Received 14 June 2018
Revised 4 March 2019
Accepted 9 April 2019

Shoplifting in mobile checkout settings: cybercrime in retail stores

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Abstract

Purpose – Retailers are implementing technology-enabled mobile checkout processes in their stores to improve service quality, decrease labor costs and gain operational efficiency. These new checkout processes have increased customer convenience primarily by providing them autonomy in sales transactions in that store employee interventions play a reduced role. However, this autonomy has the unintended consequence of altering the checks and balances inherent in a traditional employee-assisted checkout process. Retailers, already grappling with shoplifting, with an estimated annual cost of billions of dollars, fear that the problem may be exacerbated by mobile checkout and concomitant customer autonomy. The purpose of this paper is to understand the effect of mobile checkout processes in retail stores on cybercrime in the form of shoplifting enabled by a technology transformed the retail environment.

Design/methodology/approach – The authors conducted an online survey of a US sample recruited from a crowdsourced platform. The authors test a research model that aims to understand the factors that influence the intention to shoplift in three different mobile checkout settings – namely, smartphone checkout settings, store-provided mobile device checkout settings, and employee-assisted mobile checkout settings – and compare it with a traditional fixed location checkout setting.

Findings – The authors found that, in a smartphone checkout setting, intention to shoplift was driven by experiential beliefs and peer influence, and experiential beliefs and peer influence had a stronger effect for prospective shoplifters when compared to experienced shoplifters; in a store-provided mobile devices checkout setting, experiential beliefs had a negative effect on shoplifters' intention to shoplift and the effect was weaker for prospective shoplifters when compared to experienced shoplifters. The results also indicated that in an employee-assisted mobile checkout setting, intention to shoplift was driven by experiential beliefs and peer influence, and experiential beliefs had a stronger effect for prospective shoplifters when compared to experienced shoplifters.

Originality/value – This study is the among the first, if not first, to examine shoplifters' intention to shoplift in mobile checkout settings. We provide insights into how those who may not have considered shoplifting in less favorable criminogenic settings may change their behavior due to the autonomy provided by mobile checkout settings and also provide an understanding of the shoplifting intention for both prospective and experienced shoplifters in different mobile checkout settings.

Keywords Smartphone, Mobile checkout, Prospective shoplifters, Employee-assisted mobile checkout, Store-provided mobile device

Paper type Research paper

1. Introduction

"I take full responsibility for the mistake I have made – shoplifting, I know that this goes beyond me letting my school down. I let the entire country down," said Codey Riley, one of the three UCLA Bruins basketball players accused of shoplifting in China (ESPN, 2017). These players did not belong to economically disadvantaged sections of society. This is not the only such incident when celebrities or financially advantaged people have committed such an act. Even wealthy celebrities, such as Megan Fox who stole from Walmart when she was a teen, Britney Spears who stole a one-dollar lighter from a gas station and Lindsay Lohan who stole a $2,500 necklace from a jewelry store (Tinubu, 2018), have been found to shoplift.

Information Technology & People
Vol. 32 No. 5, 2019
pp. 1234-1261

0959-3845
DOI 10.1108/ITP-06-2018-0292

It is evident from these stories that shoplifting is committed not just due to financial need, but there could be other reasons for shoplifting, such as to satisfy psychological needs, due to societal influences, to satisfy the desire to possess expensive objects or for enjoyment and entertainment (Krasnovsky and Lane, 1998).

Shoplifting is defined as the act of stealing from a store by a customer when the store is open for business (Francis, 1979). It is one of the most prevalent crimes in our society. According to the National Association for Shoplifting Prevention (NASP), there are approximately 27mshoplifters in the USA and thus it is estimated that 1 in every 11 people shoplift. Out of those shoplifters, 25 percent are juveniles and 75 percent are adults (NASP, 2018). Shoplifting happens in all types of retail stores, i.e., department stores, drug stores, supermarkets, thrift shops, specialty shops, music stores and convenience stores, with supermarkets particularly prone to shoplifting as they carry a broad selection of items catering to the needs of people (Luo *et al.*, 2015). According to a recent survey, 90 percent of retail crime was due to shoplifting by customers, and the remainder was due to dishonest employees, cargo theft at the supplier, or due to administrative errors (Jack L. Hayes International, Inc., 2017). Estimates of the annual losses in retail stores from shoplifting across the globe have ranged in the billions of dollars, with the US retail industry losing nearly $50bn in 2016 (Reilly, 2017). There are big losses from shoplifting in other countries as well, with even the much smaller New Zealand retail market reporting over $800min financial losses in 2017 (RetailNZ, 2017), and the Japanese retail market suffering a loss of approximately 450bn yen in 2016 (Yamato *et al.*, 2017).

Over the past few years, retailers have invested in technology-enabled self-checkout processes to the enhance customer experience. Retailers are making mobile applications more user-friendly to create a better shopping experience and to ease transaction processing for customers (Roth *et al.*, 2009). Retailers have also integrated mobile technologies in the form of mobile checkout processes into their sales operations to create a better shopping experience for customers (Aloysius *et al.*, 2016; Chandra *et al.*, 2010). Although mobile checkout has brought benefits to both retailers and customers in the form of customer satisfaction and convenience (Fernandes and Pedroso, 2016; Venkatesh *et al.*, 2017; Vuckovac *et al.*, 2017), self-service scenarios have also been attributed to a form of cybercrime known as shoplifting using technology (Knapton, 2016; Phillips *et al.*, 2005; Taylor, 2016). Self-scanning technologies have generated losses of more than 122 percent of the average (University of Leicester, 2016). Over the past few years, the evolution of technology has brought new ways of conducting cybercrime. Our research aims to understand thus a new type of cybercrime in the form of shoplifting aided by technology that will add to the literature on criminology.

Shoplifting has serious implications not only for the retail industry, but also for society as a whole. Sales tax revenues lost due to shoplifting could be utilized for the betterment of society (Potdar *et al.*, 2018). The losses incurred by retailers due to shoplifting result in an increase in the price of merchandise and customers ultimately have to pay to cover the cost of stolen goods. Therefore, there are compelling practical reasons to investigate the factors that play a role in promoting and/or driving the act of shoplifting in retail stores.

The literature on shoplifting in the criminology as well as the retailing/marketing fields has provided a rich understanding of the motivational beliefs that are articulated for various types of shoplifters (Blum *et al.*, 2018; Cameron, 1964; Cox *et al.*, 1990; Grant, 2006; Krasnovsky and Lane, 1998; Moore, 1984). The shoplifting literature has also provided insights into the prevention mechanisms ranging from social influence (Cox *et al.*, 1993), fear appeals (Vermeir *et al.*, 2017) and control (Hirtenlehner and Hardie, 2016), to implementation of technology, i.e., in the form of video cameras, and image analysis to electronic article surveillance (EAS) systems (McCarty, 2017; Yamato *et al.*, 2017). Although these studies have given us an understanding of the motivations and beliefs and have provided effective means of preventing

shoplifting, the literature lacks an understanding of the new form of cybercrime resulting from emerging customer-facing technologies used by retailers in the stores. Such a new context can result in changes to our theories (see Johns, 2006) – and technology-specific theories have been shown to outperform general theories (see Hong *et al.*, 2014). Although some studies do discuss the role of self-service technologies tied to shoplifting (Phillips *et al.*, 2005; Taylor, 2016), there is a need for a deeper understanding of the motivations and beliefs driving intention to shoplift in mobile checkout settings that feature increased autonomy to customers. Further, empirical work has mostly studied experienced shoplifters with a history of criminal shoplifting behavior and how their impulsive desire to steal, societal influences and desire to possess wealthy objects motivate them to commit shoplifting (Blum *et al.*, 2018; Cameron, 1964; Cox *et al.*, 1990; Grant, 2006; Krasnovsky and Lane, 1998; Moore, 1984). The literature lacks an understanding of prospective shoplifters, who do not have prior shoplifting experience, but do not have a moral repugnance toward shoplifting and could thus be enticed into shoplifting in the right circumstances – here, mobile checkout settings. Given the emerging mobile technology-driven changes to retail shopping processes, there is a need for more theory-driven investigations of the underlying factors that can lead to a new form of cybercrime tied to shoplifting in a mobile technology-enabled checkout context and ultimately, to retail losses.

Our work aims to understand shoplifting intention among customers in different mobile checkout settings using a multi-theoretic lens to allow us to tap into related yet distinct aspects that drive shoplifting intention: theory of planned behavior (TPB; Ajzen, 1991) and situational action theory (SAT; Wikström, 2006). TPB provides a framework to understand the determinants of intention to shoplift. Underlying TPB is the core argument that an individual's intention to perform a behavior determines the actual performance of the behavior. Beyond that, TPB states that an individual's attitude toward performing the behavior, subjective norm, and perception of behavioral control drive an individual's intention to perform the behavior. TPB will thus help us understand the link between shoplifter beliefs and shoplifting intention in different mobile checkout settings. SAT hypothesizes that human action is influenced by the settings in which he or she takes part. In mobile checkout technologies, customers have either reduced or no engagement with store employees in comparison to traditional fixed location employee-assisted checkout. These mobile checkout settings could act as criminogenic settings for shoplifters. SAT will help us understand the influence of environment settings in the form of mobile checkout settings on shoplifting intention. SAT is a general theory of crime that explains criminal behavior by integrating persons' crime propensity and criminogenic settings, and an environment conducive to crime, to which an individual is exposed. Integrating these two theoretical lenses will strengthen our understanding of the emerging scenarios by integrating environmental factors in the form of mobile checkout settings with beliefs and how these beliefs drive shoplifting intention. Different types of customer-friendly checkout mechanisms implemented in retail stores could not only contribute to customer satisfaction, but also function as a driver of shoplifting. To the best of our knowledge, no prior research has been conducted to understand the influence of technology in driving shoplifting intention. Against this backdrop, the overall goal of this work is to investigate the beliefs instrumental in shoplifting intention in different mobile checkout settings among experienced shoplifters and prospective shoplifters. Given the role that technology can play in creating situations – e.g. store processes – store processes that facilitate shoplifting, the specific objectives of this work are to:

(1) understand the factors driving shoplifting intention in different mobile checkout scenarios;

(2) compare the effect of factors driving shoplifting intentions for experienced and prospective shoplifters in different mobile checkout settings; and

(3) empirically validate the model with data gathered from experienced and prospective shoplifters.

This work is expected to contribute to the literature in different ways. First, it will enrich our understanding of the drivers of shoplifting in the context of the new, emerging mobile checkout scenarios, which become the criminogenic settings, and how conducive they are to shoplifting. Second, we will contribute to the shoplifting literature by understanding shoplifting intention among both experienced shoplifters, and among prospective shoplifters who possess the beliefs and desire to shoplift but never had the exposure to criminogenic settings in the form of mobile checkout settings that bestow the customer with a high degree of autonomy. Third, our work will extend the shoplifting literature by integrating two theoretical lenses to provide a holistic understanding of the factors influencing experienced and prospective shoplifters, not to mention the subtle differences across these two sets of shoplifters. Lastly, our work will complement research on cybercrime by understanding how the use of technology in the retail industry can work to shoplifters' advantage.

2. Theory

2.1 Literature review

The first incident of shoplifting was examined in 1838 by two French physicians – Jean-Etienne Esquirol and C.C. Marc. They coined the term "Kleptomania" to describe shoplifting as an involuntary and irresistible action (Abelson, 1989). Shoplifting is committed either by professional criminals to resell stolen items for monetary benefits or by respectable citizens who do not resell the items they steal but have chronic impulsivity to shoplift (Cameron, 1964). The complexity of factors associated with motivations and characteristics of shoplifters resulted in various extensions of Cameron's typology and researchers have delineated several types of shoplifters based on personality and social class (Goldman, 1991; Moore, 1984; Schlueter *et al.*, 1989). The literature on shoplifting has studied different gender and age groups to understand the factors driving customers to shoplift, such as peer pressure, psychological needs, experiential beliefs and monetary benefits (Blum *et al.*, 2018; Cameron, 1964; Cox *et al.*, 1990; Grant, 2006; Krasnovsky and Lane, 1998; Moore, 1984). Much of the IS literature in retail settings has dealt with the relationship between technology and customer satisfaction (e.g. Aloysius *et al.*, 2016; Fernandes and Pedroso, 2016; Venkatesh *et al.*, 2017; Vuckovac *et al.*, 2017), and the benefits of technology in preventing shoplifting (Yamato *et al.*, 2017). The literature on cybercrime has dealt with various kinds of cybercrime: from cyberbullying (Lowry *et al.*, 2016) to hacking and spreading of malicious software (Bossler and Holt, 2009; Choi, 2008) to cyber-trespassing (Maimon and Louderback, 2019) to cyber-deception (Jajodia *et al.*, 2017) to digital piracy (Lowry *et al.*, 2017) to cyber porn (Lewis, 2018). Although there have been attempts to define and classify cybercrime (e.g. Wall, 2007), such efforts tend to evolve over time following the evolution of technology and how people use that technology. Jahankhani *et al.* (2014) provide a typology of cybercrime that includes a category defined by "using a computer as the instrumentality of the crime (e.g. fraudulent use of automated teller machine (ATM) cards and accounts, credit card and telecommunication fraud)." The extant research does not consider a form of crime in this category – the emerging form of cybercrime tied to shoplifting using technology, such as mobile phones and store devices, used either by employees or customers. Although shoplifting has featured in some research related to cybercrime, it was mostly descriptive (Rempala and Okdie, 2017).

Shoplifting is one means of customer product acquisition (Cox *et al.*, 1990) and has been defined as the act of acquiring products through stealing as a customer misbehavior (Cox *et al.*, 1990; Fullerton and Punj, 1993; Tonglet, 2001). Thus, we define shoplifters as the category of customers engaging in an act of misbehavior of stealing merchandise from

stores either for fun, money or to satisfy their psychological impulses (Cameron, 1964; Cox *et al.*, 1990; Moore, 1984). Ray (1987) argued that customers who are more likely to perceive shoplifting in retail stores as not a bad thing are more likely to engage in the act of shoplifting. We define experienced shoplifters as those who have engaged in prior shoplifting. Thus, shoplifters could be experienced as they have shoplifted in the past or could be customers who have a desire to shoplift but, in the past, were deterred due to less favorable retail settings that caused a feeling of apprehension toward being detected. We delineate people who have not shoplifted in the past into prospective shoplifters and honest customers. We define prospective shoplifters as those who have not previously shoplifted, but have the desire to shoplift and could commit shoplifting given conducive retail store settings. We define honest customers as those who have not previously committed shoplifting and have high repugnance toward shoplifting in retail stores.

2.2 Criminogenic settings

A setting is defined as an environment to which a person is exposed. Mobile checkout technologies in retail stores can be criminogenic settings as customers have either no engagement or limited engagement with store employees in comparison to traditional fixed location employee-assisted checkout and customers have increased autonomy in the transaction process during checkout (Aloysius *et al.*, 2016). Mobile checkout settings in retail stores are forms of self-service technology checkout settings in which the customer purchases a product without direct contact with a store employee or with minimal interaction with an employee (Fernandes and Pedroso, 2016; Tseng and Yazdanifar, 2015; Vuckovac *et al.*, 2017). We studied three types of mobile checkout scenarios (Aloysius *et al.*, 2013) that have been implemented by retailers to speed up customer transaction processing and create better customer-store engagement (Fernandes and Pedroso, 2016; Tseng and Yazdanifar, 2015; Venkatesh *et al.*, 2017; Vuckovac *et al.*, 2017). SAT assumes that human action is influenced by the settings in which an individual takes part. Settings are termed as criminogenic when they are conducive to crime. This theory in the context of mobile checkout settings helps us to understand the context in which shoplifting could take place.

2.2.1 Smartphone checkout settings. This process requires the use of a smartphone to scan products by opening an app on the phone and making the payment through a mobile wallet. Technology failure, no employee engagement and lack of scanning knowledge by the customer could create problems, preventing the smooth operation of this process.

2.2.2 Store-provided mobile device checkout settings. This process requires the use of a store-provided mobile device by a customer to scan products in the basket and the basket is assigned an electronic ID. The customer uses a self-service lane and the basket ID is used for payment. This process requires registration of the customer at the store before they can use the store mobile device. Technology failure, no employee engagement and lack of knowledge about scanning on the part of the customer could create problems preventing the smooth operation of this process.

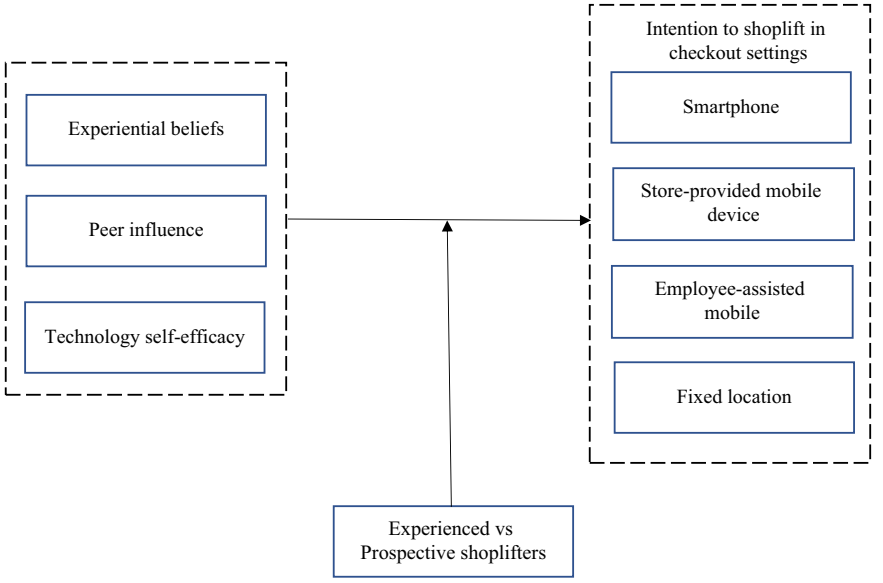
2.2.3 Employee-assisted mobile checkout settings. A store employee is equipped with a mobile device to scan the products in a customer's basket and uses a mobile credit card machine to accept payment on the shop floor. Customers do not need to go to fixed checkout terminals for transaction processing. During busy periods, an employee-assisted mobile checkout setting could create problems for customers having to find a store employee to process a transaction.

2.2.4 Fixed location checkout settings. In this process that has been the traditional mode of checkout for about 100 years, a store employee at a fixed checkout terminal (point-of-sale terminal) helps customers to scan products in their basket and payment is done either by

cash or using a credit or debit card machine at the terminal. During busy periods, fixed location checkout settings could create inconvenience to customers as they have to wait in line for sales transactions to be processed by the server.

2.3 Research model

Mobile checkout settings in retail stores are forms of autonomous technology checkout settings in which a customer purchases a product either without any direct contact with a store employee or with minimal interaction with an employee (Fernandes and Pedroso, 2016; Tseng and Yazdanifar, 2015; Vuckovac *et al.*, 2017). Such checkout settings provide autonomy and convenience to customers, as they do not need to stand in line at fixed registers for scanning and payment. We examine intention to shoplift in these mobile checkout settings. Figure 1 shows our conceptual model. TPB provides a framework to understand the determinants of intention to shoplift. TPB posits that intention, an indication of individual's readiness to perform a given behavior and is considered to be a direct determinant of behavior (Ajzen, 1991), is determined by three factors: attitude, "an individual's positive or negative feelings (evaluative affect) about performing the target behavior" (Fishbein and Ajzen, 1975, p. 216); subjective norm, "the person's perception that most people who are important to him think he should or should not perform the behavior in question" (Fishbein and Ajzen, 1975, p. 302); and perceived behavioral control, "the perceived ease or difficulty of performing the behavior" (Ajzen, 1991, p. 188). It is typical for beliefs underlying these core constructs to be identified for particular contexts including the prediction of technology-related behaviors (e.g. Brown and Venkatesh, 2005; Venkatesh and Brown, 2001). For the shoplifting context, we conceptualized attitude, subjective norm, and perceived behavioral control in the form of experiential beliefs, peer influence, and technology self-efficacy and define: intention to shoplift as an individual's willingness to shoplift; experiential beliefs as the extent to which a customer views shoplifting in mobile



Notes: Not all possible moderation effects are hypothesized. The specific moderation hypotheses are presented in the "Hypotheses development" section

Figure 1.
Conceptual model

checkout settings as fun or exciting (Ray, 1987); peer influence as the extent to which a customer is influenced by peers to shoplift (Cox *et al.*, 1990); and technology self-efficacy as the belief in one's ability to complete a checkout process using technology (McDonald and Siegall, 1992).

We also used SAT to understand how motivations and beliefs drive people to engage in an act of shoplifting behavior in different criminogenic settings – here, mobile checkout settings (Wikström, 2006). Situational action theory states that interaction between persons' crime propensity and criminogenic exposure guide actions. Therefore, SAT will provide insights into drivers of intention of shoplifters in different mobile checkout settings. Although we do not examine actual behavior in our research, but as shown in Figure 1, we study intention, which is a predictor of actual behavior (Ajzen and Fishbein, 1980; Venkatesh *et al.*, 2016; Yang *et al.*, 2016), including shoplifting (Tonglet, 2001).

2.4 Hypotheses development

2.4.1 Experiential beliefs. TPB posits that beliefs, such as the experiential belief identified here, underlying attitude influences intention to perform a behavior. Mobile checkout settings, namely smartphone bestow a high level of autonomy to shoplifters. Such autonomous checkout settings will foster a feeling of fun or excitement that shoplifters want to experience (Ray, 1987). Fernandes and Pedroso (2016), in their study on self-service technologies in retail stores, argued that customers find it enjoyable and entertaining when they scan items themselves. For example, customers could make a scanning motion without activating their mobile phone app. Therefore, we argue that shoplifters, both experienced and prospective, are more likely to derive pleasure from the entertainment in autonomous mobile checkout settings as they pretend to scan the items and are able to carry out more items from the store than for which they actually pay. Thus, we posit that:

H1a. Experiential beliefs will have a positive relationship with intention to shoplift in smartphone checkout settings for both experienced and prospective shoplifters.

Store-provided mobile checkout settings require registration in order to use a store device for scanning. Such checkout settings are likely to induce fear in the minds of the shoplifters. Research has shown that shoplifting behavior is influenced by apprehension risks (Cox *et al.*, 1990; Dahlback, 1998; Ray, 1987). Shoplifters are likely to have negative feeling toward store-provided mobile checkout settings. In TPB terms, this is a negative evaluative effect that undermines the positive effect of experiential beliefs. Thus, we posit that:

H1b. Experiential beliefs will have a negative relationship with intention to shoplift in store-provided mobile device checkout settings for both experienced and prospective shoplifters.

In employee-assisted mobile checkout settings, a store employee helps a customer to checkout by scanning the items on the floor. In such checkout settings, employees sometimes find it hard to manage foot traffic. Shoplifters could take advantage of such situations and walk away from the store without paying for the items. A shoplifter might have an accomplice engage with a store employee and stand between the store employee and the shoplifter so that they mask the act of concealment. This will have a positive evaluative effect on shoplifters and such affect is likely to excite and add to the hedonic motivation of shoplifters (Holbrook and Hirschman, 1982). Thus, we posit that:

H1c. Experiential beliefs will have a positive relationship with intention to shoplift in employee-assisted mobile checkout settings for both experienced and prospective shoplifters.

2.4.2 Peer influence. TPB argues that peer influence can play a key role in the intention to engage in specific behaviors. Peer influence is a strong motivational factor to engage in shoplifting (Cox *et al.*, 1990; Tonglet, 2001). Individuals tend to adopt bad habits of friends known as "deviant social influence" (Johnson, 1979). Peer influence is thus likely to influence both experienced and prospective shoplifters in mobile checkout settings as yielding to the influence will help them gain status among their peers (Johnson, 1979). Thus, we posit that:

H2a. Peer influence will have a positive relationship with intention to shoplift in smartphone checkout settings for both experienced and prospective shoplifters.

H2b. Peer influence will have a positive relationship with intention to shoplift in store-provided mobile device checkout settings for both experienced and prospective shoplifters.

H2c. Peer influence will have a positive relationship with intention to shoplift in employee-assisted mobile checkout settings for both experienced and prospective shoplifters.

2.4.3 Technology self-efficacy. TPB posits that perceived ease or difficulty of performing the behavior and the concomitant control is a direct determinant of intention to perform a behavior. Technology self-efficacy will be vital in mobile checkout settings for scanning and payment. Lack of technological expertise or the confidence in one's ability could be a challenge in order to use the mobile devices for checkout (Aloysius *et al.*, 2013). Ease of use of mobile devices, which is determined by self-efficacy (Venkatesh and Davis, 1996; Venkatesh, 2000) will contribute to the use of mobile checkout settings (see Venkatesh *et al.*, 2012). Criminals use technical knowledge to find vulnerabilities in technology in cyber deception (Jajodia *et al.*, 2017). Shoplifters could make use of their technical proficiency by either finding loopholes in store-provided mobile devices or retail stores' mobile apps on their own smartphones. We can thus expect both experienced and prospective shoplifters to be influenced by their technology self-efficacy. Thus, we posit that:

H3a. Technology self-efficacy will have a positive relationship with intention to shoplift in smartphone checkout settings for both experienced and prospective shoplifters.

H3b. Technology self-efficacy will have a positive relationship with intention to shoplift in store-provided mobile device checkout settings for both experienced and prospective shoplifters.

In the case of employee assisted checkout settings, store employee uses a store-provided mobile device for checkout. In such settings, shoplifters' technology self-efficacy becomes moot and will not play a part in helping shoplifters in checkout.

2.4.4 Interaction effect: intention to shoplift in smartphone checkout settings. As noted earlier, smartphone checkout settings bestow a high level of autonomy to the shoplifters as shoplifters do not have to interact with a store employee for checkout. When individuals use a technology for the first time, they tend to be more excited because of the novelty associated with the use of the technology (Holbrook and Hirschman, 1982). Innovativeness in the form of shoplifting and using a smartphone will act in concert (see Holbrook and Hirschman, 1982). Prospective shoplifters who desire to shoplift but never found the environment conducive to shoplifting are more likely to experience greater highs compared to experienced shoplifters to whom although the technology is novel, shoplifting itself is not. Thus, we posit that:

H4. Experiential beliefs will have positive relationship with intention to shoplift in smartphone checkout settings such that the effect will be stronger for prospective shoplifters than it will be for experienced shoplifters.

Shoplifters tend to mimic other shoplifters when their peers steal with impunity (Nettler, 1989). Peer influence will be greater on prospective shoplifters than on experienced shoplifters. This is because experienced shoplifters, having already engaged in shoplifting, will be less influenced by the peers than prospective shoplifters will be. There is significant accumulated evidence that the impact of peer pressure on intention is greater when the behavior is newer (see Venkatesh and Davis, 2000; Venkatesh *et al.*, 2003; Venkatesh *et al.*, 2012). Thus, we posit that:

H5. Peer influence will have a positive relationship with intention to shoplift in smartphone checkout settings such that the effect will be stronger for prospective shoplifters than it will be for experienced shoplifters.

Higher technology self-efficacy among experienced shoplifters is likely to lead to higher intention to shoplift because they will be more comfortable with leveraging a smartphone to shoplift. In contrast, a prospective shoplifter, despite comparable technology self-efficacy, will be more apprehensive about the act of shoplifting itself. Thus, we posit that:

H6. Technology self-efficacy will have a positive relationship with shoplifting intention in smartphone checkout settings such that the effect will be stronger for experienced shoplifters than it will be for prospective shoplifters.

2.4.5 Interaction effect: intention to shoplift in store-provided mobile device checkout settings. Store-provided mobile checkout settings require customers to reveal their identity in the registration process in order to use the store device for checkout. It will be easy for retail stores to track a shoplifter in such checkout settings. Shoplifters are more likely to develop a negative feeling toward engaging in shoplifting in store-provided mobile device checkout settings for fear of being caught. Research has shown that shoplifting behavior is influenced by apprehension risks (Cox *et al.*, 1990; Dahlback, 1998; Ray, 1987). In TPB terms, this is a negative evaluative effect that undermines the positive effect of experiential beliefs. Prospective shoplifters, given the lack of shoplifting experience, can be expected to have greater apprehension and fear, thus dampening the effect of experiential beliefs more in their case than in the case of experienced shoplifters. Thus, we posit that:

H7. Experiential beliefs will have a positive relationship with shoplifting intention in store-provided mobile device checkout settings such that the effect will be weaker for prospective shoplifters than it will be for experienced shoplifters.

In autonomous mobile device checkout settings, such as this, the more pressure put on by the peers, the more likely for shoplifters, both experienced and prospective, to engage in shoplifting in order to comply with the peers. Registration process to use store-device for checkout will induce apprehensions among both experienced and prospective shoplifters. As fear is shown to be more salient in curbing actions of novice criminals than experienced criminals (Cusson, 1993; Copes and Tewksbury, 2011), such apprehension risks are likely to be more salient to deter prospective shoplifters when compared to experienced shoplifters in store-provided mobile device checkout settings. Thus, we posit that:

H8. Peer influence will have a positive relationship with shoplifting intentions in store-provided mobile device checkout settings such that the effect will be stronger for experienced shoplifters than it will be for prospective shoplifters.

Technology self-efficacy is important to operate a store-provided mobile device for scanning and checkout. High self-efficacy will help shoplifters exploit the vulnerabilities associated with the technology used in store-provided mobile devices (see Jajodia *et al.*, 2017). SAT states that interaction between persons' crime propensity and criminogenic exposure guide action. Prospective shoplifters have constrained their actions in traditional checkout

settings owing to the fear of being caught when engaging in shoplifting (Cox *et al.*, 1990; Ray, 1987). They are more likely to perceive higher risk of being apprehended in trying to interfere with store-devices for the purpose of shoplifting. Thus, prospective shoplifters have lower intention to shoplift in store-provided checkout settings when compared to experienced shoplifters. Thus, we posit that:

H9. Technology self-efficacy will have a positive relationship with shoplifting intention in store-provided mobile device checkout settings such that the effect will be stronger for experienced shoplifters than it will be for prospective shoplifters.

2.4.6 Interaction effect: intention to shoplift in employee-assisted mobile checkout settings. Shoplifters require distraction or diversion to cover an act of theft. In retail stores, employees sometimes find it hard to manage foot traffic, and shoplifters could take advantage of such situations and walk away from the store without paying for the items. The advantage of bypassing store employees when store employees are busy handling other customers will make the task easy for shoplifters. Prospective shoplifters will have a greater urge to perform an action that would help fulfill their desire of experiencing the act of shoplifting for the first time (Schroeder, 2006) and given the task of shoplifting is made easier, they are more likely than experienced shoplifters to have higher intention to shoplift or hide items from employees who, in times of high traffic, may not be able to spot the hidden items. Thus, we posit that:

H10. Experiential beliefs will have a positive relationship with shoplifting intention in employee-assisted mobile checkout settings such that the effect will be stronger for prospective shoplifters than it will be for experienced shoplifters.

Such checkout settings provide a criminogenic environment for shoplifters to imitate the deviant behaviors of their peers (Johnson, 1979). The logic for this hypothesis is the same as the logic for *H8*. Thus, we posit that:

H11. Peer influence will have a positive relationship with shoplifting intention in employee-assisted mobile checkout settings such that the effect will be stronger for experienced shoplifters than it will be for prospective shoplifters.

2.4.7 Interaction effect: intention to shoplift in fixed location checkout settings. Prior research on shoplifting behavior was conducted in fixed location checkout settings (Cox *et al.*, 1990; Moore, 1984; Tonglet, 2001). Peer influence was found to be a determinant for shoplifters to engage in shoplifting in fixed location checkout settings (Cox *et al.*, 1990; Tonglet, 2001). In such checkout settings, payment is done either by cash or using a credit or debit card machine at the terminal. The fear of getting caught will restrain prospective shoplifters from shoplifting in fixed location checkout settings (Cox *et al.*, 1990; Dahlback, 1998) more than it does experienced shoplifters. On the contrary, experienced shoplifters will comply with their peers in such checkout settings. Thus, we posit that:

H12. Peer influence will have a positive relationship with shoplifting intention in fixed-location checkout settings such that the effect will be stronger for experienced shoplifters than it will be for prospective shoplifters.

3. Methods

3.1 Participants and data collection

Our study is a type of mixed-methods research study. We followed a sequential mixed-methods research approach (Creswell *et al.*, 2003). A mixed-methods study provides holistic understanding of the phenomena of interest (Venkatesh *et al.*, 2013). Before designing our

survey, we reached out to the NASP for insight into shoplifting in the environment of mobile checkout. In a focus group with shoplifters conducted by the NASP, one of the authors observed the discussion that suggested interest in shoplifting in mobile checkout settings. The findings from the qualitative study gave us impetus to conduct a quantitative study to get a deeper understanding of the role of technology in facilitating shoplifting in mobile checkout settings. For this, we conducted an online survey using crowdsourced platform – M-turk. All survey research is subject to limitations based on the method used to recruit subjects – whether it is a mailing, e-mail list, visitors to a physical location or otherwise. Recent literature (e.g. Goodman and Paolacci, 2017) has listed the advantages as well as the limitations of a crowdsourced data collection platform such as M-Turk and consistent with recommendations in that literature we took the precautions to ensure validity of our results. Prior to analyzing the data, we screened all responses for completeness and accuracy. We excluded those respondents who did not correctly answer reverse-coded filler items and/or took less than two minutes to complete the survey. Two minutes were used as a quality threshold based on the number of questions and we felt that those respondents who spent less than two minutes paid inadequate attention to the questions. We also included social desirability measures (Haghighat, 2007) to ensure the reliability of responses, as shoplifting is a sensitive subject and thus may be subject to dishonest reporting. Thus, we feel our sample was appropriate to understand the intention to shoplift in mobile checkout settings. We did not feel the need to compare early vs late responses because all responses were collected during a single week and we did not send out reminders (see Hair *et al.*, 1998). To collect data, we presented customers with all the four checkout scenarios present in our research model. All respondents were provided with information about the different checkout scenarios and for better clarity, we also included images of mobile checkout scenarios to further illustrate the processes defined in each of the mobile checkout scenarios. Our sample comprised 472 participants. Table AI provides information on the respondent demographics.

3.2 Measurement

Most questions were adapted from prior studies and contextualized for shoplifting in mobile checkout settings. The items used in our study are listed in Table AII. In predicting intention to shoplift, we control for various individual-level variables, i.e., gender, age, ethnicity, education, geography, employment, annual household income, urge to shoplift, shoplifting experience, shoplifting team size and social desirability score. These were controlled because they are known influences on the intention to shoplift.

4. Data analysis and results

4.1 Reliability and validity of the scales

We used Smart-PLS, version 3.2.8 to analyze our data. Factor loadings, average variance extracted, and reliabilities were examined to assess validity and reliability. We observed that Cronbach's α was higher than 0.70 for all scales. Thus, we concluded that our scales were reliable. The measurement model indicated that items measuring each construct loaded onto a single factor and all cross-loadings were less than 0.40. Thus, the evidence suggests that the scales exhibited discriminant validity. Tables AIII and AIV provide reliability and validity statistics.

4.2 Categorization of shoplifters

We first categorized the data into shoplifters, i.e., those who had committed shoplifting in the past and non-shoplifters who never shoplifted, using the corresponding survey question on past shoplifting. Ray (1987) argues that customers who do not have a repugnance toward shoplifting in retail stores are more likely to shoplift. Based on the responses on opinions

about shoplifting in retail stores measured on a seven-point Likert-type scale adapted from Ray (1987), we identified prospective shoplifters as those who may desire to shoplift in retail stores but have never shoplifted. We computed a median split of the observations from non-shoplifters for opinions about shoplifting in retail settings and checked the differences in the intention to shoplift across different mobile checkout settings between prospective shoplifters, who have less repugnance toward shoplifting in retail stores, and honest customers, who view shoplifting as bad in retail stores. After categorization, the sample comprised 146 experienced shoplifters, 126 prospective shoplifters and 200 honest customers. In comparing prospective shoplifters (opinions about shoplifting in retail stores: $M = 3.81$, $SD = 0.88$) with honest customers (opinions about shoplifting in retail stores: $M = 1.56$, $SD = 0.61$), we found that prospective shoplifters have higher shoplifting intention in smartphone checkout settings ($t(216.55) = 2.08$, $p < 0.05$), store-provided mobile device checkout settings ($t(182.45) = 2.88$, $p < 0.01$), and employee-assisted mobile checkout settings ($t(178.46) = 2.36$, $p < 0.05$). We compared shoplifting intention in fixed location checkout settings between experienced and prospective shoplifters, and found that experienced shoplifters have a higher intention to shoplift in fixed location checkout settings $t(232.18) = 5.462$, $p < 0.001$. We further found that for experienced shoplifters, intention to shoplift in mobile checkout settings compared to fixed location checkout settings showed no statistically significant differences ($t(145) = 0.374$, $p > 0.05$). Prospective shoplifters showed higher shoplifting intention in mobile checkout settings compared to fixed location checkout settings ($t(125) = 1.962$, $p < 0.05$). The results provided support for our belief that mobile checkout settings may entice prospective shoplifters to shoplift.

We included social desirability measures (Haghighat, 2007) to ensure the reliability of responses as shoplifting is a sensitive subject and thus may be subject to dishonest reporting. These items are included in Appendix 4. The proportion of the respondents who admitted to shoplifting is consistent with previous studies on shoplifting (see Farrington, 1999; Klemke, 1992; Tonglet, 2001). We compared the social desirability scores of experienced and prospective shoplifters and found scores to be consistent across both types of shoplifters ($t(263.634) = 0.767$, $p > 0.05$).

4.3 Hypotheses tests: structural model tests

To test our research model, we used Smart-PLS v 3.2.8. To study the main effects of experiential beliefs, peer influence, and technology self-efficacy on intention to shoplift in mobile checkout settings and fixed-location checkout settings, we analyzed experienced shoplifter data that had a sample size of 146 and prospective shoplifter data that had a sample size of 126. To examine the interaction effects, we analyzed the data pooled across both experienced and prospective shoplifters that had a sample size of 272. Tables I–III show the results for predicting intention to

Intention to shoplift in checkout settings	Smartphone		
Models	1: Experienced	2: Prospective	3: Interaction
Study variables			
Experiential beliefs	0.302*	0.543**	0.456***
Peer influence	0.205*	0.483**	0.340**
Technology self-efficacy	0.42**	0.020	0.396*
Pros_Exp			−0.090*
Experiential beliefs × Pros_Exp			0.178**
Peer influence × Pros_Exp			0.155*
Technology self-efficacy × Pros_Exp			−0.401**
Adj. R^2	0.560	0.542	0.608

Notes: Pros_Exp, prospective or experienced shoplifter. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table I. Structural model results for smartphone checkout settings

shoplift in mobile checkout settings, and Table IV shows the results for predicting intention to shoplift in fixed location checkout settings.

4.3.1 Mobile checkout settings. Table I shows the results for predicting intention to shoplift in smartphone checkout settings. Models 1–3 explain shoplifting intention in smartphone checkout settings. Model 1 examined the main effects for experienced shoplifters and explained 56 percent of the variance. Model 2 examined the main effects for prospective shoplifters and explained 54 percent of the variance. Model 3 examined the

Table II. Structural model results for store-provided mobile device checkout settings

Intention to shoplift in checkout settings	Store-provided mobile device		
Models	4: Experienced	5: Prospective	6: Interaction
Study variables			
Experiential beliefs	−0.293**	−0.755*	−0.606**
Peer influence	0.490**	0.011	0.260**
Technology self-efficacy	0.073	−0.089	0.017
Pros_Exp			−0.084*
Experiential beliefs × Pros_Exp			−0.349***
Peer influence × Pros_Exp			−0.241**
Technology self-efficacy × Pros_Exp			−0.071
Adj. R^2	0.536	0.647	0.602

Notes: Pros_Exp, prospective or experienced shoplifter. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Table III. Structural model results for employee-assisted mobile checkout settings

Intention to shoplift in checkout settings	Employee-assisted mobile		
Models	7: Experienced	8: Prospective	9: Interaction
Study variables			
Experiential beliefs	0.281	0.771***	0.449***
Peer influence	0.794**	0.017	0.426***
Pros_Exp			0.065
Technology self-efficacy			
Experiential beliefs × Pros_Exp			0.565***
Peer influence × Pros_Exp			−0.328***
Technology self-efficacy × Pros_Exp			
Adj. R^2	0.529	0.616	0.573

Notes: Pros_Exp, prospective or experienced shoplifter. **$p < 0.01$; ***$p < 0.001$

Table IV. Structural model results for fixed location checkout settings

Intention to shoplift in checkout settings	Fixed location checkout settings		
Models	10: Experienced	11: Prospective	12: Interaction
Study variables			
Experiential beliefs			
Peer influence	0.707***	0.630	0.659***
Pros_Exp			0.114*
Technology self-efficacy			
Experiential beliefs × Pros_Exp			
Peer influence × Pros_Exp			−0.601*
Technology self-efficacy × Pros_Exp			
Adj. R^2	0.500	0.397	0.525

Notes: Pros_Exp, prospective or experienced shoplifter. *$p < 0.05$; ***$p < 0.001$

interaction effects of experiential beliefs and type of shoplifters, peer influence and type of shoplifters, and technology self-efficacy and type of shoplifters, and explained 60 percent of the variance. The results indicated that the experiential beliefs and peer influence had positive, significant effects on intention to shoplift in smartphone checkout settings for both experienced and prospective shoplifters, thus supporting *H1a* and *H2a*. The results indicated that technology self-efficacy had a positive, significant effect on intention to shoplift in smartphone checkout settings for only experienced shoplifter, thus partially supporting *H3a*. The interaction effect of experiential beliefs and type of shoplifters was significant. Figure 2 shows that high experiential beliefs lead to higher shoplifting intention in smartphone checkout settings among prospective shoplifters, thus supporting *H4*. The interaction effect of peer influence and type of shoplifters was significant. Figure 3 shows that high peer influence leads to higher shoplifting intention in smartphone checkout settings among prospective shoplifters, thus supporting *H5*. The interaction effect of technology self-efficacy and type of shoplifters was significant. Figure 4 shows that high technology self-efficacy leads to higher shoplifting intention in smartphone checkout settings among experienced shoplifters, thus supporting *H6*.

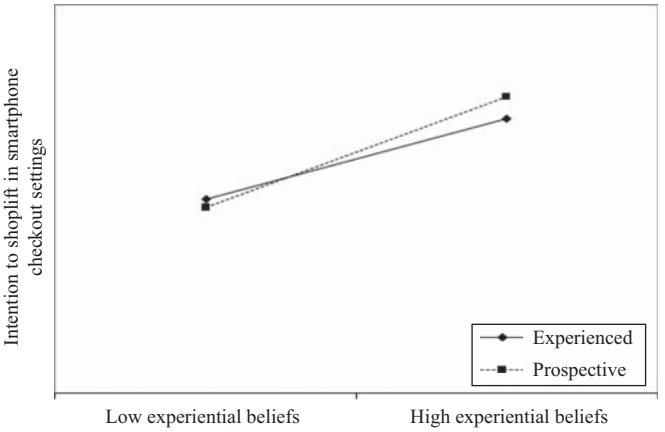


Figure 2.
Interaction effect of type of shoplifter and experiential beliefs on intention to shoplift in smartphone checkout settings

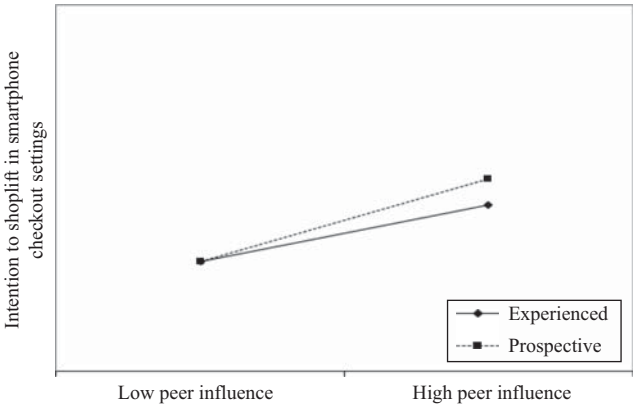


Figure 3.
Interaction effect of type of shoplifter and peer influence on intention to shoplift in smartphone checkout settings

Table II shows the results for predicting intention to shoplift in store-provided mobile device checkout settings. Models 4–6 explain shoplifting intention in store-provided mobile device checkout settings. Model 4 examined the main effects for experienced shoplifters and explained 54 percent of the variance. Model 5 examined the main effects for prospective shoplifters and explained 65 percent of the variance. Model 6 examined the interaction effects of experiential beliefs and type of shoplifters, peer influence and type of shoplifters, and technology self-efficacy and type of shoplifters, and explained 60 percent of the variance. The results indicated that the experiential beliefs had negative, significant effects on intention to shoplift in store-provided mobile device checkout settings for both experienced and prospective shoplifters, thus supporting *H1b*. The results indicated that peer influence had a positive, significant effect on intention to shoplift in store-provided mobile device checkout settings for only experienced shoplifter, thus partially supporting *H2b*. The interaction effect of experiential beliefs and type of shoplifters was significant. Figure 5 shows that high experiential beliefs lead to lesser shoplifting intention in store-provided mobile device checkout settings and effect is weaker among prospective shoplifters, thus supporting *H7*. The interaction effect of peer influence and type of shoplifters was significant. Figure 6 shows that high peer influence leads to higher shoplifting intention in store-provided mobile

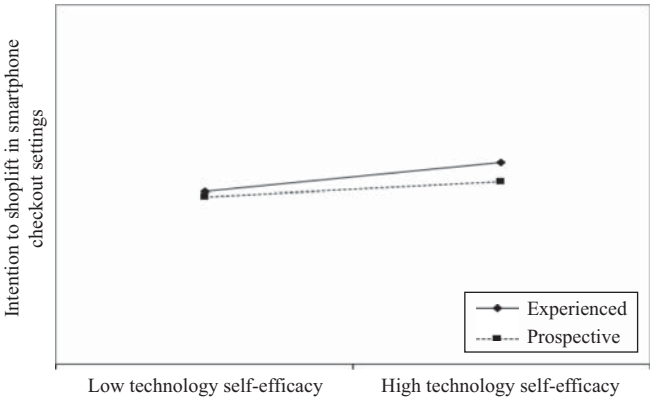


Figure 4.
Interaction effect of type of shoplifter and technology self-efficacy on intention to shoplift in smartphone checkout settings

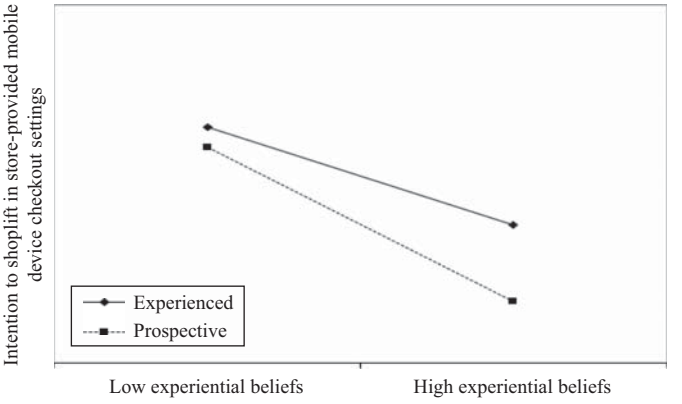


Figure 5.
Interaction effect of type of shoplifter and experiential beliefs on intention to shoplift in store-provided mobile device checkout settings

checkout settings among experienced shoplifters, thus supporting *H8*. The results indicated that *H3b* and *H9* were not supported.

Table III shows the results for predicting intention to shoplift in employee-assisted mobile checkout settings. Models 7–9 explain shoplifting intention in employee-assisted mobile checkout settings. Model 7 examined the main effects for experienced shoplifters and explained 53 percent of the variance. Model 8 examined the main effects for prospective shoplifters and explained 62 percent of the variance. Model 9 examined the interaction effects of experiential beliefs and type of shoplifters, and peer influence and type of shoplifters, and explained 57 percent of the variance. The results indicated that the experiential beliefs had positive, significant effects on intention to shoplift in employee-assisted mobile checkout settings for only prospective shoplifters, thus partially supporting *H1c*. The results indicated that peer influence had a positive, significant effect on intention to shoplift in employee-assisted mobile checkout settings for only experienced shoplifter, thus partially supporting *H2c*. The interaction effect of experiential beliefs and type of shoplifters was significant. Figure 7 shows that high experiential beliefs lead to higher shoplifting intention in employee-assisted mobile checkout settings and effect is stronger

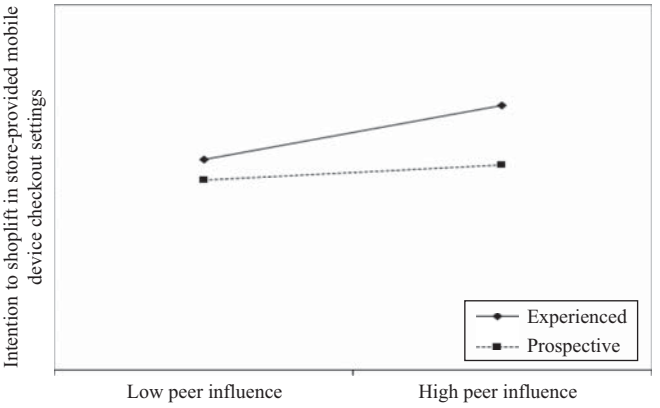


Figure 6.
Interaction effect of type of shoplifter and peer influence on intention to shoplift in store-provided mobile device checkout settings

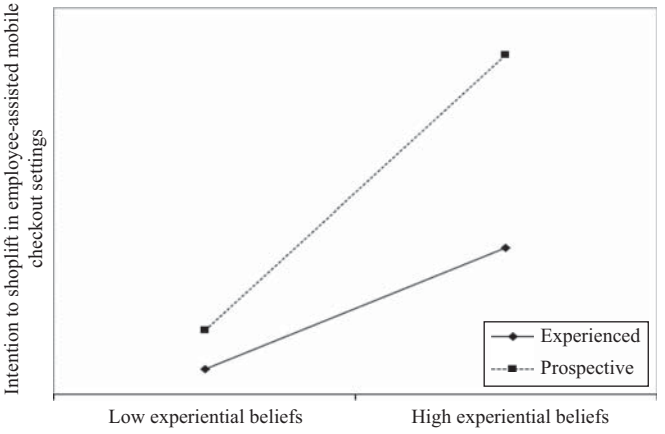


Figure 7.
Interaction effect of type of shoplifter and experiential beliefs on intention to shoplift in employee-assisted mobile checkout settings

among prospective shoplifters, thus supporting *H10*. The interaction effect of peer influence and type of shoplifters was significant. Figure 8 shows that high peer influence leads to higher shoplifting intention in employee-assisted mobile checkout settings among experienced shoplifters, thus supporting *H11*.

4.3.2 Fixed location checkout settings. Table IV shows the results for predicting intention to shoplift in fixed location checkout settings. Models 10–12 explain the intention to shoplift in fixed location checkout settings. Model 10 examined the main effects for experienced shoplifters and explained 50 percent of the variance. Model 11 examined the main effects for prospective shoplifters and explained 39 percent of the variance. Model 12 examined the interaction effects of peer influence and type of shoplifters, and explained 52 percent of the variance. The interaction effect of peer influence and type of shoplifters was significant. Figure 9 shows that high peer influence leads to higher shoplifting intention in fixed location checkout settings and effect is stronger among experienced shoplifters, thus supporting *H12*.

Table V summarizes the support for the hypotheses.

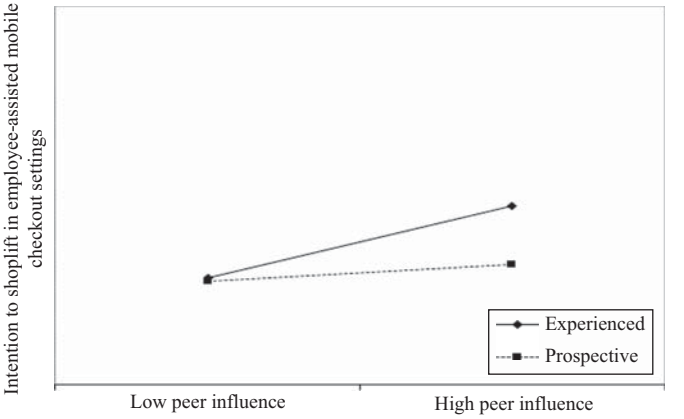


Figure 8.
Interaction effect of type of shoplifter and peer influence on intention to shoplift in employee-assisted mobile checkout settings

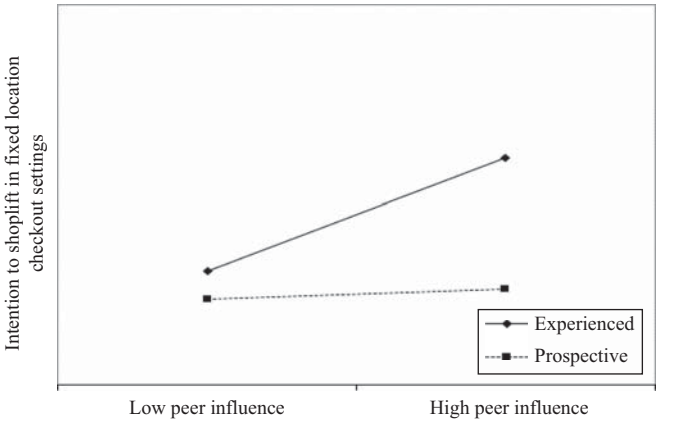


Figure 9.
Interaction effect of type of shoplifter and peer influence on intention to shoplift in fixed location checkout settings

Study	Hypothesis	Results
Experiential beliefs in smartphone checkout settings for both experienced and prospective shoplifters	*H1a*	Supported
Experiential beliefs in store-provided mobile device checkout settings for both experienced and prospective shoplifters	*H1b*	Supported
Experiential beliefs in employee-assisted mobile checkout settings for both experienced and prospective shoplifters	*H1c*	Partially supported
Peer influence in smartphone checkout settings for both experienced and prospective shoplifters	*H2a*	Supported
Peer influence in store-provided mobile device checkout settings for both experienced and prospective shoplifters	*H2b*	Partially supported
Peer influence in employee-assisted mobile checkout settings for both experienced and prospective shoplifters	*H2c*	Partially supported
Technology self-efficacy in smartphone checkout settings for both experienced and prospective shoplifters	*H3a*	Partially supported
Technology self-efficacy in store-provided mobile device checkout settings for both experienced and prospective shoplifters	*H3b*	Not supported
Interaction effect of experiential beliefs and shoplifter in smartphone checkout settings	*H4*	Supported
Interaction effect of peer influence and shoplifter in smartphone checkout settings	*H5*	Supported
Interaction effect of technology self-efficacy and shoplifter in smartphone checkout settings	*H6*	Supported
Interaction effect of experiential beliefs and shoplifter in store-provided mobile device checkout settings	*H7*	Supported
Interaction effect of peer influence and shoplifter in store-provided mobile device checkout settings	*H8*	Supported
Interaction effect of technology self-efficacy and shoplifter in store-provided mobile checkout settings	*H9*	Not supported
Interaction effect of experiential beliefs and shoplifter in employee-assisted mobile device checkout settings	*H10*	Supported
Interaction effect of peer influence and shoplifter in employee-assisted mobile checkout settings	*H11*	Supported
Interaction effect of peer influence and shoplifter in fixed location checkout settings	*H12*	Supported

Table V.
Summary of support for hypotheses

5. Discussions and implications

We found support for our proposed model linking shoplifters' experiential beliefs, peer influence, and technology self-efficacy to their shoplifting intention in mobile checkout settings. We found that both experienced and prospective shoplifters have a higher shoplifting intention when retail stores allow customers to use their own smartphones for mobile checkout. Our model explained about 50 percent of the variance in shoplifting intention among experienced and prospective shoplifters in various mobile checkout settings. We found that shoplifters are reluctant to shoplift when they had to use a store-provided mobile device for scanning and checkout even if they have skills and knowledge to use a store-provided mobile device. We found that experiential beliefs resulted in higher shoplifting intention among prospective shoplifters in employee-assisted mobile checkout settings.

5.1 Theoretical implications

This work makes several key contributions. This work contributes to the importance of shoplifting in criminology. Although prior research in criminology has studied factors leading to shoplifting in retail markets, extant empirical literature was limited in that it mainly studied shoplifters who had been apprehended. To the best of our knowledge, our research is the first to study prospective shoplifters who desire to shoplift but never had favorable criminogenic settings in retail stores. Mobile checkout settings provide autonomy to the customers in which

customers can scan products and process payments without needing to go to fixed terminals for sales transactions. We extend the literature by studying the motivations among both experienced and prospective shoplifters in different criminogenic settings. Also, to the best of our knowledge, no research has studied the influence of technology on shoplifters to commit shoplifting. The model proposed here complements and advances prior work on shoplifting. Retailers have invested in mobile checkout settings for customer satisfaction and competitive advantage. Our work not only leverages ideas from the literature highlighting mobile checkout settings, but also contextualizes the exploitation of mobile checkout settings by shoplifters and how these settings play a role among different shoplifters in their shoplifting intention by developing arguments and providing empirical evidence. Thus, our work contributes to the literature on the dark side of technology by bringing to light the potential downside of emerging mobile checkout settings engendering special type of cybercrime in the form of shoplifting using technology.

5.2 Practical implications

One of our key findings is the higher shoplifting intention in mobile checkout settings than fixed location checkout settings. The use of smartphone checkout settings for scanning and payment was found to be conducive to shoplifting both for experienced and prospective shoplifters. Mobile checkout settings are instrumental in reducing the costs associated with manual processing of purchase transactions. These mobile checkout processes have not only resulted in cost savings and improvements in service quality, but also created an opportunity for customers to exploit technology in committing cybercrime in the form of shoplifting. Shoplifters can easily use mobile technologies to their advantage because of the vulnerabilities associated with the technology. Our findings revealed that in autonomous mobile checkout settings both experienced and prospective shoplifters express intention to shoplift. Technology undoubtedly helps the business in terms of cost savings, surveillance mechanisms, and operational efficiency, but our findings highlight the adverse effects that arise with the implementation of technology. We caution retailers to put in place extra measures such as separate exit inspections for smartphone checkout settings, audible feedback associated with a successful scan in store mobile devices used for checkout so that unrecorded scans do not go undetected, use of data analytics to trigger extra checks for customers who were convicted before, warning messages provided in mobile applications and emails to the dishonest customers engaged in the shoplifting, use of corralling at checkout to separate customers based on the mode of checkout they choose to use, inspection check points to match the items in the basket with the receipt, higher employee engagement to monitor customers for any malicious acts, and use of electronic article surveillance (EAS) protocols to help retailers detect unpaid merchandise when it exits the store (Aloysius *et al.*, 2013), to implementation of technology, i.e., in the form of video cameras, image analysis, to EAS systems (McCarty, 2017; Yamato *et al.*, 2017). Our work is one of the initial steps in providing insights that could help reduce losses incurred by retailers from one form of cybercrime, shoplifting enabled by technology.

5.3 Limitations and future research

There are a few limitations of our study that must be acknowledged. First, we collected cross-sectional data. We only measured intention but this concern is alleviated given that extant previous research has shown intention to be a strong predictor of behavior (Venkatesh *et al.*, 2016). Future research could measure behavior over different intervals of time to see whether intention results in shoplifting. Second, we did not study how technology failure and employee shirking could assist shoplifters. Technology failure could help shoplifters as failed scans will help customers to get merchandise without payment. Employees could collude with shoplifters because they are not directly responsible for

monitoring transactions. Future research could extend our work by incorporating technology failure and employee shirking behavior in the model. Third, our study was conducted in the USA. Future research could study shoplifters from different countries and we could thus extend our model by examining its generalizability across cultures. Fourth, future research could add another dimension to cybercrime related to shoplifting by studying the hacking of mobile applications and devices used in mobile checkout settings. Finally, our work did not make use of different typologies of shoplifters having different needs. Future research could include other kinds of shoplifters – e.g., impulsive shoplifters, nonrational shoplifters (Moore, 1984). This will help in enhancing our understanding of various types of shoplifters and their reactions when exposed to mobile checkout settings.

6. Conclusion

We found support for our model that shoplifters have higher shoplifting intention in the context of mobile checkout settings. The intention among shoplifters can vary depending on the kind of mobile checkout settings retailers have in place. Shoplifters showed higher intention when they used their own smartphone for checkout and were less likely to shoplift using store-provided mobile devices. Peer influence played a role in influencing shoplifting intention in all three different mobile checkout settings, namely smartphone, store-provided mobile device and employee-assisted mobile checkout settings. This work contributes to our understanding of shoplifting and use of technology by shoplifters to their advantage by identifying, justifying, and empirically testing determinants of shoplifting intention. Our model can serve as a platform for future research and our findings can help retailers in taking necessary steps to curb the losses due to shoplifting in mobile checkout settings. This work complements prior work on the dark side of technology use by adding another component to the literature on cybercrime, i.e., focusing on the context of shoplifting using technology.

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Appendix 1

	n	%		*n*	%
Gender			Geography		
Men	240	50.8	Rural	189	40
Women	232	49.2	Urban	283	60
Age			Employment		
Under 25	50	10.6	Full-time	309	65.5
25–29	90	19.1	Part-time	74	15.7
30–39	175	37.1	Retired	18	3.8
40–49	87	18.4	Unemployed	71	15
50–59	41	8.7	Annual household income		
60 and over	29	6.1	Less than $20k	64	13.6
Ethnicity			$20k–$40k	110	23.3
African-American	29	6.1	$40k–$60k	107	22.7
Asian/Pacific Islander	35	7.4	$60k–$80k	91	19.3
Caucasian	366	77.5	$80k–$100k	42	8.9
Hispanic/Latino	30	6.4	More than $100k	58	12.3
Native American	5	1.1			
Others	7	1.5			
Education					
College or school dropout	50	10.6			
Undergraduates	258	54.7			
Graduates	125	26.5			
Others	39	8.3			

Note: Sample $n = 472$

Table AI.
Demographic statistics of the respondents

Appendix 2

Constructs (measurement source)	Items
Items measured on seven-point Likert-type scale	
Intention to shoplift in smartphone checkout settings (Ajzen, 1991)	I intend to shoplift in a store that has smartphone checkout settings
	I predict I would shoplift in a store that has smartphone checkout settings
	I plan to shoplift in a store that has smartphone checkout settings
Intention to shoplift in store provide mobile device checkout settings (Ajzen, 1991)	I intend to shoplift in a store that has store-provided mobile device checkout settings
	I predict I would shoplift in a store that has store-provided mobile device checkout settings
	I plan to shoplift in a store that has store-provided mobile device checkout settings
Intention to shoplift in employee-assisted mobile checkout settings (Ajzen, 1991)	I intend to shoplift in a store that has store employee-assisted mobile checkout settings
	I predict I would shoplift in a store that has store employee-assisted mobile checkout settings
	I plan to shoplift in a store that has store employee-assisted mobile checkout settings
Intention to shoplift in fixed location checkout settings (Ajzen, 1991)	I intend to shoplift in a store that does not have mobile checkout settings
	I predict I would shoplift in a store that that does not have mobile checkout settings
	I plan to shoplift in a store that does not have mobile checkout settings
Experiential beliefs (Ray, 1987)	I will shoplift just for fun
	I will shoplift for excitement
	I will shoplift just to see what it's like
	I will shoplift to see if I could get away with it
Peer influence (Cox *et al.*, 1990)	Will you shoplift because friends are doing it?
	Will you shoplift because friends dare you to do it?
	Will you shoplift because you want to please friends?
	Will you shoplift because your friend needs the item?
	Will you shoplift because your friend can't legally buy the item?
	Will you shoplift because your friend might be embarrassed to buy the item?
	Will you shoplift because your friend is told that he/she can't have the item?
	Do your friends encourage you to shoplift?
Technology self-efficacy (McDonald and Siegall, 1992)	In general, I could complete the checkout using the technology if I could call someone for help if I got stuck
	In general, I could complete the checkout using the technology if someone else had helped me get started
	In general, I could complete the checkout using the technology if I had lot of time to complete the checkout for which technology was provided
	In general, I could complete the checkout using the technology if someone showed me how to do it first
	In general, I could complete the checkout using the technology if I had used technology before this one for checkout
	In general, I could complete the checkout using the technology if I had just the built-in help facility for assistance

(*continued*)

Table AII. Scales used

Constructs (measurement source)	Items
Opinion about shoplifting in retail stores (Ray, 1987)	People shoplift in retail stores because items are overpriced The shoplifted items will never be missed in retail stores
Items measured on a five-point scale with 0 denoting "none" and 4 denoting "extreme"	
Urge to shoplift from retail stores during past one week (Grant and Kim, 2002)	If you had urges to steal during the past WEEK, on average, how strong were your urges? During the past WEEK, how many times did you experience urges to steal? During the past WEEK, how many hours (add up hours) were you preoccupied with your urges to steal? During the past WEEK, how much were you able to control your urges? Please circle the most appropriate number[a]

Table AII.

Note: [a]These items were reverse coded

Appendix 3

Scale	Cronbach's α	Average variance extracted	Range of the loadings
Intention to shoplift in smartphone checkout settings	0.939	89.1	0.923–0.967
Intention to shoplift in store-provided mobile device checkout settings	0.957	92.1	0.948–0.975
Intention to shoplift in employee-assisted mobile checkout settings	0.952	91.2	0.952–0.957
Intention to shoplift in fixed location checkout settings	0.966	93.6	0.964–0.976
Experiential beliefs	0.960	89.2	0.931–0.950
Peer influence	0.953	75.5	0.796–0.902
Technology self-efficacy	0.944	68.3	0.839–0.900

Table AIII.
Reliability and validity statistics of the scales

Construct	Items	IM	ISM	IEA	IC	ExB	PI	TSE
Smartphone checkout settings	IM1	*0.97*	0.14	0.30	0.21	0.21	0.15	0.25
	IM2	*0.94*	0.20	0.30	0.21	0.19	0.16	0.19
	IM3	*0.92*	0.17	0.20	0.24	0.22	0.17	0.29
Store-provided mobile device checkout settings	ISM1	0.14	*0.98*	0.21	0.15	0.13	0.19	0.26
	ISM2	0.17	*0.95*	0.19	0.17	0.14	0.23	0.20
	ISM3	0.15	*0.96*	0.22	0.15	0.19	0.14	0.27
Employee-assisted mobile checkout settings	IEA1	0.30	0.10	*0.96*	0.25	0.30	0.20	0.36
	IEA2	0.30	0.07	*0.95*	0.28	0.30	0.15	0.33
	IEA3	0.18	0.09	*0.96*	0.25	0.20	0.24	0.40
Fixed location checkout settings	IC1	0.30	0.09	0.21	*0.98*	0.17	0.09	0.32
	IC2	0.26	0.04	0.28	*0.96*	0.15	0.17	0.33
	IC3	0.30	0.08	0.29	*0.96*	0.15	0.14	0.32
Experiential beliefs	ExB1	0.28	0.10	0.18	0.39	*0.95*	0.34	0.29
	ExB2	0.24	0.08	0.20	0.40	*0.95*	0.25	0.30
	ExB3	0.25	0.19	0.18	0.42	*0.94*	0.23	0.30
	ExB4	0.25	0.07	0.16	0.33	*0.93*	0.29	0.22
Peer influence	PI1	0.10	0.22	0.15	0.14	0.24	*0.88*	0.36
	PI2	0.12	0.21	0.14	0.17	0.25	*0.90*	0.33
	PI3	0.17	0.15	0.18	0.15	0.14	*0.88*	0.32
	PI4	0.20	0.14	0.08	0.15	0.15	*0.85*	0.24
	PI5	0.18	0.14	0.15	0.09	0.16	*0.89*	0.26
	PI6	0.16	0.15	0.15	0.12	0.19	*0.90*	0.37
	PI7	0.15	0.17	0.17	0.22	0.17	*0.84*	0.30
	PI8	0.28	0.15	0.14	0.21	0.20	*0.80*	0.26
Technology self-efficacy	TSE1	0.19	0.18	0.27	0.25	0.23	0.25	*0.86*
	TSE2	0.15	0.14	0.23	0.18	0.21	0.24	*0.84*
	TSE3	0.28	0.26	0.37	0.29	0.32	0.36	*0.86*
	TSE4	0.18	0.16	0.25	0.24	0.17	0.21	*0.87*
	TSE5	0.23	0.23	0.38	0.33	0.28	0.34	*0.90*
	TSE6	0.29	0.28	0.42	0.36	0.32	0.38	*0.87*

Notes: IM – smartphone checkout settings; ISM – store-provided mobile device checkout settings; IEA – employee-assisted mobile checkout settings; IC – fixed location checkout settings; ExB – experiential beliefs; PI – peer influence; TSE – technology self-efficacy

Table AIV.
Loadings and cross-loadings

Appendix 4

Social desirability questionnaire (Haghighat, 2007)

Please check the appropriate box below:

Q1. Would you smile at people every time you meet them? ☐ Yes ☐ No

Q2. Do you always practice what you preach to people? ☐ Yes ☐ No

Q3. If you say to people you will do something, do you always keep your promise no matter how inconvenient it might be? ☐ Yes ☐ No

Q4. Would you ever lie to people? ☐ Yes ☐ No

Q5. Would you ever laugh at a dirty joke people may make? ☐ Yes ☐ No

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