Original Article

‘Thinking thief’ in the crime prevention arms race: Lessons learned from shoplifters

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Abstract Retailers invest considerable sums of money in security measures designed to prevent shoplifting. However, little is known about shoplifters’ perceptions of anti-shoplifting security measures or shoplifters’ techniques for outmaneuvering them. Building on Ekblom’s recommendation to ‘think thief’ to disengage from the crime prevention arms race, our data consist of in-depth interviews with active shoplifters who simulated shoplifting at two national retail stores while wearing an eye-tracking device. Shoplifters in the present study describe their perceptions of the deterrence potential of specific security measures and the various counter-moves employed to successfully steal merchandise. Implications for ‘thinking thief’ in the retail environment are discussed.
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Shoplifting is one of the most common crimes, yet it is among the least likely to be detected or reported (Clarke, 2002). An estimated 27 million persons shoplift annually in the United States, resulting in at least US$13 billion worth of goods shoplifted each year and more than $100 billion annually worldwide (NASP, 2006). Because shoplifting is harmful to retail establishments, to individual consumers, and to the economy at large, retailers have invested considerable sums of money in security techniques aimed at reducing shoplifting (Schultz, 2011). These techniques include closed circuit television (CCTV), electronic article surveillance (EAS), and specially designed packaging, among others. The effectiveness of such measures in reducing shoplifting is questionable, however, as shoplifters continually develop counter-techniques to successfully steal merchandise.

This article considers anti-shoplifting security measures from shoplifters’ perspectives. We begin by describing Ekblom’s (1997) concept of the arms race between offenders and crime preventers, followed by a review of prior research on the employment and effectiveness of anti-shoplifting security devices. We then describe our methods and data, which consist of qualitative interviews with active shoplifters who simulated shoplifting at national retail stores while wearing an eye-tracking device. Next, we present our analysis of

whether shoplifters considered particular security measures to be effective deterrents and the techniques used for defeating them. Finally, we conclude by discussing the implications of our findings for outmaneuvering shoplifters and for potentially avoiding future arms races in the retail environment.

Understanding Adaptation in the Shoplifting Arms Race

Shoplifting and its prevention exemplify what Ekblom (1997, 1999) refers to as the arms race of crime prevention. Ekblom compares the longstanding struggle between offenders and crime prevention practitioners to the evolutionary struggle of both weapons-based and natural arms races (that is, predators versus prey or pathogens versus immune systems). Like other forms of the arms race, the fight between offenders and preventers is at risk of continuing indefinitely. As retailers and merchandisers conceive of new security measures to deter and to detect shoplifting, shoplifters quickly conceive of countermeasures for overcoming them. Retailers are then forced to develop counter-countermeasures in the fight against shoplifters, which shoplifters then outmaneuver. How can crime preventers ensure that the rate of offender adaptation remains less than the rate of preventive development?

Of course, there is no way for preventers to 'win' the arms race against offenders, but it is possible to adapt security measures so that the scale is tipped in favor of prevention. Ekblom (1999) suggests that preventers focus attention on ways to avoid the arms race altogether by anticipating offenders' moves in advance. To do so, Ekblom (2012, 2014) suggests that preventers begin to 'think thief', that is, to become familiar with offenders' perspectives and to use this knowledge to anticipate their likely countermoves. Doing so requires that crime prevention practitioners and security designers are willing to adapt their strategies and products. They must accept that passing time renders the effectiveness of security measures obsolete because offenders adapt their own techniques in response (Ekblom, 2014).

The present study aims to appraise current loss prevention practices through the perspectives of active shoplifters to further illustrate how such security measures can be adapted in light of known countermoves. The study was not designed to be an evaluation of any specific security measure; instead it was designed to investigate shoplifters' perceptions and decision making during the crime event. Its results contribute to efforts to enact evidence-based loss prevention (see Hayes, 2006) by updating past efforts to 'think thief' in the retail environment (for example, Butler, 1994; Gill *et al*, 1999; Carmel-Gilfin, 2011).

A number of studies have been published on the effectiveness of various retail security measures (for example, Handford, 1994; Sherman *et al*, 1997; Beck and Willis, 1999; Hayes and Blackwood, 2006). However, very little is known about shoplifters' perceptions of these measures' effectiveness. Past research on shoplifters' perspectives has typically involved retrospective interviews with apprehended offenders (for example, Gill *et al*, 1999; Hayes, 1999; Cardone, 2006), which limits insight into how active shoplifters make decisions in the moment that they are confronted with a specific security measure. It is imperative to begin 'thinking thief' about shoplifting to learn from shoplifters themselves what security measures they consider effective or ineffective deterrents while actively stealing, as well as what techniques they employ to overcome these measures. Knowledge gained from 'thinking thief' can illuminate how security measures can be adapted to outmaneuver shoplifters' countermoves and thereby assist retailers in avoiding the continuation of this arms race.

What is Known about the Effectiveness of Anti-Shoplifting Security Measures?

Retailers commonly use a combination of the following security measures in the hopes of deterring shoplifters: mirrors, closed-circuit television, public viewing monitors, electronic article surveillance, product packaging and product placement. In this section, we present summaries of prior research about the effectiveness of these security measures as deterrents to shoplifting. To begin 'thinking thief' for shoplifting, we answer the following questions for each security measure: Do shoplifters consider this technique an effective deterrent? Why or why not? And what countermoves do they use to overcome it? Past research provides preliminary insight about the effectiveness of these security measures and about known countermoves. This study expands on the conclusions of prior research by considering the perceptions and techniques of active shoplifters.

Mirrors

Retailers frequently place convex mirrors in ceiling corners and at the ends of aisles to increase natural surveillance capability within the store. To date, formal evaluation on the effectiveness of mirrors as a shoplifting deterrent has not been conducted. However, some conclusions about mirrors can be drawn from their relatively minimal mention in the literature. Mirrors are considered, at best, to have fair potential as shoplifting deterrents, and, at worst, to facilitate shoplifting.

According to Gill (2007), scholars are divided in their views about whether mirrors are a useful countermeasure against shoplifting or whether they are actually a threat to security. In Clarke's (2002) summary of shoplifting prevention techniques, he simply states that when mirrors are properly placed within a store they can assist staff in monitoring both customers and goods. Cardone (2006), however, argues that few stores locate mirrors in positions useful for employees to reflect easily upon concealed, high-theft merchandise. Among those who maintain that mirrors are counterproductive to store security, both Ekblom (1986) and Hayes and Cordone (2006) argue that shoplifters can use mirrors to keep a covert watch over staff to ensure that they are not observed concealing merchandise.

Closed-circuit television

CCTV is an increasingly common security device in retail establishments. Retailers appear to place a great deal of faith in its potential to reduce shoplifting and other store-based crimes, despite limited empirical evidence demonstrating CCTV as an effective deterrent. According to Beck and Willis (1999, p. 34), CCTV is considered by retailers to be the technological equivalent to in-store policing, representing 'an omnipresent, near-infallible robot eye in the sky on duty 24 hours a day.' However, not a single study has confirmed CCTV's role in the long-term deterrence of shoplifting.

To date, the only formal evaluation of CCTV in the retail setting is that by Beck and Willis (1999). The authors measured the impact of installing CCTV on total levels of shrinkage (defined as loss because of shoplifting, employee theft, or genuine mistakes) longitudinally to assess whether the cost of CCTV was compensated by its crime control benefits. Fifteen stores in the United Kingdom were equipped with one of three different

types of CCTV systems: high-level (with 2–4 moving and 8–12 static color cameras recording footage and being monitored by staff at all times, as well as public viewing monitors (PVM), medium-level (involving 6–12 static color cameras that recorded but were intermittently monitored, as well as PVM), and low-level (with 12 dummy cameras, PVM, and no recording ability). The authors found that the initial percentage change in stock loss was highest for stores with low-level systems (23 per cent), followed by medium-level (20 per cent), and high-level (17 per cent). Six-month follow-up findings were mixed, showing that stores with high-level systems experienced an increase in stock loss, while stores with the other two systems continued to experience a decrease, though less than that upon implementation. Beck and Willis conclude that the initial short-term decrease associated with each of the three systems suggests that CCTV, at least initially, deters offenders by increasing their perception of risk. However, their results show that CCTV's effects diminish over time.

One of the countermoves used by offenders to overcome the risk posed by CCTV is to evaluate the positioning of cameras to find blind spots – that is, areas unmonitored by CCTV where they can conceal goods undetected (Hayes and Cardone, 2006). Evidence of this is provided in Hayes' (1999) analysis of over 3000 incidents of shoplifting occurring in three stores in 1996. He found that 62 per cent of items shoplifted were initially taken from areas with high CCTV visibility and then concealed in areas with low CCTV visibility, that is, blind spots. The deterrence capability of CCTV is reduced by improper placement that creates blind spots (Cardone, 2006; Carmel-Gilfin, 2013), and, as a result, offenders are able to undermine the effectiveness of this security measure.

Shoplifters are unlikely to be convinced that CCTV footage is being consistently monitored. Gill (2007) concluded from his analysis of interviews with an international sample of shoplifters that although they do not want to be captured on camera concealing merchandise, this risk is abated by the belief that cameras are insufficiently monitored. Moreover, shoplifters in his sample described various techniques they used to appear as normal shoppers and to avoid catching the attention of staff monitoring CCTV. As explained by Spriggs and Gill (2006), installation of CCTV will be ineffective against retail crimes if personnel do not actively monitor the footage. Moreover, Clarke (2002) states that employees are crucial to the effectiveness of CCTV but they must be properly trained to hone in on suspicious individuals.

Public viewing monitors

PVM are typically placed at the entrance/exit areas of stores or in store centers. These television screens display live images captured through the store's CCTV system. Like mirrors, this security measure has not been extensively evaluated. The few evaluations of PVM suggest that researchers have mixed opinions as to whether PVM is an effective deterrent against shoplifting.

According to Hayes and Downs (2011), PVM is an effective shoplifting deterrent because it is designed to overload potential offenders with concerns for rapid detection by employees, as well as with fear of being detained by employees for law enforcement action. Farrell and Farrara (1985) likewise argue that PVM represents an effective warning for offenders. They suggest that the primary benefit for stores using PVM is that it deters shoplifting while having a neutral or possibly beneficial effect on customer satisfaction, as law-abiding

customers enjoy seeing themselves on the screens. Cardone (2006), however, warns that PVM must be implemented with care. Poor positioning of monitors can obscure portions of the store and can create blind spots where shoplifters can more easily conceal merchandise. In addition, she argues that shoplifters can be encouraged to steal if the images on monitors indicate that the store has poor quality CCTV.

Electronic article surveillance

EAS is nearly omnipresent in the current retail environment, with widespread use beginning in the 1980s (DiLonardo, 1996). The systems consist of electronic tags attached to clothing and electronic stickers that are applied to other products. An alarm sounds if tagged goods pass through the electronic sensors at the store's exit without having been deactivated upon purchase.

Unlike other forms of antishoplifting devices, EAS has been subject to slightly more evaluations as retailers seek to justify their costs. Overall, findings indicate that EAS systems can reduce losses because of shrinkage from 35–75 per cent (DiLonardo, 1996; Clarke, 2002; but see Eck, 2002). A major theme across past studies on EAS systems is the importance of employee involvement in the systems, which has a huge impact on whether EAS is able to fulfill its goals of detecting and deterring shoplifters (Bamfield, 1994; Hayes and Blackwood, 2006). Over-reliance on technological fixes can lead to employees becoming complacent in their efforts to follow-up on system alarms or their proactivity in the fight against shoplifting (Nelson and Perrone, 2000; Clarke, 2002; Hayes and Cardone, 2006).

Researchers also have observed faults in the design of EAS systems that shoplifters can exploit. Handford (1994) describes the system's various design flaws, noting that merchandise can be passed above, below, or on the side of detectors. In such instances, the tags or stickers will not activate the warning alarm. Shoplifters can take advantage of these flaws, particularly when store employees are not vigilant in monitoring exits or in-store behavior (Gill, 2007). Furthermore, as Hayes and Blackwood's (2006) evaluation of EAS in 21 stores illustrates, shoplifters can exploit the system's tendency to 'cry wolf', that is, to sound alarms in instances of non-theft, especially when no employees follow up on alarms.

Product packaging

As explained by Clarke (1999), items most likely to be shoplifted are those that fit the CRAVED model – Concealable, Removable, Available, Valuable, Enjoyable and Disposable. Hayes and Downs (2011) explain that packaging can work to increase the risk of stealing CRAVED products by methods such as making loud crackling noises, sounding alarms, and requiring the shoplifter to make demonstrative movements

Packaging on products can be designed to deter shoplifting in two ways. First, packaging can be larger than necessary for the product, with the assumption that shoplifters will avoid targeting products with increased bulk. Second, items can be placed in specialized security packaging (for example, keeper boxes, spider wrapping) that can only be removed with specific tools. Both forms of item packaging have seen an increased popularity as retailers and merchandisers seek to 'design out crime' (Ekblom, 1995, 2012).

Hayes *et al* (2011) present evidence for the effectiveness of keeper boxes with a 10-store randomized control trial. Keeper boxes were installed on razor blades in five stores, while the other five served as controls. Results reveal that product shrinkage in the experimental stores decreased by 52 per cent compared with the control stores over the study period of 3.5 months, while sales in the experimental stores increased by 69 per cent compared with the control stores. As such, the authors conclude that keeper boxes are cost-effective security measures that deter shoplifting.

Item placement

Few studies have examined the effectiveness of store item layout on reducing shoplifting. However, Carmel-Gilfin's (2011, 2013) offender-based data indicate that carefully considered placement of items in high-visibility areas or in locked cases will effectively deter shoplifting. Methods involve moving high-loss products to locked display cases, visible ends of aisles, or closer to registers. The logic of this technique is clear from the perspectives of situational crime prevention and crime prevention through environmental design – namely, target hardening and increasing natural surveillance.

Carmel-Gilfin's (2011, 2013) research on how store layout and design influences shoplifting decisions provides evidence for the effectiveness of item placement techniques. Replicating Carroll and Weaver's (1986) study of expert and novice shoplifters, she gathered data by having 48 participants narrate their thought processes as they considered shoplifting in various stores. However, Carmel-Gilfin (2011, 2013) extends previous research by focusing specifically on how the design and the layout of stores influence expert and novice shoplifters' decision making. She found that both types of shoplifters are strongly affected by store design and item placement and that most offenders do not decide on shop theft before taking layout into consideration (Carmel-Gilfin, 2013). Moreover, shoplifters in her sample claimed to be deterred from attempting to steal items that were placed in high-visibility areas, such as at ends of aisles or near registers, or that were held in locked display cases (Carmel-Gilfin, 2011). Others stated that they would be tempted to defeat target hardening measures, such as tamper-proof packaging, but were deterred by the design of the store's layout.

In additional, Hayes *et al* (2012) conducted a 57-store randomized control trial of two loss reduction strategies: protective display fixtures and special employee handling procedures. Both were found to be effective in reducing the theft and loss of hot products, while not decreasing legitimate product sales. The researchers conclude that protective display fixtures can reduce shoplifting by increasing the effort and risk required to obtain and to conceal products, as well as reducing the rewards associated with their theft.

Focus of current study

Only a handful of studies have sought to evaluate the effectiveness of anti-shoplifting security measures, and even fewer have taken shoplifters' perspectives in account. Some security measures, such as mirrors and PVM, are considered to facilitate rather than to deter shoplifting. Others, such as CCTV and EAS, offer short-term benefits that decrease as shoplifters discover loopholes in these systems. Hence, it remains an open question, one

deserving of further scrutiny, as to whether shoplifters consider these measures effective deterrents and what countermoves they use to outmaneuver them.

No study has looked at all of these security measures with a single sample. This article builds on Ekblom's (1995, 2014) strategy of designing out crime through anticipating offenders' countermoves, which requires that preventers learn how to 'think thief'. To start 'thinking thief', preventers must learn from shoplifters why they consider each security measure an effective or ineffective deterrent to shoplifting and what techniques they employ to overcome them. Such information can be used by retailers and security designers to begin disengaging from the arms race. This strategy necessitates understanding and appreciating the decision-making processes described by shoplifters. As explained by Gill (2007), offenders are not only the targets of security measures, but also the ones who succeed in negating their effectiveness. Therefore, shoplifters' perspectives are invaluable to crime prevention practitioners.

Methods and Data

Thirty-nine active shoplifters were recruited through purposive and snowball sampling. The purposive sample consisted of college students and was recruited in two ways: first, a trained graduate student recruited college students from classes with large enrollments (for example, Introduction to Criminal Justice) at a large public university; and, second, from a subject pool bank in the Department of Psychology. Both forms of purposive recruitment produced about 40 per cent of the participants (80 per cent total). Next, we used snowball sampling to recruit the remaining 20 per cent of participants by asking initial recruits to inform their associates (for example, friends, family) about the study. Snowball sampling extended the study's sample beyond college students and provided for greater variation in expertise, motives, and techniques. Altogether, 71.8 per cent of participants ($n = 28$) were currently-enrolled students, either at the researchers' institution or elsewhere, while 28.2 per cent ($n = 11$) were not. Participants were paid $75 for taking part in this study and an additional $40 for successfully recruiting an associate.

Participants were mostly male (71.8 per cent), white (56.4 per cent), currently employed (51.9 per cent), and had obtained no higher than a high school diploma (92.3 per cent). The average age was about 24 years old (ranging from 18 to 56). During interviews, the procedure for which is described below, participants were asked about their prior shoplifting experiences. Participants had shoplifted 7.95 times on average over the previous 6 months, and had typically shoplifted from three different stores (24.3 per cent), most often stealing one item (43.6 per cent) or three (25.6 per cent). The most frequently stolen items were food (41.0 per cent), clothing (30.8 per cent), health and beauty products (25.6 per cent), electronics (25.6 per cent), and alcohol (5.1 per cent). The types of stores most commonly targeted were discount (66.7 per cent), grocery (48.7 per cent) and department (46.2 per cent). Drug stores (15.4 per cent) and gas stations (15.4 per cent) were less often targeted. Over the course of their lifetimes, 30.8 per cent of the sample had been apprehended by an employee while shoplifting and 20.5 per cent had been arrested for this crime. Participants' self-described typical shoplifting techniques are provided in Appendix A.

Data were collected by having participants shoplift items from cooperating stores while wearing an eye-tracking device and then interviewing them about their decision making as

they watched the eye-tracking device video. The eye-tracking device has two small cameras mounted to a pair of black glasses without lenses. The cameras are wired to a laptop computer connected to a backpack worn by the participant. The eye-tracking device records real-time data, with one camera projected inward to the wearer's line of sight and recording eye movement, while the other camera is projected outward to record the wearer's field of vision. Using proprietary software, the two recordings are combined into a single image that displays a reticle (that is, 'crosshair') on what the participant is looking at directly in their line of vision.

The study was conducted in a Midwestern city at four stores of two nationally known chain retailers during weekday business hours. The research team spent 2 8–10 hour days at each location. Security personnel and a few selected employees (for example, manager on duty) were aware of the study; the remaining employees were not informed. Management agreed not to arrest or to prosecute any participant for prior unsolved crimes or for stealing merchandise while they were participating in the research.

Each shoplifter arrived at a pre-determined store's main entrance and was greeted by a research team member. They were then escorted to a private interview room (for example, employee break room, storage room) that was off-limits to employees during interviewing. After obtaining consent, the participant was fitted with the eye-tracking device and was brought back to the outside of the store's main entrance. Participants were primed for the study by being told (i) to shoplift as usual; (ii) no employees – 'except the manager' – or shoppers know of their role in the research and thus someone may attempt to apprehend them for shoplifting if spotted offending, and (iii) should this occur, to cooperate with the individual, as the manager would immediately free them of any criminal wrongdoing. No participant was apprehended by store employees during the course of this study. The participant then entered the store to shoplift items as he or she normally would, although the items were later returned to the store. The interview portion of the research began after the participant exited the store and was escorted back to the private interview room.

The strength of the eye-tracking device is that by recording exactly what the wearer is seeing, it allowed us to 'see thief' in our endeavor to 'think thief' (Ekblom, 1995). Past research has generated valuable information about shoplifters' perspectives on security through methods such as interviewing about past offenses (for example, Gill *et al*, 1999; Cardone, 2006), recording hypothetical decision making (for example, Carroll and Weaver, 1986; Carmel-Gilfin, 2011, 2013), and covert observations of shoplifters using CCTV (Dabney *et al*, 2004). In the current study, participants narrated their thought processes while viewing their own video recordings, which could be paused to ask for clarification or follow-up questions. This method guarded against selection bias, participants' potentially limited recall ability, or the possibility for fabrication.

Interviews consisted of three parts. First, participants were asked closed-ended questions about their demographic characteristics (for example age, highest level of education attained, employment history), criminal involvements besides shoplifting (for example, drug use or commission of offenses like assault), and criminal records (for example, number of times arrested and imprisoned). Second, they were asked closed- and open-ended questions about previous shoplifting experiences (for example, targeted stores and items, typical shoplifting techniques). Finally, participants viewed their respective eye-tracking videos on a computer screen with the research team. During this portion of the interview, participants described their decision making as they moved through the store. For example, they narrated how and

why they selected a particular item, what security measures they noticed, and how a particular concealment technique was chosen and implemented. Videos could be rewound or paused as needed when the participant wanted to further explain a point or when the research team sought clarification on a statement. Interviews were audio recorded and the final portion was also visually recorded. When this part of the interview was completed, participants were escorted out of the store by a research team member.

All audio-recordings were transcribed verbatim. Transcripts were coded by the first author using NVivo Version 10, a form of qualitative analysis software. The coding process consisted of three stages. The first stage was open coding, during which data fragments were labeled according to the concept or action occurring therein (Lee, 1998). Examples include 'notice CCTV' and 'fake cameras'. In the second stage, focused coding, the broad codes generated by open coding were integrated into narrow conceptual categories (Charmaz, 2006). For instance, all data coded as relating to CCTV were streamlined into the broader 'CCTV' category. The final stage was theoretical coding, during which relationships between focused categories were developed so as to give way to emergent themes (Charmaz, 2006).

Shoplifters' Perceptions of Security Measures

The findings are organized according to the same order as the subsections in the above review of past research, although shoplifters' evaluations of the effectiveness of each security measure are not necessarily in accordance with past researchers' conclusions. To assist in 'thinking thief' for shoplifting, we aim to answer the following questions for each security measure: Do shoplifters consider this technique an effective deterrent? Why or why not? And what countermoves do they use to overcome it? Understanding shoplifters' perceptions of effectiveness and how they outmaneuver security measures will offer a starting point for retailers to begin disengaging from the arms race by anticipating shoplifters' potential countermoves in advance. Commonly mentioned techniques for outmaneuvering each specific security measure are provided in Appendix B.

Mirrors

Not one shoplifter in our sample considered mirrors an effective deterrent. The majority of shoplifters paid mirrors no mind, suggesting that mirrors are largely considered a negligible aspect of the retail landscape. As Participant 1 explained, mirrors 'are not something I was really concentrating on. I was concentrating on the people most'. However, some shoplifters used mirrors as a method of counter-surveillance. Mirrors were used in this way to view employees and to assess whether or not a particular aisle was free from employee surveillance. According to Participant 11, 'I was looking at it (the mirror) to see if the security guard could see it. Like, see me, or the worker'. Similarly, Participant 14 stated, 'I knew that if there was somebody over here or over here, they could see me in those aisles'. Not only are mirrors considered an ineffective deterrent, but shoplifters can make use of them to monitor employees and can use them as orienting devices for determining ideal places to conceal items.

Closed-circuit television

The prevalence of CCTV might suggest that it is an effective shoplifting deterrent, but this claim is not supported by the shoplifters in our sample. Some shoplifters stated that awareness of CCTV heightened their sense of risk, as Participant 20 explained: 'I started thinking maybe somebody might be coming, like see me … the whole time I'm thinking somebody probably seen me'. However, increased nervousness does not necessarily serve to deter offenders. According to Participant 34, 'It makes you edgy [but] I don't think it would deter you'.

Shoplifters provided several reasons for CCTV's inability to deter them. One common line of reasoning is that most stores are too large for CCTV footage to be monitored effectively. As Participant 1 explained, 'I don't usually expect a security guard to be looking at the camera that I'm facing at the same time because that's usually a coincidence'. Similarly, Participant 5 stated, 'I don't really expect people to be sitting in the back of stores like watching video cameras and stuff like that'. According to Participant 16, 'I feel like stores like this don't really have security running all the time, like somebody sitting there analyzing every camera'.

Aspects of the store, such as having few employees on duty, can indicate to shoplifters the unlikelihood of CCTV footage being actively monitored. As Participant 30 explained, 'They don't usually have staff monitoring it, from my understanding. It takes a lot of store security, it takes a lot of money, and sometimes if there's not a lot of staff outside the store then there's probably not a lot of staff behind the scenes either'. This same shoplifter indicated that his previous experience of being detained for shoplifting confirmed his suspicion that cameras are not being actively monitored: 'I've been in the security room before and they've got all the electronics and stuff, but there's usually no one there watching them'.

Other shoplifters explained that the deterrence potential of CCTV is limited because of knowledge that retailers often make use of fake security cameras. Participant 3 described indicators of fake cameras: 'I pretty much came to the conclusion all the cameras in here are fake … If they're real, they have them all throughout the store and that means they have loss prevention. And if they're all at the front, and they just put those little domes in, you know, those shiny domes, they're fake'. In addition, he stated that stores in low income areas are unlikely to be able to afford real cameras, making them ideal targets for shoplifting: 'Older store, lower income area … I just feel like they don't have the money for cameras'.

Despite beliefs that many cameras in stores are unmonitored or fake, shoplifters still take care to avoid them when concealing merchandise in case their belief is mistaken. As explained by Participant 23, 'Of course, you don't want to conceal it in front of a camera, whether it's a fake camera or not … You don't know'. In this sense, it could be argued that CCTV functions as an orienting device for shoplifters by directing them toward ideal locations for concealing products. Participant 17 stated, 'You can't put [the item] in your pocket as soon as you grab it, so you want to go to an area where there's not cameras … So, the cameras affect my route through the store'. Many shoplifters explained that they evaluate the positioning of cameras in order to find blind spots where they can be assured of not being seen. As Participant 11 stated, 'I look for the cameras [to] find out where the blind spots are.' Similarly, Participant 36 explained, 'I didn't want it [concealment of merchandise] to be on film, so I tried to get [to] a blind spot'.

In the event that CCTV is being actively monitored, shoplifters employed certain 'passing' techniques (see Goffman, 1963). Sleight of hand techniques may be used by shoplifters to make sure they are seen on camera holding and putting back merchandise, meanwhile concealing *other* items when out of view of cameras. Participant 23 described this process: 'You find a blind spot. You obviously want to have something in your hand when you're in the camera's view, then when you get [to] the blind spot, then you grab something that's similar to it, do the concealment, come out, then you're on camera again'. Participant 26 also made use of this technique and explained his method: 'I stayed close enough so they could see that I didn't have anything in my hand, grabbed one off the shelf real quick, backed up so the camera could see I had something in my hand, slipped it back on the shelf and walked away'. Similarly, a number of shoplifters believed that, by avoiding directly looking at cameras, they could prevent drawing the attention of loss prevention personnel. For example, Participant 22 stated, 'I just don't pay attention to the cameras just because I feel like if somebody is watching you then they're gonna see you looking at cameras and you look suspicious'. Hence, some shoplifters take care to evade detection by deliberately being captured on camera while engaged in unsuspicious behavior.

Our data suggest that, in general, CCTV is not an effective deterrent to shoplifting. Shoplifters expect its presence in the retail environment but have adapted their methods to account for the threat it poses. Although shoplifters have little faith that CCTV is being actively monitored by security staff or that all cameras in a store are real, they incorporate awareness of its presence into their concealment methods. These techniques include using the cameras to orient themselves to the location of blind spots and deliberately appealing to the camera in an unthreatening manner.

Public viewing monitors

PVM is considered to deter shoplifters by raising their awareness that customer behavior is being monitored. The majority of shoplifters in our sample who encountered PVM paid little attention to it, suggesting that, like mirrors, PVM is a negligible aspect of the retail environment. As explained by Participant 2, 'No, I didn't really pay too much attention to what's on the TV, honestly'. In fact, some shoplifters were aware that PVM functions to alert customers that they are being watched, and considered it an ineffective deterrent for this very reason. According to Participant 6, 'The only thing about the TVs is, I've always thought it's to scare me, the shoplifter, into thinking, "Oh, they have me on camera." But a store of this size, there's not someone monitoring the camera 24–7'

While most shoplifters did not pay attention to PVM, some mentioned that they are effective devices for facilitating shoplifting. According to several shoplifters, PVM displays the angles at which CCTV is recording, allowing them to orient themselves to an ideal location for the concealment of goods. Participant 8 stated, 'That's where that camera is pointing, so you know it's not watching behind it or anything'. According to Participant 11, 'That's where the cameras are and I can see what they're seeing.' Participant 14 illustrated the effectiveness of PVM as a countermeasure, explaining 'I'm looking at the TV screen right there … I got up closer to see where that camera was looking'. Altogether, our data suggest that PVM is an ineffective deterrent against shoplifting and that shoplifters can make use of PVM to facilitate the concealment of goods.

Electronic article surveillance

EAS exhibits a certain degree of effectiveness, as indicated by the fact that the majority of shoplifters stated they avoid products that are likely to be electronically tagged. According to Participant 1, upon encountering a product with a security tag, 'I usually put it back down.' Participant 35 said, 'I just wouldn't take anything with a tag on it … I stay away from anything like that'. Although one shoplifter stated that he would decide not to shoplift if a store appeared to have an EAS system, the overall deterrence potential of EAS is limited by the various countermeasures other shoplifters adopt to evade it.

The most common method of evasion was searching for items that were considered unlikely to be electronically tagged, such as lower priced products. As explained by Participant 17, 'usually the security monitor things are high priority, high price tags'. A similar method involved searching among tagged items for items that did not have tags. Participant 18 stated, 'It wouldn't deter me completely. It would just mean that I'd have to look for a pair of batteries that doesn't have the tag on it'. Some shoplifters claimed to have methods for removing tags, such as Participant 31, who proclaimed 'You can either break those or burn those so [they no longer work]'.

Another common method for overcoming EAS was to remove items from their packaging, with the assumption that packages are often tagged while the items inside are not. Dressing rooms are particularly useful for this, as Participant 1 explained: 'If I'm getting a Wii controller off the shelf, I'll take that back with me [to the dressing rooms] and take the controller out of the box'. Participant 34 described the rationale for removing packaging before concealing products: 'The little copper thing [was] stuck on the side of the box, so it would have been best for me to take it out of that package, because it [the security tag] wasn't on the item, it was on the packaging'.

The security tag detectors placed at store exits are another potential shoplifting deterrent. Although most shoplifters took care either to remove electronic tags from products while in the store or to target untagged items, the tag detectors represent an additional obstacle in shoplifters' minds. However, many shoplifters are aware of the extent to which such systems give off false alarms, and make use of this knowledge to sidestep the devices. As explained by Participant 9, 'With my experience in retail, that thing beeps all day, so they don't necessarily check anybody ever; so if it beeps, you just keep walking'. In addition, some shoplifters are cognizant of the fact that EAS systems do not always perform as expected. Participant 14 stated, 'Usually, they [security tag detectors] don't work so well … In my past experience, I only ever once had an issue with an alarm going off'.

Additional methods for overcoming security tag detectors include sneaking around the structures or raising bags containing concealed merchandise over them. Participant 36 stated, 'My [intention] was to sneak around the scanners'. Shoplifters who make use of such methods explained that they do so because employees do not monitor exits unless alerted by the EAS system. According to Participant 39, 'I don't think people are looking at you as you're walking out the door until the little sensor goes off'.

Overall, our findings on EAS systems indicate that although shoplifters are concerned about their presence, most are undeterred by this security measure from shoplifting altogether. While many shoplifters may avoid targeted tagged products, they nonetheless tend to displace their efforts to untagged items. Other shoplifters have developed various

countermeasures to overcome the threat of EAS systems, such as removing security tags and sidestepping tag detectors. Counter-techniques aimed at overcoming EAS appear dependent on the complacency of employees, since shoplifters believe that employees rely on the EAS systems to alert them to shoplifting rather than proactively seeking to prevent it.

Item packaging

Packaging on items can be designed to deter shoplifters either by increasing the bulk of packaging around small products or by encasing products in special devices that need to be removed at point of sale. Our data suggest that such techniques typically deter shoplifters from targeting particular items, though some shoplifters will invest effort in removing special packaging from products if the item is sufficiently valuable.

Shoplifters described various techniques used to overcome special packaging on products. The most common technique is to remove items from their bulky packaging for easier concealment. Participant 37 stated that she typically steals cosmetics, which 'do come in a cardboard thing on the back. I always just break it open and lay the wrapper right in my cart'. Another version of overcoming packaging involves taking a number of individual items from a bulk package containing products such as diapers, feminine products, or certain food items. For example, Participant 30 described that she 'put[s] as many diapers as I can carry in my big purse. And then I just throw [the bag]. I throw it in the baby aisle'.

Another common method is to target items without special packaging, such as less valuable items or those that employees have neglected to encase. As explained by Participant 30, 'Each perfume has its own plastic encasement so this is why it [the perfume stolen] became so easy to take, because it wasn't in one, but this was a higher priced perfume so I was wondering why it wasn't'. Similarly, two participants explained that they target certain stores known to have unsecured video games displayed alongside specially packaged ones. Such statements reveal that shoplifters are likely to discover unsecured products amongst protected ones.

Although less common, another technique is to defeat anti-theft packaging by using specific tools. Some shoplifters bring tools with them to stores that facilitate the removal of security packaging. Participant 38 stated, 'All the Playstation games, the cameras, all the major electronic stuff … if I would have had like a knife or something to cut it out, I could have [stolen those items], like a razor blade'. Shoplifters can even find the requisite tools in the stores themselves. Participant 23 explained that he examines products' security devices to determine which tools are required for overcoming them, which he will then locate elsewhere in the store: 'You find out what you're stealing and you can utilize whatever's in here and defeat whatever you need to defeat … If you need to defeat a package or something, then you get the tools for that'. When asked whether there is a form of packaging that would deter him from stealing an item, this participant stated, 'Nothing makes it harder to steal'.

Our data indicate that, for the most part, special packaging on products is an effective deterrent to shoplifting. Shoplifters often avoid stealing specially packaged items and instead displace their efforts to products without bulky or secure packaging. However, other shoplifters are not deterred at all by such packaging and instead either remove items from packaging or use special tools to overcome this security measure.

Item placement

The placement of items within a store is an important consideration for shoplifters when determining which products to steal. Shoplifters may avoid stealing from particular styles of item displays, such as from displays that are close to the register or from locked cases. Participant 1 stated, 'Anything close to the register or nothing's blocking the register or people in front, I won't [steal]. It kind of sketches me out'. Participant 3 avoided stealing a cell phone because it was placed 'right up by the registers … And I'm pretty sure those are strategically placed so they're hard to steal'. Several shoplifters said that they avoid products locked in cases because they see them as too risky to attempt shoplifting. Participant 18 stated, 'It's just too hard … it's too much of a risk for me'.

However, not all shoplifters agreed that stealing products from locked display cases was too much of a risk, and described two specific techniques used to accomplish this task. The first is asking an employee to hand over the merchandise. Participant 23 said that he often asks sales associates for locked items because of the chance that they will allow him to take the item elsewhere in the store where it can be concealed. He explained this technique in his description of attempting to steal a TV projector during the study: 'It was secure and I was gonna unsecure it and she said "Well, I'll hold it for you" … She wanted to hold on to it. They had it secure [but] sometimes you can trick them into falling asleep and just take it'. The participant was prevented from stealing the item by an attentive employee who did not permit him to leave with the item. This technique also was employed by Participant 39, who offered similar descriptions of the method and of how he was thwarted: 'She was about to ring me up back there and that's when I asked her, like, "I haven't finished shopping yet, can I pay for it in the front?" That way I can still walk around with it. And she was like, "No, we have to let other people know that you're walking around the store with it," so I was just like, "No, that's fine"'. The second technique for stealing locked merchandise is similar to the first, but involves using a friend to distract attentive employees. Participant 28 explained that he would have stolen an item from a locked display case 'If I had another person with me that asked a lot of questions … yeah, distraction. I mean, so you don't get caught. It's better that way'.

The majority of shoplifters in our sample avoided targeting items that were locked up or near the register, indicating that the placement of items acts as an effective deterrent. Regardless, not all shoplifters avoid these items and will make an effort to steal them. In such instances, they can be hindered from doing so by attentive employees who request that items be purchased directly at displays.

Discussion and Conclusion

Shoplifters and crime preventers are engaged in what Ekblom (1997, 1999) refers to as an arms race that threatens to continue indefinitely. How can crime preventers disrupt this struggle and begin working to tip the scale in the favor of prevention for the long term? One way is to 'think thief' (Ekblom, 1997, 1999, 2014) by learning about shoplifters' perceptions of security measures and their techniques for overcoming them. Knowledge gleaned from 'thinking thief' can be used to adapt existing security measures in anticipation of shoplifters' likely countermoves. Below, we integrate the knowledge generated from prior research on security measures and the lessons learned from our sample of active shoplifters to advance

the process of evidence-based loss prevention through 'thinking thief'. The following discussion conceptualizes how current security measures can be adapted to increase deterrence by exploiting shoplifters' fear of apprehension in the retail landscape (Ekblom, 1986, 1999, 2012).

Mirrors

According to conclusions drawn from past research, the deterrence potential of mirrors is mixed. Some scholars maintain that mirrors could be an effective deterrent but that their ability to do so is hindered by their poor placement in stores (Clarke, 2002). Others, however, claim that mirrors are not only incapable of deterring shoplifters, but that they facilitate shoplifting (Ekblom, 1986; Hayes and Cardone, 2006). As for our data, no shoplifter claimed that mirrors were a deterrent. Most paid them no mind, while others described ways to use mirrors for counter-surveillance. This implies that the current use of mirrors in stores is counterproductive in terms of deterrence and detection. However, shoplifters' neglect of mirrors, combined with the prospects of effective redesign, suggest that this security technique could be adapted in a way that outmaneuvers shoplifters and catches them by surprise. Farrell and Ferrara (1985) suggest that flat or two-way mirrors could replace the common convex design and allow employees to discreetly observe shoppers' behaviors.

Closed-circuit television

Prior research shows that CCTV offers short-term benefits after implementation, which then decay over time. The primary downfall of this 'high-tech fix' is that those who implement it then believe it will function on its own to deter offenders (Beck and Willis, 1994). Ineffective monitoring of CCTV leads to its obsolescence as a preventive measure (Spriggs and Gill, 2006). This is exacerbated by the poor placement of cameras in retail settings, which the observant offender can use for locating blind spots where the concealment of goods is unlikely to be observed (Cardone, 2006). Our data offer several explanations for why CCTV is currently an ineffective shoplifting deterrent. Shoplifters are aware that footage is scantly monitored, are aware that some cameras are fake, and have developed rules of thumb for discerning the indicators of such in various retail settings. Moreover, camera placement can direct shoplifters to areas with poor surveillance – blind spots – showing them the best places for concealing merchandise. In additional, some shoplifters play to the cameras, ensuring that if footage is watched, they are only seen engaging in normal shopping behavior. The capability of CCTV to deter shoplifting in the future is possible. CCTV's ubiquity means it is constantly present in the minds of shoplifters. Correct placement of cameras in stores can eliminate blind spots, and thereby eliminate the predominate countermove of offenders. Proper monitoring of CCTV footage is necessary for its effectiveness. It may appear impractical for most stores to implement uninterrupted and unfatigued surveillance, yet research on CCTV beyond the retail setting offers insights for improving its effectiveness, especially in light of known shoplifting countermoves (see for example, Welsh and Farrington, 2003, 2004; Gill *et al*, 2005; Spriggs and Gill, 2006).

Public viewing monitors

Prior research by Hayes and Downs (2011) indicates that PVM is an effective shoplifting deterrent when properly placed in a store, although Cardone (2006) concludes that PVM can be used to a shoplifter's advantage. Our data suggest that PVM typically has no deterrent impact on shoplifters' behavior, although some may use it to outmaneuver anti-theft security. For example, displayed footage can be used in determining camera placement, which can assist with finding blind spots for the concealment of goods. Some researchers, such as Farrell and Ferrara (1985), speculate about implementation techniques that can increase theft deterrence without decreasing sales, yet most scholars choose not to take this security measure into consideration when conducting evaluations. It is possible for loss prevention specialists to innovate PVM in a way that renders it more effective. Perhaps future considerations of shoplifters' perspectives on security measures could assist in adapting PVM so that it exploits shoplifters' sense of risk and decreases their ability to take advantage of its presence. As it stands, this security device is unlikely to be adapted effectively if it continues to be ignored by offenders and preventers alike.

Electronic article surveillance

The majority of researchers consider EAS an effective deterrent (DiLonardo, 1996; Clarke, 2002). However, some scholars have expressed concern that shoplifters are adapting their techniques to overcome this measure, particularly by taking advantage of employee complacency (Bamfield, 1994; Handford, 1994; Hayes and Blackwood, 2006). Our data reveal that EAS is effective in the sense that many shoplifters will avoid tagged products altogether, but ineffective in that they displace their offending to untagged products. In addition, a number of shoplifters have developed various means to remove tags from products or else to outsmart tag detectors. EAS' ineffectiveness to deter thieves is primarily because of its lack of evolvement, as well as to retailers' failure to properly monitor tag detectors at store exits. As Hayes and Blackwood (2006) explain, it would not be cost-effective for stores to electronically tag all items, so instead they should continually update their tagging policies according to which items are currently targeted by shoplifters. In addition, retailers can make use of other loss prevention efforts to reduce the theft of untagged items, such as by strategically placing these products within the store or by preventing customers from entering dressing rooms with such items.

Product packaging

Anti-theft measures involving packaging are highly effective at deterring shoplifters. Bulky tamper-proof packaging greatly increases offenders' efforts and risk of detection. By equipping the most frequently stolen products with anti-theft packaging, the overall rate of shoplifting is reduced (Hayes *et al*, 2011). The effectiveness of this security measure is confirmed by our data. The majority of shoplifters avoid items with bulky or specialized packaging, although this means that their thievery is displaced to other products. A minority of shoplifters have developed methods for overcoming this security measure, such as removing bulky packaging or using tools that they either bring with them or find in the store. In light of this, it appears that not only should packaging continue to be adapted, but that

retailers should keep displacement in mind. If packaging reduces the theft of the most commonly stolen products, other products become the most commonly stolen. By reassessing CRAVED items and anticipating which items are the next mostly likely to be CRAVED, retailers can stay one step ahead of shoplifters.

Item placement

Past research shows that the placement of items in highly visible locations or in locked display cases can be an especially effective shoplifting deterrent since the layout of items in a store can have a strong impact on shoplifters' decisions to steal (Carmel-Gilfin, 2011, 2013). Our data confirm this, as most of the shoplifters in our sample avoided targeting products placed in areas with high visibility or in locked displays. A few shoplifters claimed to have methods for stealing locked items, such as by distracting employees or by convincing them to hand over the products. However, their attempts to do so during the study were unsuccessful and this suggests that this security measure is currently effective.

Implications for 'thinking thief' in the arms race against shoplifting

Overall, our data largely confirm the findings of past research on the most and least effective security measures, while highlighting aspects of the retail environment that are in need of adaptation. Our data also suggest ways in which shoplifters' countermoves can be anticipated. However, like with all offender-based research, this study had several limitations. First, some participants claimed to have techniques to defeat certain target hardening measures, but since we requested them not to tamper with products (since all items were to be returned to the store), we were unable to witness these countermoves. Second, our endeavor to consider the perspectives of all shoplifters in our sample prevented distinguishing subtle, but perhaps important, differences in perceptions of security measures that can relate to gender, race, or degree of expertise. Third, because the eye-tracking device recorded participants' direct lines of sight, we were unable to assess their outward appearances or physical behaviors while they were engaged in shoplifting. This precluded us from being able to draw conclusions about how shoplifters appear to observers or about tell-tale actions that can alert store personnel to shoplifting, such as those made by Dabney *et al* (2004). Fourth, although appropriate for a qualitative study, our sample was small and largely composed of college students. As a result, this limited our ability to make strong conclusions or recommendations or to generalize our results to the larger population of shoplifters. Finally, this study was not a formal evaluation of any of the considered security measures, but rather an assessment of shoplifters' described perceptions of them and their most likely countermoves. Accordingly, we are unable to assess whether such security measures reduced shoplifting in the retail stores that participated in this research.

Despite these limitations, our findings have important implications for 'thinking thief' and learning how to anticipate offenders' countermoves in the arms race against shoplifting. Certain security measures are effective deterrents. When these measures are combined, well-implemented, and well-monitored by employees, their success for reducing the rate of shoplifting is enhanced. For example, a combination of EAS, item packaging, and item placement is likely to deter thieves, especially if staff members are vigilant. Other security

measures show promise for eventually serving as deterrents if they are adapted. For instance, mirrors and PVMs can be designed to more effectively deter shoplifting (Farrell and Farrara, 1985). By redesigning security measures that shoplifters consider negligible in such a way that captures their attention, preventers can begin exploiting offenders' fear in the crime setting (see Ekblom, 1999). The deterrent effectiveness of CCTV could be amplified through increased monitoring and proper placement. This security measure also has promise for post-offense detection, especially if retailers increase their collaboration with other entities, such as law enforcement or nearby stores (see Spriggs and Gill, 2006 for an overview).

Several promising considerations for future research are evident from this study. Past research reveals that the ineffectiveness of certain security measures has less do to do with design flaws and more to do with poor implementation by retailers and neglect by employees. This contention is generally confirmed by our findings, as the success of many techniques adopted by the shoplifters in our sample depended on employee complacency. Thus, future research could examine shoplifters' perceptions of employees and how store personnel serve to deter or to facilitate shoplifting. Future research should also consider whether and how shoplifters' countermoves are related to their levels of expertise, which could provide retailers with a greater understanding of how best to adapt specific security measures. In addition, efforts to 'think thief' could be enhanced through a similar study in which retailers permitted shoplifters to overcome target hardening measures by tampering with packaging. This would permit a more thorough examination of shoplifters' specific techniques. Finally, future research could seek to enhance our understanding of the shift in CRAVED products by examining which products are targeted when shoplifters' efforts are displaced.

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Correction

This article has been corrected online to include the corresponding author information which was erroneously removed. This has not affected the research in any way and no other element of the article is under question.

Appendix A

Table A1: Self-described shoplifting techniques

Type of technique	*Per cent*	*Frequency*
Concealment	97.4	38
Tag/merchandise tampering	71.8	28
Consume item on site	43.6	17
Self-scan omission	28.2	11
Distract employee	25.6	10
Aided by an employee	17.9	7
Snatch and run	10.2	4

Note: Percentages sum to greater than 100 per cent because participants could give multiple responses.

Appendix B

Table B1: Shoplifting countermoves

Type of technique	*Per cent*	*Frequency*
Mirrors		
Did not notice mirrors	61.5	24
Noticed but ignored	25.6	10
Used to find blind spot	7.7	3
Used to assess employees	5.1	2
Closed-circuit television		
Used to find blind spot	59.0	23
Assumed unmonitored or fake	35.9	14
Avoid direct eye contact	23.1	9
Used sleight of hand	12.8	5
Public viewing monitors[a]		
Did not notice PVM	31.6	6
Noticed but ignored	42.1	8
Used to find blind spot	26.3	5
Electronic article surveillance		
Target untagged items	61.5	24
Remove tag/sticker	25.6	10
Ignore (does not work, false alarms)	12.8	5
Sidestep detectors	7.7	3
Decide not to shoplift	2.6	1
Item Packaging		
Remove bulky packaging	64.1	25
Target small or unpackaged items	41.0	16
Remove special packaging (spider wrapping, Keeper boxes)	7.7	3
Item placement		
Target unlocked/out of sight items	92.3	36
Ask employees to unlock items	7.7	3

[a]Only 19 of the 39 participants completed the study in a store equipped with public viewing monitors.

Note: Percentages can sum to greater than 100 per cent because participants could describe multiple techniques.