



# The Effects of Adopting and Using a Brand's Mobile Application on Customers' Subsequent Purchase Behavior<sup>☆</sup>

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## Abstract

Mobile applications (apps) have become an important platform for brands to interact with customers, but few studies have tested their effects on app adopters' subsequent brand purchase behavior. This paper investigates whether adopters' spending levels will change after they use a brand's app. Using a unique dataset from a coalition loyalty program with implementations of propensity score matching and difference-in-difference-in-difference methods, we compare the spending levels of app adopters with those of non-adopters. Specifically, we examine whether the use of the app's two main interactive features—information lookups and check-ins—influences adopters' spending levels. We find that app adoption and continued use of the branded app increase future spending. Furthermore, customers who adopt both features show the highest increase. However, we also observe “the recency effect” – when customers discontinue using the app, their spending levels decrease. Our findings suggest that sticky apps which attract continuing uses can be a persuasive marketing tool because they provide portable, convenient, and interactive engagement opportunities, allowing customers to interact with the brand on a habitual basis. We recommend that firms should prioritize launching a mobile app to communicate with their customers, but they should also keep in mind that a poorly designed app, which customers abandon after only a few uses, may in fact hurt their brand experience and company revenues.

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**Keywords:** Mobile app; Log data; Location check-ins; Interactivity; Stickiness; Purchase behavior; Propensity score matching; Difference-in-difference-in-difference (DDD) model

## Introduction

The rapid adoption of smartphones and subsequent development of mobile applications (“app” or “apps” hereafter) have been changing the ways in which customers interact with a brand. According to [comScore \(2014, October 7\)](#), smartphone penetration in the United States reached 72% as of August 2014. The switch from feature phones to smartphones is happening globally, and many parts of the world are embracing the adoption of smartphones ([Meena 2014, August 8](#)). The rapid growth of

mobile technologies comes with the proliferation of various types of apps. Over 110 billion apps have been downloaded in 2013 ([Ingraham 2013, October 22](#); [Welch 2013, July 24](#)). The number is expected to surpass 268 billion by 2017 ([Fox 2013, Sep 19](#)). Mobile apps account for more than 50% of time spent on digital media ([Lipsman 2014, June 25](#)), suggesting that apps have deeply penetrated into the daily lives of smartphone users.

Companies have welcomed mobile apps as an additional communication channel to attract new customers and increase brand loyalty among existing ones ([Wang, Kim, and Malthouse 2016](#)). They realize that customers use a variety of app features to perform diverse tasks such as searching, retrieving, and sharing information, passing time with entertainment content, paying bills, and navigating maps. Therefore, companies have started to use apps to increase brand awareness and enhance brand experience. Given younger customers' high expectations regarding a brand's savvy use of mobile technology ([Annalect](#)

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2015, January 28), it becomes increasingly important for companies to offer branded apps that can provide a seamless, convenient, and enjoyable customer experience.

Despite the growing interest in apps and their potential marketing impact, there is a dearth of research on the use of branded apps as a persuasive communication channel or loyalty building platform that can influence future spending levels. This paper addresses such shortcomings and examines the adoption (i.e., downloading and logging into the app at least once) and uses of two interactive features (i.e., information lookups and location check-ins). We analyze the effect of app adoption on purchase behavior by comparing the spending levels of adopters with those of matched non-adopters, whose pre-adoption demographic and behavioral characteristics are similar. We also investigate the impact of using different app features on purchase behavior. Lastly, we examine the impact of repeated and discontinued use of a branded app. Most studies have examined the positive outcomes of adopting and/or using apps, but we know little about how their spending levels change if customers cease using them. About 20% of the apps are used only once after being downloaded (Hosh 2014, June 11). Nearly half of customers report that they would delete an app if they find a single bug in it (SmartBear 2014). Thus, understanding how customers' purchase behavior changes after abandoning a branded app has major marketing implications.

This paper offers two substantive contributions. First, by linking customers' app use with their actual spending, this study provides quantified evidence that shows how adoption of a branded app impacts customers' spending at its firm. Second, it discusses the mechanisms for how a branded app leads to an increase in future spending, using the concepts of interactivity and stickiness, which have been mostly discussed in the web context. By applying these concepts to mobile apps, this study expands our understanding of how the use of interactive technology influences purchase behavior. Lastly, we offer an empirical contribution by using improved measures for key variables—app use and purchase behavior—taken from customers' app logs and transaction data. Given the issues of using self-reported measures of mobile phone use (Boase and Ling 2013) and purchase intentions (van Noort, Voorveld, and van Reijmersdal 2012), our study adds to the mobile marketing literature by incorporating behavioral measures of app use and purchase histories.

## Literature Review and Hypotheses

### *Values Created by Using a Mobile App*

A growing body of literature has identified distinctive characteristics of mobile devices and discussed their implications. Perceived ubiquity is one of the most important aspects of mobile services (Balasubramanian, Peterson, and Jarvenpaa 2002; Watson et al. 2002). Okazaki and Mendez (2013) find that perceived ubiquity is a multidimensional construct consisting of continuity (i.e., “always on”), immediacy, portability, and searchability. In a marketing context, mobile media are distinct from mass marketing channels because the former allow for location-specific, wireless, and portable communication (Shankar and Balasubramanian 2009). Similarly, Lariviere et al. (2013) contend that mobile

devices are unique in that they are portable, personal, networked, textual/visual and converged. They explain that these unique characteristics provide value to customers, including information (e.g., searching for information), identity (e.g., expressing personality), social (e.g., sharing experience or granting/gaining social approval), entertainment and emotion (e.g., killing time by streaming music/movies or playing games), convenience (e.g., speedy multitasking such as paying bills), and monetary value (e.g., getting discount or promotion offers).

Motivated by these types of value and convenience, customers may initially adopt an app, however, what makes a branded app powerful is its interactive nature that allows them to experience the brand by using its advanced features (Bellman et al. 2011; Calder and Malthouse 2008; Mollen and Wilson 2010; Novak, Hoffman, and Yung 2000; Yadav and Varadarajan 2005). Kim, Lin, and Sung (2013) document interactive features that promote the persuasive effectiveness of branded apps. Their content analysis of 106 apps of global brands finds that most employ attributes such as vividness, novelty, motivation, control, customization and feedback. Their findings suggest that, unlike computer-based websites, branded apps provide “anytime, anywhere” interactivity with navigation and control features that customers can easily use in the mobile environment. Furthermore, these apps also increase customers' enjoyment and willingness to continue the relationship with the brands by giving them a sense of agency.

Although there are numerous studies on mobile marketing, few specifically examined the financial effect of using branded apps. One exception is a study by Bellman et al. (2011), which conducts an experiment to see whether using popular branded apps impacts brand attitude and purchase intention. They demonstrate that using branded apps increases interest in the brand and product category. They also find that apps with an informational/user-centered style had larger effects on increasing purchase intention than those with an experiential style because the former focus on the users, not on the phone, thus encouraging them to make personal connections with the brand.

Reflecting on a limited number of previous studies, we see that the persuasive effectiveness of branded apps is attributable to the rich user experience made possible by interacting with the app and the brand. Branded apps allow customers to get easy access to information, enjoy entertainment, receive customized coupons, and experience the brand on the move. Also, the interactive features deepen the customer–brand relationship and serve as antecedents of positive attitude toward the brand, purchase intention, and ultimately purchase behavior. Based on the review of existing literature, we propose the following hypothesis.

**H1.** The adoption of a branded app increases subsequent spending with a brand.

### *Experiences of Using Interactive Features of a Mobile App*

Research on human–computer interaction provides theoretical explanations for how branded apps create awareness, attitudes, intentions, and behavior. Previous studies have shown that there are five mechanisms in which technology influences the process

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