Where and How to Advertise? An Empirical Study on Mobile Ad Attitude and Response Based on Contextual Factors

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A B S T R A C T

Mobile technologies have enabled marketers to target consumers anywhere and anytime. However, as consumers react and respond differently depending on what situation they are in, there is an apparent need to determine when, where, and what kind of advertisement is most relevant to the consumer. This paper proposes a holistic approach to examine the response of consumers when faced with two types of contextual factors (environmental/spatial and social contexts) through the lens of the Mobile Advertising Effectiveness Framework. We focus on the contextual effects of perceived distance from the offline store and the effect of popularity cue indication. A scenario-based survey is conducted to investigate the effects of perceived distance and popularity cue on the users' attitudes, and ultimately on their response intentions, upon receipt of mobile ads. Results of the study confirm the hypotheses: first, mobile ads sent when users perceive the physical store to be in close proximity tend to evoke more positive attitudes and elicit better responses compared to when users perceive the store to be farther away. Additionally, ad messages indicating high popularity were found to be more appealing than those with low popularity. These empirical results underscore the pivotal role of context, encompassing both spatial context (proximity to offline stores) and social context (popularity cues), in shaping consumer attitudes and response intentions in mobile advertising. The findings of the study offer theoretical insights that underline the significance of holistic context-based approaches that in turn, marketers may use to design more effective mobile ad campaigns that may elicit better responses from consumers.

Keywords: Mobile Ad Response, Contextual Factors, Perceived Distance, Offline Store Proximity, Perceived Popularity, Popularity Cues, Mobile Targeting

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Ⅰ. Introduction

Mobile technologies have become inextricably bound up with modern lifestyle. This trend is expected to significantly proliferate as mobile devices diffuse rapidly. One industry forecast company has found that the number of smartphone users worldwide was 6.4 billion in 2022 and is forecast to exceed 7.7 billion by 2028.[1] Moreover, about 73% of internet users are expected to access the web exclusively through their smartphones by 2025.[2] Therefore, companies are concentrating their marketing budget into mobile-based promotion, reaching a record of $327.1 billion in mobile advertising spending worldwide in 2022, and is expected to amount to nearly $399.6 billion by 2024.[3]

Mobile advertising has unique properties compared to traditional advertising. Mobile technologies enable "ubiquitous access capability" which users can access whenever and wherever they want (Bang et al., 2013, p. 6). This makes marketing communications via mobile devices an attractive option for marketers (Wehmeyer, 2007). As the mobile device is equipped with sensors that can identify users' context, location-based advertising (LBA) has allowed marketers to target advertisements to provide for the needs of consumers in a particular situation (Grewal et al., 2016). Targeted advertisements ensure the right person receives the right message at the right time (Adam, 2002) by deriving relevant personal information from users including location, time, behavior, and preferences.

Contextual factors complicate optimal advertising

behavior that pose interesting problems to marketers (Andrews et al., 2016), thus, it has been an interesting topic for IS researchers. Context, defined by Abowd et al. (1999) as any information used to characterize the situation of an entity that is relevant to the interaction between a user and an application, is an important factor in determining the effectiveness of advertising. Prior studies have examined the extent to which contextual factors such as physical location (Ghose et al., 2018), location characteristics (Andrews et al., 2016; Ghose et al., 2018; Hong and Im, 2018), time of day (Phang et al., 2019), and consumer behavior (Fong et al., 2015) affect the effectiveness of mobile ads.

However, due to the complexity of examining context, existing literature has focused on isolated aspects of context where only few studies have ventured to explore the simultaneous impact of multiple contextual factors. To address this research gap, our study investigates the combined influence of two contextual factors: spatial and social factors on mobile ad attitudes and response intentions. The primary research questions for this study are as follows:

Q1: *How does perceived proximity to offline store and perceived popularity affect consumer's attitudes to mobile ads?*
Q2: *Does this effect ultimately influence the consumer's response to the mobile ad?*

To investigate these questions, we employ a 2x2 between-subjects scenario-based survey design, examining the impact of perceived proximity (near vs. far) of offline physical store and perceived popularity (low vs. high) on mobile ad attitudes and response intentions. Our goal is to discern the optimal conditions for delivering advertisements that resonate most effectively with consumers. This study seeks

to provide guidance for marketers and researchers alike, offering insights into when, where, and what type of advertisements are most relevant to consumers. By unraveling the complex interplay of contextual factors when sending mobile ads, we aim to pave the way for more efficient targeting of consumers.

The rest of the research is organized as follows. In Section II, the theoretical background and literature review of existing research on contextual factors and mobile ad effectiveness are discussed. Section III consists of the research model and hypotheses development of this study. Section IV contains the research methodology and study design to test the hypotheses, and Section V includes the data analysis and results. Lastly, Section VI discusses the conclusion, as well as the implications and limitations of the current study.

Ⅱ. Theoretical Background

The theoretical foundation of this study is grounded on the Mobile Advertising Effectiveness Framework developed by Grewal and colleagues (2016). This framework is a significant contribution to the field of mobile advertising research, shedding light on the multifaceted nature of factors that influence the effectiveness of mobile advertisements. Understanding the intricacies of this framework is vital to appreciate the context-based approach adopted in this study.

Grewal et al. (2016)'s framework promotes the pivotal role that context plays in determining the success of mobile advertising campaigns. It recognizes seven key drivers, each of which contributes to the overall effectiveness of mobile ads: (1) environmental and technological context, (2) consum-

er-related context, (3) advertising goals, (4) market factors, (5) advertising elements, (6) outcome metrics, and (7) firm-level macro factors. In the context of this study, we focus on three specific drivers within Grewal et al. (2016)'s framework: environmental context (spatial), consumer-related context (social), and outcome metrics. By concentrating on these drivers, we aim to dissect and analyze the contextual elements that directly influence mobile advertising effectiveness in the contemporary digital landscape. Understanding the dynamics between these drivers and their impact on mobile ad campaigns is fundamental to our research objectives.

2.1. Environmental Context: Distance

Environmental context is characterized depending on *where* and *when* a mobile advertisement is delivered (Grewal et al., 2016), which highlights the need for adaptability and relevance in mobile ad content. Previous studies have investigated how physical location (Ghose et al., 2018), location characteristics (Andrews et al., 2016; Ghose et al., 2016; Hong and Im, 2018), time of day (Phang et al., 2019) influence how a consumer views and responds to mobile ads. Five representative literatures that examine the effect of environmental context on mobile ad response are compiled in <Table 1>.

Location-based technologies in the mobile device have enabled geo-targeting, or the delivery of personalized ads to users based on their geographical location, allowing marketers to deliver mobile ads when a user enters a certain vicinity. Prior research has consistently demonstrated that the spatial distance between a store and a mobile user significantly influences their attitudes and responses to mobile advertisements. For instance, Fong et al. (2015) uncover geotargeting effects wherein consumers tar-

<Table 1> Representative Literature on Environmental Context and Mobile Ad Response

Paper	Variables	Metric	Findings
Andrews et al. (2016)	Crowdedness	Redemption	Commuters in crowded subway trains are twice as likely to respond to a mobile offer than in noncrowded trains
Ghose et al. (2018)	Trajectory (user's offline movement)	Redemption	Trajectory-based mobile targeting achieved higher coupon redemption rates and higher revenues.
Hong and Im (2018)	Temporal captivity	Mobile ad opening	Users are more receptive to mobile ads under captive transit conditions, more so under additional temporal conditions.
Ghose et al. (2019)	Commuting	Redemption	Commuters are about 3x likely to redeem a coupon than noncommuters. Multi-coupon distribution increased redemption by noncommuters.
Phang et al. (2019)	Time of day	Response to message	Utilitarian value presented in the morning is more appealing while hedonic value is more appealing in the afternoon.

geted in a geo-fenced area in proximity to a store ended up purchasing more than those who received the same mobile promotion at another location.

Actual geographical distance has been extensively studied by previous studies but location characteristics that relate to activities and interactions of a user or system are found to provide more meaningful location information than actual geographical location (Arminen, 2006). Thus, guided by the importance that not just physical distance matters but rather the significance of how consumers perceive and interpret that distance in the context of their current situation and intent, we try to understand further the effects of environmental context by investigating perceived distance which is defined as "the representation of the distance between oneself and an object" (Woods et al., 2009). In this study, we turn our attention toward the consumer's perception of the distance between themselves and the physical store at the precise moment when the mobile ad is sent.

2.2. Consumer-related Context: Popularity Cues

The second driver, consumer-related context,

delves into the diverse characteristics and behaviors of mobile users which encompasses a wide range of factors that pertain to the characteristics, behaviors, and social aspects of consumers. When discussing the drivers that influence mobile advertising effectiveness, it's common to consider both the broader consumer-related context and, within that, the specific dimension of social context.

Human behavior is not solely determined by the immediate physical environment but is profoundly shaped by social interactions and influences. Given that mobile applications inherently facilitate social connections and interactions, it becomes imperative to understand how these social contexts exert their sway on the efficacy of mobile advertisements (Grewal et al., 2016). Previous research has looked at concepts such as co-location (Zubcsek et al., 2017), which show that users who find themselves in the same physical location simultaneously exhibit similar responses to mobile advertisements.

Popularity cues, a form of consumer-driven cues, is defined as "promotional cues that indicate pervasive consumer interest in a product" (Goldstein et al., 2008) which act as social norms that drive intention to purchase products. Popularity cues also serve as

social norms that are effective in lowering perceived consumption risk and provide social validation for product quality (Goldstein et al., 2008; Griskevicius et al., 2009). This is further supported by the Social Impact Theory (Latané, 1981) which proposes that people's behaviors are influenced socially by (a) the number of people, (b) strength (i.e., power or social status), and (c) immediacy). Banerjee (1992) presents a common example of this effect from our everyday life in that we often choose stores or restaurants based on how popular they seem to be.

In this study, we explore the concept of perceived popularity and its profound impact on mobile advertisements. Specifically, we investigate how mobile ads that incorporate popularity cues (particularly those shown with high popularity) serve as a mechanism for social context that improves attitudes and responses of consumers towards the mobile ad.
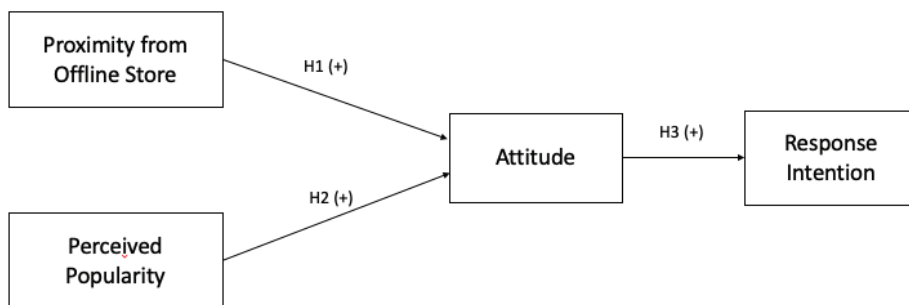
Ⅲ. Research Model And Hypotheses

In this current research, we empirically test the MAEF by Grewal et al. (2016) in determining consumers' attitudes and response intention to mobile ads. Our hypotheses first investigate the role of contextual factors (spatial and social) and how they influ-

ence consumers' attitudes toward mobile ads. Due to the difficulty of measuring actual distance and popularity in a survey setting, we chose to investigate perceived distance and perceived popularity to disclose the effects of the context variables. Finally, we determine the effect of attitudes on mobile ad attitudes to response intention. <Figure 1> presents the current study's research model.

Users engage more when messages are useful at the time of their receipt (Grewal et al., 2016). Tobler's (1970) first law of geography states that "everything is related to everything else, but near things are more related than distant things." This foundational principle underscores the significance of geographic proximity and when applied to mobile advertising, this law suggests that the proximity of the user to a physical store creates a stronger connection between the ad's content and the user's current location. This heightened relevance stems from the fact that the advertised products or services are readily accessible to the user, aligning with their immediate geographic context.

Additionally, the theory of immediate gratification suggests that individuals are more likely to engage with offers or opportunities that are immediately accessible. In essence, an offer close by is inherently more tempting to redeem because of its immediate availability (O'Donoghue and Rabin, 2000). When

<Figure 1> Research Model

a mobile ad offers a promotion, discount, or product availability at a store nearby, it taps into this psychological principle. Consumers are drawn to the prospect of instant gratification, making them more inclined to view the ad positively and consider taking immediate action.

Empirical evidence from a study involving 2,131 US consumers[4] reveals a compelling consumer behavior pattern. It indicates that a significant majority, approximately 93.2%, typically choose to purchase from stores that are within a 20-minute travel time (or less). This finding underscores the practical significance of proximity in consumer decision-making. When a mobile ad conveys that a physical store is conveniently located within a short travel distance, it aligns with the prevailing preference for nearby shopping options. Consequently, users are more likely to view such ads positively, as they offer a convenient and relevant shopping opportunity.

In light of these logical arguments, we posit that the perceived proximity of a physical store at the moment of receiving a mobile ad contributes significantly to consumers' positive attitudes toward the ad. This heightened relevance, driven by immediate gratification, and the principles of geographic proximity, enhances the ad's overall effectiveness in capturing users' attention and fostering favorable attitudes. Consequently, proximity to offline stores emerges as a key contextual factor shaping consumers' perceptions of mobile ads, forming the basis for our first hypothesis:

H1: Proximity from offline store positively influences consumer's attitudes towards mobile ads.

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4) https://cdn2.hubspot.net/hubfs/263750/Access_Consumer_Spend_Study_2016.pdf

Since mobile apps are inherently social, it is also essential to determine how social contexts influence the effectiveness of mobile ads (Grewal et al., 2016). We look at the effect of indicating popularity cues on ads as a mechanism of perceived popularity. Popularity cues within ads can be regarded as potent descriptive norms. Descriptive norms refer to the tendency of individuals to align their behaviors and decisions with what they perceive as typical or normal among their peers (Cialdini et al., 1990). In the context of online shopping, studies such as the one conducted by Kim and Min (2014) have demonstrated that consumers are often persuaded to purchase products endorsed as popular or trending among others. When consumers perceive that a mobile ad is associated with a high level of popularity, it triggers the psychological mechanism of conformity, leading them to view the ad more favorably.

The principle of perceived popularity can also be seen as a cognitive shortcut in decision-making. Amidst information overload and the cognitive demands of evaluating numerous options, consumers often seek shortcuts to simplify their decision processes (Tversky and Kahneman, 1974). When an ad conveys high popularity, it serves as a cognitive cue that signals to consumers that the product or service in question is likely to align with the preferences and choices of a broader audience. This reduction in cognitive effort can lead to a more positive evaluation of the ad, as consumers are inclined to choose what "most people" have chosen (Kim, 2018).

Moreover, human behavior is inherently influenced by social validation. When individuals observe others engaging with or endorsing a particular product or service, they are more likely to perceive it as desirable and worthy of attention (Guadagno and Cialdini, 2009). In the context of mobile advertising, the mere presence of popularity cues that indicate

a high number of people viewing or interacting with the ad can trigger a sense of social validation. Consumers are more likely to view the ad positively, driven by the belief that it is endorsed by a substantial and satisfied audience.

We therefore propose that the perceived popularity of a mobile ad, particularly when it is conveyed through popularity cues, provides a powerful influence on consumers' attitudes towards the ad. When consumers perceive an ad as being associated with a high level of popularity, driven by the principles of descriptive norms, reduced cognitive effort, and social validation, they are more inclined to hold a positive attitude toward the ad. Consequently, this hypothesis underscores the importance of perceived popularity in shaping consumers' responses to mobile ads, forming the basis for our second hypothesis:

H2: High (low) perceived popularity of the ad positively (negatively) influences consumer's attitudes towards mobile ads.

Lastly, we propose that the more positive the attitude of the user towards the ad, the more likely he or she is to respond to the ad. The Theory of Planned Behavior (Ajzen, 1991) posits that individuals' actions are influenced by three core components: attitude, subjective norms, and perceived behavioral control. Specifically, attitude is defined as one's predisposition to react favorably or unfavorably to an object, person, institution, or event (Ajzen, 1988). Applied to our context, users' attitudes toward a mobile ad correspond to their disposition to respond favorably or unfavorably to the ad's content and message. According to this theory, a positive attitude towards the ad should increase the likelihood of a favorable behavioral response, such as clicking on the ad or making a purchase.

Contemporary research continues to find a strong connection between positive attitudes toward ads and subsequent behavioral intentions. Neuroscientific studies show that ads that evoke positive emotions and attitudes are more likely to stimulate areas of the brain associated with reward and decision-making, which can increase the likelihood of favorable responses (e.g., Venkatraman et al., 2015). Further, positive attitudes towards an ad through likes, comments, and shares on social platforms, were also proven to significantly boost the likelihood of others responding positively to the same ad (Cheung et al., 2018). Building on those theories and recent studies, we argue that the attitude of users towards an ad likely affects the response intention of users towards the same ad. Hence, we present our third and final hypothesis:

H3: Attitude towards an ad positively influences response intention towards the ad.

Ⅳ. Methodology

This section explains the study design used to test the hypotheses and the research model. To verify the hypotheses, a 2x2 between-subjects scenario-based survey design was conducted to examine the impact of perceived distance (near vs. far) of offline physical store and perceived popularity (low vs. high) on mobile ad attitudes and response intentions. A Pilot study was first conducted to confirm whether manipulations and measures are appropriate. After confirmation of the manipulations, the main study was then revised according to the results of the pilot study and was conducted.

4.1. Pilot Study

4.1.1. Pilot Study Design

The primary objective of our pilot study was two-fold: first, to assess the validity and reliability of our chosen measurements, and second, to gather invaluable feedback regarding the manipulation of key variables within our research model. This initial phase was integral to laying the groundwork for the subsequent main study. In the pilot study, we opted for an online survey format, leveraging the accessibility and convenience of the digital realm. To facilitate a comprehensive evaluation of our hypotheses, we meticulously designed two distinct Google Forms. Respondents were selected at random through the use of a randomized link generator—a methodology chosen for its ability to minimize selection bias.

4.1.2. Pilot Study Results

Respondents of the pilot study consist of 26 graduate students with 11 males (42.3%) and 15 females (57.7%). Through the pilot study, distance was asked in open-ended questions *"What distance do you consider to be in close/far proximity from where you are currently located?"* to determine the appropriate distance for the manipulation in the scenario. The mean for the near distance is 580 meters and the mean for the far distance is 3030 meters (approximately 3 kilometers). The message appeal (which is to be used as a control variable) was also checked and confirmed that the manipulation for informational and emotional appeal were appropriate. The final questionnaire was then revised according to the comments and suggestions gathered from the pilot study.

4.2. Main Study

Data is gathered through the assistance of DataSpring, a survey company. Following the research model, a 2x2 between-subjects scenario-based survey is conducted (i.e., near vs. far perceived distance x low vs. high popularity). <Appendix A> shows each group's manipulation in detail from scenario, message appeal, and indication message manipulations. <Table 2> provides an overview of the sample sizes per manipulation group, showing they are more or less equal in size.

4.2.1. Study Setting and Context

South Korea is chosen as the setting for the study because of its rapidly growing e-commerce market and high mobile usage. More than 98% of South Korean households access the Internet daily with over 85% of the population owning a smartphone.[5] With 88.5% of the nation's population using e-commerce platforms in 2019, and is expected to rise to 94.4% by 2023, South Korea's e-commerce market has reached 134.5 trillion won ($112.6 billion) in revenue by mid-2020.[6] These statistics underscore the profound digital penetration and tech-savvy nature of South Korean society, which is relevant to the context of the study. As the respondents of the study are Korean, the survey was backtranslated from English to Korean. This methodological consideration was pivotal in minimizing language-related

<Table 2> 2×2 Scenario Design

Distance	High Popularity (50 people viewing)	Low Popularity (2 people viewing)
Near (500m)	77	75
Far (3km)	78	78

5) https://santandertrade.com/en/portal/analyse-markets/south-korea/reaching-the-consumers
6) https://www.ajudaily.com/view/20200730143740953_

biases and enhancing the accuracy of our data.

We have decided to use the product winter jacket to be advertised in the study due to several reasons. First, considering the season the study was conducted in our study setting (South Korea) which is during winter, winter jackets are one of the top products that are inherently relevant for this season. The sales for coats and jackets market alone amounted to $3.22 billion in 2023 in South Korea and is expected to grow annually by 1.29%.[7] During the colder months, individuals are more inclined to seek out and engage with advertisements for winter-related products, such as jackets, as these products directly cater to their immediate needs. By selecting winter jackets, we tap into this season-specific consumer behavior, offering a pertinent and dynamic context for the study.

Additionally, winter jackets are commonly categorized as high-involvement products, requiring consumers to invest considerable time and effort in the decision-making process. The choice of a high-involvement product category is particularly intriguing from a research perspective. Consumers are more likely to engage in thorough evaluation, comparison, and consideration when it comes to high-involvement products like winter jackets. This heightened involvement provides an opportunity to scrutinize how contextual factors impact consumer responses within a more complex decision-making framework. This choice enhances the study's ability to yield meaningful insights into the effectiveness of mobile advertising within a context that aligns with real-world consumer behavior and decision-making processes.

4.2.2. Procedure and Measures

The survey measures four key constructs: perceived

proximity, perceived popularity, attitude, and response intention. The items of the main constructs are derived from existing literature, and some were developed mainly for the study (see <Table 3> for the measures). Control variables include user demographics (age, gender, occupation, educational background), general attitude towards mobile ads, frequency of mobile ads received per week, and a variable for message appeal (informational vs. emotional). Apart from the demographics, all other measures were assessed via a 7-point Likert scale. <Appendix A> shows the different scenarios and ad messages in detail.

As control variable, we have added Message Appeal to introduce a controlled diversity effect. To do this, we divided message appeal into two groups: emotional and informational appeal. An ad message's appeal emphasis has been found to lead to different attitudinal and behavioral outcomes such as attitudes (Liu and Stout, 2006) and purchase intentions (Zhang et al., 2014). Emotional message appeal arouses empathy and triggers positive emotions toward the receiver (Lewis and Weaver, 2013). Informational message appeal (Leonidou and Leonidou, 2009) focuses on facts and objective information about the product being advertised.

By categorizing participants into two distinct groups based on message appeal (emotional and informational), we introduce controlled variation into the study. This controlled diversity ensures that any observed differences in consumer responses can be attributed to the specific type of message appeal, rather than random variations or other unaccounted factors.

Age and Gender were asked first in the survey to distribute the respondents and assign them to their respective manipulations randomly and equally. As much as possible, there was effort made to obtain

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7) https://www.statista.com/outlook/cmo/apparel/men-s-apparel/coats-jackets/south-korea

<Table 3> Main Study Measures and Items

Construct	Scale	Item	Mean	SD
Perceived Proximity	Far to Near	Describe your feelings towards the distance of the store	4.21	1.773
		Do you think the distance is of near distance?	4.36	1.874
Perceived Popularity (van Herpen et al., 2009)	Unpopular to Popular	Describe your feelings towards the number of people currently viewing the ad based on the popularity cue.	3.43	1.612
		What do you think of the popularity of the ad based on the popularity cue?	3.52	1.601
Attitude (Nan, 2006)	Strongly Disagree to Strongly Agree	I like this advertisement	4.09	1.382
		I think positively of this ad	4.23	1.402
		I think this ad is persuasive.	4.07	1.454
Response Intention (Wu et al., 2012)	Strongly Disagree to Strongly Agree	I want to know more about the advertised product	3.99	1.548
		I have the intention to click 'See More'	4.02	1.715
		I am likely to click 'See More'	3.98	1.566
Control Variables				
Message Appeal (McKay-Nesbitt et al., 2011)	Emotional to Informational	What is the appeal of the ad content?	4.61	1.600
		What is being emphasized in the ad?	4.79	1.642
		What elements of the product are seen in the ad?	4.66	1.553
General Attitude Towards Mobile Ads (Merisavo et al., 2007)	Strongly Disagree to Strongly Agree	Generally, I like receiving mobile ads	2.79	1.605

approximately equal sample sizes for each condition to avoid statistical complications during analysis due to unbalanced designs (Field, 2009). By randomizing and equally distributing participants based on these demographic variables, we control for their potential confounding effects. This allows us to isolate and examine the specific effects of the manipulated contextual factors, such as proximity and popularity, without the interference of age or gender-related biases. Likewise, equal representation of various age groups and genders in the study enhances the generalizability of our findings.

Next, respondents were asked what kind of mobile device they own, and only those who selected "Smartphone" as their answer were allowed to continue the survey. In Part 2 of the survey, they were shown the scenario they were assigned to for which they can only click the Next button after staying on the page for 10 seconds. This allows the respondents to focus and read the scenario. Part 3 of the survey consists of the distance items, Part 4 is for the perceived popularity items, and Part 5 is for the message appeal items. The scenario and ad message are also shown on each page of Parts 3, 4, and 5 for easy recall for the respondents. Lastly, the demographics and remaining control variables were asked in the final section. The item for general attitude toward mobile advertising is adopted from Merisavo et al. (2007).

4.2.3. Participants

<Table 4> Main Study Respondents Profile

Variable	Values	Response
Gender	Male	151 (49.2%)
	Female	156 (50.8%)
Age	18~20	21 (6.8%)
	21~30	105 (34.2%)
	31~40	90 (29.3%)
	41~50	67 (21.8%)
	51~60	20 (6.5%)
	61~70	4 (1.3%)
Occupation	Student	46
	Employee	139
	Public Official	25
	Self-Employed	28
	Unemployed	47
	Others	22
Education	High School Diploma and Less	32
	Bachelor's Degree (Enrolled)	41
	Bachelor's Degree (Graduate)	234
(Year) Start of Smartphone Use	1996~2019 (Range)	2011 (Mean)
Frequency of Mobile Ads received per week	0~200 (Range)	18.02 (Mean)
General Attitude towards Mobile Ads	1~7 (Scale)	1.79 (Mean)

In total, 307 valid responses were obtained. As shown in <Table 4>, the respondents are approximately equal in terms of gender wherein 50.8% were female and 49.2% were male. The age of the respondents ranged from 18 to 70, where ages ranging from 21 to 50 took the highest percentage. According to the 2019 Korea Shopping App User Analysis Report,[8] which analyzed the mobile shopping app market through its data intelligence service "Mobile Index," the number of people using mobile shopping apps was 22.49 million as of August. The mobile index survey showed that mobile shopping app users consisted of 60% female, and 40% male, with ages ranging from 20 to 40 years old taking up the majority of the shopping app market. The current study is conducted following these values to follow the market trends.

Ⅴ. Data Analysis And Results

In this section, the data analysis results from the main survey conducted outlined in Section Ⅳ are presented and examined in detail. The effects of the major contextual factors on attitude and response intention for mobile ads are explained, and various implications are discussed.

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8) https://www.ilovepc.co.kr/news/articleView.html?idxno=31697

5.1. Measurement Analysis

Smart PLS3 was used to test and analyze the measurement reliability and validity of the measurements in the study. <Table 5> shows the results of the measurement analysis in detail. The results show high internal consistency within the measurements as composite reliability values are all higher than 0.9, as compared to the quality criteria of 0.7 or higher (Bagozzi and Yi, 1988), and Cronbach's alpha

<Table 5> Construct Reliability and Validity

	Cronbach's Alpha	CR	AVE
ATT	0.874	0.923	0.8
DIST	0.851	0.931	0.871
POP	0.9	0.952	0.908
INT	0.942	0.962	0.895

Note: *ATT = Attitudes, DIST = Perceived Distance, POP = Popularity, INT = Intention

<Table 6> Discriminant Validity

Fornell-Larcker criterion				
	ATT	DIST	POP	INT
ATT	0.894			
DIST	-0.388	0.933		
POP	0.369	-0.277	0.953	
INT	0.829	-0.41	0.357	0.946
Cross-loadings				
ATT1	0.912	-0.387	0.361	0.766
ATT2	0.907	-0.34	0.287	0.713
ATT3	0.863	-0.311	0.338	0.743
DIST1	-0.365	0.934	-0.294	-0.399
DIST2	-0.36	0.932	-0.223	-0.367
POP1	0.312	-0.227	0.943	0.309
POP2	0.384	-0.295	0.963	0.367
INT1	0.797	-0.368	0.334	0.941
INT2	0.748	-0.389	0.31	0.95
INT3	0.806	-0.407	0.369	0.948

for all constructs is higher than 0.8, as compared to the quality criteria of 0.7 or higher. Convergent validity is also established as the AVE values for each construct are all higher than 0.8, higher than the minimum of 0.5 for quality criteria (Bagozzi and Yi, 1988).

The results of the discriminant validity test (see <Table 6>) are in accordance with the Fornell-Larcker criterion and cross-loadings where the square root of each construct's AVE is higher than its correlation with other constructs and each item loads highest on its associated construct, hence, discriminant validity has been established.

5.2. Main Results

To test the hypotheses formulated in this study, a series of linear regression analyses were conducted using SPSS. The results shed light on the intricate relationship between perceived proximity, perceived popularity, attitudes toward mobile ads, and response intentions.

The analysis of the effects of perceived proximity and perceived popularity on attitudes towards mobile ads explains 21.6% of the variance and the model was significant $F_{(2,304)} = 43.270$, $p < 0.001$. Subsequently, when the attitude towards mobile ads was examined alongside control variables in relation to response intention, results show 69.5% of variance, significant at $F_{(9,297)} = 78.620$, $p < 0.001$. The path coefficients of variables are described in <Table 7>. The detailed path coefficients of the variables are presented in <Table 7>. The results show support for all three hypotheses (Hypothesis 1, 2, 3) posited in this study.

Hypothesis 1 (DIST → ATT): The path analysis demonstrated a significant relationship between perceived proximity (DIST) to the physical store and

<Table 7> Coefficients

Path	B	Std. Error	t	P Values
DIST → ATT	0.231	0.039	5.910	0.000
POP → ATT	0.230	0.043	5.304	0.000
ATT → INT	0.972	0.042	23.309	0.000
Control Variables				
CV_Appeal → INT	-0.077	0.034	-2.227	0.027
CV_Occ → INT	-0.011	0.032	-0.346	0.730
CV_Edu → INT	0.108	0.057	1.895	0.059
CV_Gender → INT	0.070	0.102	0.689	0.491
CV_Age → INT	0.000	0.005	-0.028	0.977
CV_Start → INT	0.029	0.014	2.156	0.032
CV_Freq → INT	0.004	0.002	1.942	0.053
CV_GenAtt → INT	0.073	0.032	2.287	0.023

attitudes towards mobile ads (ATT). Specifically, as consumers perceived themselves to be closer to the store when receiving the mobile ad, their attitudes toward the ad became more positive. This result reinforces Hypothesis 1, suggesting that perceived proximity plays a pivotal role in shaping consumers' attitudes toward mobile ads (B = 0.231, p < 0.001).

Hypothesis 2 (POP → ATT): The analysis revealed that perceived popularity (POP) of the mobile ad significantly influences consumers' attitudes (ATT) toward the ad. In essence, when consumers perceived the ad as more popular, their inclination to view the mobile ad positively increased. Thus, Hypothesis 2 finds robust support in these findings (B = 2.30, p < 0.001).

Hypothesis 3 (ATT → INT): The final hypothesis posited a relationship between attitudes toward mobile ads (ATT) and response intentions (INT). This path analysis confirmed that a more favorable attitude toward the mobile ad indeed leads to a higher likelihood of consumer response, exemplified by clicking 'See More' or taking further action. Hypothesis 3 is substantiated by a significant and relatively high path coefficient (B = 0.972, p < 0.001).

Control variables were also included in the analysis to account for potential confounding factors that might influence the relationship between the main variables of interest. Results show that ad appeal (CV_Appeal) is significant in that informational appeal (vs. emotional) is associated with reduced intention. Higher education levels (CV_Edu) showed a marginally significant positive link to positive responses. The start of mobile phone use (CV_Start) and general attitude toward ads (CV_GenAtt) were also significant positive predictors. Meanwhile, Occupation (CV_Occ), Gender (CV_Gender), Age (CV_Age), and Frequency of mobile ad exposure (CV_Freq) did not demonstrate significant associations with response intentions, highlighting their limited impact in this study's context.

The findings of this study provide valuable insights into the complex dynamics of mobile advertising in the context of perceived proximity, perceived popularity, attitudes, and response intentions. Moreover, the results highlight the significance of consumers' spatial perception (proximity) and their perception

of an ad's popularity in shaping their attitudes toward mobile ads. Lastly, a positive attitude toward mobile ads emerges as a strong predictor of consumer response intentions.

Ⅵ. Conclusion

6.1. Discussion

In the world of mobile advertising, what captures a consumer's attention is crucial. As the effectiveness of an advertisement is highly dependent on the consumer, there is an apparent need to determine when, where, and what kind of advertisement is most relevant to the consumer. Our study investigated the fundamental question: Are consumers more likely to have positive attitudes on mobile advertisements when perceived proximity to a physical store is near, and when the perceived popularity of the ad is high? Moreover, we ventured into the intricate relationship between consumer attitudes and their subsequent response intentions.

The results of this study provide robust evidence supporting all the hypotheses posited in this study. These findings substantiate the significant influence of perceived proximity, perceived popularity, and attitudes on consumer responses to mobile advertisements, offering valuable insights into the dynamics of mobile advertising effectiveness. These discoveries open the door to further research on how different ad strategies work in various contexts. As mobile advertising continues to evolve, these insights provide a valuable compass for marketers to create effective ad campaigns.

6.2. Research Implications

This study makes several interesting contributions to the literature. First, we investigate two types of psychological distance (spatial and social) which offer valuable insights into context-based literature. By investigating both spatial and social psychological distances simultaneously, this study adds depth to the understanding of how different contextual factors influence mobile ad receptiveness. Next, this study empirically tests the Mobile Advertising Effectiveness framework by Grewal et al. (2015), and the results have proven the central role of context in the effectiveness of mobile ads. Researchers can build upon this framework, incorporating additional context-related variables to refine and expand the comprehension of mobile ad effectiveness.

Our findings demonstrate that perceived proximity to offline store and indication of popularity cues perform a crucial role in promoting positive interaction between the mobile ad and the consumer. These findings also show the importance of incorporating the context of the consumer the moment they receive mobile ads, which can be applied to mobile marketing and e-commerce, and contribute further to its literature. In conclusion, this study not only adds to the existing body of knowledge but also encourages further research in the dynamic field of mobile advertising, e-commerce, and consumer behavior. The insights obtained from this study have the potential to inform marketing strategies, improve advertising effectiveness, and ultimately contribute to the growth and success of brands in the digital age.

6.3. Practical Implications

Providing empirical evidence of how these contextual factors and ad elements interplay on the effectiveness of mobile advertising contributes good prac-

tical implications specifically for marketers. Businesses can therefore explore more real-time context-aware advertising techniques to enhance user engagement and conversion rates. Marketers and e-commerce business owners should leverage the context of consumers when they design and send mobile advertisements, making mobile ads relevant to the specific context of the consumer at that point in time.

As our findings have shown, consumers are more likely to have positive feedback and are more likely to act upon the ad when the mobile ad sent to them has a store that is physically near the consumer and shows high popularity. Businesses should consider customizing their mobile ad content and placement based on the user's physical proximity to their offline stores. For users in close proximity, ads can emphasize in-store promotions or events, while those farther away may receive messages focused on online shopping and delivery options.

Using these findings, marketers should pay attention to the geolocation of consumers and also show ads that are popular among similar consumers at that time. Leveraging real-time data on user context, such as location and popularity cues, can help businesses deliver more relevant and engaging mobile ads. Implementing geotargeting and social targeting strategies can improve ad performance.

Recognizing the importance of consumer context at the moment they receive mobile ads opens up new avenues for targeted mobile marketing. Additionally, they may also enhance user's ad response and satisfaction by determining when to show what kind of advertisement to users.

6.4. Limitations and Future Research

While this study makes significant contributions to the understanding of mobile ad attitudes and responses, it is essential to acknowledge its limitations and recognize opportunities for future research to build upon and refine the current findings. We describe the main limitations of this study as well as future research directions in this section.

First, while this study employed manipulations that were deemed appropriate and realistic based on manipulation checks, we acknowledge that conducting the research in an experimental or natural setting would have provided a more accurate reflection of consumer behavior. Future studies could address this limitation by conducting field experiments that allow for real-time manipulations and observations of consumer responses in authentic environments.

Next, we limit the scope of the study to physical distance to offline stores and how it influences consumers' evaluation of the relevance of ads. This study did not explore other forms of spatial distance (i.e., mobile stores, distance of competitors) or social distance (i.e., brand affinity, social proximity to other consumers). For future research, expanding the investigation to include a broader range of distance dimensions could yield more comprehensive insights into the contextual factors affecting mobile ad effectiveness.

Additionally, the study concentrated on a specific product category (winter jackets) to align with the seasonal context of the research. However, this product category may not represent the dynamics of all industries or consumer preferences. Future research should diversify the product categories under investigation to encompass both hedonic and utilitarian products, as well as experiential and exploratory items, to validate and extend the findings to different consumer contexts.

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<Appendix A> 2×2 Manipulation

A1. Scenario (Situation)

Near Distance Scenario (in Korean)
시나리오: 겨울이 다가오고 있고, 귀하는 패딩을 구매하려고 합니다. 어느 날 귀하는 아래 이미지와 같은 모바일 광고(앱 푸시)**를 받았습니다. 이와 동시에 귀하는 해당 광고 상품을 판매하는 매장이 현재 자신의 위치에서 500m (평균 속도로 걸어서 7분) 거리에 있다는 것 또한 알고 있습니다. 귀하는 '클릭하여 더 보기'를 클릭하거나 광고 창을 닫을 수 있습니다. **핸드폰에서 현재 설치했던 쇼핑앱에서 보냈던 '앱 푸시'라고 생각하면 됩니다.
Near Distance Scenario (English Annotation)
Winter is fast approaching, and you are interested in purchasing a padding jacket. One day, you receive a mobile ad (app push notification)** similar to the image below. Additionally, the advertised product has a physical store **500m (7 minutes' walk-in average speed)** away from your current location. You may click 'See More' or close the push notification. **Imagine that this app notification is sent from an existing shopping app installed on your phone.

Near Distance Scenario (in Korean)
시나리오: 겨울이 다가오고 있고, 귀하는 패딩을 구매하려고 합니다. 어느 날 귀하는 아래 이미지와 같은 모바일 광고(앱 푸시)**를 받았습니다. 이와 동시에 귀하는 해당 광고 상품을 판매하는 매장이 현재 자신의 위치에서 3km (평균 속도로 걸어서 45분, 지하철을 이용할 경우 20 분) 거리에 있다는 것 또한 알고 있습니다. 귀하는 '클릭하여 더 보기'를 클릭하거나 광고 창을 닫을 수 있습니다. **핸드폰에서 현재 설치했던 쇼핑앱에서 보냈던 '앱 푸시'라고 생각하면 됩니다.
Near Distance Scenario (English Annotation)
Winter is fast approaching, and you are interested in purchasing a padding jacket. One day, you receive a mobile ad (app push notification)** similar to the image below. Additionally, the advertised product has a physical store **3km (45 minutes walk-in average speed or 20 minutes via subway)** away from your current location. You may click 'See More' or close the push notification. **Imagine that this app notification is sent from an existing shopping app installed on your phone.

<Appendix A> 2×2 Manipulation (Cont.)

A2. Message Appeal: Control Variable

Informational Message (in Korean)
Informational Message (English Annotation)

Meet our newly launched product, long padding jacket
We introduce to you our lightweight padding jacket made of 80% goose down:20% goose feather. With 100% polyester on the outside and 100% nylon on the inside, it is soft and extremely warm.
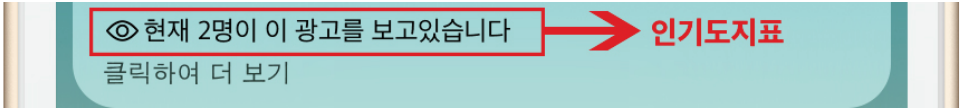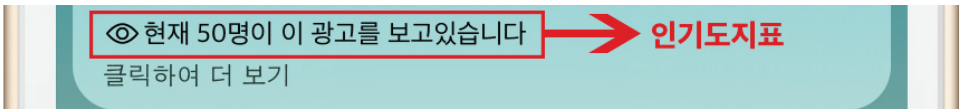**<Popularity Cue>**
Click to see more

<Appendix A> 2×2 Manipulation (Cont.)

Emotional Message (in Korean)
Emotional Message (English Annotation)

Meet our newly launched product, long padding jacket
We introduce to you our padding jacket that you can use either in special occasions or in everyday situations. Despite the cold weather, don't give up on fashion, we'll deliver warmth to you through a trendy design.
<Popularity Cue>
Click to see more

<Appendix A> 2×2 Manipulation (Cont.)

A3. Popularity Cue

Low Popularity Cue (in Korean)
◉ 현재 2명이 이 광고를 보고있습니다 ➡ **인기도지표** 클릭하여 더 보기
Low Popularity Cue (English Annotation)
Currently, 2 people are viewing this ad

High Popularity Cue (in Korean)
◉ 현재 50명이 이 광고를 보고있습니다 ➡ **인기도지표** 클릭하여 더 보기
High Popularity Cue (English Annotation)
Currently, 50 people are viewing this ad

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