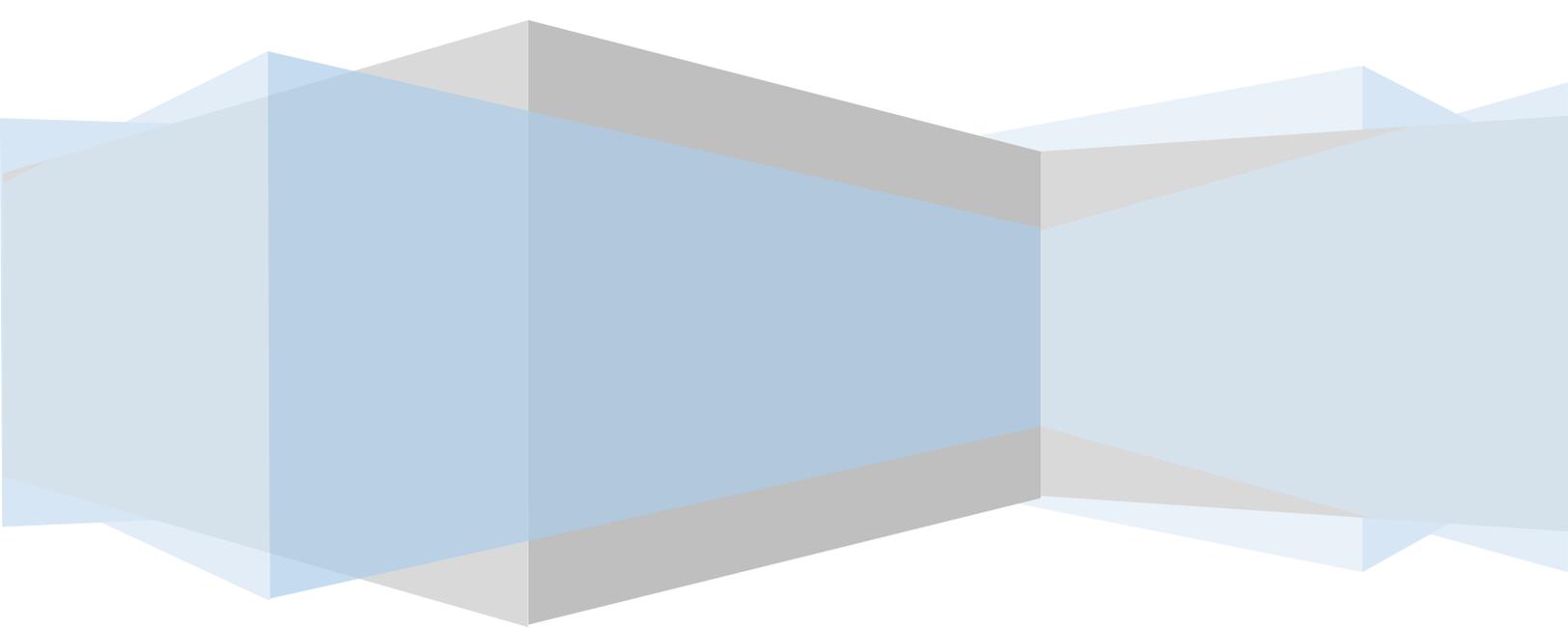




InVue OneKEY Ecosystem: Effectiveness and Customer, Employee, and Offender Perceptions – Phase 1

Stuart Strome, Ph.D., Mike Giblin, Read Hayes, Ph.D.



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Executive Summary

➤ The goal of this project was to better understand the effects of the InVue OneKEY Ecosystem on sales, shrink, and theft in small big-box retail stores.

➤ *Sales and Shrink*

- The InVue OneKEY Ecosystem store saw a significant decline in known thefts (33%) as compared to the average of control stores (13%).
- Sales of electronics increased 22% in the InVue OneKEY Ecosystem from the pretest period (July 2016-February 2017) to the posttest period (July 2017-February 2018). However, there was little difference in sales increases between the InVue store and the control stores, as the average control store saw sales of electronics increase of 23% from pretest to posttest.

➤ *Offender Surveys*

- Offenders' responses suggest that they would generally be deterred from committing theft by the InVue OneKEY Ecosystem. However, certain fixtures (e.g. tethers and sliding glass fixtures) were more of a deterrent than others (e.g. safer boxes and peg hooks).
- Offenders most commonly identified attempts to defeat the packaging for Smart Peg Hooks, and attempts to either crack the plastic of Smart Safer Boxes, or simply carry the Safer Box out of the store, as possible ways to defeat the InVue OneKEY Ecosystem.

➤ *Associate Surveys*

- Three out of four associates (75%) responded that the InVue OneKEY Ecosystem positively affects their ability to provide customer service.
- Associates strongly agreed that the InVue OneKEY Ecosystem increases associate accountability, and further agreed that the InVue OneKEY Ecosystem

makes their store a safer place to work.

- More than nine in ten (92%) associates approved of the InVue OneKEY Ecosystem's assignment of a single key assigned to a single associate, and 67% *strongly* approved of this aspect of the system.
- Associates identified key sharing as a possible method dishonest associates may use to attempt to defeat the system.

➤ *Customer Surveys*

- Most (87%) customers had a positive overall impression of the InVue OneKEY Ecosystem, while 50% had a *very* positive overall view of the system.
- Most (90%) customers did not know that they could ask any associate to open any fixture in the InVue OneKEY Ecosystem-equipped test store.
- Customers generally preferred to shop at an InVue OneKEY Ecosystem store compared to a store with traditional lock and key fixtures.

➤ *Adoption in Larger Store*

- Offenders and associates generally agreed that the InVue OneKEY Ecosystem would be effective in a full-sized retail environment.
 - Offenders noted that the InVue OneKEY Ecosystem could increase the effectiveness of a larger security presence in larger stores.
 - Associates noted that accounting of additional keys would be more difficult in larger stores.
- Initial results are promising, however LPRC Researchers recommend additional research, encompassing a larger and more representative sample of stores, including larger stores.

Introduction

Retail theft remains a persistent problem, costing companies a total of \$ 48.9 billion in lost assets in 2017 (National Retail Security Survey 2017, p. 1). Both internal theft, conducted by dishonest employees, and external theft, conducted by individuals outside the organization, represent a continued challenge for loss prevention teams. In 2017, external theft (shoplifting and organized retail crime) accounted for roughly 36.7% of shrink, while internal theft accounted for 30% of shrink. As a result, retailers have persistently sought technologies to minimize the threat of both internal and external theft in their retail environments.

Technologies that protect products and increase employee accountability may be effective in limiting both internal and external theft. However, because different retail environments offer unique incentives to would-be offenders, it is necessary to subject new systems to rigorous tests to fully understand their effectiveness. Moreover, while new anti-theft systems may be effective at reducing theft, if they also interfere with the shopping experience, reduce sales, minimize employee productivity, or create a culture of fear among employees, their costs to the business may offset benefits.

Conversely, retailers have expressed increased interest in anti-theft technologies that can both limit theft, and drive sales. Anti-theft systems that increase employee productivity, increase employee security, or improve the shopping experience may provide benefit to the enterprise beyond their loss prevention function.

In 2018, LPRC researchers undertook a study to better understand the effect of implementing the InVue OneKEY Ecosystem in two small big-box retail stores. Generally, the goals of the research were to: 1) understand the effects of implementing the InVue OneKEY Ecosystem on overall sales, shrink, and theft; 2) understand the offender perceptions of the InVue OneKEY Ecosystem, and its ability to deter theft; 3) understand employee perceptions of the InVue OneKEY Ecosystem; and 4) understand customer perceptions of the InVue OneKEY Ecosystem and its effects on overall shopping experience in comparison with other anti-theft systems.

InVue OneKEY Ecosystem

How It Works

The InVue OneKEY Ecosystem is a system of anti-theft technologies designed to both limit external theft through integration with traditional fixtures and product protection technologies, and increase employee accountability through:

- 1) Increased ability to secure keys through employees having to activate, or “sign out”, a key at the beginning of their shift by inputting a PIN.
- 2) Increased ability to control unauthorized access by disabling lost keys, or by automatically disabling a key after it has been signed out for 12 hours or more.
- 3) Increased accounting and data collection on employees accessing fixtures and employee removal of product protection technologies.

Additionally, the InVue OneKEY Ecosystem may improve associates’ ability to provide customer service by allowing multiple associates to possess keys to open different fixtures:

- 1) Decreasing the necessity of finding a manager or someone from a certain department to access a protected product.
- 2) Decreasing customer wait time by providing more associates on the floor with access to protected products.

Modes and Mechanisms of Action – Effort, Risk, Reward

Anti-theft technology deters would-be offenders along three dimensions: it can increase the effort to commit a crime, increase the risk of committing a crime, or decrease the benefit of the crime. Technologies that accomplish all three of these tasks – increasing effort, increasing risk, decreasing reward – are the most effective deterrents. The InVue OneKEY system operates along all three dimensions:

- For external theft, the OneKEY Ecosystem works to increase the effort necessary for theft. The OneKEY Ecosystem integrates with protective fixtures and technologies such as locked cases, product protection wraps, and peg hooks, to make it more difficult to access a product without authorization. This requires the offender to either break the fixture or damage the product.
- For external theft, the OneKEY Ecosystem increases the risk of committing theft in two ways. First, the time necessary to defeat product protection measures (i.e. product protection wraps, peg hooks) or protective fixtures (e.g. cabinets or locked display cases) increases the possibility of being noticed by other customers or associates. Second, breaking or attempting to defeat these measures increases the possibility that an offender will be noticed, either by a customer or associate.
- For internal theft, the OneKEY Ecosystem increases the risk of theft in two ways. First, the accounting system allows LP managers to produce exception reports for associates who open cases frequently, or at unauthorized times. Second, it increases accountability by assigning an individual key to an individual associate, providing a record in case of any unauthorized access to a product.
- For internal theft, the OneKEY Ecosystem decreases or denies the benefit of stealing keys. Traditional keys can be stolen and used by dishonest employees or external offenders to commit theft. They may be used after hours or given to collaborators to commit theft. The InVue OneKEY Ecosystem allows keys to be deactivated, therefore denying benefit to associates who steal keys to commit theft.

Employee Productivity and Sales

Recent pressure on LP/AP departmental budgets, along with increased pressure from both competing brick-and-mortar and online retailers, have resulted in a drive towards LP/AP technology that can be used to increase sales and productivity while simultaneously reducing shrink. The InVue OneKEY Ecosystem is designed to increase sales by providing better customer service through:

- Increasing the number of associates with access to protected products, thereby decreasing customer wait time to inspect or purchase products.
- Providing the ability for associates from different departments to access protected products, similarly decreasing customer wait time to inspect or purchase products.

Research Goals

- Identify the effect of the InVue OneKEY Ecosystem on shrink and theft in small big-box retail stores.
- Identify the effect of the InVue OneKEY Ecosystem on sales in small big box retail stores.
- Identify the deterrence effect of the InVue OneKEY Ecosystem on offenders.
- Identify ways that offenders may attempt to defeat the InVue OneKEY Ecosystem.
- Better understand associate perceptions of the InVue OneKEY Ecosystem.
- Understand how the InVue OneKEY Ecosystems affects associates' ability to provide customer service.
- Better understand the effects of the InVue OneKEY Ecosystem on customer shopping experience.
- Understand how adaptable the InVue OneKEY Ecosystem is to a larger big-box store.

Methodology

LPRC researchers adopted a multi-method approach to better understand the effects of the InVue OneKEY Ecosystem in small big-box stores. First, LPRC researchers implemented a small-n quasi experimental design utilizing pre and post-intervention retailer data on shrink for the verticals protected by the OneKEY Ecosystem, as well as sales data for the entire electronics section of the stores under study. Our analysis included two test stores, and three control stores.¹ LPRC researchers identified stores that were similar to the test stores in as many ways as possible to adjust for confounding factors. Data on shrink and sales were gathered for both pretest and test periods. Additionally, offender interviews (n=8), associate interviews (n=12), and customer intercept interviews (n=30) were conducted on-site in one store equipped with the InVue OneKEY Ecosystem. Additional information on sampling and population demographics can be found in Appendix A.

¹ Locations were not listed upon request of the retailer.

Results

Overall Sales and Shrink

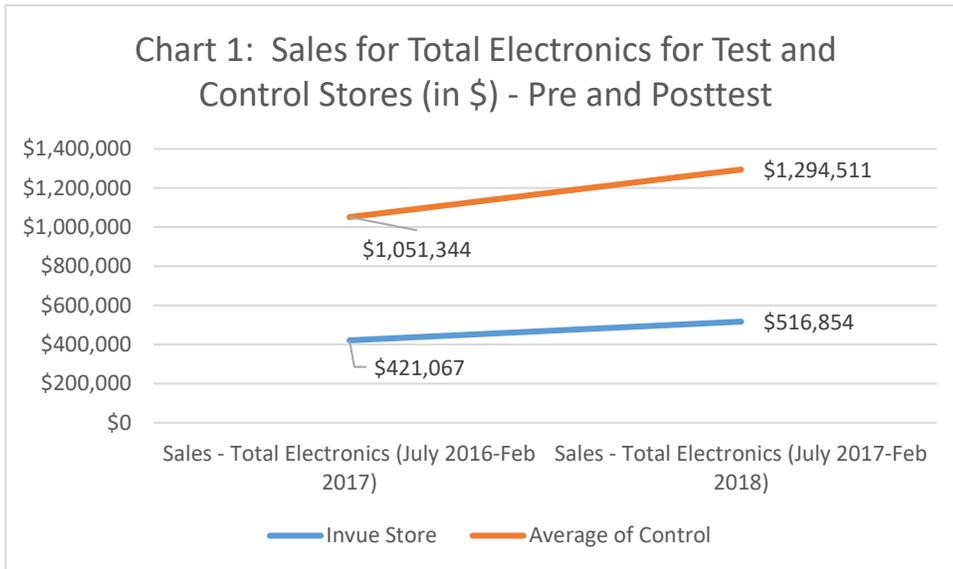
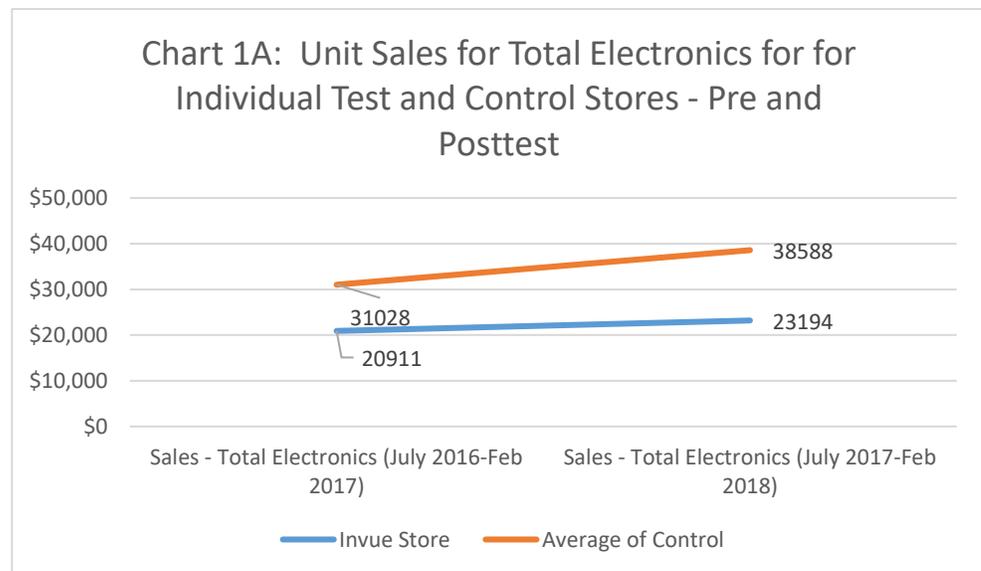


Chart 1 shows data for the test (InVue) store as well as average total electronics sales for the control stores for pre and post installation of the InVue OneKEY Ecosystem. Total electronics sales increased in control stores from an average of \$1.05 million in for the pretest period (July 2016-February 2017), to an average of \$1.29 million in the posttest (July 2017

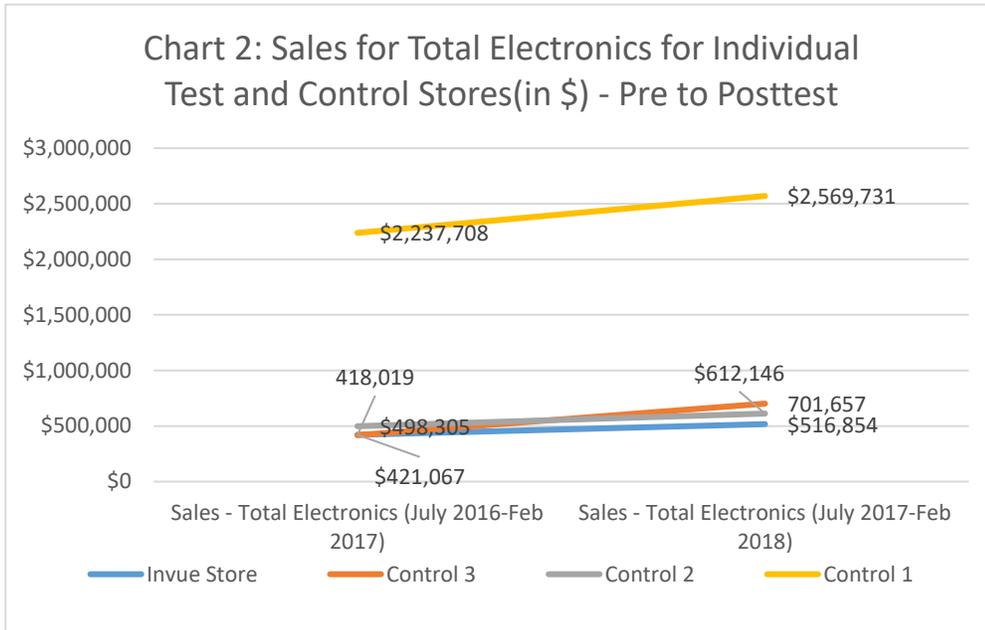
to February 2018), representing a 23% increase year over year. In the InVue store, total electronics sales increased from \$421,067 in the pretest period (July 2016 to February 2017), to \$516,854 in the posttest (July 2017 to February 2018), representing a 22% increase year over year. These results were not statistically significant.

Chart 1A shows unit sales for total electronics in test (InVue) and control stores before and after installation of the InVue OneKEY Ecosystem. Similarly, the InVue store did not outperform control stores in unit sales growth from pre to posttest periods. In control stores, sales increased from an average of 31,028 units



for the pretest period to an average of 38,588 units for the posttest period, representing an increase of 24% year over year. In the test store, unit sales increased from 20,911 in the pretest period to 23,194 in the posttest period, representing an increase of 11%. Due to the parameters of the test, these results are not statistically significant.

Chart 2 shows individual store data for pre and post-installation sales of total electronics. As shown below, all stores (including the test store) experienced an increase in sales from pretest (July 2016-February 2017) to posttest (July 2017 to February 2018). The InVue store increased sales for total electronics from \$421,067 to



\$516,854 from pre to posttest, which is not markedly different from the control stores. Given the high sales figures in the Control 1 location it is difficult to discern year over year sales growth.

Chart 2A shows percentage increase between pretest (July 2016 to February 2017) and posttest (July 2017

to February 2018) sales figures for electronics for the InVue store and control stores. As shown in this chart, the InVue store ranked third, with an increase of 22.75%, below both control store 3, exhibiting a 68%

increase in electronics sales, control store 2, exhibiting a 22.85% increase in electronics sales. The InVue store did rank above the Control 1 store, which exhibited a 14.84% increase in sales. However, due to the small sample size, researchers could not draw wide-ranging inferences from this analysis.

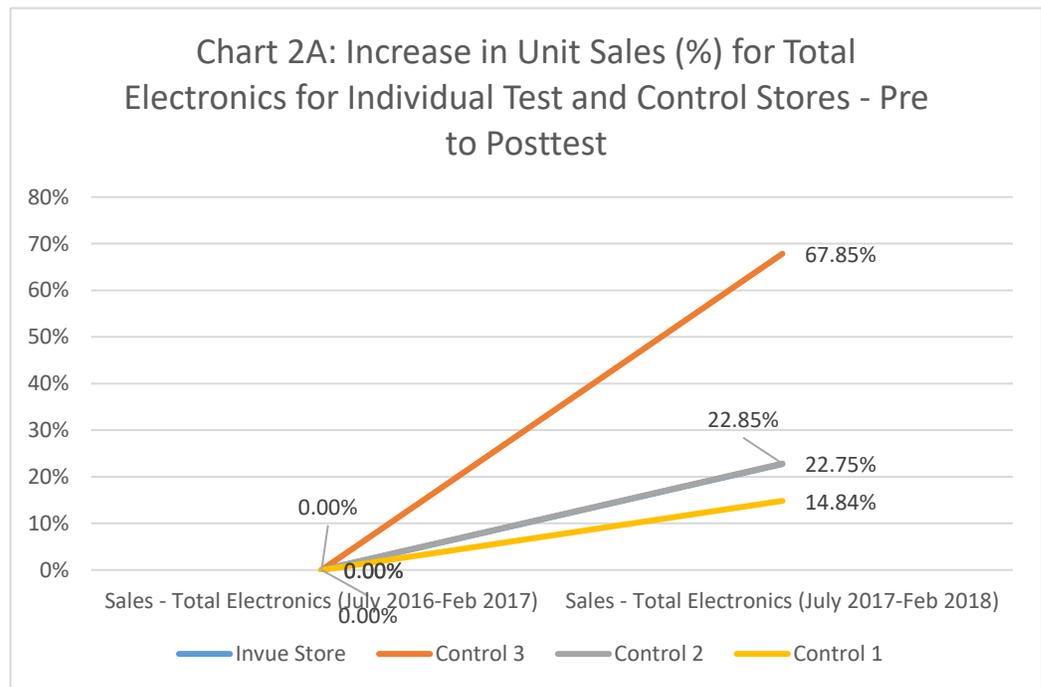


Chart 3: Unit Sales for Total Electronics for Individual Test and Control stores from 2016 to 2017

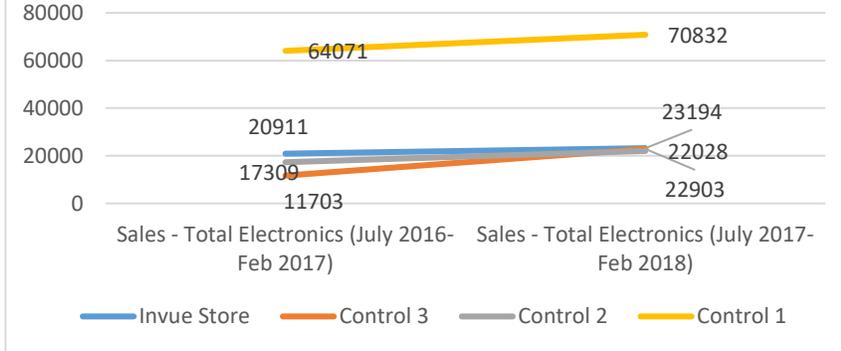
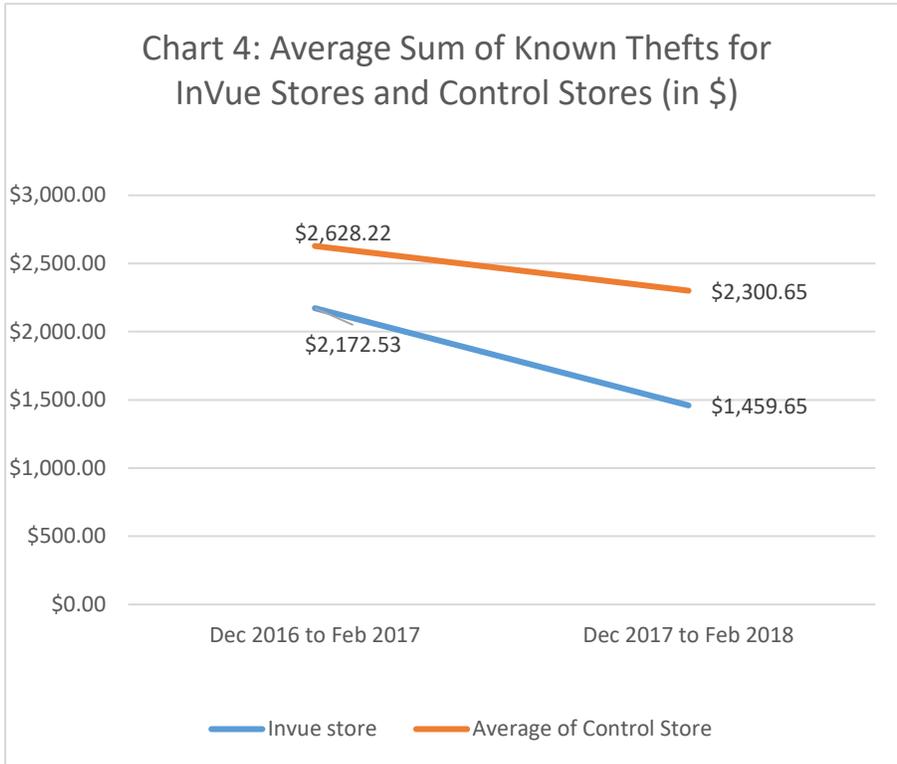


Chart 3 shows increase in unit sales pre and posttest for all electronics for the InVue store and control stores. Unit sales increased from 20,911 to 23,194 in the InVue store from pretest (July 2016 to February 2017) to posttest (July 2017 to February 2018). Among the control stores, the Control 3 store exhibited a 95% increase in unit sales for all electronics from pre to posttest, Control 2 store exhibited a 27% increase in unit sales for all electronics from pre to posttest,

and finally, the Control 1 store exhibited an increase of 12%.

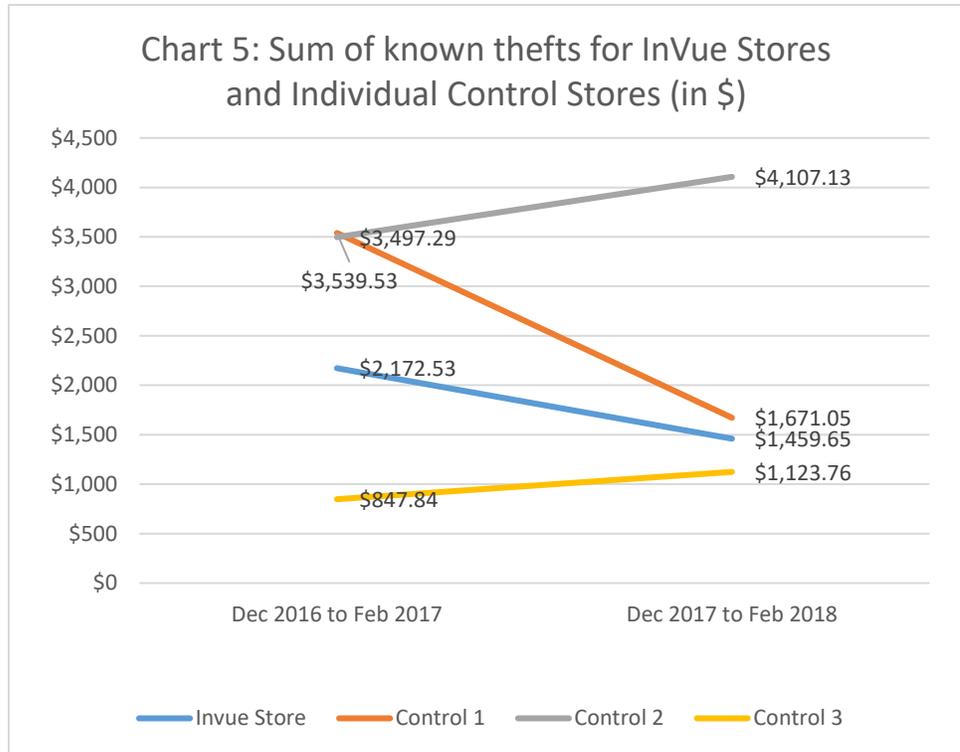
LPRC researchers also gathered data on known thefts for one test (InVue) store and three control stores. Chart 4 shows average period value of known theft among the 25 protected SKUs for test and control stores. The InVue store experienced \$2,172.53 in known thefts in the pretest period (December 2016 to February 2017), and experienced



\$1,459.65 in total known thefts for the posttest period (December 2017 to February 2017). This represents a year over year reduction of 33%. The control stores averaged \$2,628.22 for the pretest period (December 2016 to February 2017), reducing to \$2,300.65 for the posttest period (December 2017 to February 2018). This represents a year over year reduction of 13%. Reductions in known theft value were two times as great for the InVue store as compared to the average of control stores. While promising, due to the small sample size, these results are

not statistically significant.

Chart 5 shows the sum of known thefts for InVue stores and individual stores (in \$) from the pretest period (December 2016 to February 2017) and the posttest period (December 2017 to February 2018). While the InVue store experienced a reduction of 33%, two stores experienced increases (Control stores 2 and 3) while one store experienced a significant decline (Control 1). The InVue store outperformed two of the three control stores.



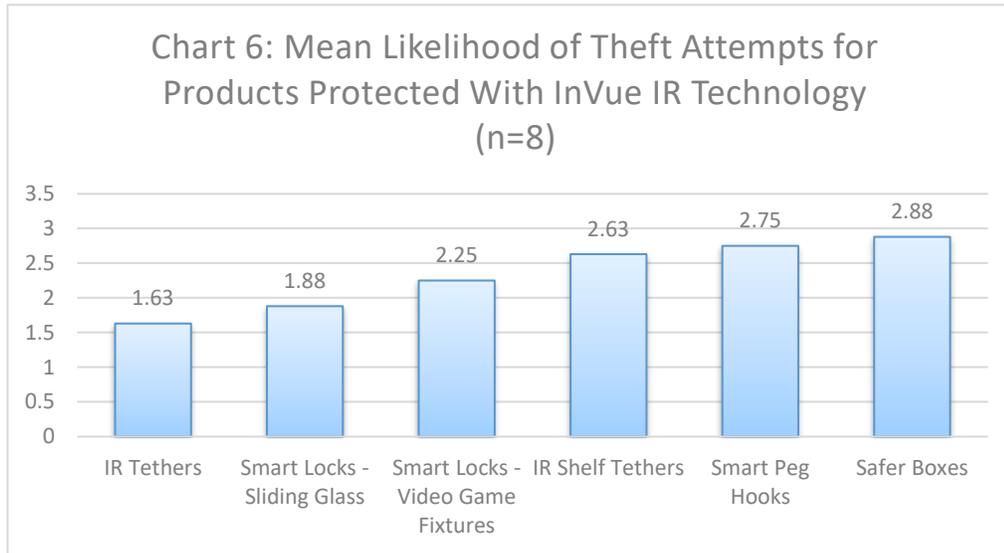
Offender Interviews

LPRC researchers first asked questions regarding offenders’ shoplifting history. Researchers made efforts to gather a representative sample, with offenders ranging from those that shoplift multiple times a year (n=1) to those that shoplift more than once a week (n=2). The median offender reported shoplifting multiple times a month. Total value shoplifted over the offenders’ history ranged from \$200 to \$250,000, while the median offender shoplifted \$10,000 over their history. Figure 1 shows offender shoplifting experience. All offenders (100%) reported shoplifting items from stores not protected with any noticeable anti-theft technology. Most respondents (75%) indicated that they shoplifted items from stores protected with video surveillance technology. Most offenders (75%) also reported shoplifting from stores where there was an associate visible to them. The majority of respondents (63%) shoplifted from a store while an LP associate or security guard was visible to them, and similarly, the majority (63%) had shoplifted after they were approached by an associate.

Table 1: Offender shoplifting experience (n=8)

	Responses
Shoplifted items from stores not protected with noticeable anti-theft technology.	100%
Shoplifted items from stores protected by video surveillance technology.	75%
Shoplifted items from stores while there was an associate was visible to me.	75%
Shoplifted from a store while an LP associate or store security guard was visible to me.	63%
Shoplifted items after I was approached by an associate.	63%
I have shoplifted items protected by product protection technology (e.g. product protection wraps, keeper boxes, tethers, etc.).	38%

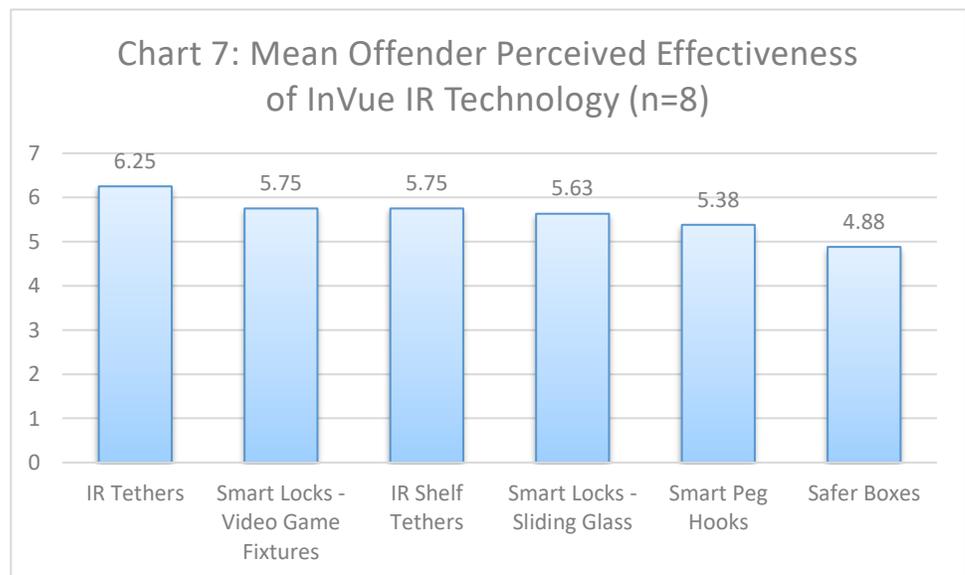
The next portion of the survey examined offender perceptions of the deterrence capacity of six different individual technologies within the InVue OneKEY Ecosystem. The technologies studied were: IR tethers,



Smart Locks with Sliding Glass Fixtures, Smart Locks with Video Game Glass Fixtures, IR Shelf Tethers, Smart Peg Hooks, and Smart Safer Boxes. **First, respondents were asked, on a 1 to 7 scale, where 1 is very unlikely, and 7 is very likely, how likely they would be to attempt theft of**

products protected with the technologies. The results are shown in Chart 6. Respondents reported that they were least likely to attempt theft of products protected with IR tethers (1.63), Smart Lock equipped sliding glass fixtures (1.88), and Smart Lock equipped video game fixtures (2.25). Respondents were most likely to attempt theft of products protected with Safer Boxes (2.88), Smart Peg Hooks (2.75), and IR Shelf Tethers (2.63).

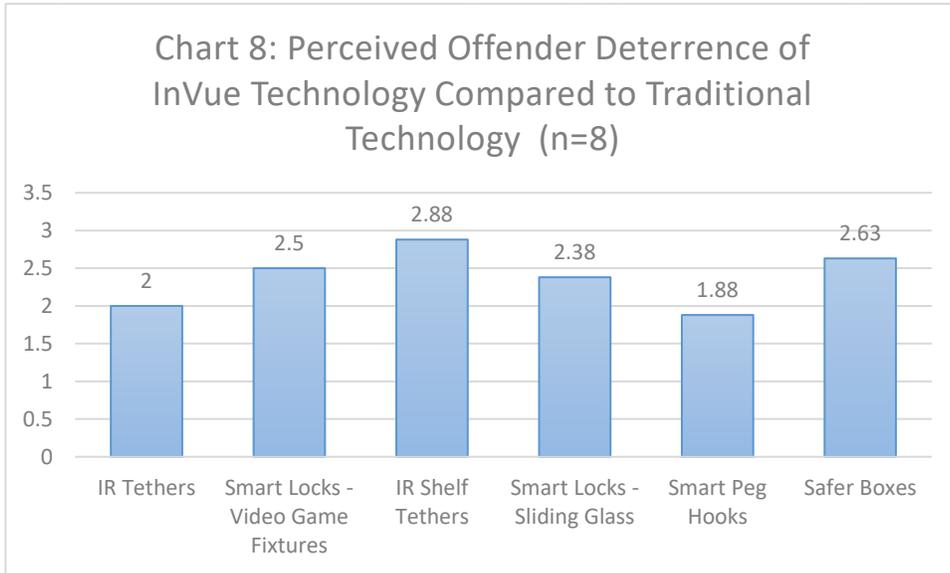
Next, offenders were asked, on a 1 to 7 scale, where 1 is “not at all effective” and 7 is “very effective”, how effective the technologies would be at deterring shoplifting. Results are shown in Chart 7. In all, offenders generally found the InVue OneKEY Ecosystem technologies to be effective deterrents. However, certain technologies were



identified as better deterrents than others. Offenders reported the most effective deterrents were IR tethers (6.25), Smart Lock equipped video game fixtures (5.75), and IR shelf tethers (5.75). Offenders reported the

least effective deterrents were Smart Safer Boxes (4.88), Smart Peg Hooks (5.38), and Smart Lock equipped sliding glass fixtures (5.63).

Finally, we asked offenders to rate the effectiveness of fixtures equipped with the InVue OneKEY Ecosystem compared to more traditional fixtures. **A score of “1” meant that offenders responded they were much less likely to steal with InVue OneKEY Ecosystem equipped fixtures as compared to traditional fixture types**



(e.g. OneKEY Ecosystem Safer Boxes versus traditional Safer Boxes), a score of “4” meant there was no difference, and a score of “7” indicated they were more likely to attempt to steal from InVue OneKEY Ecosystem fixtures as compared to traditional fixture types.

Results are shown in Chart 8. Respondents generally reported that they were less likely to attempt theft

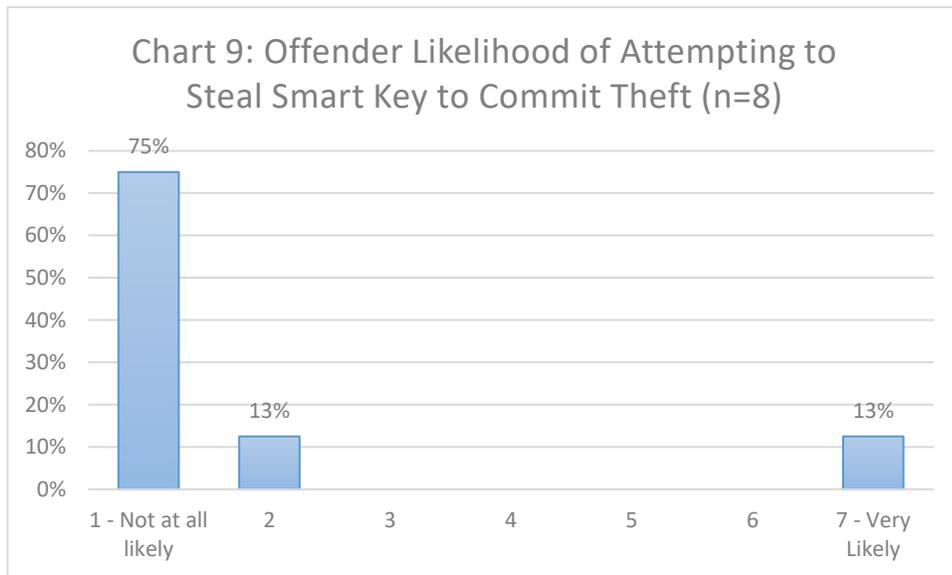
from InVue OneKEY Ecosystem-equipped fixtures than from more traditional fixtures. Smart Peg Hooks (1.88), IR Tether (2), and Smart Lock equipped Sliding Glass Fixtures (2.38) represented the most deterrent benefit over traditional fixtures, while Smart Lock equipped video game fixtures (2.5), InVue IR Equipped Safer Boxes (2.63), and IR Shelf Tethers represented the least deterrent benefit over traditional fixtures.

Offenders were then asked to list ways they, or other offenders, would attempt to defeat the InVue OneKEY Ecosystem-equipped fixtures. Common responses are shown below in Table 2.

Table 2: Offender Input on Attempted Defeat of InVue OneKEY Ecosystem Technology

InVue OneKEY Ecosystem Technology	Offender Answers “How would you attempt to defeat?”
IR Tethers	Rip the tether and run (n=2), use a razor to cut the wire (n=1)
Smart Locks – Video Game Fixtures	Pry open with screwdriver (n=2), collude with employee (n=1)
IR Shelf Tethers	Cut or otherwise defeat packaging (n=3), try to stretch product protection wrap to remove product (n=1),
Smart Locks – Sliding Glass Fixtures	Collude with an employee (n=1), wait for an employee to forget to close the fixture (n=1), break glass and run (n=1), try to break the InVue lock (n=1)
Smart Peg Hooks	Clip through or defeat packaging (n=4), collude with an employee (n=1), distract associate while it is open and coordinate with a friend to steal (n=1)
Smart Safer Boxes	Crack the safer box plastic and take product (n=3), walk out of the store with the product still in safer box (n=2)

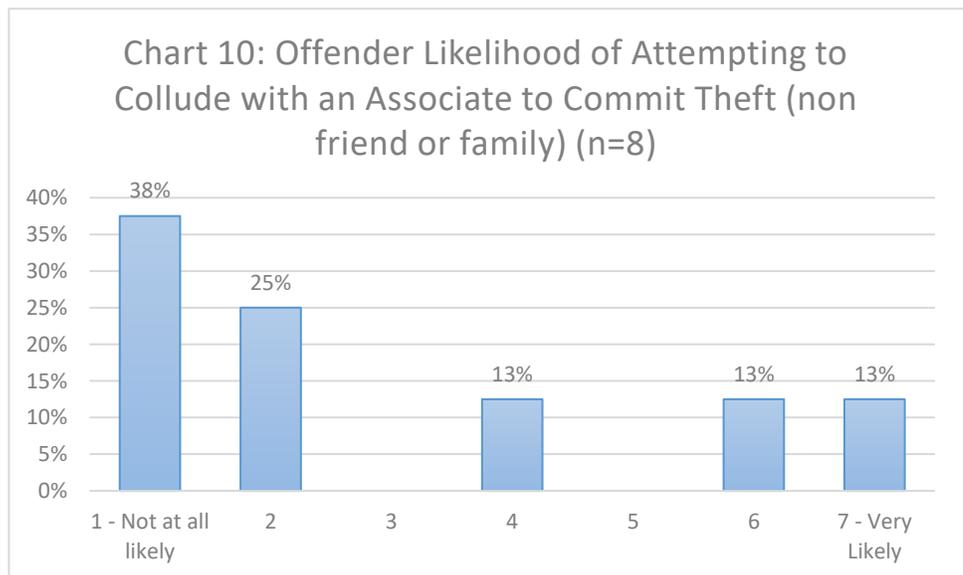
For most InVue OneKEY Ecosystem technologies, anywhere from three to six respondents identified ways they, or other offenders, would attempt to defeat it. For IR tethers and IR shelf tethers, some respondents suggested that offenders would try to rip the wire or rip the tether and run. For the IR shelf tethers, which use product protection wraps in conjunction with tethers, three respondents suggested offenders would try to defeat the packaging. For both the Smart Peg Hooks, and Smart Safer Boxes, defeating packaging was a popular answer.



Next, offenders were asked how likely they would be to steal Smart Keys or collaborate with employees to commit theft. Offenders were first asked, on a 1 to 7 scale, where 1 is “not at all likely” and 7 is “very likely”, how likely they would be to attempt to steal a smart key to commit theft. Results are shown in Chart 9. For the most part, offenders

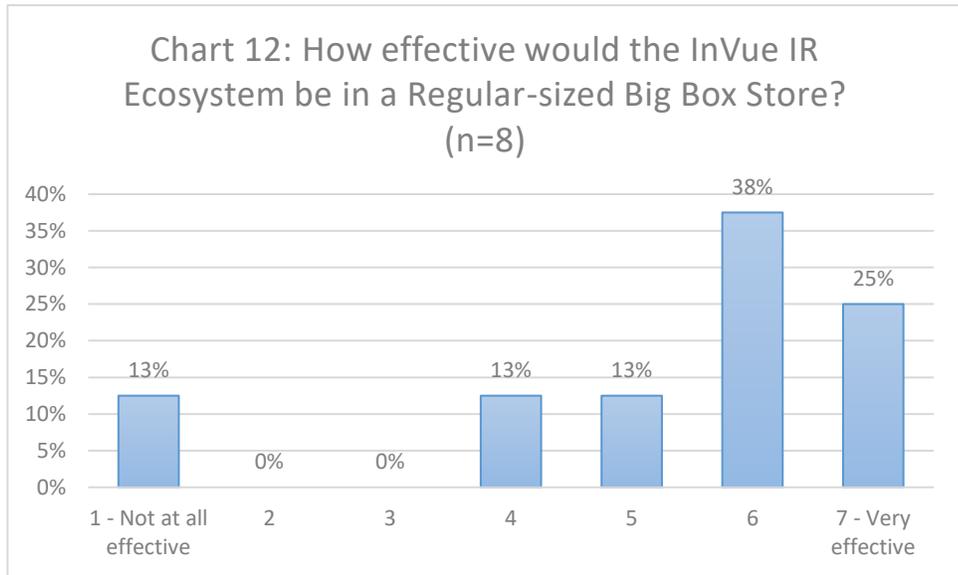
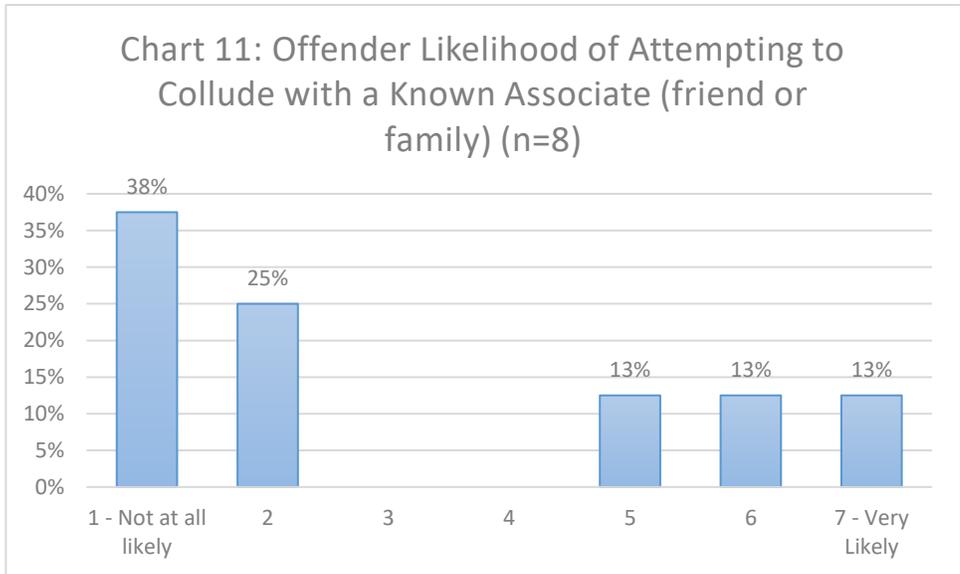
would be reluctant to steal a smart key to commit theft.

Next, offenders were asked on a 1 to 7 scale, where 1 is “not at all likely”, and 7 is “very likely”, to indicate how likely they were to try to collude with an associate that wasn’t a friend or family to commit theft. Results are shown in Chart 5. Over half (63%) were not likely to collude, while 25% were likely to collude, and 13% were somewhat likely to collude with an



associate who wasn’t a friend or family member. Percentages do not add to 100% due to rounding.

Offenders were asked on a 1 to 7 scale, where 1 is “not at all likely” and 7 is “very likely,” to indicate how likely they were to try to collude with a known associate, such as a friend or family. Results are shown in Chart 11. Similarly, 63% answered they were not likely to collude with friends or family, while 38% were likely or very likely to collude with friends or family members to attempt to steal. Percentages do not add to 100% due to rounding.



Finally, offenders were asked how effective this technology would be at deterring theft in a regular-sized big box Store. **The mean response was 5.25, indicating that most thought it would be either effective or very effective.** Results are shown in Chart 12. Three-fourths (75%) of offenders responded that it would be effective in a regular-sized big box store, while

25% answered that it would be very effective. Respondents were finally asked to provide reasons why it would, or would not, be effective in a larger big box store. Reasons given why it may be as effective, or more effective, include:

- Larger store has more security. This system would compound the effects of that security.
- More associates mean you’d have a greater chance of getting caught.

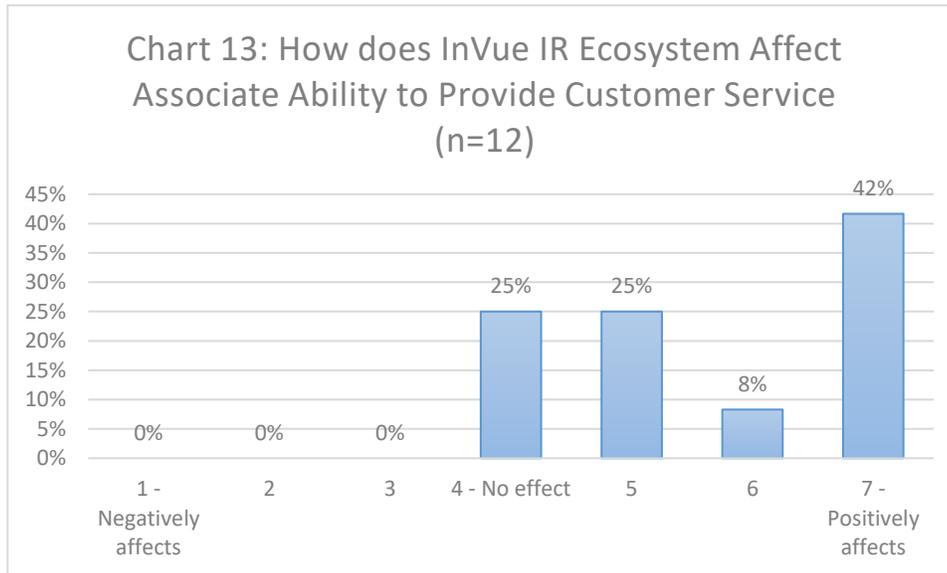
Reasons given why it may not be as effective included:

- Larger stores are less transparent. There are more people, and therefore it’s easier to go unnoticed.
- Larger stores would have more “vulnerable products” that the InVue OneKEY Ecosystem could not protect.

However, for the most part, respondents found that the InVue OneKEY Ecosystem would be just as effective in a large store as compared to a small store.

Associate Interviews

LPRC researchers surveyed 12 associates, encompassing a variety of roles, from customer service, to front-end, to LP staff. LPRC researchers asked questions regarding overall effectiveness, impact on ability to



provide customer service, as well as ways that dishonest employees may attempt to defeat the InVue OneKEY Ecosystem. First, respondents were asked how the InVue OneKEY Ecosystem technology affects overall ability to provide customer service. Results are shown in Chart 13. **The mean response was 5.67, indicating that, overall, it has a positive effect on associate ability to**

provide customer service. Three-fourths (75%) responded that it had a positive effect, while 25% responded that it had no effect on customer service.

Next, respondents were asked to list general ways in which the InVue OneKEY Ecosystem may improve, or detract from, ability to provide customer service. For the most part, respondents indicated that it was helpful. Mostly, the critiques of it were based on user error. The most commonly referenced positive and negative attributes of the InVue OneKEY Ecosystem as it relates to customer service were:

Positive:

- Makes associates more accountable for their actions (n=3).
- Allows me to show customers different products more easily (n=3).
- Checking out the key means each associate can have a key all of the time (n=1)

Negative:

- If you forget to check a key out, you have to wait for someone to open a door for you (n=1)
- At first, keys didn't work well – they would flash "red" instead of "blue" – so there was an adjustment period (n=1).

Next, researchers asked associates questions regarding their opinions on the InVue OneKEY Ecosystem, and how it affected their ability to perform job duties, whether it increased employee accountability, and whether it made them feel safer. Researchers asked associates to rate several statements on a 1 to 7 scale, where 1 is "strongly disagree", 7 is "strongly agree", and 4 is "neutral". Mean responses are shown below in Table 2. **Respondents generally agreed that the OneKEY Ecosystem makes it generally easier to perform job**

duties (6), and that the OneKEY Ecosystem allows them to show customers products more quickly (5.75). Generally, respondents agreed that the OneKEY Ecosystem allows the team to serve customers more quickly (5.42). Responses were mixed, though generally positive, regarding whether the Smartkey allows for the team to upsell (4.67).

Table 2: Associate Opinions Regarding InVue OneKEY Ecosystem

From 1 (strongly disagree) to 7 (strongly agree), how much do you agree with the following statements? (n=12)	Mean Response
InVue OneKEY Ecosystem makes it easier for me to perform my job duties.	6
InVue OneKEY Ecosystem allows me or my team to show customers more products.	5.75
InVue OneKEY Ecosystem allows me or my team to serve customers more quickly.	5.42
InVue OneKEY Ecosystem allows me or my team to upsell, or sell a more expensive product in lieu of a less expensive one, more easily.	4.67
InVue OneKEY Ecosystem technology makes me or my team feel safer.	6.08
Having an individual key assigned to an associate makes them more accountable for their mistakes.	6.92
Having an individual key assigned to associates may make them accountable for others' mistakes.	2.91
Having an individual key assigned to associates will make them less likely to share keys.	5.75
Smartkey technology limits employee theft.	5.91
Smartkey technology limits theft from customers or non-employees.	5.91
Smartkey technology deters violent crimes such as robbery.	4.45

The next questions examined associates' opinions on how the InVue OneKEY Ecosystem affects employee safety and accountability. **Overall, associates agreed that the InVue OneKEY Ecosystem makes them feel safer (6.08), and strongly agreed that having an individual key assigned to associates makes them more accountable for mistakes (6.92). Relatedly, associates generally disagreed with the statement that having an individual key assigned to associates may make them accountable for others' mistakes (e.g. if they open a cabinet for an associate that then commits theft). Associates generally agreed that having individual keys assigned to associates will make them less likely to share keys (5.75), and also agreed that Smartkey technology limits employee theft (5.91) as well as theft from customers or non-employees (5.91). However, opinion was mixed on whether this technology deters violent crimes such as robbery (4.45).**

Next, LPRC researchers surveyed customer service associates on customer perceptions of the InVue OneKEY Ecosystem. Associates were read a series of statements about their interactions with customers and asked to rate each statement on a 1 to 7 scale, where 1 is "strongly disagree", 7 is "strongly agree", and 4 is "neutral." Mean responses are shown below in Table 3.

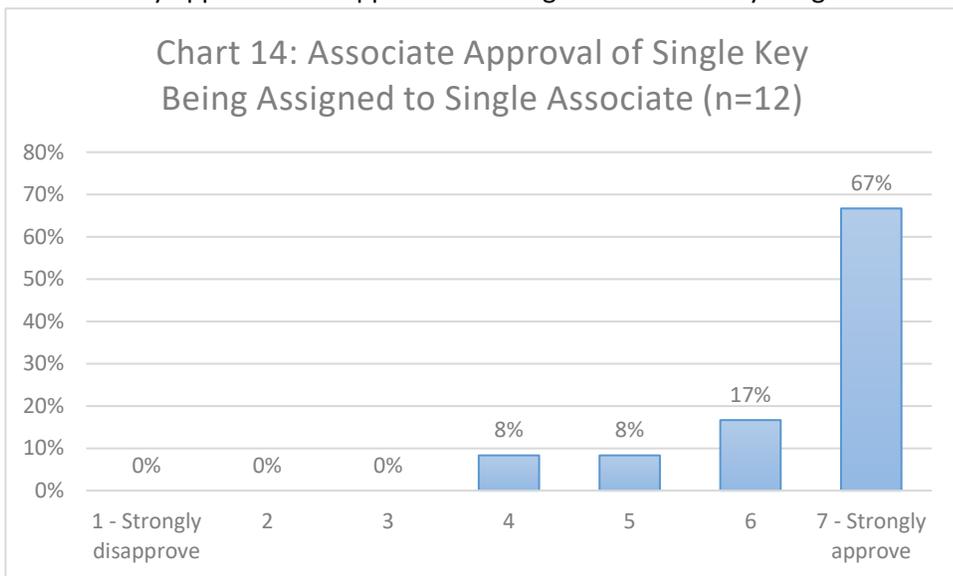
Table 3: Customer Service Associate Opinions on Customer Interaction with InVue OneKEY Ecosystem

From 1 (strongly disagree) to 7 (strongly agree), how much do you agree with the following statements? (n=9)	Mean Response
Customers understand the purpose of InVue OneKEY Ecosystem technology	4.11
Customers are less likely to shop here because of InVue OneKEY Ecosystem technology	1.33

Customers get frustrated with InVue OneKEY Ecosystem technology	1.77
Customers find InVue OneKEY Ecosystem technology to be more convenient	4.33

Generally, customer service associates responses were neutral (4.11) when asked whether customers understand the purpose of InVue OneKEY Ecosystem technology. Associates generally disagreed (1.33) that customers would be less likely to shop at their retail location because of the InVue OneKEY Ecosystem, and similarly disagreed (1.77) that customers would get frustrated with the InVue OneKEY Ecosystem technology. Finally, customer service associate responses were neutral (4.33) when asked whether customers find InVue OneKEY Ecosystem technology to be more convenient than traditional technology.

Next, associates were asked, on a 1 to 7 scale, where 1 is “strongly disapprove” and 7 is “strongly approve” whether they approve or disapprove of having an individual key assigned to an individual associate. Results



are shown in Chart 14. Two-thirds of respondents strongly approved of this aspect, while all but 8% (n=1) of associates approved. One associate (8%) was neutral. Associates were then asked to list some reasons why they approve or disapprove of this aspect of InVue OneKEY Ecosystem technology. All responses were positive, save for one respondent,

who indicated that it didn't matter either way. The most commonly referenced reasons are shown below:

- It increases employee accountability (n=6)
- It gives a sense of empowerment to individual employees, makes them feel like they have an important role (n=3)
- Increases impression of control (n=1)
- Gives a sense of security. I know I won't be blamed for anything I didn't do (n=1)

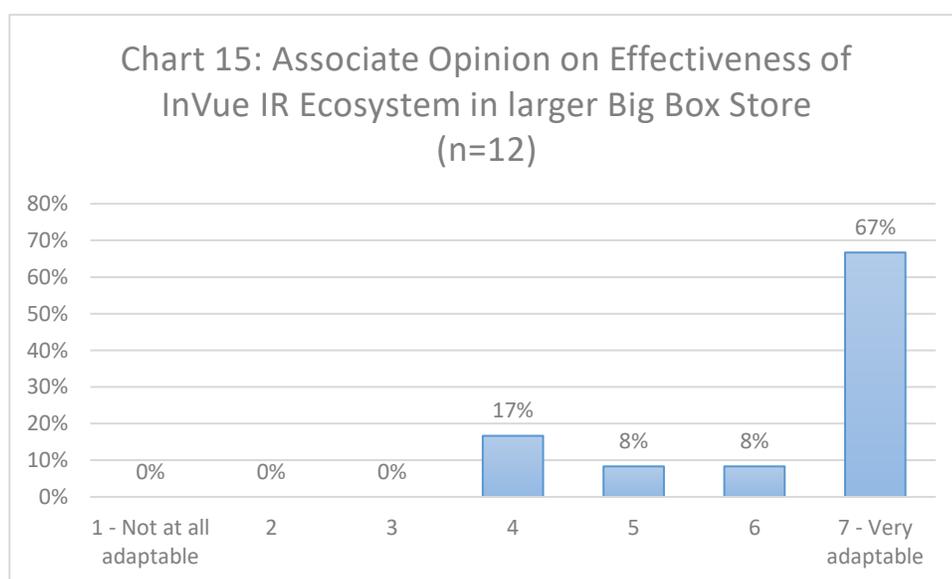
Associates were then asked whether they had previously worked in retail. Three-fourths (75%) of respondents indicated that they had previously worked in retail. Those respondents were then asked a series of questions comparing the store they work in now, equipped with the InVue OneKEY Ecosystem, with previous stores.

Table 4: Associate experience with InVue OneKEY Ecosystem versus other stores (n=30)

From 1 (strongly disagree) to 7 (strongly agree), how much do you agree with the following statements? (n=9) Mean Response

InVue OneKEY Ecosystem technology will make this store more inviting to the customer than others stores I've worked in.	5.11
InVue OneKEY Ecosystem technology will make this store safer than others I've worked in.	6.55
InVue OneKEY Ecosystem technology will make it easier to do my job as compared to other store environments I've worked in.	5.89
InVue OneKEY Ecosystem technology will make it easier for me to serve customers compared to other store environments I've worked in.	5.67

Results are shown above in Table 4. **Associates somewhat agreed (5.11) with the statement that InVue OneKEY Ecosystem technology would make this store more inviting to the customer as compared to other stores. Associates strongly agreed (6.55) that the InVue OneKEY Ecosystem will make this store safer than others they have worked in. Finally, respondents generally agreed that the InVue OneKEY Ecosystem would make it easier to do their job (5.89) and that InVue OneKEY Ecosystem technology would make it easier to serve customers (5.67) compared to other stores.**



The next questions examined associate opinions on effectiveness of the InVue OneKEY Ecosystem in larger big box stores. Most (83%) responded that it would be adaptable, while (67%) responded that it would be very adaptable, and 17% were neutral. Following this, associates were asked to list reasons why they believed this system would be

adaptable, or not adaptable, to a large store. While many respondents did not give any reasons, the most commonly referenced reasons are shown below:

Reasons why it may be adaptable:

- It is simple and easy to work with; nothing would preclude it from working in a larger big box store (n=3)
- Simple interface allows tracking of multiple keys (n=1)
- It would improve guest service for a larger store; would make it so customers had to wait around less for a manager (n=3)

Reasons why it may not be adaptable:

- Accountability would be more difficult at a larger store, because there are more keys to track (n=2)
- Would only work if keys were designated for specific departments (n=1)

Finally, we asked associates to identify ways that other associates may attempt to defeat or circumvent the InVue OneKEY Ecosystem. While many respondents did not give reasons, the most commonly referenced reasons are shown below:

- Associates may attempt to share keys (n=4)
- Learning others' pins to share or steal a key (n=2)
- Directly stealing a key off another associate (n=2)
- Taking multiple products while the cabinet is open (n=1).

Customer Interviews

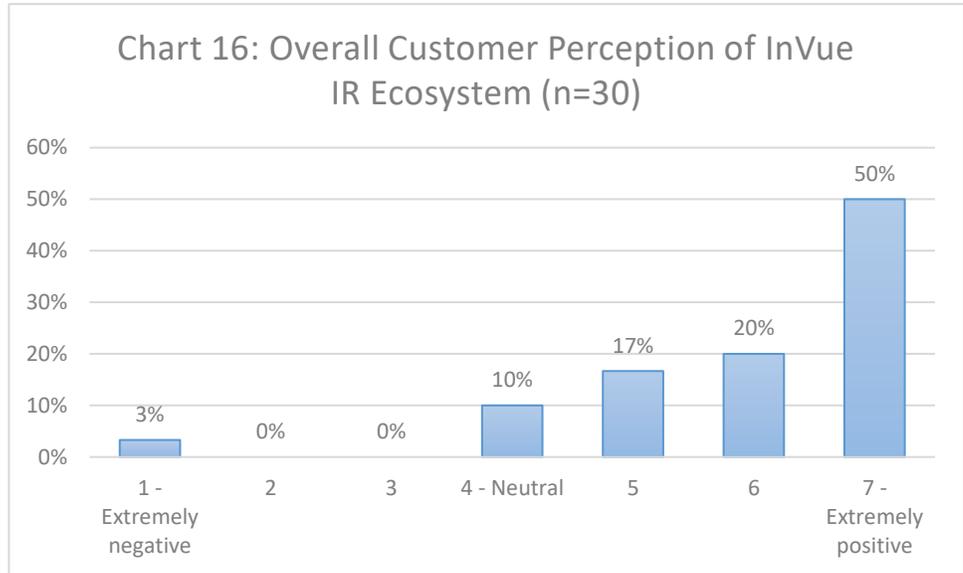
LPRC researchers conducted intercepts with 30 customers at one of our test stores. Customers were asked about their overall satisfaction with their shopping experience, their awareness of the capabilities of the InVue OneKEY Ecosystem, as well as how it would affect their shopping experience. Demographics were also recorded.

First, customers were asked, on a 1 to 7 scale, where 1 is “strongly disagree”, and 7 is “strongly agree”, to rate each of the following statements. Results are shown below in Table 5.

	Mean Response
I have a positive overall impression of this store.	6.73
I enjoy the customer service at this =store.	6.73
The customer experience at this store is better than other retail stores.	6.03
The customer experience at this store is better than other stores of the same brand.	5.4

Overall, customers had a very positive impression of one test store with a mean score of 6.73. Customers also had a very positive impression of the customer service at that store (6.73). Compared to other retail stores, customers rated the experience at their store higher than other retail stores (6.03). When asked to compare the customer experience at this store vis-à-vis other stores of the same brand, they generally rated it higher (5.4).

Next, customers were given a brief demonstration of the InVue OneKEY Ecosystem. LPRC researchers explained that they could ask any associate to help them with a product. **They were then asked to rate their overall impression of the InVue OneKEY Ecosystem on a 1 to 7 scale, where 1 is “extremely negative”, 7 is “extremely positive”, and 4 is “neutral”.**



Results are shown in Chart 16. Half (50%) of respondents had an extremely positive view of the InVue OneKEY Ecosystem, while 87% had a positive view. One out of ten (10%) of respondents had a neutral view, while only 3% had an extremely negative view.

Customers were then asked whether they knew that they could ask any associate from any department to open a fixture to allow them to inspect a product (n=30). Most (90%) customers responded that they did not know this, while 10% responded that they did. The ones that knew this was a possibility had all shopped at this location before and had all been helped by associates with Smart Keys.

Next, customers were asked a series of questions comparing stores equipped with the InVue OneKEY Ecosystem with other types of stores. Respondents were asked where they would prefer to take the following actions: enter a store to shop, check out or inspect products, and buy a product. **They were asked to rate each action on a 1 to 7 scale, where a 1 indicates they would much rather take these actions in a store without any anti-theft technology, 7 indicates they would much rather take these actions in an InVue OneKEY Ecosystem equipped store, and 4 indicates neutral, or no preference.** Results are shown in Table 6.

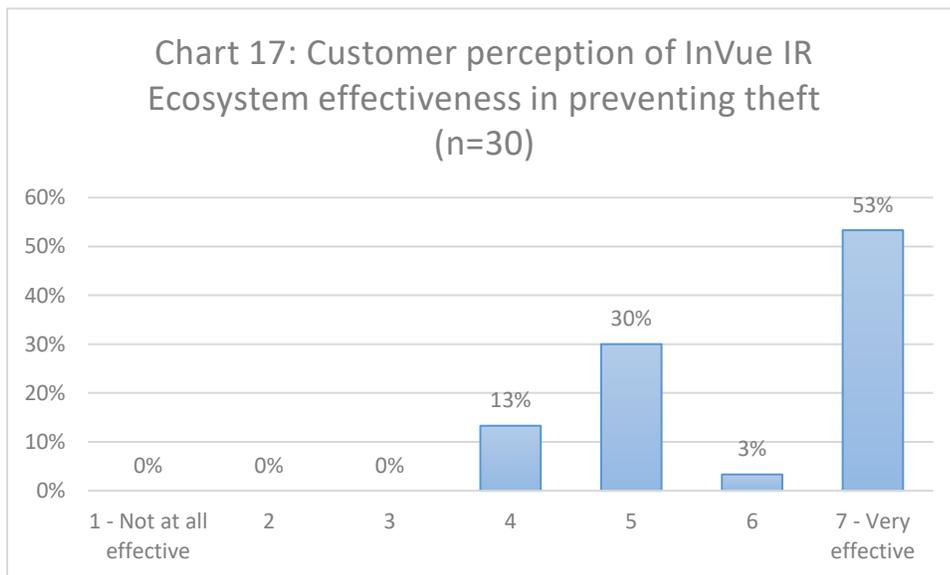
Action	Mean Response
Enter a store to shop	4.7
Inspect a product	4.7
Buy a product	4.97

Customers exhibited a slight preference for InVue OneKEY Ecosystem for entering a store to shop (4.7), as well as inspecting a product (4.7), and buying a product. Overall, however, customers didn’t exhibit a significant preference either way, and the modal (most common) response for all three questions was neutral (4).

Customers were then asked the same series of questions, this time comparing stores equipped with the InVue OneKEY Ecosystem with stores that had traditional lock-and-key fixtures. **Customers were asked to rate each action on a 1 to 7 scale, where 1 indicates they would much rather take these actions in a store with traditional lock-and-key fixtures, 7 indicates they would much rather take these actions in an InVue OneKEY Ecosystem equipped store, and 4 indicates neutral, or no preference.** Results are shown in Table 7.

	Mean Response
Enter a store to shop	5.07
Inspect a product	5.43
Buy a product	5.47

Overall, InVue-equipped stores fared better in a comparison against traditional lock-and-key stores than against stores with no anti-theft technology. **Customers exhibited a slight preference for entering an InVue OneKEY Ecosystem-equipped store versus a store with traditional lock and key anti-theft technology and exhibited a clear preference for inspecting a product (5.43) and buying a product (5.47) at an InVue OneKEY Ecosystem equipped store as compared to a lock and key store.**



Finally, customers were asked to rate perceived effectiveness of the InVue OneKEY Ecosystem on a 1 to 7 scale, where 1 is “not at all effective”, and 7 is “very effective.” Results are shown in Chart 17. **The mean rating was 5.97.** Over half (53%) of customers responded that the InVue OneKEY Ecosystem would be very effective at preventing theft. Overall,

87% rated it 5 or higher. Only 13% of customers rated effectiveness at preventing theft a four, while none rated it three or less.

A few notes before concluding this portion. First, given its location, this sample was skewed heavily towards college-aged students, and was not representative of the entire population of retail customers. Seventy percent of customers surveyed in this store responded that they were currently a student at a local college. Younger individuals may be more comfortable with new technology, and less likely to want to wait for customer service. Second, this store exhibited reduced traffic due to the time of the survey (during the

summer semester). Therefore, it is important to consider these two points when inferring any patterns from these results. Demographic breakdowns of survey participants can be found in Appendix A.

Conclusion

The aim of this project was to better understand the effects of the InVue OneKEY Ecosystem on shrink and sales in small big box stores, as well as understand offender, customer, and associate perceptions of the technology. Moreover, LPRC researchers wanted to understand how adaptable the InVue OneKEY Ecosystem would be to a larger store environment.

Identify the effect of the InVue OneKEY Ecosystem on shrink and theft in small big box stores.

Overall, the InVue OneKEY Ecosystem store experienced a larger reduction (33%) in known theft value as compared to the average of control stores (13%). Furthermore, it outperformed two out of three control stores. However, additional study would be needed to assess whether this is a statistically valid reduction.

Identify the effect of the InVue OneKEY Ecosystem on sales in small big box stores.

Overall, there was little difference in electronics sales increases between the InVue OneKEY Ecosystem and control stores. Total sales of electronics increased by 22% in the InVue store, as opposed to 23% in the control stores. Unit sales of electronics increased 24% in control stores, versus 11% in the InVue store. However, 90% of customers were unaware that they could ask any associate with an InVue key to open any fixture, which may explain the lack of significant increases in sales for the InVue store.

Identify the deterrence effect of the InVue OneKEY Ecosystem on offenders.

Additional analysis on offender perceptions reveal that offenders generally found the InVue OneKEY Ecosystem to be a credible deterrent to committing theft. However, the deterrent effects varied by the type of fixture. IR tethers and glass fixtures were better deterrents than IR-equipped safer boxes or peg hooks, though most offenders still found even these to be credible deterrents. Furthermore, after LPRC researchers explained the system, the InVue OneKEY Ecosystem technology generally dissuaded offenders from attempting to collude with other employees to commit theft or fraud. Over half (63%) of respondents indicated that they were unlikely to collude with associates to commit theft in an InVue OneKEY Ecosystem-equipped store.

Identify ways that offenders may attempt to defeat the InVue OneKEY Ecosystem

When asked to identify ways that they may attempt to defeat the InVue OneKEY Ecosystem for different fixtures, methods varied by the type of fixture. Attempting to defeat the packaging, shimmying open glass fixtures, or colluding with an employee were popular responses, depending on the fixture in question. Attempting to defeat peg hooks by clipping through the packaging (n=4), and cracking safer boxes (n=3), or simply walking out of the store with the product still in the safer box (n=2) were also popular responses.

Better understand associate perceptions of the InVue OneKEY Ecosystem

Three out of four associates (75%) generally approved of the OneKEY Ecosystem, while 25% were neutral. Similarly, associates approved of the fact that the InVue OneKEY Ecosystem increased accountability by providing individually assigned keys. Associates also reported that the InVue OneKEY Ecosystem would make them feel safer, yet they were less convinced that it would deter robbery or other violent crimes. Some

associates identified possible sharing of keys as a way that dishonest associates may attempt to overcome the system.

Understand how the InVue OneKEY Ecosystems affects associates' ability to provide customer service

Associates generally agreed that the InVue OneKEY Ecosystem improved their ability to provide customer service. However, responses were mixed as to the InVue OneKEY Ecosystem's ability to increase sales or allow associates to upsell. Associates that work with customers regularly reported that customers were not less likely to shop at an InVue OneKEY Ecosystem-equipped big box store, nor were they frustrated by the technology. However, associate opinion was mixed as to whether customers found the keys to be more convenient.

Better understand the effects of the InVue OneKEY Ecosystem on customer shopping experience

Customers had a positive view of the InVue OneKEY Ecosystem overall, with 50% of those interviewed claiming they had an "extremely positive" view of the system. Customers also perceived the InVue OneKEY Ecosystem to be an effective deterrent to theft, with 53% answering that it was "very effective" in preventing theft. Customers generally were neutral as to whether they'd prefer to enter a store to shop, inspect products, or purchase products at an InVue store versus a store with no anti-theft technology, erring on the side of the InVue store. However, when presented with the choice to enter a store to shop, inspect products, or purchase products at an InVue store versus a store with traditional lock-and-key fixtures, they clearly preferred the InVue store.

Understand how adaptable the InVue OneKEY Ecosystem is to a larger big box store

Associates and offenders agreed that the InVue OneKEY Ecosystem would be adaptable to a larger big box store. Three-fourths of offenders (75%) responded that the InVue OneKEY Ecosystem would be effective in a larger big box store, while 25% responded that it would be very effective. Similarly, 83% of associates responded that the InVue OneKEY Ecosystem would be effective in a larger big box store, while 67% responded that it would be very effective.

When asked to list possible obstacles to adoption in a larger big box store, offenders responded that, as larger stores are "less transparent," and as there are more people, it's easier to go unnoticed. This would increase the possibility of attempted defeats of the InVue OneKEY Ecosystem. Others suggested that larger stores would have vulnerable products, and it would be difficult for the InVue OneKEY Ecosystem to protect them all. A couple of associates suggested that a larger number of keys in a larger big box store would be more difficult to track.

Generally, however, both offenders and associates believed that adoption to a larger big box store would be feasible. A few offenders even suggested that this would compound the effectiveness of a larger in-store security team in a conventional big box store.

Future Research

Results from this study should be interpreted with caution, given the small sample size for the quasi-experimental design (e.g. one test store and three control stores) as well as the fact that the survey samples are not representative of the entire population of retail shoppers. Moreover, additional sales, theft, and

shrink data will be necessary to fully understand the continued effects of the InVue OneKEY Ecosystem in small big box stores. LPRC researchers recommend an additional study that examines the effects of the InVue OneKEY Ecosystem in: 1) additional stores, particularly ones that are more representative of the general population of retail shoppers and 2) full-sized big box stores. Furthermore, LPRC researchers recommend an installation schedule that can take full advantage of end-of-year audits or inventory to better understand the year over year effects of the InVue OneKEY Ecosystem on sales, shrink, and theft. Finally, as 90% of customers were unaware that they could ask any associate with an InVue key to open any fixture, further study into how customer knowledge of the InVue OneKEY Ecosystem may impact sales is warranted. While initial results are promising, further study is needed to fully understand the effect of the InVue OneKEY Ecosystem on sales, shrink, and theft in small big box stores.

Appendix A – Methodology and Sampling

Shrink and Sales

Data on sales were gathered from pre (10/1/16 to 2/12/17) and during (10/1/17 to 2/12/18) treatment for all stores except for one test store. Data on known thefts were gathered for all stores except for one test store for the pre (12/1/16 to 2/12/17) and treatment (12/1/17 to 2/12/18) phases of the project. Finally, overall shrink data were gathered for 2016 and 2017 for all stores except one test store. For sales data, all items coded as “electronics” were included. For theft and shrink data, 25 SKUs protected by the InVue OneKEY Ecosystem were included.

To supplement these results, and better understand the mechanisms behind the effectiveness of the OneKEY Ecosystem, LPRC researchers conducted associate (n=12) and offender interviews (n=8) interviews, along with customer intercept surveys (n=30). The survey instrument was designed in conjunction with the input of our retail partner and InVue. Questions were designed to maximize validity and, when applicable, statistical tests were performed to assure reliability of the questions in the survey instrument. Survey questions were also field tested to assure validity and reliability.

Offender Interviews

Offenders were recruited through an online advertisement and subject to pre-screening. Potential study participants were asked to recount the last time they committed theft and asked which types of products they stole. Offenders who weren't active in the last two years or had only stolen low-value items (e.g. candy bars) were excluded from the sample. Once they were screened, offenders were scheduled for a 30 minute interview slot. Offenders were evenly split between men (n=4) and women (n=4). Due to the demographics of the area, the sample skewed towards younger offender respondents. Six respondents (75%) reported being 18-29, while two (25%) respondents were between 30 and 39. Five respondents (62.5%) reported having completed high school, while three (37.5%) had completed some college.

Offender interviews were conducted on-site at the one test store from May 9th to 11th. An LPRC researcher provided a brief introduction and demonstrated the InVue OneKEY Ecosystem in five different forms: Smart locks with video game fixtures (protecting video games), Smart Locks with sliding glass fixtures, Smart Peg Hooks (protecting earbuds), IR product protection wraps, Smart Safer Boxes (protecting Amazon Fire Sticks) and IR shelf tethers (protecting smart phone demos). After each demonstration, an LPRC researcher allowed the offender to use the product and asked if they understood how it worked. An LPRC researcher then asked

offenders how effective each particular form would be in deterring theft overall, how effective it would be at preventing them from stealing the product the device was protecting, and how they would attempt to defeat the product. We then asked general questions about how the offender would behave in a store generally protected with the InVue OneKEY Ecosystem, whether this technology would deter them from collaborating with an employee to commit theft, and whether the respondent thought it would be effective in a larger store. Offenders were compensated with a \$50 Visa gift card at the end of the survey.

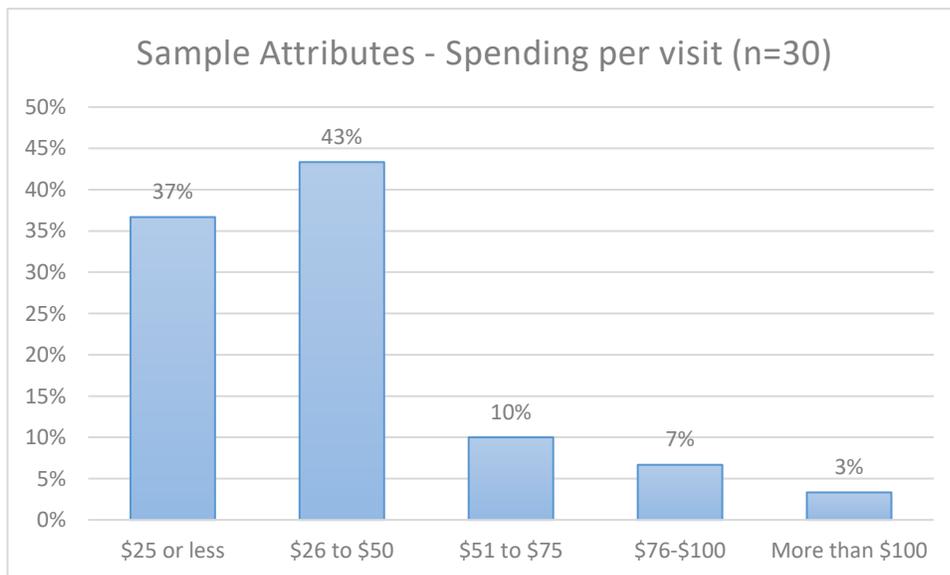
Associate Interviews

Interviews with store associates (n=12) were conducted on-site at the one test store from May 16th to the 24th, 2018, and included questions measuring associates' familiarity with the system and their opinions on the InVue OneKEY Ecosystem's effect on their ability to provide customer service and more effectively sell products. Additionally, the survey measured associates' views on the InVue OneKEY Ecosystem's effect on internal and external theft, employee accountability, employee safety, and whether the system could be implemented in a conventional store. Finally, the interview asked associates to identify possible ways that the InVue OneKEY Ecosystem may be defeated.

One AP lead, one general manager, six customer service/floor employees, and 3 front-end employees/cashiers were interviewed. Additional data on customer service/floor employees were gathered. Respondents indicated that, in many cases, they serve multiple functions. They were asked to answer for the function they were occupying today. However, two front end associates had significant customer service experience (e.g. showing products or helping customers with products) and researchers included their answers in the customer service data.

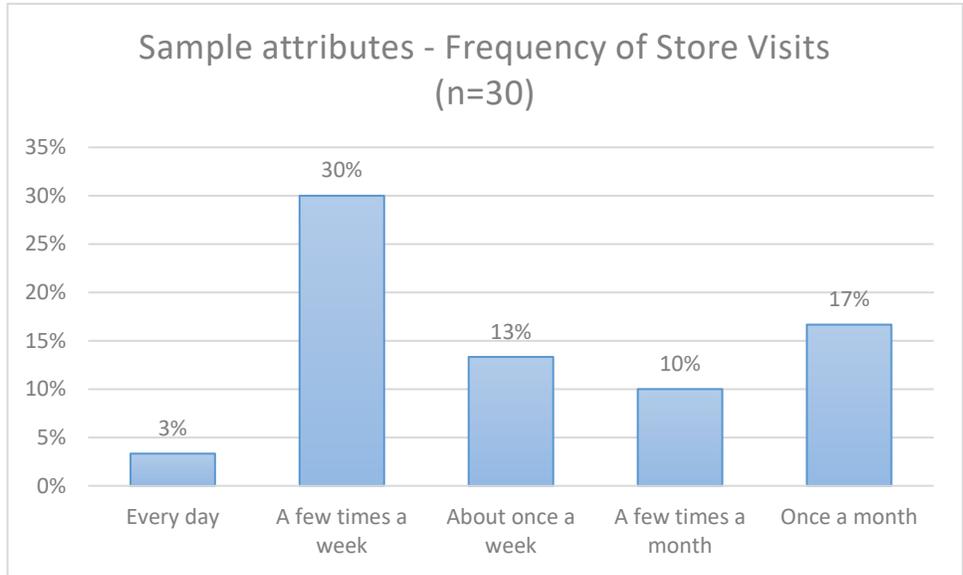
Of a total of 12 associate respondents (n=12), three-fourths (75%) were aged 18-29, 17% were aged 30-39, and 8% were aged 50-59. Respondents were also asked to provide the highest level of education they had completed. Of the 12 respondents, 8% completed a high school diploma or GED, 67% completed some college, 17% had completed an associate degree or equivalent, and 8% had completed a bachelor's degree.

Customer Intercept Surveys



Customer intercept surveys (n=30) were conducted between June 5th and June 25th on-site at one test store. LPRC researchers asked questions concerning general customer satisfaction, and then briefly explained how the InVue OneKEY Ecosystem operates. The survey then measured customers' opinions on their overall impression of the InVue OneKEY Ecosystem, as

well as its effect on their customer experience. Finally, the survey asked questions regarding customer preference for shopping in stores outfitted with the InVue OneKEY Ecosystem as compared to stores without anti-theft technology, and stores with traditional anti-theft fixtures. Customers were compensated with a \$5 gift card to a fast food establishment.



The sample of retail shoppers in this location was skewed heavily towards younger-aged college students. Overall, 63% were 18-29 years old, 27% were 30-39 years old, 7% were 40-49 years old, and 3% were 50-59 years old. Additionally, LPRC researchers asked respondents how much they spent on an individual trip, as well as how often they visited this

retail location. Results are shown above in Charts 1A and 2A.