

# **Increasing Satisfaction With and Stickiness of Branded Mobile Apps in Online and Hybrid Brick-and-Click Retail Channels: A Perceived Value Perspective**

**Peggy Choong**  
**Niagara University**

**Paul S. Richardson**  
**Niagara University**

**Paul Sauer**  
**Canisius College**

*Branded mobile apps are software applications developed by companies that carry the names and logos of the organizations and have functions designed to interact with customers using smartphones or digital devices. We find that consumer satisfaction and continued use of these branded apps are positively related to the fulfillment of utilitarian and hedonic benefits in online channels. For hybrid channels, utilitarian rather than hedonic benefits are key. Regardless of channel type, satisfaction is a key determinant of stickiness. Implications for management are discussed.*

*Keywords: branded mobile app, satisfaction, stickiness, perceived value*

## **INTRODUCTION**

Mobile software applications for smartphones and devices, commonly known as apps, have transformed the way we live, work, play and shop. Consumers downloaded an astounding 204 billion apps and spent more than \$120 billion on the purchase of apps for their smartphones in 2019 (McCue, 2019; Clement, 2020a). Apps facilitate consumers' lives by performing functions that fall into five categories namely, experiential functions in the form of games and entertainment, social functions such as social networking facilitated by platforms such as Snapchat and Facebook, utilitarian functions in the forms of maps, emails and calendars, search functions enabled by sites such as Yelp and Tripadvisor, and shopping functions provided by retailers such as Wanelo, an entirely online store, and Urban Outfitters, a hybrid brick-and-click retailer (Tiongson, 2015; Choong et al., 2016).

The development of retail mobile apps in particular and mobile technology in general, represents a significant opportunity for marketers to engage, delight, market, and sell to an increasingly demanding consumer market. More recently, marketers have developed branded apps. A branded app refers to a mobile app that is developed by a company, carries the name of the organization and its logo, and has functions designed by the company to interact with its customers. Examples of retail branded apps are Wanelo,

Ssense, Forever 21 and Urban Outfitters. Branded apps represent an under tapped marketing opportunity for retailers. These apps are a powerful form of interactive branding (Shankar & Balasubramanian, 2007; Nielsen, 2014). Consumers personally select these apps and download them into their smartphones. They encounter these branded apps each time they scroll through their smartphones during the course of the day. In effect, branded apps are akin to having billboards of companies on one's smartphone (Choong et al., 2016). More importantly, consumers—through selecting and downloading the app—in effect give permission to the company to market to them (Im and Ha, 2013). Consumers thus view apps as non-intrusive, are receptive to their message, and are more willing to engage with the content and the company. There is evidence that branded apps are able to build strong relationships with consumers, influence favorable brand attitude and purchase intentions, and enhance consumer loyalty (Bellman et al., 2011; Ozturk et al., 2016).

While a significant number of companies have developed branded apps, few have achieved significant success. More than ninety percent of these branded apps have less than ten thousand downloads, suggesting that consumers perceive little value in their functions (Lella, et al., 2015; Marketingcharts, 2016; McCue, 2019). Furthermore, research also indicates that 25% of consumers abandon an app after only one use (Clement, 2020b). This represents a substantial opportunity cost to the company that is unable to leverage this rich permission marketing prospect.

Therefore, an understanding of factors that drive satisfaction and continued app use or stickiness is important. However, despite the importance of branded apps and their marketing potential, there is a dearth of research on key issues such as determinants of satisfaction and drivers of stickiness with branded mobile apps.

The technology acceptance model (TAM) has often been used to explain consumers' acceptance of computer technology (Davis, 1989; Taylor & Todd, 1995; Humbani & Wiese, 2019). While this body of research has yielded some valuable insights into the consumers' propensity to adopt a new program or information technology, it has provided little insight in the continued use of and satisfaction with branded apps. Much of its limitations is centered on its inability to adequately capture the hedonic aspect of branded apps. Users of branded apps consume them not just for their utilitarian functions but also for the pleasure they derive from them. As such, a growing body of literature has increasingly emphasized the need to focus on consumer motivations to understand consumer behavioral intentions towards technology. This stream of work examines perceived value and its impact on post-adoption behaviors. Utilitarian benefits, defined as perceived usefulness and perceived ease of use, both of which serve as independent variables in the TAM, have been identified as an important factor that leads to the acceptance of technology and satisfaction (Hsu & Lin, 2016). Hedonic benefits capture the notion of pleasure and is shown to be related to satisfaction (Davis et al., 1992; Lin et al., 2005).

The industry chosen in this study is the fashion apparel industry. This is because apparel shopping in the U.S. is a regular and frequent activity with more than seventy percent of Americans having purchased apparel in the last six months (Nielsen, 2016). In addition, it is a highly competitive industry for both the online only and hybrid brick-and click retailer, which are currently experiencing major disruptions. An online retailer is one that operates only in the digital space, whereas a brick-and-click retailer operates in both the digital and physical setting. The issue of how branded app requirements differ between these two channels remains unanswered in the literature.

The purpose of this paper is to address this need by examining the effects of consumer motivations on post-adoption satisfaction with and stickiness of branded mobile apps. To perform this examination, we use motivation theory within the framework of the technology acceptance model to examine consumers' post-adoption behavior in the online-only and the hybrid brick-and-click channels in the fashion retail industry.

## **LITERATURE REVIEW**

### **Technology Acceptance Model**

The technology acceptance model (TAM) is a widely accepted and validated model in the literature and has often been used to explain consumers' propensity to adopt a new program or information technology

(Davis, 1989; Mathieson, 1991; Taylor & Todd, 1995; Humbani & Wiese, 2019). The strength of the TAM is its parsimony, which lends itself to relevance in a multitude of technology adoption contexts (Mathieson, 1991). The independent variables in TAM are perceived usefulness and perceived ease of use. The former is defined as the perception of consumers that the adoption of the new technology will enable them to enhance their task performance or effectively complete their task. Perceived ease of use, on the other hand, is characterized as consumers' perception that the technology is easy to use and requires little effort or cost on their part. Extending the TAM, additional studies have examined the post-adoption behavioral intention of consumers and find that ease of use, and task performance and completion are linked to consumer satisfaction (Doll & Torkzadeh, 1991; Davis et al., 1992; Gatian, 1994). More recent works find that perceived usefulness and perceived ease of use are directly related to consumer satisfaction (Mather et al., 2002; Hsu & Lin, 2016; Humbani & Wiese, 2019). In the same way, studies have also demonstrated that perceived ease of use and perceived usefulness are positively related to continued use or stickiness (Li et al., 2006; Racherla et al., 2012; Park et al., 2011; Kim, et al., 2016).

The limitation of TAM is its inability to adequately capture the hedonic aspect of branded apps. As such, a stream of research has turned to consumer motivations to enhance their understanding of behavioral intentions towards technology. This stream of work examines perceived benefits and its impact on post-adoption behaviors.

### **Perceived Benefits**

According to motivation theory, consumers are driven by their perception of overall gains or benefits to be derived from the use and continued use of technology (Fagan et al., 2008; Park et al., 2011; Kim et al., 2016). The overall gains are conceptualized as utilitarian benefits that fulfill the consumer's goal directed behaviors towards task performance and hedonic benefits that fulfill the consumer's need for pleasure. Kim et al. (2016) identified perceived usefulness and perceived ease of use as utilitarian benefits. These are goal directed behaviors that are fundamental to task performance or completion. Hedonic benefits are captured in the ability of consumers to engage with the technology to fulfill their need for pleasure (Debu et al., 2003; Wami et al., 2017). This aspect is especially important in the case of fashion retail where consumers actively seek hedonic benefits. This may take the form of pursuing pleasure and engaging in fun by creating virtual closets, assembling outfits with accessories fashioned on their virtual selves, as well as consulting with a stylist provided by the company (Choong et al. 2016). This pursuit of pleasure and discovery can be characterized as playfulness, and this has been shown to have an impact on the post-adoption consumer behavior intentions. Consumers engage with the app for their own sake because they enjoy it and are inherently interested. As a result, they are more likely to be satisfied with the app, which enhances continued app usage (Maghnatic & Kwek, 2013; Choong et al., 2016).

## **CONCEPTUAL MODEL AND HYPOTHESES**

Based on previous literature, perceived usefulness (PU) and perceived ease of use (EOU) are conceptualized as utilitarian benefits and playfulness (PLAY) as a hedonic benefit (Debu et al., 2003; Park et al., 2011; Kim et al., 2016). In this area, research has found that perceived value, both utilitarian and hedonic, has a significant impact on satisfaction (Lin & Wang, 2006; Overby & Lee, 2006; Kuo et al., 2009). More specifically, perceived usefulness and perceived ease of use have been established to have a significant and positive impact on satisfaction (SAT) (Mather et al., 2002; Thong et al., 2006; Rose et al., 2012; Hsu & Lin, 2016; Fleischman et al., 2016; Humbani & Wiese, 2019). Hedonic benefits, captured by the ability of consumers to engage in playfulness (PLAY), have been shown to be positively related to satisfaction (SAT) (Lin & Lu, 2011; Choong et al., 2016).

Previous research has also indicated that when the technology is perceived by consumers to be easy to use and entails little cost to obtain its benefits, consumers may perceive that the technology is useful, resulting in higher satisfaction and stickiness. This indicates that perceived ease of use also has an indirect effect on satisfaction and stickiness when mediated by perceived usefulness (Hong et al., 2006; Tojib &

Tsarenko, 2012; Cho, 2016; Hong et al., 2017; Newman et al., 2018). Therefore, the following hypotheses are posited below for both the online-only (ON) and hybrid brick-and-click (HY) channels:

***H1-ON and H1-HY: Perceived usefulness (PU) is positively related to satisfaction (SAT).***

***H2-ON and H2-HY: Perceived ease of use (EOU) is positively related to satisfaction (SAT).***

***H3-ON and H3-HY: Perceived ease of use (EOU) is positively related to perceived usefulness (PU).***

***H4-ON and H4-HY: Playfulness (PLAY) is positively related to satisfaction (SAT).***

Hong et al., (2006) find that perceived usefulness is a key determinant of stickiness (STICK). Consumers who perceived technology to require little cost or effort on their part are more likely to continue using it (Cho, 2016). Kim, Kang and Jo (2014) highlighted the positive influence of hedonic factors on stickiness. Therefore, the following hypotheses are posited:

***H5-ON and H5-HY: Playfulness (PLAY) is positively related to stickiness (STICK).***

***H6-ON and H6-HY: Perceived usefulness (PU) is positively related to stickiness (STICK).***

***H7-ON and H7-HY: Perceived ease of use (EOU) is positively related to stickiness (STICK).***

Satisfaction is the ex-post consumer response to the experience and has been demonstrated to be at the core of continuance of use in the area of technology (Bhattacharjee, 2001; Kim & Son, 2009). Previous studies have shown that consumers with higher levels of satisfaction have strong stickiness (Thong et.al., 2006; Idemudia et al. 2016; Fleischmann et al., 2016; Wani et al., 2017) and satisfaction is a predictor of stickiness (Zhou, 2011). Therefore, it is hypothesized that:

***H8-ON and H8-HY: Satisfaction (SAT) is positively related to stickiness (STICK).***

## **METHODOLOGY**

### **Sample**

Data was collected from a sample of university students who owned smartphones and were frequent users of branded mobile apps. Respondents were instructed to download the branded mobile apps under study. They were then given some time to interact with the app and instructed to do so in the same manner they would if they were browsing, shopping, and purchasing. After completing the interaction with the branded app, respondents were then subjected to the questionnaire. This sequence of instruction was conducted for the pure-online mobile fashion app (Wanelo) and the hybrid (brick-and-click) mobile fashion app (Urban Outfitters). A total of 100 completed questionnaires was used in the analysis.

### **Measures**

Measurement items for the questionnaire were formulated based on constructs identified and operationalized in previous studies (Davis, 1989; Mahatanankoon, 2007; Hsu & Lin, 2008; Choong et al., 2016; Kim et al., 2016; Lee, 2018).

Perceived ease of use (EOU) is characterized as the technology being perceived by consumers as involving minimal cost to themselves in the form of effort (time and cognitive effort to learn to reap the benefits of the app) and money and is operationalized as being easy to use and to navigate as well as downloadable without cost (Hsu & Lin, 2008; Choong et al., 2016). Perceived usefulness (PU) captures the ability of the technology to enhance consumers' task performance and task completion and is operationalized as quick load and response time, an easy checkout process and, a one-click purchase option

that includes shipping (Kim et al., 2016). Playfulness (PLAY) is characterized as the technology enabling consumers to pursue pleasure and discovery and is operationalized as the app enabling them to create outfits and style with clothing and accessories, have the ability to create a virtual closet, and has a stylist option with personalized information about the latest trends (Mahatanankoon, 2007; Choong et al., 2016). SAT is the overall evaluation of satisfaction with the shopping experience and the app functions and features while STICK is measured as the propensity to continue using the app and to recommend it to others (Lee, 2018). All items are measured on a 7-point Likert scale where “1” indicates strongly disagree and “7” indicating strongly agree.

## RESULTS

### Measurement Model

Confirmatory factor analysis using AMOS, was conducted to assess the reliability and validity of the measurement model. The criteria for inclusion in the model is that variables with factor loadings less than 0.5 on any factor must be removed. The results indicate that factor loadings ranged from 0.6 to 0.98, thus exceeding the minimum acceptable value of 0.5 (Hair et al., 2010). Composite reliability (CR) was computed to assess the internal consistency of the measurement model. The results indicate that the composite reliability of all five factors exceeded the minimum of 0.7 (Fornell, 1982). The composite reliabilities ranged from 0.71 to 0.99.

Average variance extracted (AVE) indicated that all factors, except PU, exceeded the benchmark value of 0.5 (Fornell and Larcker, 1981). Here, the values of the AVE ranged from 0.8 to 0.9. The AVE for PU was 0.47 and 0.45 for pure online (ON) and hybrid brick-and-click (HY) stores respectively. However, the composite reliability for both these retail outlets were 0.771 and 0.770 respectively both of which are higher than 0.6. According to Fornell and Larcker (1981), convergent validity of factors are valid if their AVE is less than 0.5 but their composite validity is higher than 0.6. Thus, in accordance with Fornell and Larcker (1981), convergent validity for PU in both channels is acceptable. Based on these findings, the scales for evaluating these constructs are determined to exhibit adequate convergent validity. Table 1 indicates the results of CR and AVE.

**TABLE 1**  
**RESULTS OF CFA**

Construct	(A.) Online Retailer (ON)		(B.) Hybrid Retailer (HY)	
	CR	AVE	CR	AVE
EOU	0.995	0.903	0.980	0.840
PU	0.771	0.473	0.770	0.454
PLAY	0.738	0.796	0.740	0.799
SAT	0.900	0.841	0.870	0.892
STICK	0.829	0.892	0.892	0.919

### Discriminant Validity

Discriminant validity was determined by comparing the square root of the AVE with the shared correlation between each pair of constructs to ensure that the constructs are unique (Fornell & Larcker, 1981). Tables 2a and 2b indicate that all diagonal values exceed the inter-construct correlations for both retail channels. This indicates that the constructs for both the online and hybrid channels are empirically distinct and exhibit discriminant validity (Fornell & Larcker, 1981).

**TABLE 2A**  
**RESULTS OF DISCRIMINANT VALIDITY OF ONLINE RETAIL OUTLET**

	EOU	PU	PLAY	SAT	STICK
EOU	<b>0.950</b>				
PU	0.398	<b>0.687</b>			
PLAY	0.042	0.128	<b>0.892</b>		
SAT	0.005	0.426	0.149	<b>0.917</b>	
STICK	0.034	0.308	0.197	0.854	<b>0.944</b>

\* Diagonal elements represent the square roots of the AVE. The off-diagonal elements represent the correlation coefficients.

**TABLE 2B**  
**RESULTS OF DISCRIMINANT VALIDITY OF HYBRID RETAIL OUTLET**

	EOU	PU	PLAY	SAT	STICK
EOU	<b>0.916</b>				
PU	0.374	<b>0.674</b>			
PLAY	0.013	0.113	<b>0.894</b>		
SAT	0.006	0.463	0.146	<b>0.944</b>	
STICK	0.029	0.298	0.195	0.855	<b>0.959</b>

\* Diagonal elements represent the square roots of the AVE. The off-diagonal elements represent the correlation coefficients.

In summary, the measurement model tests for composite reliability and construct (convergent and discriminant) validity satisfy the statistical criteria needed, leading therefore to the next step of evaluation and interpretation of the structural component of the model. For the structural part of the model, goodness-of-fit measures indicated in Table 3 are all at or above acceptable levels (Hair, et al., 2010). Hence the model provides a good fit to the data and is appropriate for tests of the hypotheses.

**TABLE 3**  
**FITNESS INDICES FOR THE STRUCTURAL MODEL**

Measures	Recommended Criteria	(A.) Online Retailer (ON)	(B.) Hybrid Retailer (HY)	References
$X^2/df$	<2	1.412	1.601	Tabachnick & Fidell, 2007.
CFI	$\geq 0.95$	0.981	0.971	Hu & Bentler, 1999.
NFI	>0.8	0.938	0.925	Bentler & Bonnet, 1980.
RMSEA	<0.08	0.065	0.078	MacCallum et al., 1996.
SRMR	<0.08	0.061	0.072	Hu & Bentler, 1999.

**Structural Model and Hypotheses Tests**

The initial Amos computations revealed the significant and non-significant paths exhibited in Table 4. Results also indicate that the models for both the ON and HY retail channels achieved acceptable levels of

goodness-of-fit, though not all the regressions coefficients are significant based on the t-tests. This is addressed in the next section as steps are taken to work towards a more parsimonious model.

**TABLE 4**  
**STRUCTURAL PATH T-TEST**

Hypothesis	Hypothesized Path	(A.) Online Retailer (ON)		(B.) Hybrid Retailer (HY)	
		Estimate	p-value	Estimate	p-value
H1-ON; H1-HY	SAT ← PU	0.681	0.005	1.227	0.000
H2-ON; H2-HY	SAT ← EOU	0.352	0.155	0.526	0.092
H3-ON; H3-HY	PU ← EOU	0.333	0.042	0.439	0.006
H4-ON; H4-HY	SAT ← PLAY	0.233	0.003	0.090	0.262
H6-ON; H6-HY	STICK ← PU	0.208	0.092	0.401	0.076
H7-ON; H7-HY	STICK ← EOU	0.002	0.985	0.241	0.216
H5-ON; H5-HY	STICK ← PLAY	0.087	0.038	0.062	0.216
H8-ON; H8-HY	STICK ← SAT	1.035	0.000	0.934	0.000

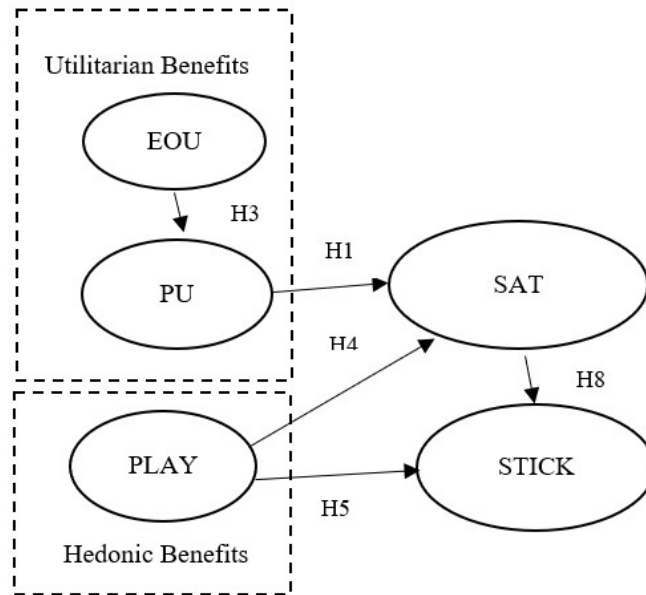
**Towards a More Parsimonious Model**

Though the results of the Amos structural equation model shown in Table 4 provide evidence that the models for both the ON and HY retail channels achieve an acceptable level of goodness-of-fit, the fact that not all regression coefficients are significant based on the t-tests needed to be addressed. There is general agreement that parsimonious models are preferable and this is achieved by evaluating the nested models resulting from excluding these non-significant regression paths without loss of goodness-of-fit (Arbuckle, 2014). To achieve this goal, we excluded one structural path parameter at a time and reran the AMOS SEM analysis. For the HY format, the first parameter removed was PLAY → SAT with a high p-value of 0.262; and for the ON format, the first parameter removed was EOU → STICK with a high p-value of 0.985. This procedure was concluded when any one of the retail channel format showed all significant coefficients. This resulted in five remaining coefficients in the ON retail channel. To substantiate the claim that these more parsimonious models did not result in a loss of goodness-of-fit, a Chi-Squared difference test for each retail format comparing the full model to the reduced model was conducted. The results of the Chi-Squared difference tests displayed in Table 5 shows that the null hypothesis, that there is no difference in the goodness-of-fit between the full and reduced models, cannot be rejected for both the HY (sig=0.125) and ON (sig=0.202) retail formats. As such, it has been demonstrated that the more parsimonious reduced models, displayed in Figure 1, can be used to interpret adoption behavior without loss of explained variance in either customer satisfaction or stickiness.

**TABLE 5**  
**CHI-SQUARE DIFFERENCE TESTS OF FULL vs. REDUCED MODELS**

Model	(A.) Online Retailer (ON)		(B.) Hybrid Retailer (HY)	
	CMIN	DF	CMIN	DF
Full Model	64.966	46	73.642	46
Reduced Model	69.583	49	79.374	49
$\Delta\chi^2$	4.617	3	5.732	3
Sig.	0.202		0.125	

**FIGURE 1**  
**PERCEIVED BENEFITS, SATISFACTION AND STICKINESS**



**Hypotheses Testing**

The results of the SEM are presented in Table 6. Hypothesized relationships among the constructs are examined for both the online-only and hybrid brick-and-click retail outlets. In the online-only retail outlet, PU is positively related to satisfaction. This result is significant at the  $p < 0.01$  level. Furthermore, EOU is positively and significantly related to PU ( $\beta = 0.45$ ;  $p < 0.001$ ), with PU mediating its positive impact on satisfaction, thus supporting hypotheses H1 and H3 in the online retail format. This is consistent with previous research (Thong et al., 2006; Kuo et al., 2009; Hsu & Lin, 2016; Cho, 2016; Fleischman et al., 2016).

Playfulness (PLAY) is also positively and significantly related to satisfaction ( $\beta = 0.24$ ;  $p < 0.01$ ) thereby supporting H4. These findings confirm that when consumers obtain utilitarian and hedonic benefits from the branded mobile app, for the online retail outlet, they experience satisfaction (Lin & Wang, 2006; Kuo et al., 2009).

In the hybrid retail format, PU is found to be positively and significantly related to satisfaction ( $\beta = 0.87$ ;  $p < 0.001$ ). Similar to the online retail format, EOU is also positively and significantly related to PU ( $\beta = 0.43$ ;  $p < 0.001$ ). However, unlike the online only retail format, in the hybrid retail context, PLAY is not significantly related to satisfaction ( $\beta = 0.10$ ;  $p < 0.20$ ). Hence H4-HY is not supported. PLAY is found to be positively related to stickiness. However, it is not significant ( $\beta = 0.054$ ;  $p < 0.3$ ). Thus, H5-HY is not supported.

This result is different for the online-only retail outlet. Here PLAY is seen to be an important construct. PLAY is positively and significantly related not only to satisfaction, as discussed previously, but also to stickiness ( $\beta = 0.09$ ;  $p < 0.03$ ). Hence, hypotheses H5-ON is supported. These results indicate that when consumers realize high levels of hedonic value through engagement with the branded app for the online fashion retail channel, they tend to be satisfied and continue their usage of the app (Kim et al., 2014). Finally, satisfaction is found to be positively and significantly related to stickiness for both the online ( $\beta = 0.99$ ;  $p < 0.001$ ) and hybrid ( $\beta = 0.86$ ;  $p < 0.001$ ) retail channels (Idemudia et al., 2016; Fleischmann et al., 2016; Zhou, 2011). Hypothesis H8 is therefore supported.



**TABLE 6**  
**RESULTS OF HYPOTHESES TESTING**

Hypothesis	Hypothesized Path	(A.) Online Retailer (ON)		(B.) Hybrid Retailer (HY)	
		Parameter Estimate	p-value	Parameter Estimate	p-value
H1	SAT ← PU	0.863	0.008	0.871	0.001
H3	PU ← EOU	0.453	0.000	0.428	0.001
H4	SAT ← PLAY	0.238	0.003	0.102	0.204
H5	STICK ← PLAY	0.092	0.028	0.054	0.287
H8	STICK ← SAT	0.992	0.000	0.858	0.000

## DISCUSSION

Branded mobile apps represent an under leveraged marketing opportunity with immense potential in the retail sector. The permission that consumers give to marketers when they download branded apps provides organizations the valuable opportunity to engage directly with customers who are more receptive to their messaging. The findings indicate that in the online-only retail format, customers use branded mobile apps not only to fulfill their utilitarian needs but also to engage in their pursuit of discovery and pleasure to meet their hedonic needs. The utilitarian need of task enhancement and completion with little cost to the consumer is shown to be a key determinant of satisfaction. In addition, consumers who perceive that the branded mobile app is easy to use tend to believe that the app is more useful and exhibit greater satisfaction.

In this online-only retail format, functions within the mobile fashion app that allow for fun and playfulness fulfill hedonic needs and have a positive impact on consumer satisfaction and stickiness. Here, consumers engage with the app to experience fun and pleasure. When this need is fulfilled, consumers exhibit greater satisfaction. Very importantly, hedonic need fulfillment is also positively related to stickiness, thereby indicating that consumers who are able to indulge in these pursuits of pleasure and discovery tend to exhibit a higher propensity to continue using the branded app.

The results are slightly different in the hybrid retail format. Here, playfulness is not found to be significantly related to satisfaction and stickiness. While this result was not anticipated, it does explain the phenomena that retailers have noticed in recent years. The research-online and buy-offline phenomena is well documented (Ellett, 2018). In the fashion apparel category, consumers still desire the tactile experience of touching and interacting with the merchandise. Although the results indicate that there is a significant and positive relationship between playfulness, and satisfaction with and stickiness of branded apps of online-only retailers, this result is not significant in the hybrid retail channel where consumers have the option to go to the physical brick-and-mortar store to experience the merchandise. Hence, hedonic needs can be satisfied by visiting the store in the physical domain rather than only through engaging with the branded app.

Furthermore, retailers in hybrid retail channels may not promote playfulness and discovery as part of their store image and shopping experience as much as online-only retailers. Therefore, efforts to stress playfulness in apps may be less convincing or even conflict with competing marketing claims in offline channels for which utilitarian appeals related to price or promotion may be more dominant. This suggests that for app-playfulness to be an effective tactic for hybrid retailers, it should be aligned with store image and merchandising tactics at the retail store level as well.

It should be emphasized that satisfaction is positively and significantly related to stickiness for both the online-only and hybrid-retail outlets, leaving no doubt that continued use of the mobile branded app depends strongly on the consumer's satisfaction with the value received from it. Finally, our results indicate that the parsimonious model can be used to interpret behavioral intentions without loss of explained variance in either satisfaction or stickiness, which suggests that our model is robust.

## MANAGERIAL IMPLICATIONS

Branded apps for online-only fashion retailers have an explicit requirement of fulfilling both the consumer's utilitarian needs as well as their hedonic needs. Satisfaction is impacted by this, as is the continued success of the organization in achieving app stickiness. This is in contrast to the hybrid brick-and-click retail channel. Here, the most important requirement of the branded app is the fulfillment of utilitarian needs while satisfying hedonic needs in physical channels.

However, in the fast-changing environment of fashion retail that is undergoing major disruption, management of hybrid stores need to go beyond simply viewing apps as tools that support or augment location-based retailing. Better retailers have relinquished this siloed perspective and have begun focusing on providing a quality shopping experience regardless of where consumers buy. Hence, providing the entire spectrum of a quality shopping experience will enable the hybrid stores of the future the opportunity to compete with the growing number of online competitors.

Our findings attest to the growing importance of mobile apps in marketing. This research also complements past research that shows the importance of apps in building strong relationships with consumers, influencing brand attitude and purchase intentions (Bellman et al., 2011), and enhancing loyalty (Ozturk et al., 2016), which are all much-coveted outcomes for any marketing manager.

## LIMITATIONS

While student sample employed often presents some limitations, in the area of computer technology studies, Compeau et al. (2012) provide evidence that students are appropriate respondents. They are certainly appropriate respondents for this study because they rely more heavily on mobile apps to accomplish their daily tasks and are aptly referred to as digital natives, spending an average of 90.5 hours per month on mobile apps (comScore, 2017). When students are a segment of the target population under study, Compeau et al. (2012) assert that research findings of studies that use student samples are generalizable.

Our finding that perceived playfulness may be moderated by merchandising tactics and store image of hybrid retailers suggest that future researchers should measure attitudes to the store and brand and include such measures as possible covariates in analyses.

## REFERENCES

- Arbuckle, J.L. (2014). *Amos 23.0 User's Guide*. Chicago: IBM SPSS.
- Bellman, S., Potter, R., Treleaven-Hassard, S., Robinson, J., & Varan, D. (2011). The effectiveness of branded mobile phone apps. *Journal of Interactive Marketing*, 25(4), 191-200.
- Bentler, P.M., & Bonnet, D.C. (1980). Significance test and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88(3), 588-606.
- Bhattacharjee, A. (2001). Understanding information systems continuance: An expectation confirmation model. *MIS Quarterly*, pp. 351-370.
- Cho, J. (2016). The impact of post-adoption beliefs on the continued use of health apps. *International Journal of Medical Informatics*, 87, 75-83
- Choong, P., Richardson, P.S., Sauer, P., & Fazio, A. (2016). Leveraging the power of branded apps: An exploratory study of salient performance. *Journal of Applied Business and Economics*, 18(7), 53-64.
- Clement, J. (2020a, January 17). *Annual number of global mobile app download 2016-2019*. Retrieved from <https://www.statista.com/statistics/271644/worldwide-free-and-paid-mobile-app-store-downloads/?id=mctrial>
- Clement, J. (2020b, October 8). *Mobile apps: Abandonment rate 2012-2019*. Retrieved from <https://www.statista.com/statistics/271628/percentage-of-apps-used-once-in-the-us/>

- Compeau, D., Marcolin, B., Kelley, H., & Higgins, C. (2012). Generalizability of information systems research using student subjects – A reflection of our practices and recommendations for future research. *Information Systems Research*, 23(4), 1093-1109.
- Comscore. (2017, August 24). *The 2017 U.S. mobile app report*. Retrieved from [www.comscore.com/Insights/Presentations-and-Whitepapers/2017/The-2017-US-Mobile-App-Report](http://www.comscore.com/Insights/Presentations-and-Whitepapers/2017/The-2017-US-Mobile-App-Report)
- Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- Davis, F.D., Bagozzi, R.P., & Warshaw, P.E. (1992). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology*, 22(14), 1111-1132.
- Debu, L., Cervellon, M.C., & Jingyuan, H. (2003). Should consumer attitudes be reduced to their affective and cognitive bases? *Journal of Applied Social Psychology*, 22(14), 1111-1132.
- Doll, W.J., & Torkzadeh, G. (1991). Issues and opinions – The measurement of end-user computing satisfaction: Theoretical and methodological issues. *MIS Quarterly*, 15, 5-10.
- Ellett, J. (2018, February 8). New research shows growing impact of online research on instore purchases. *Forbes*. Retrieved from [www.forbes.com/sites/johnellett/2018/02/08/new-research-shows-growing-impact-of-online-research-on-in-store-purchases/#3b4efe3e16a0](http://www.forbes.com/sites/johnellett/2018/02/08/new-research-shows-growing-impact-of-online-research-on-in-store-purchases/#3b4efe3e16a0).
- Fagan, M.H., Neill, S., & Wooldridge, B.R. (2008). Exploring the intention to use computers: An empirical investigation of the role of intrinsic motivation, extrinsic motivation, and perceived ease of use. *Journal of Computer Information Systems*, 48(3), 31-37.
- Fleischmann, M., Amirpur, M., Grupp, T., Benlian, A., & Hess, T. (2016). The role of software updates in information systems continuance. An experimental study from a user perspective. *Decision Support Systems*, 83, 83-96.
- Fornell, C.R. (1982). *A second generation of multivariate analysis methods: Vols. I and II*. New York, NY: Praeger Special Studies.
- Fornell, C.R., & Larcker, D.F. (1981). Structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Gatian, A.W. (1994). Is user satisfaction a valid measure of system effectiveness? *Information and Management*, 26, 119-131.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.I. (2006). *Multivariate data analysis*. Upper Saddle River, NJ: Pearson University Press.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.I. (2010). *Multivariate data analysis: A global perspective*. NJ: Pearson Education.
- Hong, J.C., Lin, P.H., & Hsieh, P.C. (2017). The effect of consumer innovativeness on perceived value and continuance intention to use smartwatch. *Computers in Human Behavior*, 67, 264-272.
- Hong, S.J., Thong, J.Y.L., & Tam, K.Y. (2006). Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet. *Decision Support Systems*, 42(3), 1819-1834.
- Hsu, C.L., & Lin, J.C. (2008). Acceptance of bloc usage: The roles of technology acceptance, social influences and flow experiences. *Information Management*, 45, 65-74.
- Hsu, C.L., & Lin, J.C. (2016). Effect of perceived value and social influences on mobile app stickiness and in-app purchase intention. *Technology Forecasting & Social Change*, 108, 42-53. <https://www.nielsen.com/us/en/insights/report/2016/consumer-insights-for-apparel-purchasing/#>.
- Hu, L.T., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1-55.
- Humbani M., & Wiese, M. (2019). An integrated framework and continuance intention to use mobile payment apps. *International Journal of Bank Marketing*, 32(2), 646-664.
- Idemudia, E.C., Raisinghani, M.S., & Olusola, S.O. (2016). The contributing factors of continuance usage of social media: An empirical analysis. *Information Systems Frontiers*, 20(6), 1-14. <https://doi.org/10.1007/s10796-016-9721-3>.

- Im, H., & Ha, Y. (2013). Enablers and inhibitors of permission-based marketing: A case of mobile coupons. *Journal of Retailing and Consumer Services*, 20(5), 495-503.
- Kim, B., Kang, M., & Jo, H. (2014). Determinants of postadoption behaviors of mobile communication applications: A dual-model perspective. *International Journal of Human-Computer Interaction*, 30(7), 547-559.
- Kim, S., & Sons, J.Y. (2009). Out of dedication or constraint? A dual model of postadoption phenomena and its empirical tests in the context of online services. *MIS Quarterly*, 33(1), 49-70.
- Kim, S., Baek, T.H., Kim, Y.K., & Yoo, K. (2016). Factors affecting stickiness and word of mouth in mobile applications. *Journal of Research in Interactive Marketing*, 10(3), 177-192.
- Kuo, Y., Wu, C., & Deng, W. (2009). The relationship among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services. *Computers in Human Behavior*, 25, 887-896.
- Lee, S. (2018). Enhancing customers' continued mobile app use in the service industry. *Journal of Services Marketing*, 32(6), 680-691.
- Lella, A., Lipsman, A., & Marten, B. (2015, September 22). *2015 U.S. mobile app report*. Retrieved from [www.comscore/Insights/Presentations-and-Whitepapers/2015/The-2015-US-Mobile-App-Report](http://www.comscore/Insights/Presentations-and-Whitepapers/2015/The-2015-US-Mobile-App-Report).
- Li, D., Brown, G.J., & Wetherbe, J.C. (2006). Why do internet users stick with a specific website? A relationship perspective. *International Journal of Electronic Commerce*, 42(5), 105-141.
- Lin, C.S., Wu, S., & Tsai, R.J. (2005). Integrating perceived playfulness into expectation-confirmation model for web portal context. *Information Management*, 42(5), 683-693.
- Lin, H.H., & Wang, Y.H. (2006). An examination of the determinants of customer loyalty in mobile commerce contexts. *Information Management*, 43, 271-282.
- Lin, K.Y., & Lu, H.P. (2011). Why people use social networking sites: An empirical study integrating network externalities and motivation theory. *Computers in Human Behavior*, 27(3), 1152-1161.
- MacCallum, R.C., Browne, M.W., & Sugawara, H.M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130-49.
- Maghnati, F., & Kwek, C.H. (2013). Exploring the relationship between experiential value and usage attitude towards mobile apps among the Smartphone Users. *International Journal of Business and Management*, 8(4), 1-9.
- Mahatanankoon, P. (2007). The effects of personality traits and optimum stimulation level on text-messaging activities and m-commerce intention. *International Journal of Electronic Commerce*, 12(1), 7-30.
- Marketingcharts. (2016, May 16). *App user retention remains a struggle; In-app messages move the needle*. Retrieved from [www.marketingcharts.com/digital-68029](http://www.marketingcharts.com/digital-68029)
- Mather, D., Caputi, R., & Jayasuriya, R. (2002). Is the technology acceptance model a valid model of user satisfaction of information technology in environments where usage is mandatory? In A. Wenn, M. McGrath, & F. Burstein (Eds.), *Enabling organizations and society through information systems*. Victoria University, Australia.
- Mathieson, K. (1991). Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior. *Information Systems Research*, 2, 173-191.
- McCue, T.J. (2019, January 30). State of mobile 2019 report. *Forbes*. Retrieved from <https://www.forbes.com/sites/tjmccue/2019/01/30/mobile-app-state-of-mobile-2019-report-from-app-annie/#3982514534ab>
- Newman, C.L., Wachter, K., & White, A. (2018). Bricks or clicks? Understanding consumer usage of retail mobile apps. *Journal of Services Marketing*, 32(2), 211-223.
- Nielsen. (2014, July 1). *Smartphones: So many apps, so much time*. Retrieved from [www.nielsen.com/us/en/insights/article/2014/smartphones-so-many-apps-so-much-time](http://www.nielsen.com/us/en/insights/article/2014/smartphones-so-many-apps-so-much-time).
- Nielsen. (2016, June 8). *Consumer insights for apparel purchasing*.
- Overby, W., & Lee, E. (2006). The effects of utilitarian and online shopping value on customer preference and intentions. *Journal of Business Research*, 59, 1160-1166.

- Ozturk, A., Bilgihan, A., Nusair, K., & Okumus, F. (2016). What keeps the mobile hotel booking users loyal? Investigating the roles of self-efficacy, compatibility, perceived ease of use, and perceived convenience. *International Journal of Information Management*, 36(6), 1350-1359.
- Park, J., Snell, W., Ha, S., & Chung, T.I. (2011). Consumers' post-adoption of m-services: interest in future m-service based on consumer evaluations of current m-services. *Journal of Electronic Commerce Research*, 12(3), 165-175.
- Racherla, P., Furner, C., & Babb, J. (2012). *Conceptualizing the implications of mobile app usage and stickiness: A research agenda*. Retrieved from <http://dx.doi.org/10.2139/ssrn.2187056>
- Rose, S., Clark, M., Samuel, P., & Hair, N. (2012). Online customer experience in e-retailing: An empirical model of antecedents and outcomes. *Journal of Retailing*, 88(2), 308-322.
- Shankar, V., & Balasubramanian, S. (2007). The growth of interactions and dialogs in interactive marketing. *Journal of Interactive Marketing*, 21(2), 2-4.
- Tabachnick, B.G., & Fidell, L.S. (2019). *Using multivariate statistics* (7th edition). Boston, MA: Pearson.
- Taylor, S., & Todd, P.A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, 6(2), 144-176.
- Thong, J.Y., Hong, S.J., & Tam, K.Y. (2006). The effects of post-adoption beliefs on the expectation-confirmation model for information technology continuance. *International Journal of Human-Computer Studies*, 64(9), 799-810.
- Tiongson, J. (2015, May). *Mobile app marketing insights: How consumers really find and use your marketing app*. Retrieved from [www.thinkwithgoogle.com/consumer-insights/mobile-app-marketing-insights](http://www.thinkwithgoogle.com/consumer-insights/mobile-app-marketing-insights)
- Tojib, D., & Tsarenko, Y. (2012). Post-adoption modeling of advanced mobile service use. *Journal of Business Research*, 65(7), 922-928.
- Wami, M., Raghavan, V., Abranham, D., & Kleist, V. (2017). Beyond utilitarian factors: User experience and travel company website successes. *Information Systems Frontiers*, 19(4), 769-785.
- Zhou, T. (2011). An empirical examination of users' post-adoption behavior of mobile services. *Behavior & Information Technology*, 30(2), 241-250.