Mobile Advertising: A Framework and Research Agenda

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Abstract

Mobile advertising allows retailers, service providers, and manufacturers to provide consumers with increasingly relevant offers. The success of such campaigns depends on an ever better understanding of environmental, consumer, and technological context variables; a strong focus on advertising goals; accounting for market factors related to the nature of stakeholders and market environment; and the use of appropriate mobile ad elements to improve relevant outcome metrics. This article provides an overarching framework to synthesize current findings in mobile advertising, as well as a research agenda to stimulate additional work in this nascent field.

Keywords: mobile advertising, mobile promotions, mobile marketing

Mobile advertising is a booming business. In the United States alone, it has grown to more than $19 billion as of 2014, and projections suggest it will rise even further, to more than $65 billion by 2019, such that it will account for nearly three-quarters of all digital advertising spending (eMarketer 2015c). The global mobile advertising market is growing similarly, projected to reach over $100 billion and account for more than half of all digital advertising spending in 2016 (eMarketer 2015b). A dominant reason for this growth is the tremendous spread and adoption of smartphones and other mobile devices.

Mobile devices are highly individualized and important personal communication tools (Bacile, Ye, and Swilley 2014), and most users keep them within arm's reach throughout the day, as well as nearby while they sleep. They have truly enabled consumers' ubiquitous access to digital information, anytime and anywhere, which also means that mobile devices allow marketers to reach consumers more directly and constantly. Because consumers use their smartphones to conduct a host of activities, beyond just talking or texting, advertisers also have new opportunities for targeting their communications. People surf the web on their mobile devices and use various mobile applications (apps), many of which facilitate the delivery of advertising content. Today, social media sites such as Facebook, Twitter, and YouTube attract hundreds of millions of consumers who access the sites using their mobile devices; in turn, these sites provide tremendous insights for advertisers, due to their analytic capabilities.

An important feature that is unique to mobile devices is their ability to support location-based applications. Customers often use apps for quick access to location-based information, such as the nearest highly rated restaurant (Grewal and Levy 2016). At the same time, an indoor positioning system based on simple transmitters (e.g., iBeacon) can alert firms when a person is within a pre-determined set of locations of interest, such as when a consumer is in close

proximity to a display of detergent in a grocery store. At that moment, the grocery retailer or detergent manufacturer likely wants to provide alerts, advertisements, or coupons to grab this particular consumer's attention and move her closer to a purchase (or increase her loyalty or advocacy).

Firms across the spectrum thus are wrestling with various factors that affect their mobile advertising and marketing strategies. Along with their dynamically shifting abilities to target and deliver relevant content and promotions to current and potential customers, marketers must take into account how their mobile strategies interact with or complement their overall advertising and marketing strategies. Shankar and Balasubramanian (2009) highlight the role of mobile technology adoption in consumer purchase decision processes; in companion pieces, Shankar and Hollinger (2007) cite some trends in online and mobile advertising and mobile marketing (Shankar et al. 2010). These articles provide a solid foundation for research in this domain, yet studies of these critical issues remain few. Several articles in this issue offer notable advances to the field, such as addressing mobile promotions (Pancras et al. 2015), mobile gaming (Hofacker et al. 2015), and mobile shopper marketing (Shankar et al. 2015).

With this article, we seek to offer thought leadership by highlighting what we know about mobile advertising, as well as emphasize important research questions that warrant additional attention, such as:

- Which environmental, technological, and consumer context factors may determine the effectiveness of mobile advertising with different strategic goals?
- How can the consumer's stage in the shopping process and past behavior provide information to increase the relevance of mobile ads?

- What market factors need to be accounted for when implementing mobile advertising strategies?

In the next section, we develop and present a mobile advertising effectiveness framework, which comprises environmental and technological context factors, advertising goals that match the consumer's location in the shopping decision-making journey, market factors, ad elements, and outcome metrics. We review prior research on mobile advertising according to this framework, and we identify research issues that demand further work to ensure the continued successful development of mobile advertising practices.

Mobile Advertising Framework

Our organizing framework (Figure 1) has seven main components. First, to highlight the central role that context plays in determining the effectiveness of mobile advertising, we discuss the effects of the environmental context and the technological context. Second, we consider consumer-related contextual variables, such as their stage in the shopping process, past purchases, and socio-demographic variables. Third, we note the role of various advertising goals, and fourth, we investigate relevant outcome metrics. We combine the topics of goals and outcomes in our discussion, because goals tend to have corresponding metrics. Fifth, we cover the role of various advertising elements, such as ad media, media types, push vs. pull advertising, interactive vs. static advertising, and various promotional elements. Sixth, we include market factors in our framework, such as infrastructure, partnerships, regulations, and privacy concerns. Seventh, we discuss four important firm-level macro factors: management buy-in, big data and analytics, omnichannel and attribution, and applicability to B2B firms.

Environmental Context

Location-based apps enable a user to receive pertinent information while away from home, such as movie times at the local theater, price comparisons across local stores, or directions to a particular local outlet. To be able to offer such location-based services, mobile devices include sensors that can identify each user's context, including her or his exact location (e.g., via GPS, WiFi, beacons) and viewing direction (e.g., compass, built-in camera). Such knowledge in turn enables advertisers to target their advertising content and format to the likely needs of consumers in that particular situation. By linking its app to Uber's services for example, United Airlines enables passengers to arrange for a ride from the airport at the moment they land, from the correct terminal and vestibule (Sharkey 2014).

Physical location is just one of the cues that mobile devices can identify in consumers' environments that likely influence their behaviors and attitudes (Bargh and Chartrand 1999). For example, the time of day, weather, and physical location all can influence how each consumer evaluates and responds to mobile display ads, because these contextual factors activate different goals (e.g., related to the home or work environment; Bargh et al. 2001). Andrews et al. (2015) and Baker, Fang, and Luo (2014) offer some interesting empirical results in this realm, demonstrating that the effectiveness of SMS promotions varies with the time of day and amount of local crowding. In addition, controlled behavioral experiments run on mobile devices (Cooke and Zubcsek 2015) would facilitate further tests of multiple factors related to physical location.

For our purposes, we suggest characterizing the environmental context according to factors that depend on *where* and *when* a mobile advertising message gets delivered, such as location, time, weather, social environments, specific events, and economic conditions, among others. Consumers' surroundings (e.g., densely populated areas) influence their purchase

behavior (Choi, Bell, and Lodish 2012), such that when commuters on crowded subway trains receive mobile offers, they are approximately twice as likely to purchase as consumers on sparsely populated trains (Andrews et al. 2015). Luo et al. (2014a) also find an interaction effect between time and location, such that mobile ads that match consumers' mindsets at home or at work are more effective. Ghose, Goldfarb, and Han (2013) uncover location effects related to the distances between consumers' homes and the point of sale, and Molitor et al. (2015) quantify this effect with regard to the effectiveness of location-based advertising.

Data from Weather Co. tell retailers that they should promote hedonic products when the area has been inundated with dreary weather for weeks, because consumers need the boost of a fun purchase when they have gone too long without seeing the sun (Rosman 2013). The impact of weather on individual behavior has also been intensively analyzed in finance research. Hirshleifer and Shumway (2003) find a relationship between sunshine (which they interpret as a proxy for mood) and stock returns. Consumer research literature notes weather-related effects on consumer behavior (Gardner 1985), and according to Molitor, Reichhart, and Spann (2014), location, time, and weather effects all influence consumers' reactions to mobile advertising.

In terms of the social context, neighborhood effects lead geographically proximate consumers to imitate the behavior of their peers (Choi, Hui, and Bell 2010). To quantify the effect of other consumers, social impact theory (Latané 1981) proposes that the number of other individuals and their proximity increase their social impact. Zubcsek, Katona, and Sarvary (2015) and Molitor et al. (2014) reveal a co-location effect of consumers who are using the same mobile app in the same area at roughly the same time. This finding indicates that users located at the same location at the same time have commonalities in their preferences (Zubcsek et al.

2015). Therefore, co-location information improves predictions of consumer preferences, as well as targeting.

Contextual factors (Zhang and Katona 2012) complicate optimal advertising behavior further, thus posing interesting problems to marketers. Google Maps offers a location-sensitive version of sponsored search advertising, such that relevant business ads appear as headlines in the displayed map. The advertiser may bid separately and pay for up to two clicks per impression for different types of clicks, such as: (1) headline clicks; (2) site link clicks; (3) location detail clicks; (4) directions clicks; and (5) mobile click-to-call clicks. The ranking effects in such result lists are more powerful, due to the mobile devices' smaller screens. Furthermore, consumers' willingness to pay decreases with their distance from the store (Ghose et al. 2013a; Molitor et al. 2015).

Such evidence calls for further refinement of our understanding of the mechanisms underlying contextual factors, in terms of both the effects on consumers and the implications for marketers bidding for positions in results lists. Being able to follow mobile shoppers, from search through to payment, should significantly improve the quality of customer relationship management (CRM) databases and help marketers estimate the value of location-sensitive search advertising more precisely. Uncovering the underlying contextual moderating effects also would deliver insights needed for appropriate attribution of positive mobile ad outcomes, as well as provide guidance for optimizing the amount and placement of mobile spending within marketers' overall advertising allocation. To advance this research field, we note the importance of questions such as:

- How do contextual cues influence mobile ad effectiveness?
- How do different context variables (e.g., location, weather, social) interact?

- Can a better understanding of these contextual moderating effects advance current advertising attributions or budget allocation models?

Technological Context

The technological context for mobile advertising depends substantially on the size of the device. Mobile devices usually are equipped with a relatively small touchscreen (cf. laptops, desktops), though these screen sizes vary widely, from 38mm on the Apple Watch to 12.9 inches on the iPad Pro. The smaller screen sizes increase search costs, compared with Internet access through a desktop or laptop (Ghose et al. 2013a), yet the mobility of the devices offers benefits that often justify these costs. The display size also limits the area available for advertising and dictates both the content and delivery mechanism for advertising (e.g., browser, app). Finally, consumers interact with mobile devices through touchscreens, and touch-based interactions differ from mouse interactions, as required on most traditional laptop or desktop computers. In particular, these touch-based interactions can prompt ownership effects (Brasel and Gips 2014) that may enhance advertising effectiveness.

Mobile advertising often is embedded in other content within a browser or an app. Thus, consumers might see a mobile ad on an advertiser's website or app, or they could come in contact with the mobile advertisement through a third-party website or app (e.g., search engine, social network, news website). Such contextual factors may affect consumers' level of involvement with the ad. According to the elaboration likelihood model (Petty and Cacioppo 1986), advertising can affect brand attitudes through central or peripheral routes. Shankar and Balasubramanian (2009) propose that mobile display ads should target peripheral processing, by highlighting existing needs or potentially creating new needs for products and services that require only low consumer involvement.

However, in a large field experiment, Bart, Stephen, and Sarvary (2014) show that mobile display ads are most effective for higher-involvement, utilitarian products, because such ads may be the only ones that successfully initiate processing through a central processing route. With regard to the related technological context, a consumer searching on the advertiser's site is likely to be more involved than somebody searching on a third-party site, so these context effects (related to how the ad was presented by an advertiser and accessed by a consumer) might help explain the varying findings in prior research, as well as determine consumers' involvement.

Mobile devices might serve as either the first (and only) screen used by a consumer, or as a second screen in addition to a television or desktop screen. For example, while watching the latest episode of a televised drama series, some consumers tweet their reactions in real-time mode. Consequently, advertisers need to consider not just the mobile ad delivery mechanism but also the content (context) with which consumers are involved on the first screen (e.g., television). For this factor, the key research questions include:

- Does a mobile ad's media type effectiveness vary as a function of customers' viewing devices?
- Does the technological context (e.g., screen size, first vs. second screen) determine involvement and engagement?

Consumer Context

Other major considerations for mobile ad effectiveness include the phase of the purchase decision process, the temporal dynamics of the choice task, and whether the consumer is multitasking. Furthermore, mobile apps are often inherently social, such that the consumer context comprises network effects.

The consumer journey consists of multiple stages, from need recognition and pre-purchase activities to purchase decisions and post-purchase activities (Puccinelli et al. 2009; Yadav et al. 2013). Mobile ads can stimulate consumers' recognition of an unmet need or a purchase opportunity in their immediate vicinity. For example, a targeted ad for a store within walking distance may induce unplanned spending. In the pre-purchase stage, the consumer instead might be searching for product information through a search engine or review app (e.g., Yelp). Mobile advertisements may seek to draw a consumer into the store and away from competitor's stores (Fong, Fang, and Luo 2015). In-store mobile ads may spark purchase behavior. In the post-purchase phase, consumers often review their purchases on social media, where the advertiser in turn might place related, targeted mobile advertisements for the consumer's friends to see alongside the review.

These phases also might relate to the temporal dynamics of consumer choice. For mobile marketers, consumers' short- and long-term choices may compete and become conflicting goals (Dhar and Simonson 1999; Fishbach and Shah 2006), related to mental accounting (Thaler 1985). That is, a consumer in the purchase stage likely weighs the trade-off between vices and virtues in the near and distant futures differently than a consumer in the need-recognition stage (Trope and Liberman 2003). By considering these elements in combination, marketers can predict temporal changes in consumers' advertising responses better and thereby capture more value from consumers. For example, Luo et al. (2014a) demonstrate that same-day mobile push coupons work best for consumers who are nearby, whereas next-day coupons function better when consumers are more distant from the provider.

However, the question of optimizing mobile advertising placements remains open. For example, when consumers are engaged in multiple tasks (e.g., checking their Facebook feed and

considering advertisements for related products), if the primary task (engaging with Facebook) induces high arousal, it can lead to cognitive depletion that impairs their performance on the secondary task (processing a mobile ad) (Eysenck 1982; Fedorikhin and Patrick 2010). In terms of both brand recall and attitudinal measures, the impact of a mobile advertisement can suffer when the prospective consumer is engaged in performing a task that triggers more arousal. Prior research mostly treats arousal as a generalized antecedent to attention (MacInnis and Jaworski 1989; Petty and Cacioppo 1986), but separating and experimentally identifying the interaction of these two constructs could provide an opportunity for studying the persuasiveness of mobile display ads. For example, literature that reveals behavioral consequences of affect (Andrade 2005; Rook and Gardner 1993) identifies conditions that may account for the weak impact of display advertising in dual-task settings (Pham 1992), such as when high involvement with the advertising channel lowers subsequent recognition of the advertised brand.

The example of a consumer who browses a Facebook feed and gets exposed to advertisements at the same time also suggests the need to consider network effects. Some consumers may be influenced by information about others' decisions, and word-of-mouth (WOM) communications tend to exert more powerful influences on consumer decisions than firm-initiated communication (Herr, Kardes, and Kim 1991; Mahajan, Muller, and Wind 2000).

The emergence of sophisticated customer interaction databases that feature mobile communication, instant messaging, and social network data allow marketers to study WOM processes at the micro level (Nitzan and Libai 2011). For example, Nielsen is adding Twitter- and mobile-linked measures of popularity to its traditional television ratings (Sharma and Vranica 2013). Related network literature (Aral, Muchnik, and Sundararajan 2009; Katona, Zubcsek, and Sarvary 2011) seeks to quantify interpersonal influences using social network data.

Further investigations have suggested ways to monetize this information, using either targeted (Aral, Muchnik, and Sundararajan 2013; Goel and Goldstein 2014) or untargeted (Zubcsek, Phan, and Lu 2015) advertising.

Some of the largest social platforms already offer social advertising, which enables marketers to target ads using consumers' social profiles (Bakshy et al. 2012). Combining such detailed data with a better understanding of what makes people propagate and act on WOM (Berger and Schwartz 2011; Lovett, Peres, and Shachar 2013), as well as how social contexts moderate receivers' attitudes toward the brand (Raghunathan and Corfman 2006), should lead to more sophisticated applications of social network theory. Accordingly, we propose the following research questions:

- How does the consumer's level of multi-tasking and arousal in a primary task influence mobile ad effectiveness?
- What network effects are predominant in mobile settings, and what influences do they exert on advertising effectiveness?

Goals & Outcomes

Prior literature on consumer journeys and related concepts suggests that any advertising strategy must carefully consider how each transition in the consumer journey might be facilitated by a particular advertising action. We describe these ad elements in the next section, but first, we consider which transitions mobile advertising can reasonably target (i.e., goals) and how to measure the success of those transitions (i.e., outcomes).

The key goals in a mobile advertising context correspond to the main stages in the consumer journey, including facilitating awareness, encouraging positive attitudes, increasing engagement, increasing conversion rates, encouraging repurchases, and prompting advocacy.

Prior research mainly addresses conversion goals, typically associated with promotional activities (in Table 1, we summarize prior research on mobile advertising using field data; in this issue, Pancras et al. [2015] provide more detail on this topic). However, Barwise and Strong (2002) examine a broader spectrum of goals throughout the purchase journey (from awareness to loyalty); Ghose et al. (2013) investigate engagement with an ad, beyond coercion; and Bart et al. (2014) focus on how brand-related attitudes and purchase intent are affected by mobile ads.

Yet the challenges associated with targeting advertising goals strongly reflect the limited availability of measures of relevant outcomes. The lack of standardized metrics makes it difficult to measure any outcome other than direct behavioral response and typically requires the additional design and implementation of a post-campaign survey instrument. Prior research primarily used mobile coupon redemption rates as an outcome metric (see Table 1), with several notable exceptions. Ghose et al. (2013a) consider both click-through and conversion rates for consumers exposed to mobile display ads. Barwise and Strong (2002) examine multiple outcome metrics in addition to direct behavioral responses by conducting post-campaign phone interviews; with this approach, they find significant increases in awareness and brand attitudes due to brand-building campaigns. Bart et al. (2014) also combine multiple campaign-based field experiments and post-campaign surveys in a randomized assignment setting to measure changes in brand attitudes and purchase intentions, as induced by mobile display ads.

Furthermore, the attribution problems for mobile marketing are similar to those arising for digital advertising overall, as we discuss in more detail when we outline the omnichannel approach in the discussion section. Measures of mobile advertising outcomes need to correspond directly to goals and facilitate accurate inferences about whether a particular goal has been achieved. Thus, we suggest greater emphasis on employing data captured by mobile devices that

may reveal viewing time and click-related measures associated with engagement; using survey measures that can assess achieved brand awareness, attitudes, and purchase intentions; counting the numbers of first and repeat purchases, which reflect the degree to which a mobile campaign induces trial, repurchasing, and loyalty; and taking advantage of captured social media activity, which may correspond powerfully with the goal of inducing higher advocacy. In line with these goals and outcomes, as well as the related challenges, we suggest several questions for further research:

- Should mobile ad campaign goals depend on the stage in the consumer journey?
- What factors determine the relative benefits and disadvantages of survey-based metrics compared to behavior-based metrics?
- Which outcome measures are best suited to be used at various stages of the consumer path to purchase?

Ad Elements

Firms may adopt a variety of mobile advertising elements to satisfy a particular goal. In this section, we consider several categories of these elements and discuss their applicability in various contexts.

First, we consider the channel in which an advertising message is placed. In most instances, the mobile device is the only media channel used to contact and communicate with a consumer. However, a consumer might use the mobile device as a second screen, alongside a first screen (e.g., television). In this case, the content on the first screen is a contextual factor to consider in determining mobile advertising tactics. For example, advertising on the mobile device (i.e., second screen) could target the first screen's content (e.g., television show) or be synchronized with advertising on the first screen. Such tactics would require a means to

recognize the content accessed on the first screen (e.g., if consumers log on to a televised content–related app) or to identify a consumer across multiple devices (e.g., if a smart TV and mobile device share the IP address of the same WiFi network).

Second, an advertisement can be delivered through multiple mobile channels, including mobile websites and browser-based or native apps. A website or app might be owned by the advertiser (e.g., McDonald's, Starbucks) or a third party (e.g., news media, social networking service, mobile coupon aggregator). Using a third-party website or app usually requires the advertising firm to pay for the ad but increases its reach beyond owned media (unless consumers are exposed to these media through organic search results).

Third, advertising messages can be delivered, broadly, by push or pull methods. Pull-based mobile advertising can be delivered as browser-based or within-app ads (e.g., Molitor et al. 2014; Zubcsek et al. 2015; see Table 1). Consumers "pull" the advertisement by opening a specific mobile website or app. Push-based mobile ads are frequently delivered via SMS. Andrews et al. (2015) and Fong, Fang, and Luo (2015) (among others; see Table 1), study SMS-based mobile push coupons. Mobile apps also could send push messages, if consumers permit it by setting their device to accept them. The trigger to send a mobile push ad might depend on the location, such as when a consumer enters a geo-fence or the consumer's device detects a Bluetooth low energy beacon signal. However, such mobile push advertisements may be subject to legal restrictions; most European countries require that advertisers obtain prior customer consent (i.e., opt-in).

Fourth, firms often decide on the richness of their advertising message format, including the degree to which the ad is static (e.g., SMS or display banner), dynamic (e.g., animated banner), and interactive (e.g., based on an iAd platform) and whether it contains embedded video

elements. Decisions about advertising tactics also need to consider the degree of intrusiveness of the mobile ad (e.g., push vs. pull) and whether the ad is embedded in a website or app or else interrupts usage as a mobile interstitial (e.g., takes over the mobile device screen). The mobile ad design needs to be responsive to account for the different screen sizes of mobile devices. Furthermore, due to the limited screen size, usually only one ad is visible on a mobile screen, whereas multiple ads might appear on a regular desktop screen.

Fifth, depending on the goal, a marketer may choose to include various content information, such as promotional discounts (e.g., $ or % off), sweepstakes, or buy-one-get-one non-price promotions. It does not take much display space to communicate dollar- or percentage-off information. The promotional element also may be unconditional, attached to a condition (e.g., 20% off purchases of $50 or more) or uncertain (Ailawadi et al. 2014; Luo et al. 2014b).

The importance of identifying the effectiveness of various ad elements for satisfying various goals (i.e., facilitating consumer transitions along the path to purchase) is evident, yet prior research examines only two modes of mobile advertising. Empirical field research mainly investigates the effectiveness of mobile coupons in different contexts (see Table 1); Ghose, Han, and Park (2013) and Bart, Stephen, and Sarvary (2014) examine mobile display ads. Although this lack of attention to mobile display ads is not surprising, given the inherent technical and organizational complexity of designing a meaningful field experiment with mobile ads, marketing researchers must continue to push the boundaries of this domain. A path forward could stem from closer collaboration with practitioners who can provide greater access to relevant data, such as earned traffic via websites, apps, search engines, and paid search.

In particular, search advertising is a massive component of mobile spending, such that 45% of all U.S. digital advertising spending is allocated to search (eMarketer 2013; Lunden

2015). For mobile markets, this trend is even more prevalent; search advertising accounts for more than half of U.S. mobile advertising spending (eMarketer 2014). By 2017, mobile will account for more than 75% of companies' search ad budgets (eMarketer 2014). Furthermore, mobile search is becoming increasingly distinct from desktop search, as more platforms enter the mobile search space, typically with smartphone-oriented search apps that either span a broad scope of product categories (e.g., Amazon, Yelp), or specialize in a niche category (e.g., Orbitz for travel, LinkedIn for jobs, Shazam for music). Thus, the mobile search advertising market is becoming increasingly fragmented.

Notwithstanding these differences, most mobile searches still mimic the patterns established by prior experiences of searching through a desktop connection. Consumers do not attend carefully to their own path to content; whether they access an app or visit a website, their expectations are similar (Mimms 2014). In a simple scenario, the consumer searches by entering some keywords on a search page to describe the object he or she desires. A browser-based mobile search scenario is similar to a standard desktop search: The search engine returns a list of relevant pages, some of which are paid advertisements. Most engines return a list of *organic* results (pages deemed most relevant to the search query by the engine) and also use some variant of a generalized second-price (GSP) auction to allocate and price *sponsored search* advertisements, according to a pay-per-click bidding model.

In the GSP mechanism, each advertiser bids to be listed in the sponsored search results. The highest bidder receives the top slot, the second highest bidder the second slot, and so forth; however, the winner only pays the second-highest bid after each consumer click-through, the second-ranked advertiser the third-highest bid, and so on. The ranking of ads in sponsored search slots accounts not only for the bid per impression but also the expected click-through rate on

those impressions. Despite this added layer of complexity, economics literature (Edelman, Ostrovsky, and Schwarz 2007; Varian 2007) demonstrates that, with certain assumptions, GSP auctions earn revenues equivalent to those obtained from socially optimal Vickrey-Clarke-Groves auctions, a mechanism that in equilibrium causes advertisers to bid their true valuations for sponsored search slots.

Several papers challenge the assumptions of such economic studies, though (Edelman, Ostrovsky, and Schwarz 2007), highlighting important opportunities for both advertisers and search engines. Katona and Sarvary (2010) show that websites that tend to appear in organic search results benefit less from sponsored results than their competitors. Goldman and Rao (2014) also note that in the sponsored listings for a brand-specific search term, the click-through rate of off-brand ads receives a bigger boost from the top sponsored search slot than that of an on-brand ad, suggesting that search engines could make more profit by accounting for heterogeneity in the strength of relationship between the clickability of different advertisers' sponsored search ads and the ranking outcomes of an auction. In line with these findings, we suggest several questions for further research:

- How should advertisers coordinate their media and mobile channels?
- How effective are mobile advertising tactics, in terms of earned traffic through websites, apps, or search engines, relative to paid search?
- How do consumers react to pull versus push advertising, as well as to different forms of advertising interactivity?

Market Factors

As we discussed in the previous section, marketers can adopt a variety of advertising elements to satisfy their advertising goals and achieve desired outcomes. There is thus a strong

temptation to formulate unambiguous guidelines for marketers who want to identify the best advertising tactics for each advertising goal, but we recommend treading carefully on this ground. It is necessary to consider all pertinent restrictions and opportunities that might influence the effectiveness of mobile advertising: the nature of the industry, market differences, the variety of devices and carriers, existing and potentially available partnerships, government and industry regulations, and privacy concerns. We consider each of these factors in turn.

First, the *nature of industry* and related opportunities can affect the choice of optimal mobile advertising tactics. For example, retailers can use beacons (Bluetooth-enabled, in-store devices) to detect and communicate with shoppers' smartphones, allowing the retailer to deliver timely advertising messages. This technology has obvious appeal for retailers with brick-and-mortar locations, but beacons do not enhance mobile advertising ability in many industries, including e-commerce–only retail.

Second, firms' ability to deliver mobile advertising through a particular channel depends on *market differences*, such as the presence and strength of that channel (and its related network infrastructure) within a targeted consumer market. For example, Flipkart recently decided to abandon and shut down its mobile website, redirecting all users to download its app instead (Rao 2015). This move was necessitated by Flipkart's inability to provide a satisfactory experience to consumers who accessed its site through mobile browsers, because of the slow Internet connection speeds across India. Many emerging markets across Africa and Southeast Asia also have substantially increased their Internet penetration rates through the mobile infrastructure. Mobile phones often are the central means to access various services, such as money transfers (e.g., M-PESA system in Kenya; Eyring, Johnson, and Nair 2011). However, detailed data about the subscribers to these systems are limited, because most devices are prepaid and subject to a

high churn rate. In emerging markets, therefore, mobile advertising channels offer unparalleled reach, but mobile ad monetization is more challenging, often requiring sophisticated data mining to identify subscribers' communications and location behaviors (Srivatsa and Hicks 2012).

Third, rapidly increasing variety in mobile devices and carriers leads to growing complexity for marketers seeking to deliver each mobile ad to the most appropriate device. Advertisements sent to the "wrong" device or carrier might not render properly, which could create dissatisfaction and negative reactions. The prediction that programmatic mobile advertising will reach 68% of total mobile display ad spending in 2016 (eMarketer 2015a) reflect firms' beliefs that automated media buying is more efficient than mobile spending venues. Yet the inherent and vast complexity and uncertainty surrounding this channel represents a substantial concern. Moreover, increasing fragmentation in available mobile inventory across numerous formats leads to opacity in exchange systems (i.e., market-based mechanisms for selling and purchasing mobile inventory) and cumbersome pricing schemes. The advantage of offering more detailed contextualization through mobile (cf. online) channels becomes an impediment when the goal is to establish efficient exchanges and networks to facilitate mobile advertising markets. As media planning models improve their ability to measure and attribute mobile ad effectiveness, such that they can assess not just direct (mobile) responses but also offline responses connected to the location of the digital device, the effectiveness of these models should improve as well.

Fourth, to facilitate and increase access to mobile inventory, firms often form *relationships* with various intermediaries, such as media agencies, social networks, aggregators, mobile ad networks, exchanges, and mobile carriers. Reviewing all available intermediaries is beyond the scope of this article, yet it is important to understand how partnership choices affect

the availability of different mobile ad tactics that enable the advertiser to reach a predefined goal. Some partners may be more suitable for tactics that rely on wider, less expensive coverage and that are not constrained by restricted control over the context surrounding the ad (i.e., mobile ad exchanges and networks). Others are better matched with a more targeted, controlled approach (i.e., media agencies, direct buy from publishers, social media platforms), particularly for tactics for which such control is a priority. Partnership choices also may have a direct impact on the way marketers purchase advertising inventory.

Fifth, government and industry regulations can have a substantial effect on which mobile advertising tactics are available or appropriate. The U.S. Federal Trade Commission (FTC 2013) offers guidance on necessary disclosures in digital advertising, which should prevent marketers from using advertising tactics that fail to satisfy these requirements. Such restrictions may be particularly binding in mobile contexts, because the space constraints that are so pertinent on mobile devices make it difficult to display the required disclosure sufficiently clearly and conspicuously. Furthermore, the U.S. Congress has considered imposing requirements on companies to obtain consumer consent before collecting or sharing their mobile location data (Kaye 2012), and a recently released draft of the Consumer Privacy Bill of Rights Act suggests that firms may be required to provide clear notice about how and in which contexts they use any consumer data they collect.

Sixth, privacy concerns are important not just from a compliance perspective but also for consumer perceptions. Mobile advertising has the potential to provide customers with relevant information and promotions, or it might induce negative consequences, including customer belief that their privacy is being invaded. Previous research confirms that privacy concerns are an important driver of consumer behavior (Tsai et al. 2011); a perceived privacy invasion results in

negative attitudes toward the firm or brand. If mobile targeting seems too intrusive, such as when customers receive frequent, highly personalized advertisements, they suffer a greater sense of vulnerability and reduce their click-through rates (Aguirre et al. 2015). How marketers choose to collect the data also matters. For example, collecting information covertly may have negative effects on advertising outcomes (Aguirre et al. 2015). However, those negative effects can be offset if the ads appear on a well-known website (Aguirre et al. 2015) or come from well-known firms (Milne, Rohm, and Bahl 2009). The impact of privacy considerations and feelings of vulnerability are likely even more pronounced for ads accessed through mobile devices, because they entail more personalized information and location properties. Thus, firms must carefully assess the advantages and disadvantages of mobile ads and develop strategies to accentuate the former while mitigating the latter. Put simply, marketers need to find an optimal balance between achieving more precise targeting and preventing consumer backlash triggered by perceptions of invasive targeted ads. In this pursuit, they should recognize that the ads' presentations also influence their effectiveness and privacy concerns: If they appear self-serving or manipulative, mobile ads enhance customer skepticism and undermine their own effectiveness (Baek and Morimoto 2012; Liu et al. 2012). Ads that provide justification for their offers instead might enhance customer engagement by making their competitive value proposition more salient (White et al. 2008).

As an overarching research question, we ask:

- For each advertising goal, what are the most appropriate outcome metrics, and what are the most effective mobile advertising elements to use, given the constraints and opportunities related to market factors in each context?

Firm Factors

In this section, we focus on four firm factors: the role of top management buy-in, the use of big data and analytics, the development of an omnichannel strategy, and whether the firm's focus is more B2B as opposed to B2C. These firm factors can enhance or inhibit the use of mobile advertising by an organization.

Top Management Buy-In. Whether top managers have shifted their mindset and budget allocations to mobile advertising, and reduced their reliance on conventional advertising in parallel, is a particularly complicated question for global, multinational firms. Moving the budget from conventional advertising to more digital, social, and mobile advertising requires buy-in from all levels of the firm hierarchy. Some firms seek to make small initial shifts in their media spending, and then determine the return on these investments (ROI). However, as we have noted, ROI is currently inherently difficult to demonstrate, leaving senior leadership relatively skeptical. Bold marketing leaders thus have the responsibility to educate their senior leadership team and corporate boards about changing technology and the shifting mobile landscape, as well as the advantages of getting ahead of the curve, relative to competitors. They must bring in new senior managers from digital organizations to help spur innovative and entrepreneurial thinking. Among researchers, a parallel responsibility is to explore the following question:

- How do the mindsets of chief marketing officers, toward incremental versus radical shifts in media spending, influence the transition from traditional to mobile media and overall firm performance?

Big Data and Analytics. As part of their big data initiatives, firms need to understand the digital footprint of their customers. Thus, related to our buy-in discussion, top management must agree to invest in data storage solutions and effective analytics. With such capabilities, the firm

gains a greater ability to leverage its customer data with contextual information (e.g., location, technological context) and develop customized offers. It also can build synergies across different channels. For example, Ghose et al. (2013b) demonstrate, in a randomized field experiment, that the synergies between web and mobile display advertising result in greater clicks and purchases than does relying exclusively on any single type of advertising. Researchers in turn should consider issues related to collecting, managing, and using data generated by mobile advertising. The volume of data thus generated is substantially greater than that available through online channels, so it requires new capabilities and research techniques (statistics, machine learning). We call for additional research to answer the following question:

- What analytical capabilities are required to determine and leverage the effectiveness of mobile advertising?

Omnichannel and Attribution. As firms move to develop omnichannel marketing strategies, they need to organize the data from their various channels in a centralized manner and develop real-time analytical capabilities. Specifically, companies need to understand how to merge their mobile, social, online, and conventional data, to achieve a 360-degree view of their customers.

Attributing each purchase to a specific advertising stimulus is a constant challenge for advertisers (Abhishek, Fader, and Hosanagar 2012; Xu, Duan, and Whinston 2014), and its solution becomes even more difficult with the increased proliferation of advertising channels. Berman (2013) shows that cost-per-action compensation mechanisms, such as the last touch method (i.e., crediting conversions to the publisher that showed the last ad prior to a purchase conversion), motivates suppliers to free ride on one another's efforts. Such free-riding is likely amplified when a prospect is near a store. But Kireyev, Pauwels, and Gupta (2013) instead

identify a cross-channel impact of advertising, whereby display ads increase search conversion rates. Outdoor advertising may have similar impacts (cf. Kirchner et al. 2012). When media discontinuity exists, such as when the advertising exposure occurs online but the response takes place offline, these assessments and allocations become even more difficult. Prior research notes the effect of traditional, non-digital television advertising on online searches (Joo et al. 2014) and shopping (Liaukonyte, Teixeira, and Wilbur 2015), as well as the influence of online community participation on customers' offline (and online) expenditures (Manchanda, Packard, and Pattabhiramaiah 2015).

Being able to track consumers' movements and link their online and offline purchases to mobile ads is an ongoing challenge for advertising attribution, though the context-sensitive nature of mobile devices suggests some new opportunities. For example, information about a user's location at the time of exposure to a mobile ad may facilitate the attribution of a purchase from a nearby retail location to this ad. Marketers' heightened ability to track the location and forecast the movements of their target consumers (Bellovin et al. 2014) should improve their ability for optimal advertising budget allocation across multiple channels, including mobile. In this realm, we ask:

- What are the potential implications of omnichannel marketing, spanning not just mobile but all forms of marketing?
- What are the implications of mobile advertising for more precise advertising effect attributions?

Firm Focus: B2B vs. B2C. The firm's focus on other businesses or customers has important implications for the applicability of mobile advertising. In particular, B2C companies were first to recognize the importance of incorporating mobile advertising in their marketing

mix, but B2B firms have realized the relevance of the mobile channel for their advertising activities. In a recent survey, 64% of B2B marketers cited mobile advertising as core to their business, and 43% maintain a dedicated mobile team (*Marketing Digest* 2015). These firms also have started offering mobile applications and mobile-ready websites to assist with their mobile ad campaigns (Maddox 2013). The effectiveness of mobile ad campaigns in this B2B space might be enhanced by improved abilities to identify and target specific B2B decision makers (e.g., Airbus ads targeted at airline executives). Contextual awareness in the specific mobile setting helps advertisers reach B2B decision makers at the moment they actually are ready to make relevant decisions.

In addition, mobile ad campaigns in the B2B space likely differ in focus across the purchase journey, as well as with respect to the outcomes. Most B2B purchases are deliberate, so need recognition is less prominent even though mobile ads still can highlight a purchase opportunity and bring it to the attention of a B2B customer. In the post-purchase phase, mobile ads for product-related services offer an additional opportunity. Nevertheless, in the B2B sphere, mobile ads may be less likely to initiate a direct response (i.e., purchase) through a mobile device, because these business customers tend to use more traditional channels, such as desktop Internet access, phones, or even personal sales encounters to submit a purchase order. The "consumerization" of B2B may minimize such differences between B2B and B2C over time though. Thus, questions for further research include:

- What unique stages emerge in the B2B purchase decision process, and how should mobile ad campaign goals depend on these stages?

Conclusion

As the key research questions and suggested directions summarized above reveal, firms in virtually every sector confront multiple factors that affect their mobile advertising and marketing strategies. At the same time, as companies struggle to make sense of and leverage their mobile capabilities, consumers react and respond in various ways. We highlight several key factors that define these interactions, including marketers' constantly shifting abilities to target and deliver relevant content and promotions to current and potential customers, the combined effects of mobile strategies with overall advertising and marketing strategies, the contextual features that determine both strategic goals and mobile advertising effectiveness, and variations in relevance based on consumers' stage in the decision-making process. Together with the studies of mobile promotions (Pancras et al. 2015), mobile gaming (Hofacker et al. 2015), and mobile shopper marketing (Shankar et al. 2015) that appear in this issue, we seek to achieve thought leadership, focusing not just on what we already know about mobile advertising but also on where the interactive marketing field needs to go next in our research.

Although this review has focused on consumers, many of these issues are also relevant in business-to-business contexts, and we expect further research to apply the proposed framework in Figure 1 to that setting. Furthermore, we hope that researchers will leverage the identified key insights from prior work on mobile advertising and take the lead in addressing the remaining questions that this review has posed. We are confident that such research will be instrumental for companies struggling to make decisions about how to direct their mobile advertising efforts to reach consumers, where and when they want to be reached, without crossing legal or privacy boundaries.

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Figure 1. Mobile Advertising Effectiveness Framework

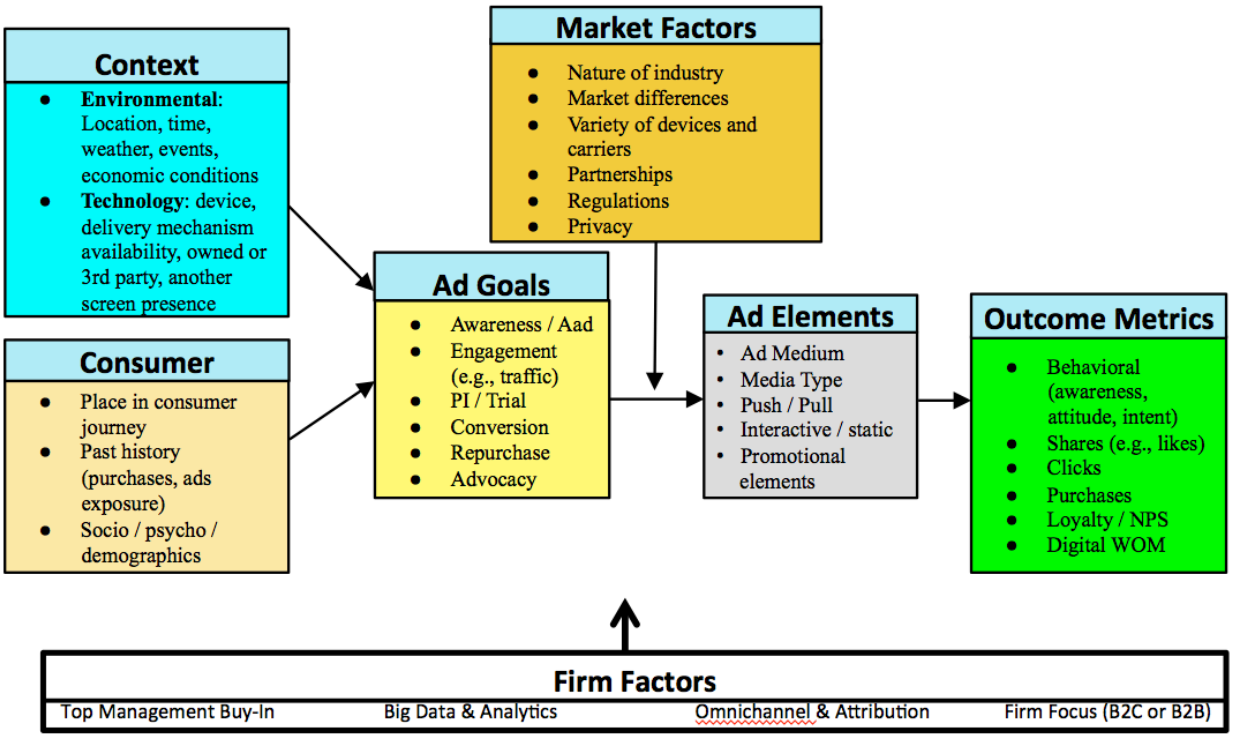

Table 2. Representative Mobile Advertising Literature

Paper	Goal	Tactic	Metrics	Findings
Andrews et al 2015	Conversion	SMS coupon	Redemption rate	Commuters in crowded subway trains are about twice as likely to respond to a mobile offer by making a purchase than those in non-crowded trains.
Bacile, Ye and Swilley 2014	Conversion	SMS coupon	Redemption rate	Mobile coupon redemptions (restaurants) are higher for users who prespecify when they want mobile coupon delivered.
Baker, Fang and Luo 2014	Conversion	SMS coupon	Redemption rate	Framing a product as either utilitarian or hedonic generates substantial differences in mobile ad effectiveness, depending on the hours during which it appears.
Bart, Stephen and Sarvary 2014	Brand Attitudes and Purchase Intent	Display ads (multiple campaigns)	Immediate mobile survey on attitudes and intent	Mobile display advertising is more effective for high involvement and utilitarian products.
Barwise and Strong 2002	Brand building, engagement, conversions	SMS ads (multiple campaigns)	Post-campiagns phone interviews	SMS advertising generates awareness, stronger brand attitudes, and direct behavioral responses.
Danaher et al 2015	Conversion	3 SMS coupons at entrance of a shopping mall	Redemption rate	Distance to store, time of delivery, and expiration date matter for mobile coupon effectiveness; these coupons work particularly well for snack foods.
Fong, Fang and Luo 2015	Conversion	SMS coupon	Redemption rate	Competitive locational targeting produced increasing returns to promotional discount depth, indicating the presence of threshold effects. Targeting a retailer's own location instead produced decreasing returns on deep discounts, indicating saturation effects and profit cannibalization.
Ghose, Han and Park 2013	Engagement and Conversion	Display ads	CTR and Conversion rates	A mix of web and mobile display advertising triggers more clicks and purchases, compared with web ads only or mobile ads only.
Hui et al 2013	Conversion	In-store SMS coupon	Redemption rate	A coupon that requires shoppers to travel farther from their planned path resulted in a substantial increase in unplanned spending ($21.29) over a coupon for an unplanned category near their planned path ($13.83).
Luo et al 2014a	Conversion	SMS coupon	Redemption rate	Messages are effective if the mobile ad message content fits the consumer mindset in two location contexts (home and work).
Luo et al 2014b	Conversion	SMS coupon	Redemption rate	For proximal targeting, same-day mobile coupons are more effective, but next-day coupons are more effective in non-proximal targeting.
Molitor et al 2015	Conversion	Field experiment with location-targeted pull coupons/ads in 3rd party app	CTR and coupon choice	Experimental manipulation of whether distance information is provided and whether coupon ranking is displayed according to distance. Increasing the distance to a store by 1 kilometer decreases mobile coupon response rates by between 2.0 and 4.7 percent. The cognitive effort of scrolling down one rank on the screen leads to a reduction in coupon response rates by approximately 4.4 to 5.2 percent.
Molitor, Reichhart and Spann 2014	Conversion	Location-targeted m-coupon/ad in 3rd party app	CTR and coupon choice	Consumers choice behavior highly depends on geographical location, mobility, time and weather. Consumer co-located is positively related to coupon response.
Zubcsek, Katona and Sarvary 2015	Conversion	m-coupon in 3rd-party app (opt-in required)	Redemption rate	Co-located (i.e., those who appeared at the same place at approximately the same time) consumers' coupon redemption rates are correlated even after controlling for demographics, referral data, and prior response rates within the category of the coupon.