558	283	Call Out			0:07:35	2012-11-21 15:35:58	2012-11-21 15:43:35
1405	0	CATL_03	D0000220121129163951	283	Call Out			0:07:32	2012-11-29 16:39:51	2012-11-29 16:47:23
0066	0	CATL_04	D0000320121121183512	284	Call Out			0:07:22	2012-11-21 18:35:12	2012-11-21 18:42:35

Figure 12 Review the Record Screen

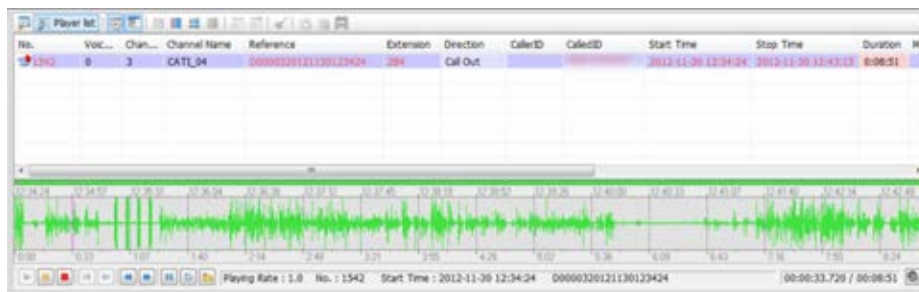


Figure 13 Voice Player Screen

The four groups in the experiments were collected one group at a time. Firstly, group #1 which is the control group. The subjects were randomly selected from the customer database and were sent the SMS messages as a batch. On hourly basis, the research firm received the list of customers and started calling the subjects for interview. The example of actual SMS message is translated and shown below in Figure 14:

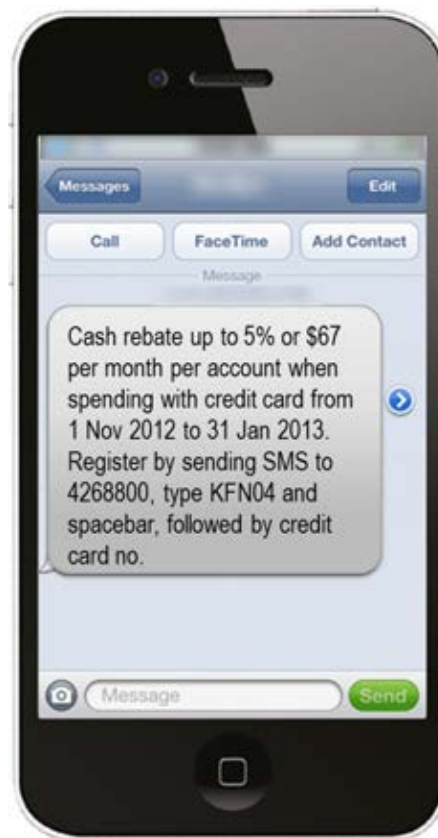


Figure 14 SMS for Control Group

Next, group #2, the context-driven personalization only group, the SMS was only sent if the customers spent and reached the specific step-base, subjects were all randomly selected. Again, on an hourly basis, the research firm received the list of

customers who received the SMS and then started calling the subjects with a similar flow of questions as the control group. The example of actual SMS messages sent is translated and shown below in Figure 15:



Figure 15 SMS for Context-driven Personalization Group

Group #3, the self-reference personalization group, the subjects were randomly selected from the customer database and were sent the SMS messages as a batch. On hourly basis, the research firm received the list of customers and started calling the subjects for interview. The example of actual SMS message is translated and shown below in Figure 16:

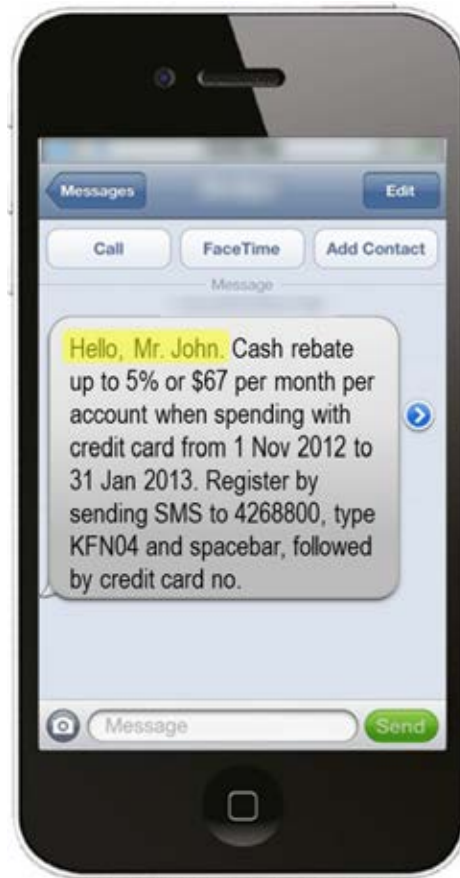


Figure 16 SMS for Self-reference Group

Lastly, group #4, the context-driven and self-reference personalization group. Also, similar to group #2, SMS was only sent if the customers spent and reached the specific step-base, subjects in this group were all randomly selected. On hourly basis, the research firm received the list of customers who received the SMS and then started calling the subjects with a similar flow of questions as the control group. The example of actual SMS messages sent is translated and shown below in Figure 17:

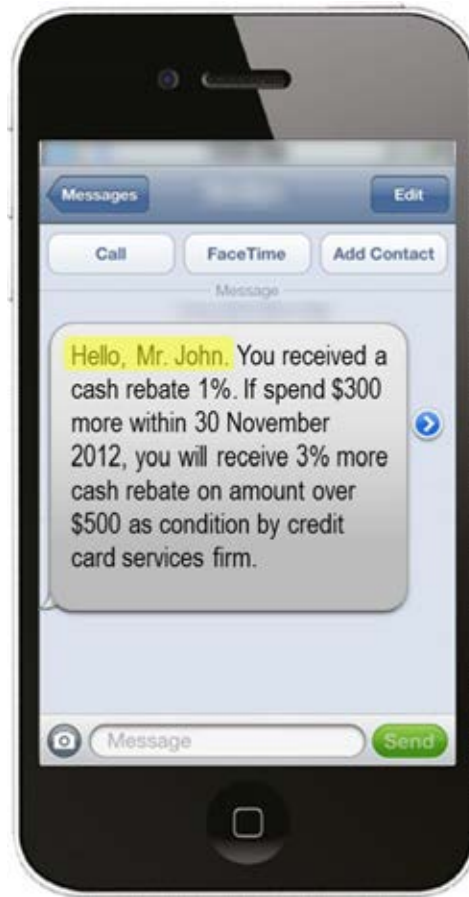


Figure 17 SMS for Context-driven and Self-reference Personalization Group

Please see Appendix F for original Thai language SMS for all groups along with English translated.

3.9. Characteristics of Field Experiment Subjects

This section provides the details of the 422 subjects resulted from the field experiment. The result of the response rate and related details are shown as Table 8:

Table 8 Response Rate Results

	Success call	Rejected call	Unreachable call	Expired call*	Total	Response rate**
Group 1	106	283	406	692	1,487	27%
Group 2	106	95	111	16	328	53%
Group 3	105	242	559	837	1,743	30%
Group 4	105	80	135	7	327	57%

* Expired call is the customer list that received SMS over one hour

** Response rate is calculated by the ratio of success call and rejected call

The profiles of subjects in each group are shown as Table 9:

Table 9 Subject Profiles of Each Group

	Female	Male	Salary Mean (US\$)	Salary SD (US\$)
Group 1	57 (54%)	49 (46%)	819	375
Group 2	63 (59%)	43 (41%)	1,757	1,377
Group 3	63	42	963	554

	(60%)	(40%)		
	67	38		
Group 4	(64%)	(36%)	1,871	1,712

Chapter IV Data Analysis and Results

In this chapter, the result from the field experiment as well as the data analysis will be presented. Two statistical techniques, ANOVA and *t*-Test used in this study, are discussed, follow by the results of the study and data analysis

4.1. Statistical technique

t-Test was used to assess H1, H2, H4 and H5 for main effect of context-driven and self-reference personalization technology. Two-way ANOVA was conducted to assess H6 for interaction effect between context-driven and self-reference personalization, along with H7 and H8 for the interaction effects between the need for cognition and context-driven personalization on elaboration and attitude toward advertising respectively. Because of specific effect of self-reference on attention solely hypothesized, H3 would be analyzed by *t*-Test. The accepted statistically significant in this study is set at an alpha level of .05 for all statistical techniques.

Two assumptions of ANOVA—the populations' normality and homogeneity—were tested before applying ANOVA (Kolmogorov-Smirnov or Shapiro-Wilk test for normality, Normal Q-Q Plot for graphical normality test and Levene's test for homogeneity of variance). However, ANOVA is robust enough even in heterogeneity of variances (Glass et al., 1972) or deviations from normality assumption (Box & Andersen, 1955; Srivastava, 1959; Tiku, 1971), given an equal number of sample for

each group and large number of total sample size. Table 10 shows a construct correlation matrix:

Table 10 Construct Correlation Matrix

	Attention	Elaboration	ATA Verbalization	ATA Four-item Questionnaire	NFC
Attention	1.00				
Elaboration	.11	1.00			
ATA Verbalization	.35	-.07	1.00		
ATA Four-item Questionnaire	.59	-.05	.47	1.00	
NFC	-.01	.06	-.02	-.10	1.00

4.2. Measurements reliability

The measurements reliability of each construct are shown as Table 11

Table 11 Measurements reliability

Construct	Reliability	Statistical Technique
Need for Cognition (5 Items)	0.76	Cronbach's alpha
Attention (2 Items)	0.77	Cronbach's alpha
Elaboration and Attitude toward Advertising from Verbalization Thought-listing	0.78	Inter-rater reliability measured by Cohen's Kappa
Attitude toward Advertising from Four-item Questionnaire (4 Items)	0.81	Cronbach's alpha

4.3. Results on Elaboration

t-Test was performed to test each main effect independently: context-driven personalization and self-reference technology.

While two-way ANOVA was conducted to test the two interaction effects between: context-driven personalization and self-reference, and context-driven personalization and need for cognition.

Levene's test for homogeneity of variance was found to be violated for the present analysis, $F(1,416) = 4.10$, $p = .01$. Hence, the homogeneity of variance assumption cannot be assumed. The results of both tests for normality (Kolmogorov-Smirnov and Shapiro-Wilk) were statistically significant, meaning that the data distribution is not normal. Reviewing the box plot analysis, however, one outlier data in group #3 was omitted, thus the skewness of all groups are lower than 1 as an acceptable level. The following Figure 18 is the histograms for all groups:

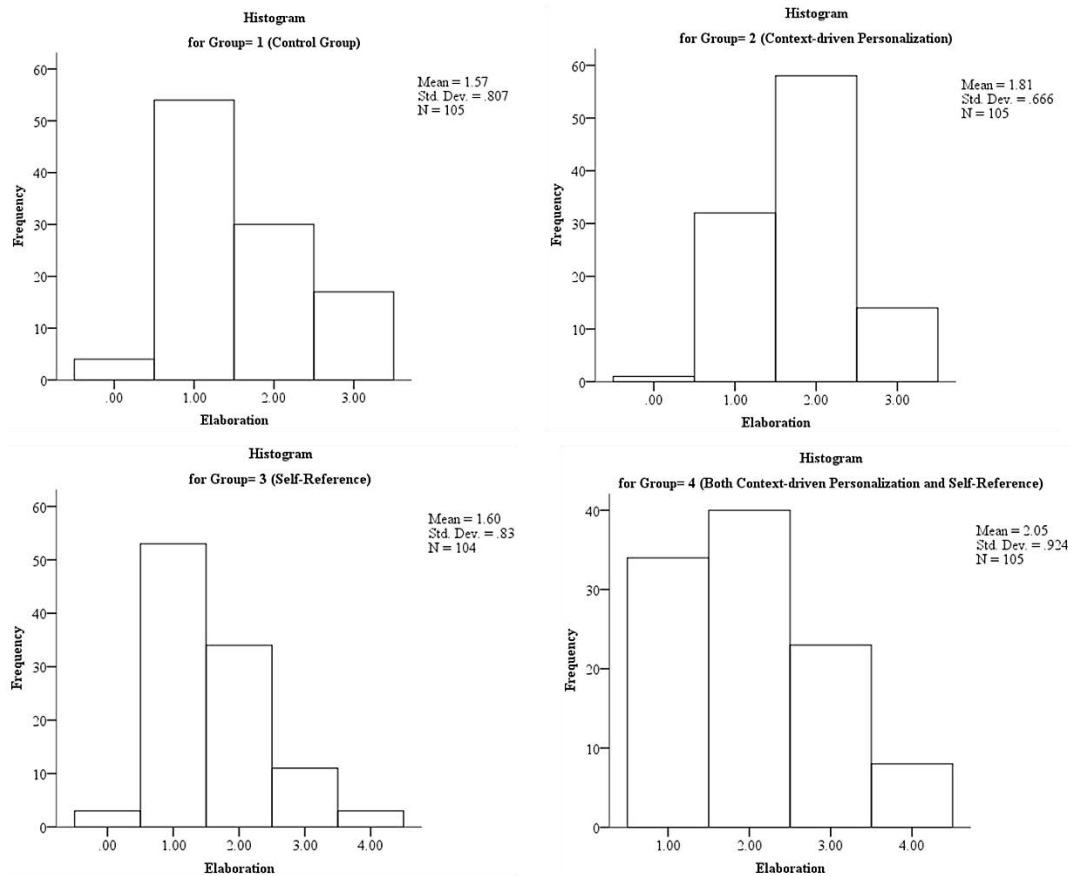


Figure 18 Elaboration Histogram for All Group

4.3.1. Effect of Context-driven personalization on Elaboration

The elaboration score was a sum of the total of advertising (Ad) related thoughts. The descriptive statistics of the elaboration score is presented in Table 12 as follows:

Table 12 Descriptive Statistics: Elaboration - Context-driven Personalization

	Mean	SD	# of Sample
Group #1: Control group	1.57	0.81	105
Group #2: Context- driven Personalization	1.81	0.67	105

Owing to this violated assumption, a t statistic not assuming homogeneity of variance was computed. This t-Test was found to be statistically significant, $t(208) = -2.33$, $p = .02$, indicating that the treatment group which received the personalized offer elaborated more (Mean = 1.81, SD = .67) than for the control group (Mean = 1.57, SD = .81). Thus H1 was supported as hypothesized that a message generated by context-driven personalization will lead to higher elaboration as a message without context-driven personalization.

4.3.2. Effect of Self-reference on Elaboration

The elaboration score was a sum of the total of advertising (Ad) related thoughts. The descriptive statistics of the elaboration score is presented in Table 13 as follows:

Table 13 Descriptive Statistics: Elaboration – Self-reference

	Mean	SD	# of Sample
Group #1: Control group	1.57	0.81	105
Group #3: Self- reference	1.60	0.83	104

Similar to prior analysis, a t statistic not assuming homogeneity of variance was computed. This t -Test was found to be statistically significant, $t(207) = -0.22$, $p = .83$, indicating that the treatment group which received the personalized offer did not significantly elaborated more (Mean = 1.60, SD = .83) than for the control group (Mean = 1.57, SD = .81). Thus H4 was not supported; the customers who receive self-reference messages did not have higher elaboration than those who receive non-self-reference messages.

4.3.3. Interaction Effect between Context-driven Personalization and Self-reference on Elaboration

Elaboration scores were compared and analyzed using a 2 (context-driven personalization) x 2 (self-reference) between-subjects analysis of variance. The results are shown as Table 14 below:

Table 14 Source for 2 (Context-driven) x 2 (Self-reference) Between-Subjects ANOVA

Source	SS	df	MS	F	p
Context-driven	12.45	1	12.45	18.88	.00
Self-reference	1.81	1	1.81	2.74	.10
Context-driven x Self-reference	1.19	1	1.19	1.81	.18
Error	273.71	415			
Total	1,582	419			

There was no interaction effect between context-driven personalization and self-reference ($F(1, 415) = 1.81, p = .18$). Therefore H6 was not supported, the difference in the extent of elaboration between personalized and non-personalized message was not significant larger for messages with a self-reference greeting. Figure 19 depicts the total thoughts on SMS under different conditions.

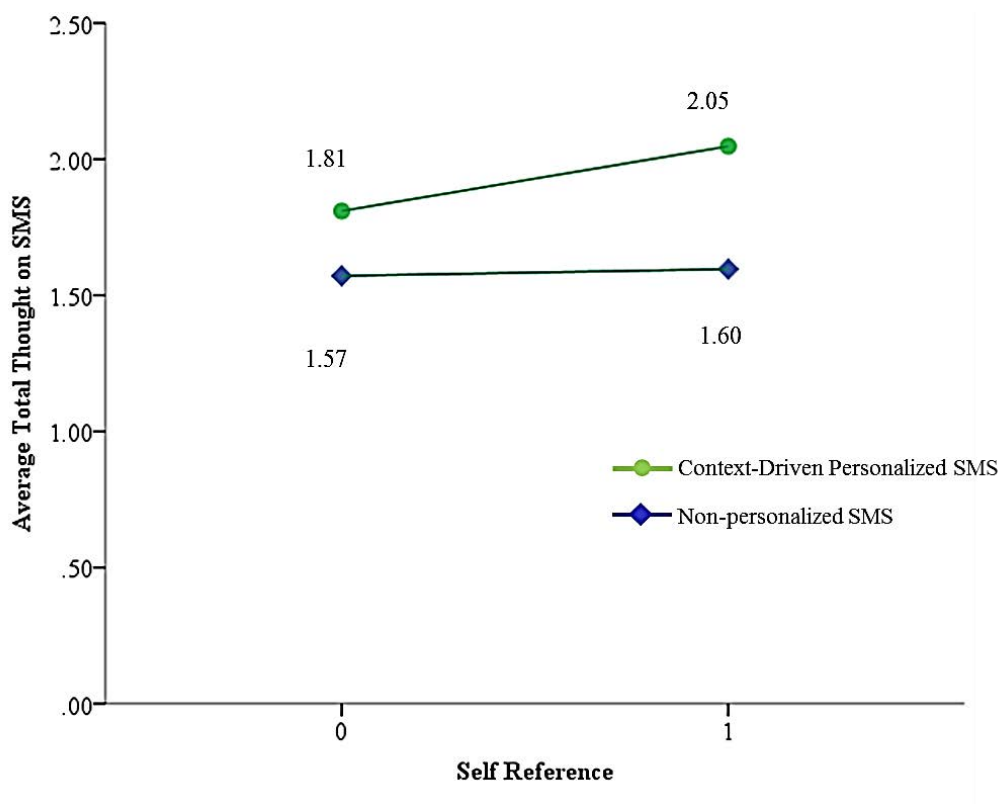


Figure 19 Elaboration Interaction Effect between Context-driven personalization and Self-reference

4.3.4. Interaction effect between Need for cognition and Context-driven personalization on elaboration

Similar to the preceding discussion, the elaboration score was a sum of the total of advertising (Ad) related thoughts. The descriptive statistics of the elaboration score is presented in Table 15 as follows:

Table 15 Descriptive Statistics: Elaboration - Context-driven Personalization and Need
for cognition

		Context-driven Personalization		
			No	Yes
Need for cognition	Low	Mean	1.64	1.87
		<i>SD</i>	.88	.58
		# of sample	42	38
	High	Mean	1.53	1.78
		<i>SD</i>	.76	.71
		# of sample	63	67

Levene's test for equality of variances was found to be violated for the present analysis, $F(1,206) = 6.03$, $p < .00$. Hence, the homogeneity of variance assumption was violated. The results of both tests for normality (Kolmogorov-Smirnov and Shapiro-Wilk) were statistically significant, meaning that the data distribution is not normal. Reviewing the box plot analysis, however, one outlier data in high NFC group was omitted, the skewness of all groups are lower than 1 as an acceptable level. The following Figure 20 is the histograms for NFC groups:

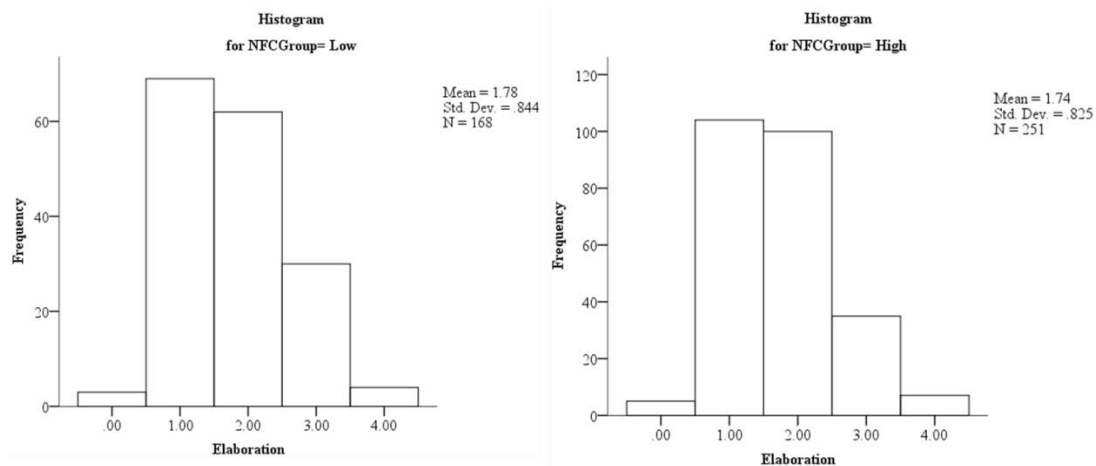


Figure 20 Elaboration Histogram for NFC Groups

Therefore, elaboration scores were compared and analyzed using a 2 (context-driven personalization) x 2 (need for cognition) between-subjects analysis of variance. The results are shown as Table 16 below:

Table 16 Source Table for 2 (Context-driven) x 2 (Need for cognition) Between-Subjects

ANOVA

Source	SS	df	MS	F	p
Context-driven	2.82	1	2.82	5.13	.03
Need for cognition	.55	1	.55	1.00	.32
Context-driven x Need for cognition	.01	1	.01	.02	.90

Error	113.34	206
Total	717	210

For the interaction effect between context-driven personalization and need for cognition, the result showed that there was no interaction effect ($F(1, 206) = .016, p = .90$). Therefore H7 was not supported; there was no significantly interaction effect between NFC and the context-driven personalization technology deployed in the elaboration stage. Figure 21 depicts the total thoughts on SMS under different conditions.

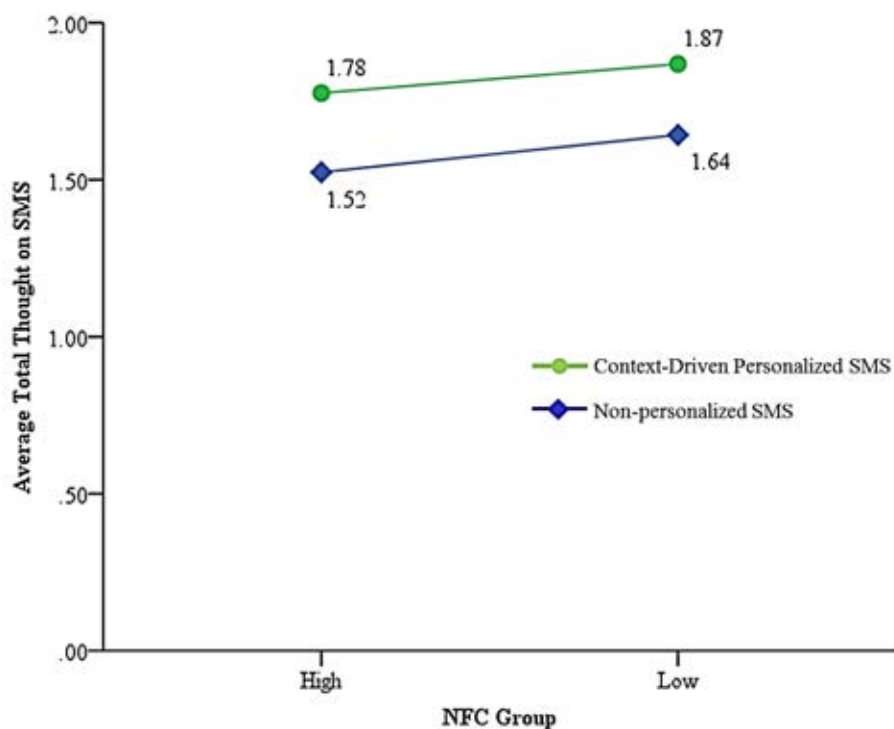


Figure 21 Elaboration Interaction Effect between Context-driven personalization and Need for Cognition

4.4. Results on Attention

In order to test the effect of self-reference on the customer attention, an independent-Samples *t*-Test was conducted, with attention as the explanatory variables between group #1 (control group) and group #3 (self-reference group). The score of attention was calculated from an average of two items. The descriptive statistics of the attention score is presented in Table 17 as follows:

Table 17 Attention Score

	N	Minimum	Maximum	Mean	Std. Deviation
Control Group	105	1	5	3.40	.96
Self-reference Group	105	1	5	3.61	.89

Normality test with both Kolmogorov-Smirnov and Shapiro-Wilk did not pass, however, the skewness of both groups were in acceptable range (group #1 = -0.28, group #3 = -0.402). Levene's test for equality of variances was found to be violated for the present analysis, $F(1,208) = .66$, $p = .42$. Owing to this violated assumption, a *t* statistic not assuming homogeneity of variance was computed. The following Figure 22 is the histograms for both groups:

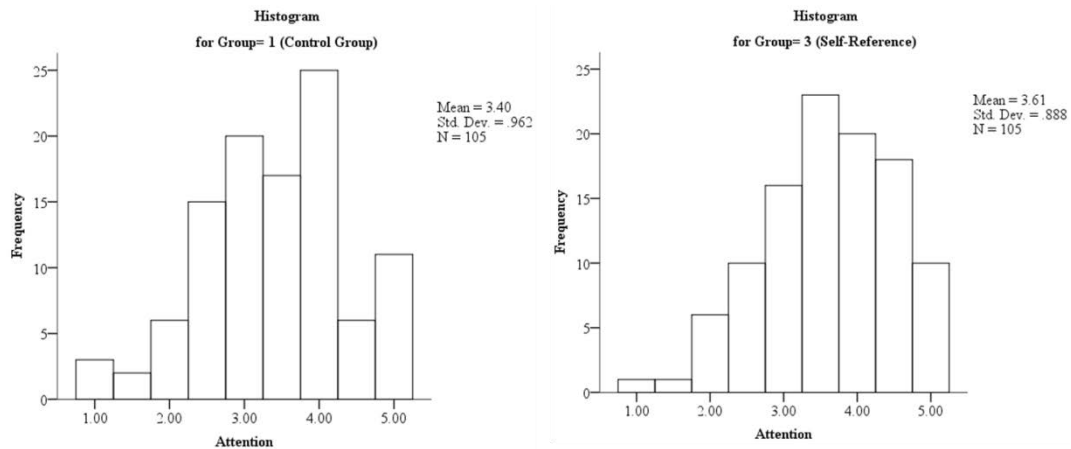


Figure 22 Attention Histogram for Self-Reference Group Test

This *t*-Test was found to be statistically non-significant, $t(208) = -1.64$, $p = .10$. In other words, the result showed that there was no significant mean difference between control group and treatment (self-reference) group. Thus H3 was not supported; customers who received self-reference messages did not give significantly greater attention than those who receive non-self-reference message.

4.5. Results on Attitude toward Advertising from Verbalization Thought-listing

t-Test was performed to test each main effect independently: context-driven personalization and self-reference technology.

Levene's test for homogeneity of variance was found not be violated, $F(1,416) = .75$, $p = .52$. Hence, the homogeneity of variance assumption is assumed. The results of both tests for normality (Kolmogorov-Smirnov and Shapiro-Wilk) were statistically significant, meaning that the data distribution is not normal. The histograms of all groups are not clearly normally distributed (with more left skewness), nevertheless,

the Normal Q-Q Plots were analyzed and the graph in Figure 23 shown relatively linear dispersion. In addition, the skewness of all groups are lower than 1 as an acceptable level.

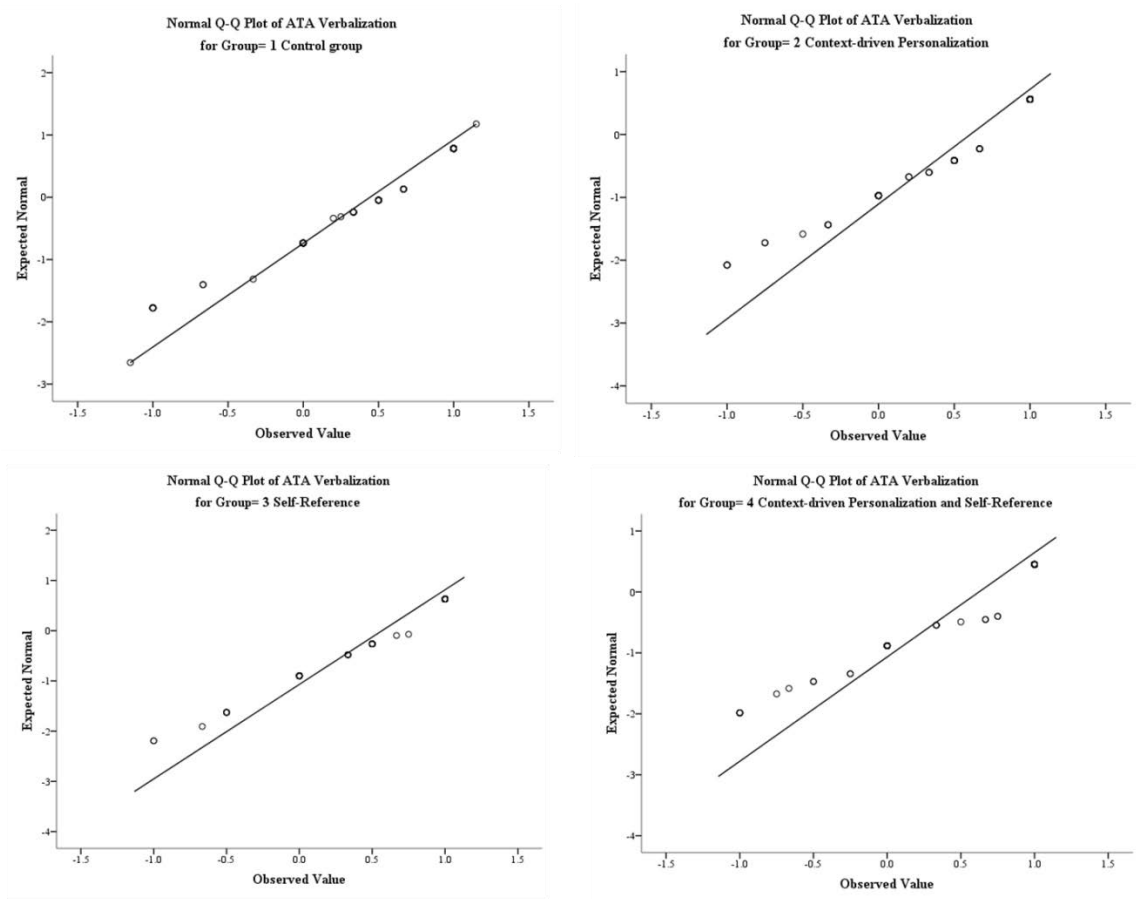


Figure 23 Normal Q-Q Plot of ATA Verbalization for All Groups

4.5.1. Effect of Context-driven personalization on Attitude Toward Advertising

The attitude toward advertising score was an index of positive-negative thoughts derived from verbalization thought-listing. The descriptive statistics of the elaboration score is presented in Table 18 as follows:

Table 18 Descriptive Statistics: Attitude Toward Advertising (Verbalization Thought-listing) - Context-driven Personalization

	Mean	SD	# of Sample
Group #1: Control group	.44	.60	105
Group #2: Context-driven Personalization	.61	.55	105

t statistic with assuming homogeneity of variance was computed. This t -Test was found to be statistically significant, $t(208) = -2.04$, $p = .04$, indicating that the treatment group which received the personalized offer demonstrated higher positive attitude toward advertising more (Mean = .61, SD = .55) than for the control group (Mean = .44, SD = .60). Thus H2 was supported, as hypothesized that the attitude toward advertising via personalized offer was more favorable with a context-driven personalized message than a message without personalization.

4.5.2. Effect of Self-reference on Attitude Toward Advertising

The attitude toward advertising score was an index of positive-negative thoughts derived from verbalization thought-listing. The descriptive statistics of the elaboration score is presented in Table 19 as follows:

Table 19 Descriptive Statistics: Attitude Toward Advertising (Verbalization Thought-listing) – Self-reference

	Mean	SD	# of Sample
Group #1: Control group	.44	.60	105
Group #3: Self-reference	.57	.53	105

t statistic not assuming homogeneity of variance was computed. This *t*-Test was found to be statistically significant, $t(208) = -1.58$, $p = .12$, indicating that the treatment group which received the self-reference message did not demonstrated statistically significant higher positive attitude toward advertising more (Mean = .57, SD = .53) than the control group (Mean = .44, SD = .60). Thus H5 was not supported; customers did not have more favorable attitude toward advertising if the message was related with self-reference than those of non-self-reference.

4.5.3. Interaction effect between Need for cognition and Context-driven personalization on Attitude Toward Advertising

The attitude toward advertising score was an index of positive-negative thoughts derived from verbalization thought-listing. The descriptive statistics of the elaboration score is presented in Table 20 as follows:

Table 20 Descriptive Statistics: Attitude Toward Advertising - Context-driven
Personalization and Need for cognition

		Context-driven Personalization		
			No	Yes
Need for cognition	Low	Mean	.42	.61
		<i>SD</i>	.64	.53
		# of sample	42	38
	High	Mean	.46	.61
		<i>SD</i>	.57	.56
		# of sample	63	67

Levene's test for equality of variances was found not to be violated for the present analysis, $F(1,206) = .56, p = .65$. Hence, the homogeneity of variance assumption was assumed. The results of both tests for normality (Kolmogorov-Smirnov and Shapiro-Wilk) were statistically significant, meaning that the data distribution is not normal. The histograms of all groups are not clearly normally distributed (with more left skewness), nevertheless, the Normal Q-Q Plots were analyzed and the graph in Figure 24 shown relatively linear dispersion. However, the skewness of all groups are lower than 1 as an acceptable level.

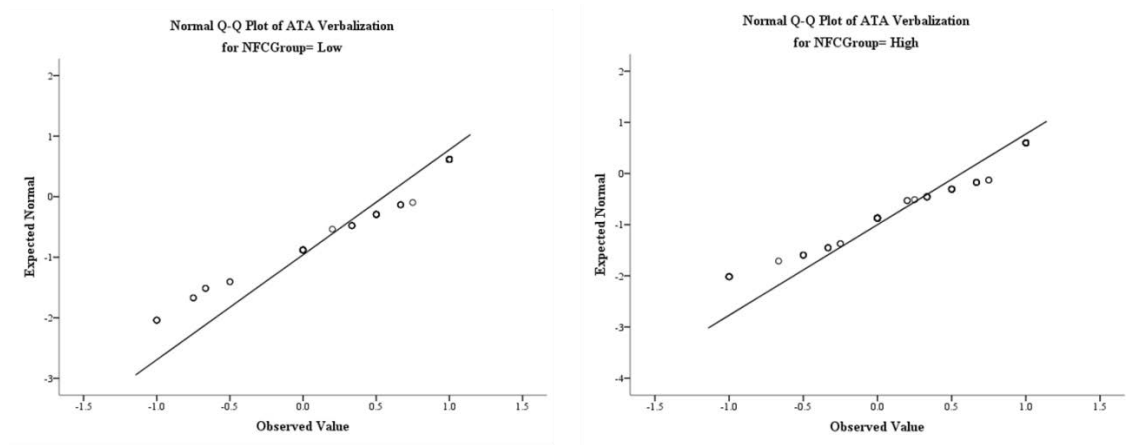


Figure 24 Normal Q-Q Plot of ATA Verbalization for NFC Groups

Therefore, attitude toward advertising scores were compared and analyzed using a 2 (context-driven personalization) x 2 (need for cognition) between-subjects analysis of variance. The results are shown as Table 21 below:

Table 21 Source for 2 (Context-driven) x 2 (Need for cognition) Between-Subjects

ANOVA

Source	SS	df	MS	F	p
Context-driven	1.36	1	1.36	4.08	.05
Need for cognition	.02	1	.02	.07	.79
Context-driven x Need for cognition	.02	1	.02	.07	.79
Error	68.61	206			
Total	127.84	210			

For the interaction effect between context-driven personalization and need for cognition, the result showed that there was no interaction effect ($F(1, 206) = .07, p = .79$). Therefore H8 was not supported; there was no significantly interaction effect between NFC and context-driven personalization technology deployed in the attitude changing stage. Figure 25 depicts the total thoughts on SMS under different conditions.

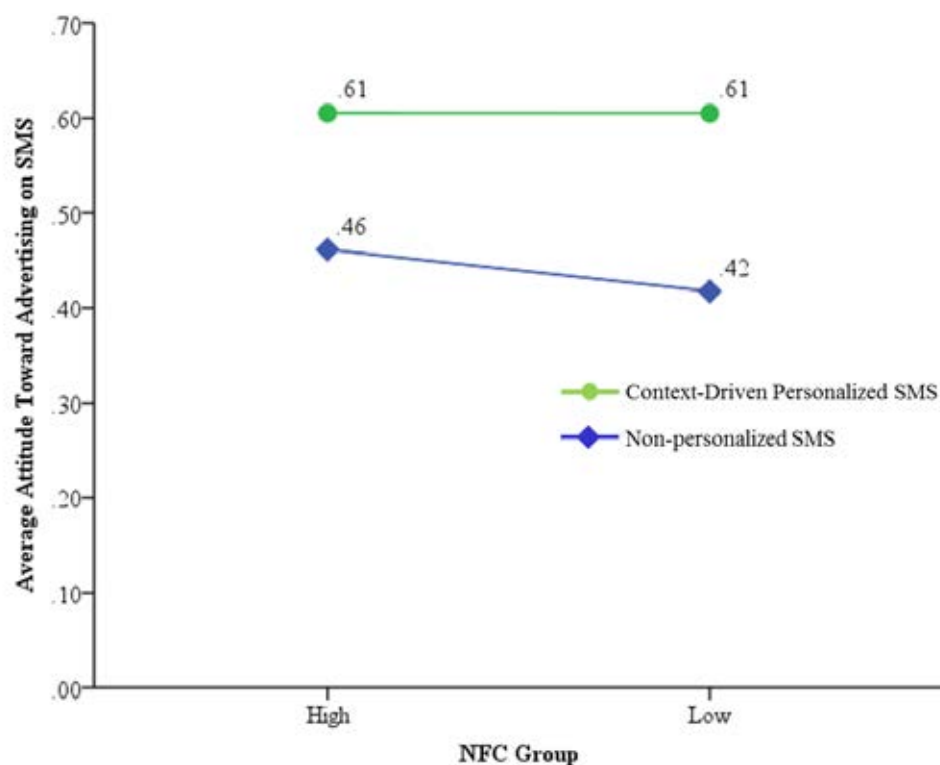


Figure 25 Index ATA Interaction Effect between Context-driven personalization and Need for Cognition

4.6. Results on Attitude toward Advertising from Four-item Questionnaire

As previously mentioned, there were two measurements to test attitude toward advertising; the first measurement was calculated based on an index of positive-

negative thoughts derived from verbalization thought-listing and the second measurement was an average score of four items based on a five-point Likert scale.

t-Test was performed to test each main effect independently: context-driven personalization and self-reference technology. While two-way ANOVA was conducted to test the effect between: context-driven personalization and need for cognition.

Levene's test for homogeneity of variance was found not be violated, $F(1,416) = .98, p = .40$. Hence, the homogeneity of variance assumption is assumed. The results of both tests for normality (Kolmogorov-Smirnov and Shapiro-Wilk) were statistically significant, meaning that the data distribution is not normal. However, the skewness of all groups are lower than 1 as an acceptable level. The following Figure 26 is the histograms for both groups:

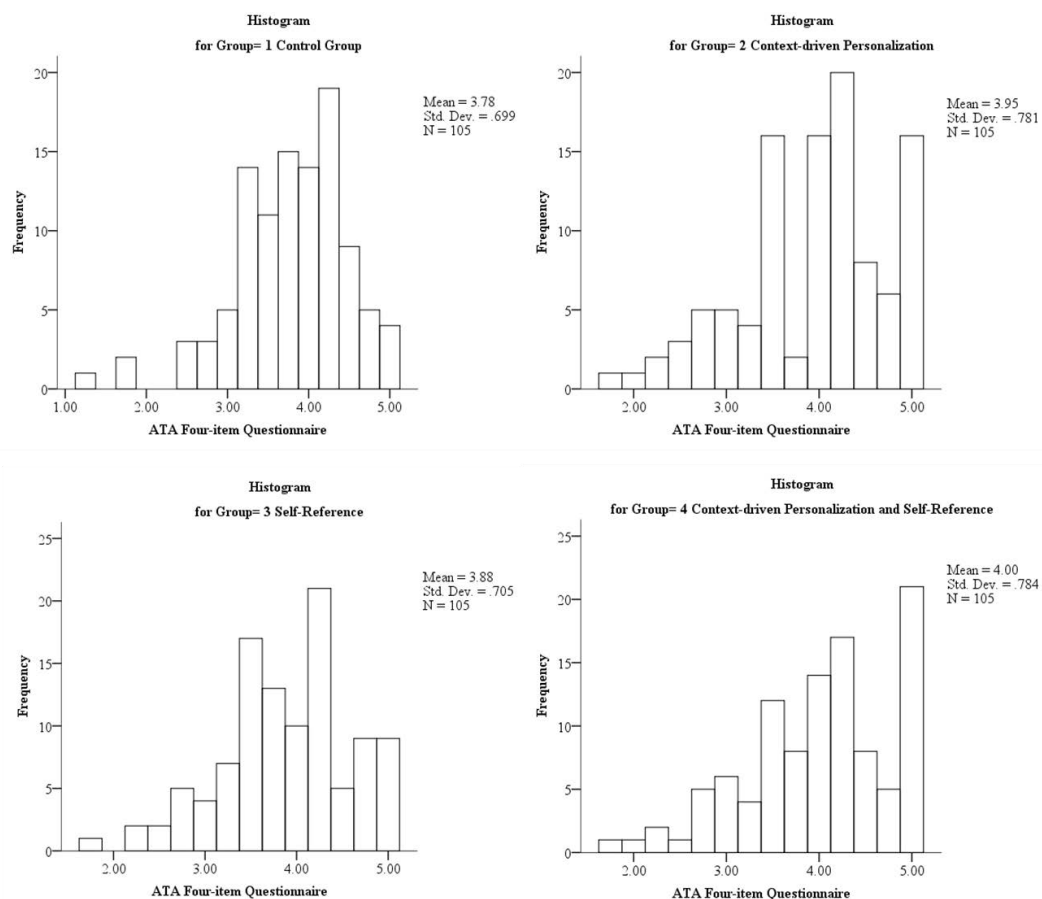


Figure 26 ATA Four-item Questionnaire Histogram for All Groups

4.6.1. Effect of Context-driven personalization on Attitude Toward Advertising

The attitude toward advertising score was an average of four-item questionnaire. The descriptive statistics of the attitude toward advertising score is presented in Table 22 as follows:

Table 22 Descriptive Statistics: Attitude Toward Advertising (Four-item Questionnaire) -

Context-driven Personalization			
	Mean	SD	# of Sample
Group #1: Control group	3.78	.70	105
Group #2: Context- driven Personalization	3.95	.78	105

t statistic with assuming homogeneity of variance was computed. This t -Test was found to be statistically significant, $t(208) = -1.65$, $p = .05$, indicating that the treatment group which received the personalized offer demonstrated higher positive attitude toward advertising more (Mean = 3.95, SD = .78) than for the control group (Mean = 3.78, SD = .70) statistically significant. Thus H2 was supported, as hypothesized that the attitude toward advertising via personalized offer was more favorable with a context-driven personalized message than a message without personalization.

4.6.2. Effect of Self-reference on Attitude Toward Advertising

The attitude toward advertising score was an average of four-item questionnaire. The descriptive statistics of the attitude toward advertising score is presented in Table 23 as follows:

Table 23 Descriptive Statistics: Attitude Toward Advertising (Four-item Questionnaire) –

Self-reference			
	Mean	SD	# of Sample
Group #1: Control group	3.78	.70	105
Group #3: Self- reference	3.88	.70	105

t statistic not assuming homogeneity of variance was computed. This t -Test was found to be statistically significant, $t(208) = -1.06$, $p = .29$, indicating that the treatment group which received the self-reference message did not demonstrated statistically significant higher positive attitude toward advertising (Mean = 3.88, SD = .70) than the control group (Mean = 3.78, SD = .70). Thus H5 was not supported; customers did not have more favorable attitude toward advertising if the message was related with self-reference than those of non-self-reference.

4.6.3. Interaction effect between Need for cognition and Context-driven personalization on Attitude Toward Advertising

The attitude toward advertising score was an average of four-item questionnaire. The descriptive statistics of the attitude toward advertising score is presented in Table 24 as follows:

Table 24 Descriptive Statistics: Attitude Toward Advertising - Context-driven
Personalization and Need for cognition

		Context-driven Personalization		
			No	Yes
Need for cognition	Low	Mean	3.75	4.07
		<i>SD</i>	.79	.76
		# of sample	42	38
	High	Mean	3.80	3.88
		<i>SD</i>	.64	.79
		# of sample	63	67

Levene's test for equality of variances was found not to be violated for the present analysis, $F(1,206) = 1.06$, $p = .37$. Hence, the homogeneity of variance assumption was assumed. The results of both tests for normality (Kolmogorov-Smirnov and Shapiro-Wilk) were statistically significant, meaning that the data distribution is not normal. However, the skewness of all groups are lower than 1 as an acceptable level. The following Figure 27 is the histograms for both groups:

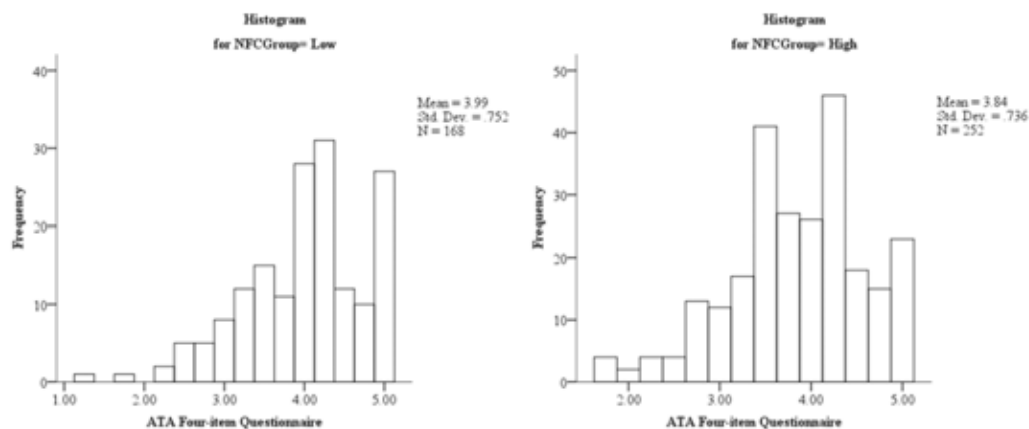


Figure 27 ATA Four-item Questionnaire for NFC groups

Therefore, attitude toward advertising scores were compared and analyzed using a 2 (context-driven personalization) x 2 (need for cognition) between-subjects analysis of variance. The results are shown as Table 25 below:

Table 25 Source Table for 2 (Context-driven) x 2 (Need for cognition) Between-Subjects

ANOVA

Source	SS	df	MS	F	p
Context-driven	1.97	1	1.97	3.57	.06
Need for cognition	.23	1	.23	.43	.52
Context-driven * Need for cognition	.67	1	.67	1.22	.27
Error	113.36	206			
Total	3,249.69	210			

For the interaction effect between context-driven personalization and need for cognition, the result showed that there was no interaction effect ($F(1, 206) = 1.22, p = .27$). Therefore H8 was not supported. Figure 28 depicts the total thoughts on SMS under different conditions.

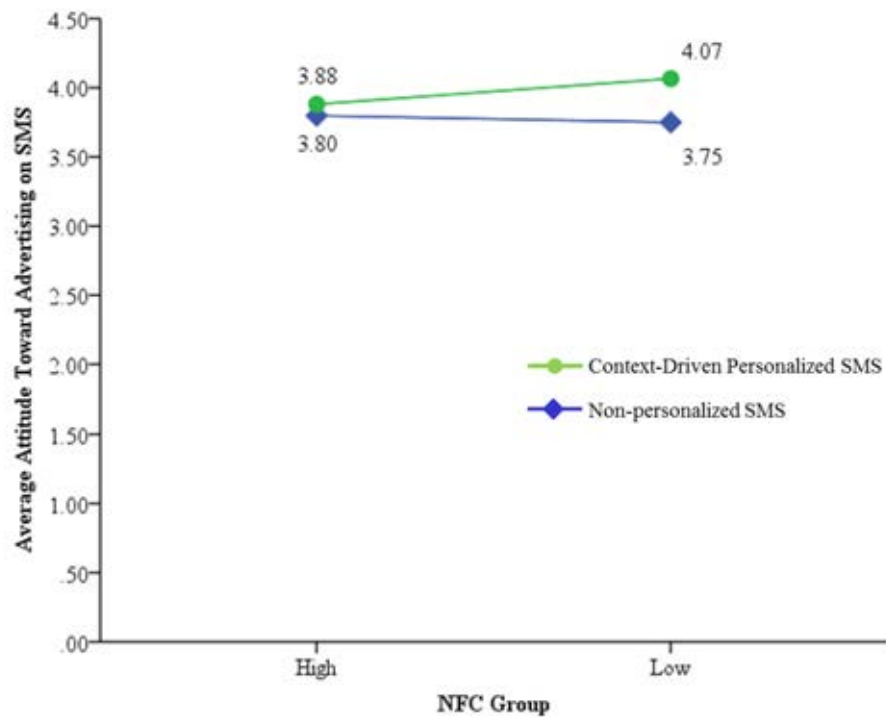


Figure 28 Four-item Questionnaire ATA Interaction Effect between Context-driven personalization and Need for Cognition

Chapter V Discussion and Conclusion

5.1. Summary of Discussion

The previous chapter examines the results of the field experiment with various statistical techniques. This chapter will summarize and review these results with the related hypotheses in this study. In addition, this section recapitulates the essences of key findings in order to answer to the research questions proposed in this study.

5.1.1. Test of Hypotheses

The results of hypothesis testing are shown in Figure 29. A solid line represents a relationship with statistical significant, whereas a dotted line shows a relationship that is not statistical significant.

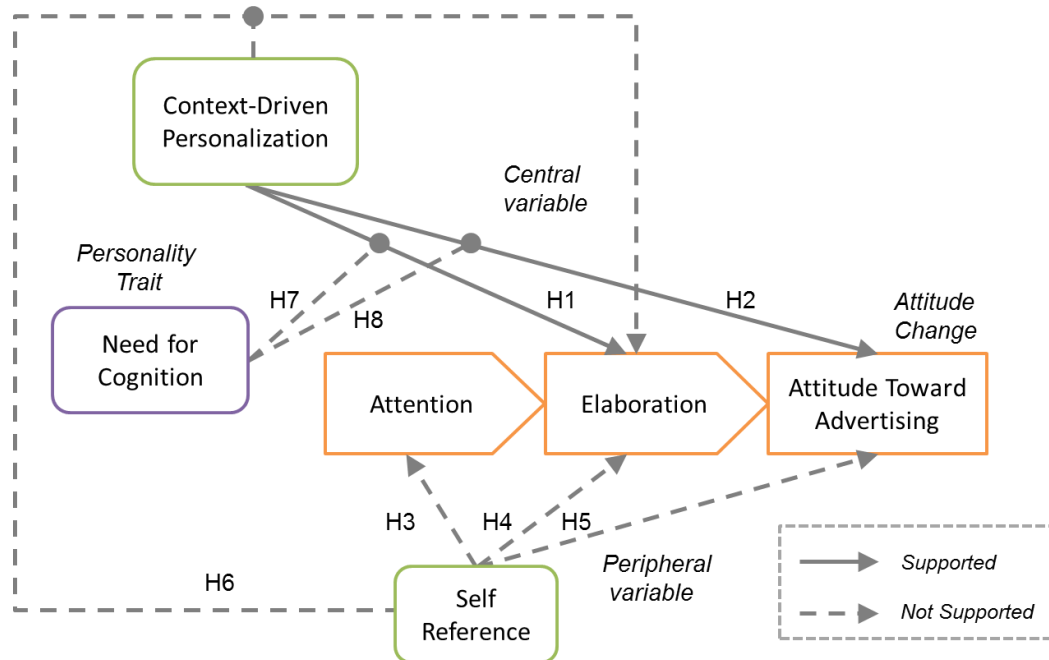


Figure 29 Research Model with Hypotheses Testing Results

The summary of the hypothesis testing is presented in Table 26. In conclusion, there are two hypotheses supported and six hypotheses not supported.

Table 26 Summary of Hypothesis Testing

<i>Context-driven Personalization</i>		
H1: <i>A message generated by context-driven personalization will lead to higher elaboration than a message without context-driven personalization.</i>	Supported	$p < .01$
H2: <i>The attitude toward advertising via personalized offer is more favorable with a context-driven personalized message than a message without personalization.</i>	Supported	$p = .05$ for thought-verbalization $p = .04$ for four-items questions
<i>Self-reference</i>		
H3: <i>Customers who receive self-reference messages will give it greater attention than those who receive non-self-reference message.</i>	Not supported	$p = .42$
H4: <i>Customers who receive self-reference messages will have higher elaboration than those who receive non-self-reference messages.</i>	Not supported	$p = .06$
H5: <i>Customers will have more favorable attitude toward advertising if the message is related with self-reference than those of non-self-reference.</i>	Not supported	$p = .20$ for thought-verbalization $p = .27$ for four-items questions
<i>Interaction of Context-driven Personalization and Self-reference</i>		

H6: <i>The difference in the extent of elaboration between personalized and non-personalized message will be larger for messages with a self-reference greeting.</i>	Not supported	$p = .30$
<i>Interaction of Context-driven Personalization and NFC</i>		
H7: <i>There is an interaction effect between NFC and the context-driven personalization technology deployed in the elaboration stage, as a high-NFC person will be more affected by context-driven personalization technology than a low-NFC person.</i>	Not supported	$p = .90$
H8: <i>There is an interaction effect between NFC and context-driven personalization technology deployed in the attitude changing stage. As a high-NFC person will be more favorably affected by context-driven personalization technology in having a positive attitude toward advertising than a low-NFC person.</i>	Not supported	$p = .79$ for thought-verbalization $p = .27$ for four-items questions

5.1.2. Results Discussion

In spite of the mix results of hypothesis testing, there are notable findings needed to be discussed in order to explain and answer to the research questions. As the research objective of this study is to investigate the role and impact of personalization technology on the customer acceptance of advertising or marketing offers via SMS. Two research questions are developed as follows: (1) What are the effects of different personalization technologies, as well as their interaction, on customer acceptance of

marketing offers?; (2) Is there an interaction effect of personality trait on the effect of personalization technologies towards customer acceptance?

5.1.2.1. What are the effects of different personalization technologies, as well as their interaction on customer acceptance of marketing offers?

Two personalization technology were chosen in this study, the more advance and complicated one—Context-driven personalization, and the basic and less advance—Self reference. The effects of these technologies alone as well as its interaction effect on customer acceptance of marketing reveal demonstrate a mix and inconclusive results.

Firstly, the effects of context-driven personalization technology exhibited clearly on this study with both hypotheses, H1 and H2, are supported. The findings fit well with the suggestion in ELM theory that the central route of persuasion does have a strong influence on an individual's thoughts and attitude changes through thoughtful information processing. Also, these empirical findings are consistent with those researchers who applied ELM theory in studying the persuasion effect in other settings (Tam and Ho (2005) in ringtone download, Bhattacharjee and Sanford (2006) in information technology acceptance).

Additionally, the results of both measurements of attitude toward advertising are aligned and consistent, though the statistical significance is slightly different. These results are coherent with ELM in that the higher elaboration of the

message due to the central route of information processing will be more predictable to the change in attitude. Also, this attitude change will be less memory decay, greater resistance to counterarguments about the ads and more persistent.

In contrast to earlier findings, there is no strongly significant evidence of the self-reference effect on customer acceptance is detected. The effect on attention is found no significantly difference between control and treatment group, even though the actual mean of attention of self-reference group is higher than that of control group (3.61 vs. 3.40). Nevertheless, when analyzing the other group mean differences, group # 1 vs. 2, 1 vs. 4 and 3 vs. 4, the results showed that there were significant mean differences among these groups: group #1 vs. 2 ($t(208) = -5.916, p < .00$), group #1 vs. 4 ($t(208) = -5.692, p < .00$), group #3 vs. 4 ($t(208) = 4.352, p < .00$). These results reinforce the effect of context-driven personalization on customer acceptance even on the attention which is not prior hypothesized in this study.

One plausible explanation is that because of the nature of field experiment, it would be very challenging and difficult to control all possible extraneous variables. Yet, some expected confounding factors could be anticipated, such a randomization does help in controlling individual differences. Nevertheless, the situational factors do exists and may exert some level of influence. In this case, while subjects received SMS, they might engage in other activities, for example, driving a car or working in the office (as indicated by some subjects during the interview). Receiving an SMS might be perceived as an interruption or distraction from the current activity, hence, the effect of self-reference (greeting message) might not be distinct or contemplated by the subjects.

Additionally, the descriptive statistic of the data on both groups have shown relatively high on attentions, both mean and median (both groups have equal median = 3.5). This might suggest that the subjects have high tendency on engaging the incoming SMS. Similarly, the effect of self-reference on elaboration is not statistically significant, although the actual mean is higher (1.64 vs. 1.57) and the actual p value (.63) is marginally lower than 0.5. Likewise, the interaction effect between self-reference and context-driven personalization on elaboration is also not statistically significant.

Again, the possible reason is the distraction and interruption as prior discussed. Besides, according to ELM theory, information processing through peripheral route as self-reference might not be necessary required high effort of cognitive assessment in order to be persuaded by the advertising message. Lastly, the results of attitude towards advertising are not statistically difference between control group and self-reference group by both measurements (index of thought verbalization and the four-item questionnaire).

Though, the attitude toward advertising of self-reference group does show higher than that of control group by both measurements (.57 vs. .44 for index of thought verbalization measurement, 3.88 vs. 3.78 for four-item questionnaire). Two likely explanations are: first, due to possible privacy concern, addressing customers in SMS by showing their names might perceived as privacy intrusion and concern over sensitive information in such financial credit card contexts become especially salient (Xu et al., 2009) which may dilute the effect of self-reference. Especially, in this setting where

customer did have direct control over the permission to receive or not from the firm (Awad & Krishnan, 2006; Bamba & Barnes, 2007; Barwise & Strong, 2002).

Secondly, as Burnkrant and Unnava (1995) suggest that in a relative short persuasive message (like SMS in this study), subjects might already elaborate sufficiently on a message, beyond that, additional elaboration might, in fact, moderate or overturn the initially positive attitude resulted from effect of elaboration on persuasion.

5.1.2.2. Is there an interaction effect of personality trait on the effect of personalization technologies towards customer acceptance?

Contrary to expectations, the hypothesized interactions effect of NFC and Context-driven personalization on both elaboration and attitude toward advertising were not found. Surprisingly, even the means of low-NFC subjects of both elaboration and attitude toward advertising were actually higher than those of high-NFC subjects (except the ATA measured by thought verbalization with the mean of high-NFC subjects being marginally higher than those of low-NFC subjects (.54 vs. .51)).

These inconsistent, or rather contradictory, results may be due to several possible explanations. First, ELM theory suggests that the central route of information process will occur under conditions where the subject is both 1) motivated and 2) possess the ability to process the message (Andrews & Shimp, 1990). With these conditions, high elaboration will ultimately affect the individual's attitude toward the message or, in this case, the advertising.

However, in this research, only the motivation aspect was studied. As Petty and Wegener (1999) postulated, the amount of elaboration will also vary with the situational factors that impact the ability to process. The two key situational factors are prior knowledge or experience and distraction. For prior knowledge or experience, Petty and Cacioppo (1986) posited that this concerns the extent to which a person has an organized structure of knowledge (schema) concerning an issue. This prior or stored knowledge might enable a person to process (elaboration) and reach a conclusion (attitude) without much processing of the information in the advertising or with processing with bias in favour or not in favour of an initial opinion. As found in the transcript, many subjects showed and expressed their opinion in comparison between the current offers with previous marketing campaigns as there were some similarities between them (examples of thought; ‘Prefer previous campaign to this one, though similar % on cashback but condition was lower and easier to meet’ or ‘This time, promotion seems inferior than the other credit cards, unlike the previous promotions were much better’).

While the distraction, as posited by Haugtvedt et al. (1992), can influence the extent of message processing and thus the route to persuasion. Distraction can affect the subject with either increasing agreement or more positive when the message or offer is weak or decreasing agreement or less positive when it is strong (Petty & Cacioppo, 1986). Because field study concerned SMS messages in mobile phones, there was a high chance that subjects were engaged in other activities simultaneously while processing the information on advertising. The level of distraction then might affect each individual

differently without control. Hence, these situational factors might distort the interaction effect of NFC and context-driven personalization, for example, a high NFC person might have prior knowledge about similar advertising while driving a car and reading a SMS which then causes a high distraction.

Second, with reference to Petty and Cacioppo (1986, p. 219, Figure 9-1), the schematic of factors—the diagram of listed factors which affect the likelihood of elaboration, motivation (to perform elaboration or information processing) are derived from both intention and effort. Intention alone is not sufficient, though a person may be high in NFC, the task or message required to perform is relevant within the supporting contextual factors, that person may not be necessary exert the effort on processing particular information received due to several personal reasons. Though effort or exertion has not been studied thoroughly, the closest suggestion would be arousal as studied and asserted by Kahneman (1973), which was not included in this study.

Finally, elaboration and attitude toward advertising were measured through only the quantitative aspect, ignoring the qualitative part in terms of how much the elaboration or attitude expressed by individual presents cogent or compelling thoughts. As the transcripts suggest, some individuals did express their feelings or opinions strongly than others but still only the number of thoughts was counted. This is not to mention that other individual differences such as introvert/extrovert may affect how much subjects will fluently express their thoughts, although the study of Crowley and Hoyer (1989) suggested no strong indication or correlation between need for cognition and introvert/extrovert.

5.2. Conclusion

Personalization technology has become a key important role in supporting marketing to enhance firm's relationship with customers, especially, through mobile advertising. At present, SMS is one of the strategic communication channel used widely in the organization, particularly, for advertising new product offering. The response rate is not very impressive and yet still SMS is the preferred choice of communication for marketer due to its unique characteristics, such as the high reachability, timeliness and personal to customers.

Very little is understood on how each marketing campaign communicated via SMS perceived by customers, why and why not one campaign will be successful. As a result, it is very challenging to improve the customer response or/and acceptance on marketing offer sent via SMS. Prior researches did not fully address these particular issues but rather focused either on different setting or other situational as well as individual factors.

Hence, this study set out with the aim of assessing the importance as well as the difference of personalization technologies would affect the customer acceptance on marketing communication via SMS in what way. In addition, the study seek to gain insight on what customer think, feel, respond and accept on personalized SMS, as well as how and what personality trait would strengthen or weaken the influence of personalization technology. The experiment comprised the context-driven personalization

technology along with the relative simple personalization technology that is self-reference, while the key personality trait chosen was need for cognition.

ELM and information processing theory were merged to form the research model and eight hypotheses were postulated for testing in the field experiment with the credit card service firm. The promotion chosen was not either too high or too low appealing, then subjects for non-personalization group was randomly selected while context-driven personalized group was automatically and randomly selected based on the preset criteria of the promotion. A total number of 420 subjects were collected, a various statistical tools employed for data analysis.

Overall, the results of the study exhibited clearly that context-driven personalization technology does have significant impact on customer acceptance of advertising. The findings are positively inline within the suggestion in ELM theory that the central route of persuasion does have a strong influence on an individual's thoughts and attitude changes through thoughtful information processing. Also, these empirical findings are consistent with those researchers who applied ELM theory in studying the persuasion effect in other settings (Tam and Ho (2005) in ringtone download, Bhattacharjee and Sanford (2006) in information technology acceptance.

Conversely, the results of self-reference effects along with those interaction effects between context-driven personalization and self-reference as well as need for cognition are surprisingly contradicted to the theoretical expectation. Several plausible explanations are due to other situational factors which are out of the scope of

this study—like prior experience or distraction, or the method of data collection bias due to the limitation of field experiment.

Despite the inconsistent results, the findings have some theoretical implications for ELM, especially as it is combined with information processing theory to help us explain this phenomenon by understanding the influence and effect of personalization technology on customer acceptance. This opens further research on the effect of other interesting factors, both situational and individual. The uncommon cognitive assessment method—Thought verbalization—used in this study provides the richness of data and other possibilities in measuring the cognitive, like the qualitative aspect of transcription.

As this research motivation and objective have been clearly aimed to explain the underlying on how customers perceive the personalized message and whether the attitude will be induced and in what way. Practitioners will now be more confident in driving more personalization on their marketing campaign as better understanding on how customer thinking, especially with context-driven personalization technology.

5.3. Implications for Research

This research contributes to and fills the gap in the existing literature in several ways. First, contrary to the pervasive embracing of personalization technology for using as a differentiation business strategy, little has been done to assess its effectiveness. In this study, two prominent theories—information processing theory and elaboration likelihood model (ELM)—which traditionally have been the focus of studies in traditional

advertising mass media (Andrews & Shimp, 1990; MacInnis & Jaworski, 1989) were integrated to help explain the phenomenon of this ubiquitous medium and the detailed exposition of these two theories as well as an illustration of its combined application. The advantages of the combined theories are the focus on the processes by which customer attitudes are formed which have the potential to understand inside of the customer thinking's black box of attitude change, in contrast to most prior theories that have been primarily factor-based.

Second, to the best of knowledge, this may be the first IS paper to study the role of context-driven personalization technology in customer acceptance due to the relatively new technology and not yet widely adopted by firms. Prior customer acceptance in advertising via SMS studies have focused on multiple factors of individual (Leppäniemi & Karjaluoto, 2005) or other behavioural intention theories (Bauer et al., 2005), but have not specifically examined how personalization technology can influence customer attitude. This research addresses a gap by highlighting the persuasion and information processes that can shape the formation of individual attitude by which such an attitude change can be accomplished and accepted. This research sheds light on new personalization technology for consumer acceptance and may help stimulate future research.

The final theoretical contribution of this study is in the selection of measurement method of the cognitive assessment–verbalization thought-listing technique (Wright, 1980), which is very rarely used or found in IS papers. Though, generally, thought-listing was deployed in written form (Axsom et al., 1987; Madden et al., 1988),

verbalization thought-listing was chosen due to it being primary data collection method (phone interview). Although this method is very time consuming and highly complex in data collection, interpretation and analysis, it provides us with a high richness of data.

5.4. Implications for Practice

Undoubtedly, the ubiquitous of mobile phone has opened up a vast opportunity for marketers to communicate and connect with their prospects as well as customers. The SMS, due to its unique characteristics, has also become an increasingly important choice for marketing communication. However, marketers are always puzzled as to how customers think about advertisements, much like a black box. The current measurement of the effectiveness of marketing offers is only at the end of the process which is either the total revenue generated or percentage of campaign accepted. These measurements cannot tell the actual effectiveness of the advertising because the high sensitivity of the advertising message affects the purchase-related variable or actual buying (Chattopadhyay & Nedungadi, 1992). For example, a person looks at a car advertisement in newspaper, the ads itself might be very appealing such that it persuaded and changed a person attitude. However, a person, even really impress about the ads, may decide not to buy the car with various reasons, such as, just spent huge money buying new house, bought a new car last week, already own five cars, etc. Therefore, the ads itself is very effectiveness if measure at attitude change but will not be if only measure at actual purchase. The empirical findings in the present study provide a new understanding into the effectiveness of advertising by looking at the amount of elaboration increase and

change in attitude toward ads. The ability to truly understand the merit and the effectiveness of advertising will provide the marketers with an invaluable feedback such that, they can either modify or fine-tune to create a better advertising in the future.

Another important practical implication is that while personalization technologies have been deployed to enhance the attractiveness and acceptance of SMS advertising for the consumer, the results and its effectiveness have not been clearly studied or identified. Due to the huge investment in personalization technologies, this result will be beneficial to practitioners by giving them more insights into how the customer perceives personalized advertising and in what way. Not only that, according to ELM theory, attitude change as a result of information processing through central route is more stable, and hence is likely to have a longer-term impact on user acceptance as well as high resistance to change and more predictable to behavior change.

Especially context-driven personalization, which has been studied and confirmed its effectiveness both on elaboration and attitude change, firms can extend its usage into other communication channels as well. For example, particularly with ETM system deployed by this credit card service firm, it can be expanded its service into either digital or traditional media. For instance, ETM can be linked with firm website or individual credit card website, mobile application or even newly instant message applications (e.g. WhatsApp, LINE) which available in various smartphone platforms. In addition, the traditional media can also benefit from context-driven personalization provided by ETM, such as the system used by call center or staff at branch can be linked

with ETM, this will assist staff providing a better customer experience by prompt and accurate services.

It will also aid executives to better plan their IT investments in personalization technology and select an appropriate personalization method aligned with their customer profiles and business objectives. For example, although context-driven personalization has shown an impressive result in the study, there are various technological options to be implemented to achieve that. This largely depends upon firm size, market potential, customer-based profile, and objective. Simple but manual process involved can be deployed, such as the batch computing process of customer transactions then analyzed and matched with the predefined offer by marketing analyst. Later one, the offer can be send via email, instant messaging, SMS or other traditional channels. In addition, there are various choices of packaged software by software vendors, such as IBM/UNICA, Teradata, SAS, though typically the investment (software, hardware and consulting service) would be massive, the return of investment may help justified it which again various firm by firm. Nevertheless, the ultimate objective of implementing personalization is to help increase the effectiveness of the marketing communication message.

5.5. Limitations of the Study and Future Research

Like most field experiments, this study is not without limitations. There were a number of limitations that should be taken into account when interpreting the findings. First, due to the nature of the field experiment, many factors cannot be

controlled and some confounding factors might be prone to affect the results of the study. For example, the time the subject received the SMS might affect and influence elaboration or/and attitude (Berry, 1990), or the difference of experience and impression on receiving the advertising SMS for each subject could cause different responses and acceptance. Also, an issue that was not addressed extensively in this study is personality traits, which previous studies in mobile advertising have addressed. For example, Beneke et al. (2010) suggested that a person with a high level of innovativeness tends to have a more positive attitude toward advertising which is consistent with Bauer et al. (2005). Also, information seeker-behaviour will influence how the subject will process the information in the advertising. Further research should be conducted into exploring these factors on its interaction with personalization technology.

Secondly, due to the limitations of personalization technology deployed in this firm, the system did not allow us to extract in real-time the SMS sent by context-driven personalization technology. Instead, hourly data extraction was implemented which resulted in longer delay time between receiving the SMS and the phone interview than expected (minimum was 25min, maximum one hour). Wright (1980) suggests that for short message advertising, immediate post-exposure verbalization should be conducted in order to reduce any bias. In addition, people's memory of thoughts, feelings or impression might be lost or difficult to retrieve (Cacioppo, Von, & Ernst, 1997).

Finally, as the phone interview was the method for thought verbalizations, there might be some bias in the interaction between the interviewers and subjects. In addition, since the subjects were the credit card firm's customers, the subjects

acknowledged that they were interviewed under the study conducted by the credit card firm. The subjects might have been unwilling to report their thoughts accurately as the subjects might sense that their responses were not anonymous (Cacioppo et al., 1997). Also, the thought-listing technique, especially through verbalization, may be inappropriate when individuals are unable to provide the relevant verbal protocols and hence cannot express accurate retrospective reports of their cognitive assessment (Crowley & Hoyer, 1989).

Several future researches might be further explored; first, the repetition of messages received or the difference levels of distraction that affect the elaboration likelihood and attitude change. ELM theory suggests that the repetition of message will increase the amount of elaboration as well as attention but the empirical study from others have shown mix results (Belch, 1981; Mackenzie, 1986).

Second, although there are a number of other potentially practical personality traits to be studied, as suggested by Haugtvedt et al. (1992), each individual difference must determine the kinds of mediating processes which may underline preferences. In some cases, it may be useful to combine situational and dispositional measures to obtain maximal differences in message processing and the predictability of attitudes over time.

Third, from the field experiment, there is a thought-provoking observation which is the difference in greeting message of self-reference group. The first experiment on self-reference was supposed to put the greeting message as "Hello, Mr. John" but rather firm mistakenly insert wrong greeting message as "Mr. John", omitted the word

“Hello”. The interesting point is the huge difference of the result on manipulation check of self-reference between these two groups: the group without “Hello” show the percentage of subject notice his or her own name was 79% while the re-run group with correct greeting message (“Hello, Mr. John”) was 94%. This significant discrepancy might be imply that the importance of the simple greeting word (“Hello”) on different cultural setting and hence, different greeting words might be considered in the further study.

Lastly, due to limitation of field study where a limited number of construct could be put into the study, other aspect of message should be considered. One notable attribute is the quality of the message or how appealing of the marketing offer, the study should focus on setting up the personalization technology on different level of message quality or appealing. In order to understand how customer acceptance would be changed differently according to the interaction effect of personalization technology and the quality of message.

References

- Andrews, J. C., & Shimp, T. A. (1990). Effects of Involvement, Argument Strength, and Source Characteristics on Central and Peripheral Processing of Advertising. *Psychology & Marketing, 7*(3) : 195-214.
- Ardissono, L., Goy, A., Petrone, G., & Segnan, M. (2002). Personalization in business-to-customer interaction. *Communications of the ACM, 45*(5) : 52-53. doi: 10.1145/506218.506245
- Areni, C. S., Ferrell, M. E., & Wilcox, J. B. (2000). The Persuasive Impact of Reported Group Opinions On Individuals Low vs. High in Need for Cognition: Rationalization vs. Biased Elaboration? *Psychology & Marketing, 17*(10) : 855-875.
- Avron, H., Boutsidis, C., Toledo, S., & Zouzias, A. (2013). *Efficient Dimensionality Reduction for Canonical Correlation Analysis*. Paper presented at the the 30th International Conference on Machine Learning, Atlanta, Georgia, USA.
- Awad, N. F., & Krishnan, M. S. (2006). The personalization privacy paradox: an empirical evaluation of information transparency and the willingness to be profiled online for personalization. *MIS Quarterly, 30* : 13-28.
- Axson, D., Yates, S., & Chaiken, S. (1987). Audience response as a heuristic cue in persuasion. *Journal of Personality and Social Psychology, 53*(1) : 30-40. doi: 10.1037/0022-3514.53.1.30
- Baghdassarian, S., & Frank, A. (2012). Forecast: Mobile Advertising, Worldwide, 2009-2016. (G00245428). from Gartner, Inc.
- Baker, S. M., & Petty, R. E. (1994). Majority and minority influence: Source-position imbalance as a determinant of message scrutiny. *Journal of Personality and Social Psychology, 67*(1) : 5-19. doi: 10.1037/0022-3514.67.1.5
- Bamba, F., & Barnes, S. J. (2007). SMS advertising, permission and the consumer: a study. *Business Process Management Journal, 13* : 815-829. doi: 10.1108/14637150710834578
- Bargh, J. A. (1982). Attention and automaticity in the processing of self-relevant information. *Journal of Personality and Social Psychology, 43*(3) : 425-436. doi: 10.1037/0022-3514.43.3.425
- Bargh, J. A. (2002). Losing Consciousness: Automatic Influences on Consumer Judgment, Behavior, and Motivation. *Journal of Consumer Research, 29*(2) : 280-285.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6) : 1173-1182. doi: 10.1037/0022-3514.51.6.1173
- Barwise, P., & Strong, C. (2002). Permission-based mobile advertising. *Journal of Interactive Marketing, 16*(1) : 14-24. doi: <http://dx.doi.org/10.1002/dir.10000>
- Bauer, H. H., Reichardt, T., Barnes, S. J., & Neumann, M. M. (2005). Driving consumer acceptance of mobile marketing: a theoretical framework and empirical study. *Journal of Electronic Commerce Research, 6*(3) : 181-192.

- Belch, G. E. (1981). An Examination of Comparative and Noncomparative Television Commercials: The Effects of Claim Variation and Repetition on Cognitive Response and Message Acceptance. *Journal of Marketing Research*, 18(3) : 333-349.
- Beneke, J., Cumming, G., Stevens, A., & Versfeld, M. (2010). Influences on Attitude Toward Mobile Text Message Advertisements: An Investigation of South African Youth. *International Journal of Mobile Marketing*, 5 : 77-97.
- Berry, J. W. (1990). Imposed etics, emics, and derived etics: Their conceptual and operational status in cross-cultural psychology. In T. N. Headland, K. L. Pike & M. Harris (Eds.), *Emics and etics: The insider/outsider debate* (Vol. 7, pp. 84-99). Thousand Oaks, CA, US: Sage Publications, Inc.
- Bhattacharjee, A., & Sanford, C. (2006). Influence processes for information technology acceptance: An elaboration likelihood model. *MIS Quarterly*, 30(4) : 805-825.
- Box, G. E. P., & Andersen, S. L. (1955). Permutation theory in the derivation of robust criteria and the study of departures from assumption. *Journal of the Royal Statistical Society. Series B (Methodological)* : 1-34.
- Brandenburger, A. M., & Nalebuff, B. J. (1995). The Right Game: Use Game Theory to Shape Strategy. *Harvard Business Review* : 57-71.
- Briñol, P., Petty, R. E., & Tormala, Z. L. (2004). Self Validation of Cognitive Responses to Advertisements. *Journal of Consumer Research*, 30(4) : 559-573.
- Brock, T. C. (1967). Communication discrepancy and intent to persuade as determinants of counterargument production. *Journal of Experimental Social Psychology*, 3(3) : 296-309.
- Brow, M. (2009). The Response Rates of Personalized Cross-Media Marketing Campaigns. pp. 1-18. Retrieved from <http://www.flprint.org>
- Burnkrant, R. E., & Unnava, H. R. (1995). Effects of Self-Referencing on Persuasion. *Journal of Consumer Research*, 22(1) : 17-26.
- Cacioppo, J. T., & Petty, R. E. (1981). Social psychological procedures for cognitive response assessment: The thought-listing technique. *Cognitive assessment* : 309-342.
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology*, 42(1) : 116-131. doi: 10.1037/0022-3514.42.1.116
- Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The Efficient Assessment of Need for Cognition. *Journal of Personality Assessment*, 48(3) : 306-307.
- Cacioppo, J. T., Von, H. W., & Ernst, J. M. (1997). Mapping cognitive structures and processes through verbal content: The thought-listing technique. *Journal of Consulting and Clinical Psychology*, 65(6) : 928-940.
- Celsi, R. L., & Olson, J. C. (1988). The Role of Involvement in Attention and Comprehension Processes. *Journal of Consumer Research*, 15(2) : 210-224.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, 39(5) : 752-766. doi: 10.1037/0022-3514.39.5.752
- Chaiken, S., & Trope, Y. (1999). *Dual-process theories in social psychology*. New York, USA: The Guilford Press.

- Chattopadhyay, A., & Nedungadi, P. (1992). Does Attitude toward the Ad Endure? The Moderating Effects of Attention and Delay. *Journal of Consumer Research*, 19(1) : 26-33.
- Cohen, A. R., Stotland, E., & Wolfe, D. M. (1955). An experimental investigation of need for cognition. *The Journal of Abnormal and Social Psychology*, 51(2) : 291-295.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*: Lawrence Erlbaum.
- Colquitt, J. A., Conlon, D. E., Wesson, M. J., Porter, C. O. L. H., & Ng, K. Y. (2001). Justice at the Millennium: A Meta-Analytic Review of 25 Years of Organizational Justice Research. *Journal of applied psychology*, 86(3) : 425-445.
- Cortina, J. M. (1993). What Is Coefficient Alpha? An Examination of Theory and Applications. *Journal of applied psychology*, 78(1) : 98-104.
- Crowley, A. E., & Hoyer, W. D. (1989). The Relationship Between Need for Cognition and Other Individual Difference Variables: A Two-Dimensional Framework. *Advances in Consumer Research*, 16(1) : 37-43.
- Dewan, R., Jing, B., & Seidmann, A. (2000, 4-7 Jan. 2000). *Adoption of Internet-based product customization and pricing strategies*. Paper presented at the the 33rd Annual Hawaii International Conference on System Sciences, Island of Maui, Hawaii, USA.
- Dey, A. K. (2001). Understanding and Using Context. *Personal Ubiquitous Computing*, 5(1) : 4-7. doi: 10.1007/s007790170019
- Dinev, T., & Hart, P. (2006). An Extended Privacy Calculus Model for E-Commerce Transactions. *Information Systems Research*, 17(1) : 61-80. doi: 10.1287/isre.1060.0080
- Don, W. B. (1974). Adolescent Attitudes and Lawful Behavior. *The Public Opinion Quarterly*, 38(1) : 98-106. doi: 10.2307/2747839
- Drossos, D., Giaglis, G. M., Lekakos, G., Kokkinaki, F., & Stavraki, M. G. (2007). Determinants of effective SMS advertising: an experimental study. *Journal of Interactive Advertising*, 7(2) : 16-27.
- Fan, H., & Poole, M. S. (2006). What Is Personalization? Perspectives on the Design and Implementation of Personalization in Information Systems. *Journal of Organizational Computing and Electronic Commerce*, 16(3-4) : 179-202. doi: 10.1080/10919392.2006.9681199
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2) : 175-191. doi: 10.3758/bf03193146
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. MA: Addison-Wesley.
- Glass, G. V., Peckham, P. D., & Sanders, J. R. (1972). Consequences of failure to meet assumptions underlying the fixed effects analyses of variance and covariance. *Review of educational research*, 42(3) : 237-288.
- Greenwald, A. G. (1968). Cognitive learning, cognitive response to persuasion, and attitude change. *Psychological foundations of attitudes*.

- Greenwald, A. G., & Banaji, M. R. (1989). The self as a memory system: Powerful, but ordinary. *Journal of Personality and Social Psychology*, 57(1) : 41-54.
- Haugtvedt, C. P., Petty, R. E., & Cacioppo, J. T. (1992). Need for Cognition and Advertising: Understanding the Role of Personality Variables in Consumer Behavior. *Journal of Consumer Psychology*, 1(3) : 239-260. doi: 10.1016/s1057-7408(08)80038-1
- Ho, S. Y., Davern, M. J., & Tam, K. Y. (2008). Personalization and choice behavior: the role of personality traits. *SIGMIS Database*, 39(4) : 31-47. doi: 10.1145/1453794.1453800
- Hong, J. W., & Zinkhan, G. M. (1995). Self-Concept and Advertising Effectiveness: The Influence of Congruency, Conspicuousness, and Response Mode. *Psychology & Marketing*, 12(1) : 53-77.
- Howard, J. A., & Sheth, J. N. (1969). *The theory of buyer behavior*. New York: Wiley.
- Icek, A. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2) : 179-211. doi: 10.1016/0749-5978(91)90020-t
- Inman, J. J., McAlister, L., & Hoyer, W. D. (1990). Promotion Signal: Proxy for a Price Cut? *Journal of Consumer Research*, 17(1), pp. 74-81. doi: 10.1086/208538
- Instone, K. (2000). Information Architecture and Personalization. pp. 1-10. Retrieved from <http://argus-acia.com/>
- ITU, I. T. U. (2013). The World in 2013 ICT Facts and Figures. *The World in 2013 ICT Facts and Figures*, (February 2013). Retrieved from <http://www.itu.int/ITU-D/ict/> website: <http://www.itu.int/ITU-D/ict/facts/index.html>
- Jackson, T. W. (2007). Personalisation and CRM. *Journal of Database Marketing & Customer Strategy Management*, 15 : 24-36. doi: 10.1057/palgrave.dbm.3250065
- Kahneman, D. (1973). *Attention and effort*: Prentice Hall.
- Katz, D. (1960). The functional approach to the study of attitudes. *Public Opinion Quarterly*, 24(2) : 163-204. doi: 10.1086/266945
- Kihlstrom, J. F., Cantor, N., Albright, J. S., Chew, B. R., Klein, S. B., & Niedenthal, P. M. (1988). Information processing and the study of the self. *Advances in experimental social psychology*, 21 : 145-178.
- Klein, S. B., & Kihlstrom, J. F. (1986). Elaboration, Organization, and the Self-Reference Effect in Memory. *Journal of Experimental Psychology: General*, 115(1) : 26-38. doi: 10.1037/0096-3445.115.1.26
- Kobsa, A. (2000). *User modeling as a key factor in system personalization*. Paper presented at the CHI 2000, The Hague, The Netherlands.
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1) : 159-174.
- Leppäniemi, M., & Karjaluoto, H. (2005). Factors influencing consumers' willingness to accept mobile advertising: a conceptual model. *International Journal of Mobile Communications*, 3(3) : 197-213. doi: <http://dx.doi.org/10.1504/IJMC.2005.006580>
- Mackenzie, S. B. (1986). The Role of Attention in Mediating the Effect of Advertising on Attribute Importance. *Journal of Consumer Research*, 13(2) : 174-195.

- MacInnis, D. J., & Jaworski, B. J. (1989). Information Processing from Advertisements: Toward an Integrative Framework. *Journal of Marketing*, 53(4) : 1-24. doi: 10.2307/1251376
- Madden, T. J., Allen, C. T., & Twible, J. L. (1988). Attitude toward the Ad: An Assessment of Diverse Measurement Indices under Different Processing "Sets". *Journal of Marketing Research*, 25(3) : 242-252.
- McGuire, W. J. (1968). Personality and attitude change: An information processing theory. In A. G. Greenwald, T. C. Brock & T. M. Ostrom (Eds.), *Psychological foundations of attitudes* (pp. 172-197). New York: Academic Press.
- Mela, C. F., Gupta, S., & Lehmann, D. R. (1997). The long-term impact of promotion and advertising on consumer brand choice. *Journal of Marketing Research*, 34(2) : 248-261.
- Merisavo, M., Kajalo, S., Karjaluo, H., Virtanen, V., Salmenkivi, S., Raulas, M., & Leppäniemi, M. (2007). An empirical study of the drivers of consumer acceptance of mobile advertising. *Journal of interactive Advertising*, 7(2) : 41-50.
- Mitchell, A. A., & Olson, J. C. (1981). Are Product Attribute Beliefs the Only Mediator of Advertising Effects on Brand Attitude? *Journal of Marketing Research*, 18(3) : 318-332. doi: 10.2307/3150973
- Mobile Marketing Association. (2012). 'Mobile Messaging in North America: A Fresh Look at Current Options for Marketers'. pp. 1-21. Retrieved from <http://www.mmaglobal.com/news/mma-publishes-whitepaper-%E2%80%98mobile-messaging-north-america-fresh-look-current-options-marketers%E2%80%99>
- Montgomery, A., & Smith, M. D. (2009). Prospects for Personalization on the Internet. *Journal of Interactive Marketing*, 23(2) : 130-137. doi: <http://dx.doi.org/10.1016/j.intmar.2009.02.001>
- Muller, D., Judd, C. M., & Yzerbyt, V. Y. (2005). When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology*, 89(6) : 852-863. doi: 10.1037/0022-3514.89.6.852
- Murphy, G. (1947). *Personality: A biosocial approach to origins and structure*. New York, NY, US: Harper & Brothers.
- Murthi, B. P. S., & Sarkar, S. (2003). The Role of the Management Sciences in Research on Personalization. *Management Science*, 49(10) : 1344-1362. doi: 10.1287/mnsc.49.10.1344.17313
- Pechmann, C., & Stewart, D. W. (1990). The Effects of Comparative Advertising on Attention, Memory, and Purchase Intentions. *Journal of Consumer Research*, 17(2), pp. 180-191.
- Personalization Consortium. (2003). What is personalization. *Personalization Consortium*. Retrieved from <http://www.personalization.org>
- Petty, R. E., Briñol, P., & Tormala, Z. L. (2002). Thought confidence as a determinant of persuasion: The self-validation hypothesis. *Journal of Personality and Social Psychology*, 82(5) : 722-741. doi: 10.1037/0022-3514.82.5.722

- Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology*, 46(1) : 69-81.
- Petty, R. E., & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer-Verlag.
- Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and Peripheral Routes to Advertising Effectiveness: The Moderating Role of Involvement. *Journal of Consumer Research*, 10(2) : 135-148. doi: 10.1086/208954
- Petty, R. E., Heesacker, M., & Hughes, J. N. (1997). The elaboration likelihood model: Implications for the practice of school psychology. *Journal of School Psychology*, 35(2) : 107-136. doi: 10.1016/s0022-4405(97)00003-4
- Rau, P.-L. P., Zhang, T., Shang, X., & Zhou, J. (2011). Content relevance and delivery time of SMS advertising. *International Journal of Mobile Communications*, 9(1) : 19-38. doi: 10.1504/ijmc.2011.037953
- Riecken, D. (2000). Personalized Views of PERSONALIZATION, Editorial, *Communications of the ACM*, pp. 26-28. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=11950559&site=ehost-live&scope=site>
- Rogers, T. B., Kuiper, N. A., & Kirker, W. S. (1977). Self-reference and the encoding of personal information. *Journal of Personality and Social Psychology*, 35(9) : 677-688.
- Sheng, H., Nah, F. F.-H., & Siau, K. (2008). An Experimental Study on Ubiquitous commerce Adoption: Impact of Personalization and Privacy Concerns. *Journal of the Association for Information Systems*, 9(6) : 344-366.
- Sicilia, M., Ruiz, S., & Munuera, J. L. (2005). Effects of interactivity in a web site: The moderating effect of need for cognition. *Journal of Advertising*, 34(3) : 31-45.
- Srivastava, A. (1959). Effect of non-normality on the power of the analysis of variance test. *Biometrika*, 46(1/2) : 114-122.
- Straus, S. G. (1997). Technology, group process, and group outcomes: testing the connections in computer-mediated and face-to-face groups. *Hum.-Comput. Interact.*, 12(3) : 227-266. doi: 10.1207/s15327051hci1203_1
- Sunikka, A., & Bragge, J. (2009). Promotional messages in multichannel banking: Attractive or annoying? *Journal of Financial Services Marketing*, 14 : 245-263.
- Szymanski, D. M., & Henard, D. H. (2001). Customer Satisfaction: A Meta-Analysis of the Empirical Evidence. *Journal of the Academy of Marketing Science*, 29(1) : 16-35. doi: 10.1177/009207030102900102
- Tam, K. Y., & Ho, S. Y. (2005). Web Personalization as a Persuasion Strategy: An Elaboration Likelihood Model Perspective. *Information Systems Research*, 16(3) : 271-291. doi: 10.1287/isre.1050.0058
- Tam, K. Y., & Ho, S. Y. (2006). Understanding the Impact of Web Personalization on User Information Processing and Decision Outcomes. *MIS Quarterly*, 30(4) : 865-890.
- Tiku, M. (1971). Power function of the F-test under non-normal situations. *Journal of the American Statistical Association* : 913-916.

- Twogood, C. (2003). The Power of Event-Based Marketing. pp. 1-11. Retrieved from <http://www.teradata.com/brochures/The-Power-of-Event-Based-Marketing-eb3097/>
- Unni, R., & Harmon, R. (2007). Perceived effectiveness of push vs. pull mobile location-based advertising. *Journal of interactive Advertising*, 7(2) : 28-40.
- Vesonen, J. (2007). What is personalization? A conceptual framework. *European Journal of Marketing*, 41(5/6) : 409-418. doi: 10.1108/03090560710737534
- Vignette Corporation. (2002). Personalization Strategies-Fit Technology to Business. Retrieved from <http://www.opentext.com/2/global.htm>
- Wendt, J. C. (1979). Canonical Correlation as an Exploratory Technique of Attitude Scale Correlation. *Public Opinion Quarterly*, 43(4) : 518-531. doi: 10.1086/268548
- Wright, P. (1973). The cognitive processes mediating acceptance of advertising. *Journal of Marketing Research*, 10(1) : 53-62. doi: 10.2307/3149409
- Wright, P. (1980). Message-Evoked Thoughts: Persuasion Research Using Thought Verbalizations. *Journal of Consumer Research*, 7(2) : 151-175. doi: 10.1086/208804
- Xu, H., Teo, H.-H., Tan, B. C. Y., & Agarwal, R. (2009). The Role of Push-Pull Technology in Privacy Calculus: The Case of Location-Based Services. *Journal of Management Information Systems*, 26(3) : 135-174.

Appendices

Appendix A Coding & Rating Instructions & Guidelines

(adapted from Wright, 1973)

Please read the instructions carefully and follow step-by-step on coding and rating.

Instructions

1. Firstly, the rater must finish reading through the whole verbatim of each subject.
2. Then follow the classification & dimension (scoring) guideline as provided in these instructions.
3. For any lack of clarity regard unitization, get advice from the researcher.

Classification Guidelines

There are two mutually exclusive classifications; the statements might be in the form of either incomplete or complete sentences, declarative sentences or rhetorical questions (Wright, 1973).

The following are the details & guidelines for classification:

1. Advertising (Ads) or SMS related: statements which are directly related to the message or content in the advertising in SMS.
2. Non-Advertising (Non-Ads): statements which are not directly related to the message or content in the advertising in SMS.

Dimension/Scoring Guidelines

There are three dimensions or scoring: positive, neutral and negative.

The following are the details & guidelines for dimensions:

1. Positive: statements which are addressed in favor of or express a good attitude toward the ads (Wright, 1973) and which:
 - (a) state a specific favorable consequence of ads.
 - (b) state a specific desirable attribute of the ads.
 - (c) suggest an undesirable consequence of other credit cards

(d) reaffirm the accuracy or validity of an argument presented in the advertisement.

The following types of statements are not to be considered as Positive.

(a) positive emotional reactions unaccompanied by any of the classifications of statements.

2. Neutral: statements which are neither favorable nor unfavorable toward the ads.

3. Negative: statements which are directed against or unfavorable attitude toward the ads and which:

(a) state a specific unfavorable consequence of ads.

(b) state a specific undesirable attribute of the ads.

(c) suggest an alternative method for handling one of the problems cited in the advertising message.

(d) state a specific favorable or desirable consequence or attribute of an alternative credit card.

(e) challenge the accuracy or validity of a specific argument contained in the advertising message.

These curiosity expressions are distinguishable from rhetorical question negative through your own discretion as to the subject's intent. If the intent was to question validity, express disbelief, or point out a counterargument, the statement is a Negative.

The following types of statements are not to be considered as Negative.

(a) emotional reactions which aren't accompanied by any of the types of statements discussed above.

Appendix B Original Four-Item of Attitude Toward Advertising

Attitude Toward Ads Scale (Mitchell & Olson, 1981)

The original items used semantic differential (SD) scale; this needed to be adapted into agreement answers on a five-point Likert scale as follows:

- 5 Strongly Agree
- 4 Agree
- 3 Neither Agree nor Disagree
- 2 Disagree
- 1 Strongly Disagree

Original SD Scales	Adapted Agreement Answer Statement
good-bad	The promotion in SMS that I just received is good
like-dislike	I like the promotion in SMS
irritating-not irritating **	The promotion in SMS is irritating.
interesting-uninteresting	The promotion in SMS is very interesting.

** Reversed score

Appendix C Measurement Items

18-Item (Short form) for Need for Cognition Scale (Cacioppo et al., 1984)

1 extremely uncharacteristic of me 2 somewhat uncharacteristic of me 3 uncertain 4 somewhat characteristic of me 5 extremely characteristic of me

1. ____	I prefer complex to simple problems.
2. ____	I like to have the responsibility of handling a situation that requires a lot of thinking.
3. ____	Thinking is not my idea of fun.**
4. ____	I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.**
5. ____	I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.**
6. ____	I find satisfaction in deliberating hard and for long hours.
7. ____	I only think as hard as I have to.**
8. ____	I prefer to think about small daily projects to long term ones.**
9. ____	I like tasks that require little thought once I've learned them.**
10. ____	The idea of relying on thought to make my way to the top appeals to me.
11. ____	I really enjoy a task that involves coming up with new solutions to problems.
12. ____	Learning new ways to think doesn't excite me very much.**
13. ____	I prefer my life to be filled with puzzles I must solve.
14. ____	The notion of thinking abstractly is appealing to me.
15. ____	I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
16. ____	I feel relief rather than satisfaction after completing a task that requires a lot of mental effort.**
17. ____	It's enough for me that something gets the job done; I don't care how or why it works.**
18. ____	I usually end up deliberating about issues even when they do not affect me personally.

Note: **=reverse scored item.

The Five Items of Need for Cognition (adapted from Cacioppo et al. (1984))

1	2	3	4	5
Extremely uncharacteristic of me	Somewhat uncharacteristic of me	Uncertain	Somewhat characteristic of me	Extremely characteristic of me

1. I prefer complex to simple problems.
2. I like to have the responsibility of handling a situation that requires a lot of thinking.
3. Thinking is not my idea of fun.**
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.**
5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.**

** Reversed score

Appendix D Questionnaire in English (Translated)

SERIAL NO. (xxxx)

CARD NO. (xxxxxx)

QN FW (xxxxxx)

BANK MOBILE

Question

Hello, my name is ... I am a research interviewer from Research Inc. which is a marketing research firm. The company is in commissioned by Chulalongkorn University and ABC credit card to survey your opinion. Your name and telephone number were given by ABC credit card.

This survey aims to improve the service; there will be no product advertising or selling to you.

A0. Are you convenient for us to survey about 5 minutes?

OK	1
Not OK	2

A1. Please tell us about your feeling and opinion regarding to the SMS from credit card company which you just received within a few minutes ago.

Read:

The following questions are for asking your own opinion, please answer from one of these opinion levels as following:

- Answer 5 means Totally agree
- Answer 4 means Agree
- Answer 3 means Not sure or Neutral
- Answer 2 means Disagree
- Answer 1 means Totally disagree

Attention

Q1 At first glance, when you received the SMS, how much did you rate the attractiveness of it?

Q2 How much have attention did you pay to the SMS?"

Attitude toward Ads

Q3 About promotion from SMS, I think it is a good promotion.

Q4 I feel impressed about promotion from SMS.

Q5 About promotion from SMS, It looks interesting.

Q6 I feel irritated about promotion from SMS.

Manipulation check (only for SMS that has greeting message)

Q7 Did you see your name in the SMS?

Personality trait

Q8 **Read:** The following questions are used to evaluate personality in general, please answer how much you do agree with the statement.

5	4	3	2	1
Extremely characteristic of me	Somewhat characteristic of me	Uncertain	Somewhat uncharacteristic of me	Extremely uncharacteristic of me

<u>Read one by one sentence:</u>		5	4	3	2	1	Don't know
How much do you agree?							
<i>Interviewer : Ask as the direction</i>		==>	==>	==>	==>		
()	01 I prefer complex to simple problems	5	4	3	2	1	98
()	02 I like to have the responsibility of handling a situation that requires a lot of thinking	5	4	3	2	1	98
()	03 Thinking is not my idea of fun	5	4	3	2	1	98
()	04 I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.	5	4	3	2	1	98
()	05 I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.	5	4	3	2	1	98

Thank you and end the interview

Appendix E Original Questionnaire in Thai Language

SERIAL NO. (xxxx)

CARD NO. (xxxxxx)

QN FW (xxxxxxx)

BANK MOBILE

คำถามหลัก

สวัสดีค่ะ/ครับ ดิฉัน/ผมชื่อ ... เป็นพนักงานสัมภาษณ์จากบริษัท รีเสิร์ช จำกัด ซึ่งเป็นบริษัทวิจัยตลาด ขณะนี้ทางบริษัทกำลังสำรวจความคิดเห็นของท่านโดยได้รับการสนับสนุนจาก "งานวิจัยระหว่างจุฬาลงกรณ์มหาวิทยาลัยและบัตรเครดิต ABC" ซึ่งได้ให้ชื่อและเบอร์โทรศัพท์ของท่านกับเรา เพื่อที่จะสอบถามความคิดเห็น ของท่าน

การสำรวจนี้ทำขึ้นเพื่อปรับปรุงการบริการให้ดียิ่งขึ้นและจะไม่มีการเชิญชวนให้ท่านซื้อสินค้าใดๆ

A0. ไม่ทราบว่าคุณสะดวกในการตอบแบบสอบถามในเวลา 5 นาทีนี้หรือไม่?

สะดวก	1
ไม่สะดวก	2

A1. กรุณาบรรยายถึงความรู้สึกและความคิดเห็นของตนเอง เมื่อท่านได้รับข้อความ sms จากบัตรเครดิต ABC ขอให้ท่านช่วยบอกความรู้สึกต่อเนื้อหาข้อความ หรือ โพรโมชันที่ได้รับก็ได้ ภายในเวลาสองถึงสามนาที

อ่าน:

ต่อไปนี้เป็นกลุ่มคำถามที่ประเมินความเห็นด้วยของตนเองต่อประโยคที่จะอ่านต่อไปนี้ โดยขอให้ตอบจากระดับความคิดเห็นดังนี้

ตอบ 5 หมายถึง เห็นด้วยเป็นอย่างมาก

ตอบ 4 หมายถึง เห็นด้วย

ตอบ 3 หมายถึง ค่อนข้างจะเห็นด้วย

ตอบ 2 หมายถึง ไม่ค่อยจะเห็นด้วย

ตอบ 1 หมายถึง ไม่เห็นด้วยเลยเป็นอย่างยิ่ง

Attention

Q1 ทันทีที่ท่านได้รับ SMS จากบัตรเครดิต ABC ทางมือถือเมื่อสักครู่นี้ ฉันรู้สึกสะดุดตา

Q2 ท่านให้ความสนใจใน SMS ที่ได้รับจากบัตรเครดิต ABC

Attitude toward Ads

Q3 โปรโมชั่นจาก SMS ที่ฉันเพิ่งได้รับทางมือถือเมื่อสักครู่นี้เป็นโปรโมชั่นที่ดี.

Q4 ฉันรู้สึกประทับใจ โปรโมชั่นจาก SMS ที่ท่านเพิ่งได้รับทางมือถือเมื่อสักครู่นี้ (คำตอบเดียว).

Q5 โปรโมชั่นจาก SMS ที่ฉันเพิ่งได้รับทางมือถือเมื่อสักครู่นี้ ดูน่าสนใจ.

Q6 ฉันอึดอัดรำคาญใจต่อ โปรโมชั่นจาก SMS ที่ท่านเพิ่งได้รับทางมือถือเมื่อสักครู่นี้.

Manipulation check (only for SMS that has greeting message)

Q7 คุณได้เห็นชื่อของตัวเองจาก SMS ที่ท่านเพิ่งได้รับทางมือถือเมื่อสักครู่นี้หรือไม่.

Personality trait

Q8 **อ่าน:** ประโยคที่จะประเมินต่อไปนี้จะเกี่ยวกับลักษณะนิสัยของคนทั่วไป และ เราอยากให้คุณประเมินว่าตรงกับนิสัยของคุณเองเพียงใด.

5	4	3	2	1
ตรงกับตัวฉัน อย่างมาก	ค่อนข้างจะตรง กับตัวฉัน	ไม่แน่ใจว่า ตรงกับฉัน หรือไม่	ไม่ค่อยจะตรงกับ ตัวฉัน	ไม่ตรงกับตัวฉัน เลย

		5	4	3	2	1	ไม่ทราบ
อ่านที่ประโยค: ตรงกับ คุณเพียงใด ค่ะ/ครับ?							
พนักงานสัมภาษณ์: ตามตาม แนวนอน			==>	==>	==>	==>	
()	01 ฉันชอบปัญหาที่ซับซ้อน มากกว่าปัญหาที่ง่าย	5	4	3	2	1	98
()	02 ฉันอยากรับผิดชอบกับ สถานการณ์ที่ต้องใช้ ความคิดมากๆในการจัดการ	5	4	3	2	1	98
()	03 การต้องใช้ความคิดไม่ใช่ สิ่งที่สนุกในความคิดของ ฉัน	5	4	3	2	1	98
()	04 ฉันชอบที่จะทำอะไรที่ไม่ ต้องใช้ความคิดเยอะ มากกว่าที่จะทำอะไรที่ทำ หายความสามารถในการ คิด	5	4	3	2	1	98
()	05 ฉันพยายามที่จะคาดคะเน และหลีกเลี่ยงเหตุการณ์ที่มี โอกาสที่ฉันจะต้องใช้ ความคิดในเชิงลึกกับ อะไรบางอย่าง	5	4	3	2	1	98

กล่าวขอบคุณและจบการสัมภาษณ์

Appendix F Actual SMS in Field Experiment for All Groups



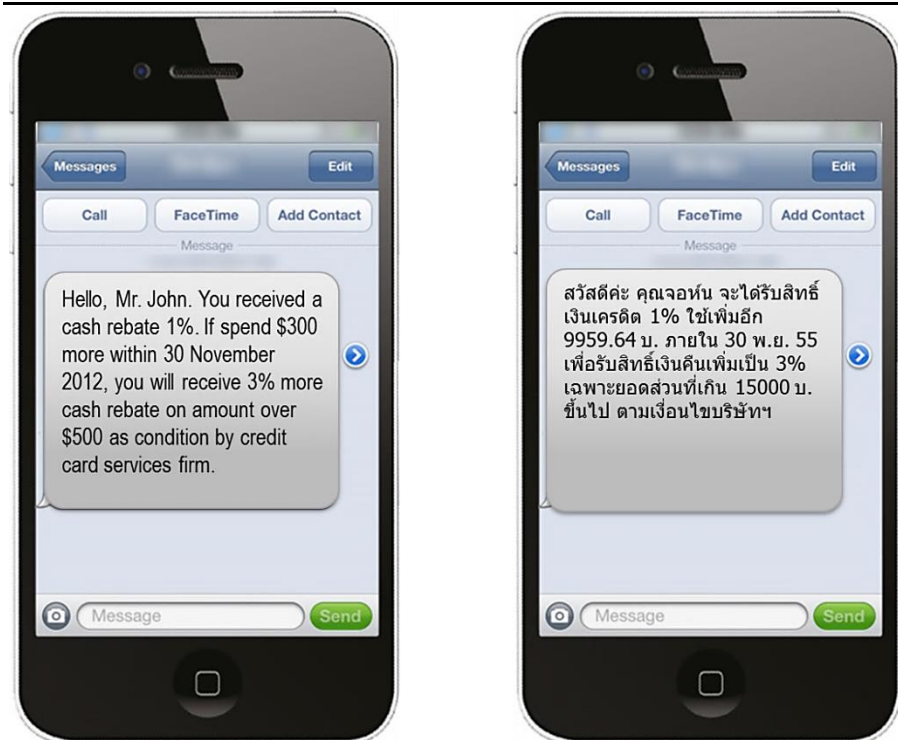
SMS for Group #1 Control Group



SMS for Group #2 Context-driven Personalization Group



SMS for Group #3 Self-reference Group



SMS for Group #4 Context-driven Personalization and Self-reference

Biography

Name: Narain Chutijirawong

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EXPERIENCES:

IBM THAILAND COMPANY LIMITED **2012 – Present**
Rational Software Brand Manager

MICROSOFT (THAILAND) LTD. **2008 – 2010**
Product Marketing Manager

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ORACLE CORPORATION (THAILAND) LTD. **2003 – 2007**
CRM Regional Strategic Account Manager for ASEAN

SASIN MANAGEMENT CONSULTING **2002 – 2003**
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COMPUTER ASSOCIATES THAILAND LTD. **2001 – 2002**
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