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The Impact Of Identity Theft Victimization On The Use Of Protective Measures

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Abstract

This study examines how financial loss and other negative repercussions of identity theft victimization influence the use of protective measures. Identity theft is a major problem in the 21st century and it is recommended that people safeguard themselves by practicing personal protective behavior. However, there are relatively few studies which examine variables that affect the use of identity theft protective measures. Those that do exist ignore that most identity theft victims do not suffer any personal monetary loss or other financial problems. This is important because rational choice theory suggests the absence of consequences could lead to victims failing to modify their protective behavior, increasing their risk of future victimization. Therefore, I will investigate how the seriousness of an identity theft incident affects an individual's use of protective measures with data from the 2016 Identity Theft Supplement of the National Crime Victimization Survey. Analyses will consist of OLS regression of number of protective measures practiced by respondents and multinomial logistic regression of self-reported motivation for use of protective measures. The OLS results show victims use more protective measures than non-victims and that the magnitude of this effect is tied to the severity of the incident. Victimization has a greater impact if it occurs multiple times, if the victims lost money, or if they experienced other financial problems. However, financial losses only have an effect when they exceed $1000, which seems to mark a tipping point. The multinomial regression results confirm these findings as victims who have suffered losses or other financial problems are more likely to say they practice protective measures because of their victimization.

Keywords: identity theft, monetary loss, negative consequences, protective measures

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INTRODUCTION

Identity theft represents a major threat to both individual consumers and the economy. Its prevalence has skyrocketed to the point where it is one of the fastest growing crimes of the 21st century, leading to millions of victims and billions of dollars in financial losses (Copes et. al. 2010; Holt & Turner 2010; Harrel 2016). Nonetheless, law enforcement and other agencies are limited in their capacity to prevent these crimes. Therefore, individuals are primarily responsible for their safety by using protective measures against identity theft (Albrecht, Albrecht, Tzafrir 2011; Gilbert & Archer 2012; Reyns 2013). Yet while there is widespread concern about identity theft, use of protective measures varies considerably among the general population (Roberts, Indermaur, Spiranovicb 2013; Harrel 2019). The reasons for these individual differences are not entirely understood as there is relatively little research on what variables affect the use of identity theft protective measures.

The rational choice perspective may provide an explanation. It claims that human beings make decisions based on the costs and benefits of perceived options. They choose the option that they perceive to have the greatest net utility compared to available alternatives (Hechter & Kanazawa 1997; Matsueda, Kreagar, Huizinga 2006; Loughran et al. 2016; Hudik 2019). This calculus should apply to everyone in all contexts, including potential victims when it comes to decisions about behaviors meant to protect them against crime. They should weigh the perceived risks and costs of becoming a victim against the perceived benefits and costs of using protective measures. People base these perceptions on information from multiple sources, including personal experiences of victimization(Cook 1986; Wilcox-Roundtree & Land 1996; Anwar & Loughran 20011; Averdijik 2011; Loughran et al. 2016). Therefore, being an identity theft victim should affect whether and to what degree individuals employ protective measures against it. However, depending on the circumstances of the victimization, it may not actually be "rational" for individuals to increase their use of identity theft protective measures.

Once insurance and/or other forms of reimbursement are considered, most identity theft victims pay nothing out of pocket while institutions such as creditors take the losses (Roberts et al. 2013; Harrel 2019). In addition, several identity theft protective measures such as credit monitoring and security software can cost hundreds of dollars. Even those that do not such as checking credit reports or changing passwords require users to regularly devote time and effort to

perform them. Therefore, it may be 'rational" for individuals to risk an event which may not even harm them rather than pay the price for using protective measures. If that is truly happening, then that is rather hazardous. There is evidence that past identity theft victimization can increase the odds of becoming a victim again(Burnes, Deliema, Langton 2020). This makes it more likely that someone will be harmed in the future, be it the individual victim or institutions such as creditors. Therefore, this paper will analyze how identity theft victimization affects individual practice of protective measures. It will specifically investigate whether respondents practice more protective measures if they have victimized more than once, have lost money and/or have experienced other financial problems because of their victimization.

LITERATURE REVIEW

Identity theft was not legally recognized as a distinct type of crime within the U.S. until the late 1990s (Newman & McNally 2005; Allison, Stuart, Schuck, Lersch 2005). Before then, cases of what would currently be called identity theft were treated by law enforcement as various types of fraud. As a result, there is less research on identity theft compared to other offenses though what there is suggests that it is a multi-faceted offense. There are actually two different illegal actions that can be classified as identity theft; illegally obtaining someone's personal information and using another's personal information for illicit purposes (Gilbert & Archer 2012; Seda 2014).

While identity theft is generally associated with the internet and information technology, there are many ways offenders commit it (Reisig, Pratt, Holtfreter 2009; Roberts 2013; Ylang 2020). Scholars frequently divide identity theft offenders and their methods into two broad categories based on how they acquire personal information: low-tech and high-tech (Allison et al. 2005; Holt & Turner 2010). Low-tech offenders primarily obtain the personal information of others through physical means. Examples of these techniques include sifting through trash for intact personal documents or stealing them directly from someone's mail. Low-tech offenders actually represent the majority of identity thieves or at least those who steal the information before selling it (Allison et al. 2005; Copes & Veiratis 2009; Copes et al. 2010; Roberts et al. 2013). On the other hand, high-tech offenders rely on computers and other information technology to commit identity theft. They can employ tactics such as phishing. pretext calling, and hacking of unassuming victims (Allison et al. 2005; Lai, Li, Hsieh 2012; Reyns 2013). The

first two involve the offender tricking the victim into handing over their information voluntarily while the last is where an offender steals the information from a computer system. High-tech offenders are becoming more common as information technology becomes more prevalent. However, it is unlikely low-tech offenders will disappear any time soon.

Identity theft protection

The overwhelming majority of the U.S. population practices at least one identity theft protective measure (Harrel 2019). Yet even though most people do something, there are disparities in the number of identity theft protective measures practiced which seem to be partially linked to demographic characteristics. Most studies that include education have found that greater education is linked to greater use of identity theft and online protective measures (Milne, Labreque, Cromer 2009;Ylang 2020; Zou et al. 2020). The one study that examines race of respondents concluded that whites use more protective measures than non-whites (Ylang 2020). However, the effects of several other variables are unclear as there have been divergent results. Milne, Rohm, and Bahl (2004) and Zou et al. (2020) observed that men used more identity theft protective measures than women while Lai et al. (2012) and Ylang (2020) found the opposite. Ylang (2020) observed that older individuals were more likely to use identity theft protective measures while Milne et al. (2004) found that older individuals use fewer identity theft protective measures. Still, other studies observed that age has no discernible effect on the use of identity theft protective measures (Milne et al. 2009; Lai et al. 2012). The findings regarding the effect of income have also been inconsistent. Income has been found to have a positive relationship with the use of identity theft protective measures (Ylang 2020), a negative relationship with them (Zou et al. 2020), or no relationship at all(Milne et al. 2004; Milne et al. 2009; Lai et al. 2012). These conflicting results are probably because different authors utilized varying measures of identity theft protective behavior, analysis methods, data sources, and sample sizes. This means there is currently a sense of ambiguity surrounding what effects these variables should have on identity theft protective measures in this study.

Victimization and use of protective measures

Victims are generally more concerned about crime and take more precautions than non-victims (Cook 1986; Liska, Sanchirico, Reed 1988; Wilcox-Roundtree & Land 1996; Wilcox, Jordan, and Pritchard 2007; Averdijik 2011; Turanovic 2018). However, it is unclear if severity

of the victimization influences the size of this effect. Most studies on the effect of victimization on protective and risk-avoidance behavior only investigate the type of victimization. There do not appear to be any studies which explore financial losses or other consequences linked to the seriousness of the victimization.

There is some evidence that changes in perceptions and concern about victimization tend to be crime specific. Individuals will become more cognizant and cautious of the type of crime they experienced but not crime in general(Wilcox et al. 2007). So, it may be that possible that only identity theft victimization will influence the use of identity theft protective measures. However, not much is known on this particular topic. There are very few studies on which examine the effect of identity theft victimization on identity theft protective measures. I have only managed to locate three peer-reviewed studies and one conference paper in that vein.

Gilbert & Archer (2012) utilized principal factor analysis to see how misuse of personal information influenced protective and risk-inducing behavior. Victims of any kind of identity theft used more protective measures and were more concerned about the crime than non-victims. Nonetheless, victims tended to adopt only one new protective measure rather than multiple ones. They also found that victims of credit card fraud had lower levels of concern and used fewer protective measures than victims of other types of identity theft. However, the effects of their key independent variables were statistically significant but rather small. Gilbert & Archer speculated that this meant that concern about identity theft may not be a very good predictor of protective behaviors. In their conclusion, they asked future studies to examine perceived prevalence or seriousness of identity theft.

The next two studies also uphold the notion that victims increase their use of protective measures in response to victimization. Ylang(2020) primarily focuses on which major demographic characteristics influence use of identity theft protective measures. However, the study did include past identity theft victimization as a control. Since she used the 2014 Identity Theft Supplement of the NCVS, this meant the effect of identity theft victimization on use of protective measures could be tested using a large, nationally representative data. Ylang (2020) observed that individuals who experienced fraud related to new or existing credit card or bank accounts were much more likely to say they practiced at least one identity theft protective measures rather than do nothing.

Zou et al. (2020), observed a similar finding while also providing its own unique contribution. Respondents to an online survey were asked whether they ever adopted or partially adopted certain online security, online privacy, and/or identity theft protective measures. Respondents were also asked if they abandoned any protective measures they reported using and why. Zou et al. (2020) observed that people who experienced identity theft previously were more likely to use all three kinds of protective measures. In fact, respondents typically adopted identity theft protective measures after they received some kind of warning about the threat of identity theft such as a data breach, a lost credit card, or anomalous activity appearing on a bank/credit statement. However, the study also found that respondents were less likely to adopt identity theft protective measures compared to online security or online privacy protective measures. It may be that many identity theft protective measures required subscribing to a service and continual communication with the service, which most respondents did not want to do. Consequently, they did not adopt identity theft protective measures. That respondents did not adopt identity theft protective measures because of their inconvenience serves as evidence that individuals weigh benefits and costs of protective measures.

Li et al.(2019) is the only study that examines how the severity of identity theft victimization affects protective behavior. The study used structural equation modeling to test the indirect effects of identity theft severity. They suggested that aspects of identity theft victimization should increase the perceived severity of the victimization: amount of money lost, the number of ways information was misused, and the amount of time to resolve issues that came from it. Perceived identity theft severity in turn should influence perceived distress which will prompt individuals to change their behavior by purchasing identity theft protection services, refraining from online transactions, and/or refraining from online information disclosure. They tested this model with a sample of 197 self-reported identity theft victims gathered through an online survey. The researchers found evidence that greater financial losses, time lost, and number of ways they were victimized all contributed to greater perceived victimization severity, which increased perceived distress, which lead to respondents being more likely to use the previously mentioned protective behaviors and risk-avoidance behaviors. Though no direct relationship between aspects of identity theft victimization and behavioral changes was observed, this conclusion serves as indirect evidence that identity theft victimization severity does positively affect protective measures

In summary, most of the existing literature agrees that identity theft victimization positively impacts the use of protective measures. There are some preliminary indications that victims who experienced more severe victimizations use more protective measures than those who experienced less severe ones. However, it is still premature to call that finding conclusive as the study that obtained it utilized a very small, nonrepresentative sample. There are also facets of identity theft victimization severity that it did not investigate. It did not include a separate category for those who lost nothing from victimization. Consequently, it is currently unknown if there is a difference between identity theft victims who suffered financial losses and those who did not. Furthermore, Li et al. (2019) did not explore negative consequences of identity theft other than financial loss such as credit or bank related problems, loss of employment, etc. even though they may have similar effects as financial losses. Finally, none of the research on identity theft investigates the number of victimizations a respondent experienced. It is unclear if being a victims of identity theft multiple times has a greater effect on protective measures than being a victim only once.

THE CURRENT STUDY

The current study seeks to establish what effect financial loss, negative consequences, and number of victimizations have on protective measures. Rational choice assumes that potential victims should weigh the perceived risks and costs of being an identity theft victim versus those of adopting identity theft protective measures. People should alter these perceptions when they receive new information, including from their own experiences such as identity theft victimization. One of the most important components of risk estimation is the perceived probability that an event will occur (Anwar & Loughran 2011; Loughran et al. 2016). Individuals should increase their perceived probability that an event occurs each time they experience it and adjust their behavior accordingly. Therefore, identity theft victims should increase their use of protective measures each time they experience identity theft.

Hypothesis #1: Respondents who have been victimized will practice more protective measures than non-victims

Hypothesis#2: Repeat victims will practice more protective measures than single victims

Another component of perceived risk that factors into decision making is perceived severity of an event (Anwar & Loughran 2011). People will estimate the amount of harm an event may cause them if it happens and factor that into their efforts to prevent it. Like the probability of identity theft victimization, the perceived severity of victimization is influenced by personal experience. Identity theft victims should base their perceived severity of future identity theft victimization on the severity of previous victimizations. The more money a victim lost or other negative consequences they experienced, the more severe they will perceive future identity theft victimizations to be. Thus, they should make a greater effort to make sure they never become victims again.

Hypothesis #3: Victims are more likely to use protective measures if they have suffered greater financial losses in their last victimization.

Hypothesis #4: Victims are more likely to use protective measures if they experienced other financial problems such as credit or bank issues in their last victimization.

However, there is the possibility that financial loss may not have a linear relationship with protective measures. Zou et al. (2020) observed that both non-victims and victims of identity theft were less willing to adopt identity theft protective measures because they cost more or required more effort compared to alternatives. However, there may exist a point where the perceived potential severity of identity theft becomes large enough that an individual will increase their protective measures even if the perceived probability that it will occur are low. Economics has a term known as a reservation price. It normally represents the maximum amount someone is willing to pay for a product or service (Wang, Venkatesh, Chatterjee 2007). In this context, it represents the amount of money someone is willing to lose in a potential future incident of identity theft before loss has an effect on protective measures. Financial loss may not have an effect on protective behavior until a reservation price for potential losses of future generations are met.

Hypothesis #5: There is a non-linear relationship between loss and protective measures

The study will also investigate respondents' self-reported motives for using protective measures. The purpose of including this alternative method is to address concerns about spuriousness and simultaneity within the relationship between protective measures and identity

theft victimization. Individuals will likely practice more protective measures after victimization but people who use none or very few protective measures are also more likely to become victims in the first place. This may cause the analyses of a respondent's number of protective measures underestimate the true impact of victimization. Moreover, since the study will be using cross-sectional data, there is the issue of establishing the time order between use of protective measures and respondent victimization. By directly inquiring respondents about the reasons why they decided to use their protective measures in the first place, a stronger argument can be made that victimization caused the increase in use of protective measures.

Hypothesis #6: Victims with greater financial losses will be more likely to attribute their use of protective measures to their victimization

Hypothesis #7: Victims who experienced other financial problems will be more likely to attribute their use of protective measures to their victimization.

Finally, a secondary goal of this study is to attain a firmer grasp on the effects of demographic characteristics on use of protective measures. Therefore, I will expand upon the Ylang(2020) study as it uses an earlier version of the dataset I will use. The analyses will include the same demographic variables Ylang(2020) had as control variables. However, it will use more detailed versions of respondent race and age. Non-whites will be separated into individual races to see if all racial minorities are less likely to use identity theft protective measures than whites or if it is just certain minorities. I also plan on including a square term of respondent age in addition to a normal continuous version. After all, it is puzzling why some studies found age to have a positive effect on the use of protective measures while others observed it has a negative one. Studies that find a negative effect of age hypothesized that this was due to older individuals being less familiar with information technology and identity theft so they are less aware of the protective measures they should take(Milne et al. 2004; Milne et al. 2009). Meanwhile, studies that reported a positive effect reasoned that individuals become more cautious as they get older, so they use more protective measures(Ylang 2020). It is possible that both of these rationales are true, and age has a non-linear effect.

METHODS

DATA

This study will utilize the 2016 Identity Theft Supplement (ITS), a supplement of the 2016 National Crime Victimization Survey (NCVS). The NCVS is a cross-sectional self-report victimization survey conducted every year on the behalf of the Bureau of Justice Statistics. The target population are all individuals in the U.S. 12 years of age and above excluding those who are homeless, institutionalized, or members of the military. Every month, respondents are selected for the NCVS on a "rotating panel" basis. Households are randomly chosen and all residents ages 12 and older become part of the panel. The panel is then divided into groups or rotations which last six months where members of the household are interviewed. Respondents are interviewed a total of seven times over a three-year period with the first being face to face while subsequent interviews are conducted via telephone. Once the final interview is conducted, the household leaves the panel and a new one is rotated into the sample. The ITS is conducted every two years and it is administered at the end of select NCVS interviews using computer assisted personal interviewing (CAPI) or computer assisted telephone interviewing (CATI). However, individuals below age 16 are excluded. It contains information regarding prevalence of identity theft among respondents, their demographics, reporting patterns to law enforcement and other authorities, as well as characteristics of particular incidents such as how someone's information was obtained and the health, financial, and legal consequences of victimization. It also includes data on personal activities related to identity theft such as the use of personal protective measures, internet activity, and the possession of assets such as credit cards and bank accounts.

The study will use the 2016 version of the ITS and only that year. This iteration was chosen because it represents the most recent and publicly available version of the ITS. Moreover, it contains around 125,000 individual respondents that should include thousands of identity theft victims within it based on findings from previous years of the survey. Thus, merging it with previous years should not be necessary.

SAMPLE

There were approximately 125,000 individuals who participated in the NCVS who were initially sampled for the ITS. Of these 125,000, approximately 29,000 did not answer any of the

ITS questions because they either could not be interviewed, the respondent refused to be interviewed, the respondent did not speak English and the interviewers could not locate a suitable translator, or the interview was done by a proxy. Therefore, only approximately 96,000 observations will be included in the sample. Of these observations, any that had missing data for any of the variables used in the analyses were excluded using list-wise deletion. Once this was completed, the final sample consisted of 92,715 respondents.

MEASURES

Dependent variables

Number of identity theft protective measures: The ITS asks respondents whether they have practiced seven different identity theft protective behaviors within the last 12 months. These behaviors include: checked your credit statement; checked your credit report; shredded sensitive documents; changed passwords on financial accounts; purchased credit monitoring and identity theft insurance; used security software; or bought identity theft protection. Respondents could have answered yes or no to each. Their responses to the seven questions were added together to create number of protective measures practiced in the last year. It is a continuous variable ranging from 0 to 7.

Motivation for protective behavior: After asking whether respondents practice a specific protective measure, the survey also asks why respondents did so for each of the seven. They could have said because of identity theft victimization or for some reason unrelated to victimization. The responses to these questions were aggregated together to create this categorical variable. The answers respondents can give are: practice no protective measures, at least one protective measure due to victimization, at least one protective measure for a reasons other than victimization, or at least one for both reasons. The categories are mutually exclusive with no protective measures as the reference. Including this variable allows the study to make a stronger causal argument as it establishes a time order between victimization and use of protective measures. Moreover, this variable provides an opportunity to test the discriminate predictability of the severity of identity theft. Incidence and severity of victimization should have

much stronger positive effects on use of protective measures because of victimization than use of protective measures for other reasons.

Independent variables

Number of identity theft victimizations: The ITS asks respondents if they have ever been a victim of identity theft in the 12 months before the survey or at any point previous to the last 12 months. A respondents is counted as a victim of identity theft if: someone used their personal information to run charges on or take money from existing credit card; bank; medical insurance; telephone; utility; online payment; investment; online shopping; entertainment; email; government program; social media; tax; and/or insurance accounts; open new accounts(any previously listed); file fraudulent tax returns; get medical treatment; apply for a job; provide false information to police; rent an apartment or house; apply for government benefits; obtain goods or services; hack into respondent's email address or obtain cash. It is a categorical variable coded as not a victim, single victim, and repeat victim. A respondent is a repeat victim if they have experienced identity theft on more than one occasion in the past 12 months or once in the past 12 months and during the previous period. Never a victim is the reference category when the whole sample is used while single victim is the reference category when only victims are considered.

Financial loss from identity theft victimization: The total amount of money a respondent paid out of pocket because of identity theft victimization. It is a categorical variable coded as $0(the reference), $1-50, $51-100, $101-500, $501-1000, $1001-4999, and $5,000+. For victimizations that occurred in the last 12 months, ITS respondents were asked to estimate how much they personally lost from their victimization as well as certain additional out-of-pocket costs they may have incurred. If multiple incidents of identity theft occurred during the past 12 months, the most recent was used. For victimizations that occurred before the last 12 months, respondents were asked about total out-of-pocket costs of all incidents that occurred during that time. The losses from both periods were then added together. If a respondent reported being a victim but the ITS recorded them as out of scope rather than they did not know or refused to answer, they were counted as having suffered $0 losses. This makes logical sense given that respondents were asked to exclude losses that were covered by third parties, that most victims suffer no personal losses, and the lack of an alternative explanation for why the losses of many victims were listed as out of scope rather than they did not remember or refused to answer. While some readers may

question the grounds for this assumption, it ultimately does not make much of a difference. This assumption was tested where instead of out of scope losses being treated as $0, the losses were treated as missing data. In analyses not presented, I treated out of scope responses as missing data. The results were similar to those I present.

Other financial problems: The ITS asks the respondents whether they ever experienced certain harmful by-products of identity theft victimization other than monetary loss during the past 12 months or the period before that. These problems include: credit-related problems; banking-related problems; having been contacted by debt collectors; having utilities cut-off or a new service denied; having been turned down or lost a job; had legal issues; been subject to criminal arrest or proceedings; and/or had income tax issues. Though respondents may answer whether they have been subject to each individual problem, the fact such a small number of the sample have experienced them necessitates aggregating them together. The variable is coded as a simple yes or no.

Control variables

Type of identity theft experienced: The type of identity theft a victim experienced. It is a categorical variable coded as existing credit card, existing bank account fraud, fraud involving another existing account, creation of a new fraudulent account, identity theft for another purpose, or multiple kinds of identity theft. Existing credit card fraud is the reference category.

Race: The racial group the respondent identifies with is a categorical variable coded as Whites, Blacks, Asians, Native-Americans, and Hispanics. Hispanics are treated as separate from other racial categories even if they technically describe themselves as Hispanic-White etc. Those who describe themselves as mixed race were placed in one of the aforementioned categories based on what racial group they identified as first. Those who report they belong to more than two racial groups were counted as missing.

Gender: The gender orientation the respondent identifies with is a dichotomous variable coded as female(0) and male(1).

Household income: The annual income of the respondent's household. It is a categorical variable coded as under $10,000, $20,000 to $29,999, $30,000 to $39,000, $40,000 to 49,000, $50,000 to $74,999, and $75000. Under $10,000 is the reference category.

Years of education: A continuous variable that ranges from 0-22.

Age: the respondent's age as allocated by the survey. It is a continuous variable that ranges from 16 to 90+

Age squared: the square of the respondent's age

ANALYSIS

The analyses consist of three parts. The first is an OLS regression of number of protective measures which only contains victimization status and demographic characteristics. The second analysis is an OLS regression of number of protective measures that adds various facets of identity theft severity such as financial loss, other financial problems, and type of identity theft. The last one will consist of a multinomial logistic regression of motivation for use of an identity theft protective measure using all variables. The first analyses will use the whole sample while the latter two will employ a sub-sample consisting of identity theft victims because variables such as financial loss and type of identity theft only apply to that group.

Results

Table 1: Descriptive Statistics

Number of protective measures	Freq.	Percent
Mean	2.698948	
S.D.	1.649677	
Motive for protection		
No protective measures	10,695	11.54
At least one for other reasons	72,006	77.66
At least one due to victimization	4,286	4.62
At least one for both reasons	5,728	6.18
Victimization		
Not a victim	73,103	79
Single victim	16,949	18
Repeat victim	2,663	3
Loss from identity theft		
$0	18,157	92.6
$1-$50	531	2.71
$51 - $100	159	0.81
$101 - $500	274	1.4
$501 - $1000	149	0.76
$1001 - $4999	178	0.91
$5,000 or more	159	0.81
Other financial problems		

No	18,942	96.7
Yes	646	3.3
Type of id theft		
Existing bank account	5,972	30.46
Existing credit card	9,323	47.56
Other type of existing account	1,013	5.17
New fraudulent account opened	1,322	6.74
Misuse for other purpose	1,599	8.16
Multiple types of identity theft	374	1.91
Gender		
Male	49,335	53.21
Female	43,380	46.79
Race		
White	66,680	71.92
Black	9,647	10.41
Asian	3,991	4.3
American	534	0.58
Hispanic	11,863	12.8
Income		
<$10,000	5,341	5.76
$10,000-19,999	8,844	9.54
$20,000-29,999	9,594	10.35
$30,000-39,999	10,761	11.61
$40,000-49,999	9,002	9.71
$50,000-74,999	16,729	18.04
$75,000+	32,444	34.99
Age		
Mean	49.29507	
S D.	18.2963	
Years of education		
Mean	14.57461	
S.D.	2.937269	

Source: 2016 ITS

The goal of the ITS, like the greater NCVS, is to obtain an accurate illustration of patterns in crime victimization from nationally representative data. Based on table 1, it appears that goal has been met. The demographic composition of the sample is generally consistent with the composition of the overall U.S. population, at least in regard to age, race, education, household income, and gender. Any minor variations can be rectified by utilizing the weights included in the data. The number of people who report an identity theft victimization reinforces that it is a serious problem. Over 20% of the sample reports being an identity theft victim at some point, though repeat victims appear to be quite rare. Most identity thefts involve the

fraudulent use of existing credit card or bank accounts. However, many of these victimizations are relatively minor. Only a small minority of identity theft victims reported any personal financial losses or other negative consequences as a result of identity theft. This may be part of the reason why the mean number of protective measures respondents practiced is 2.69, which is relatively low. Moreover, those who practice protective measures are more likely to say they do for reasons unrelated to identity theft.

Table 2: OLS regression of # of protective measures

Number of protective measures	Coef.	Std. Err.
Victimization		
Single Victim	0.67***	0.01
Repeat victim	0.95***	0.03
Male	-0.05***	0.01
Age	0.07***	0.001
Age squared	-0.0007	0.00001
Race		
Black	-0.37***	0.02
Asian	-0.55***	0.02
Native American	-0.29***	0.06
Hispanic	-0.49***	0.02
Income		
$10,000-19,999	0.05	0.03
$20,000-29,999	0.26***	0.02
$30,000-39,999	0.40***	0.02
$40,000-49,999	0.52***	0.03
$50,000-74,999	0.68***	0.02
$75,000+	0.78***	0.02
Years of education	0.12***	0.002

*p<.05, ** p<.01,*** p<.001 All coefficients are rounded to 3rd Significant decimal except for age squared.

The coefficients from table 2 suggest that victimization does positively impact the use of protective measures. Controlling for demographic characteristics, victims of a single identity theft incident practice .67 more protective measures on average than nonvictims. This effect is even stronger for repeat victims who practice .95 more protective measures than non-victims. Therefore, it appears both Hypotheses #1 and #2 have been supported by the results. The effects of demographic characteristics are mostly in line with what Ylang(2020) found. White respondents use more protective measures than respondents of any racial minority. Female respondents use slightly more protective measures than men. Lastly, education has an especially

strong positive effect on use of protective measures. However, there are also findings that were not reported in Ylang (2020). Income has a positive, substantial, and statistically significant linear effect that is independent of education.

Yet it is the results about age that are probably the most interesting. The main effect of age indicates that people use more protective measures as they get older while the square of age implies this positive influence grows weaker as respondents get older. However, it actually goes further than that. Figure 1 is based on the predicated probabilities of a respondent's number of protective measures across age while holding all other variables constant. It shows that the number of protective measures practiced peaks between the ages of 40 and 60 until the predicted number of protective measures starts to decline. This continues until there is only a small difference between those under 20 and over 90. Consequently, age does in fact have a non-linear relationship with use of protective measures.

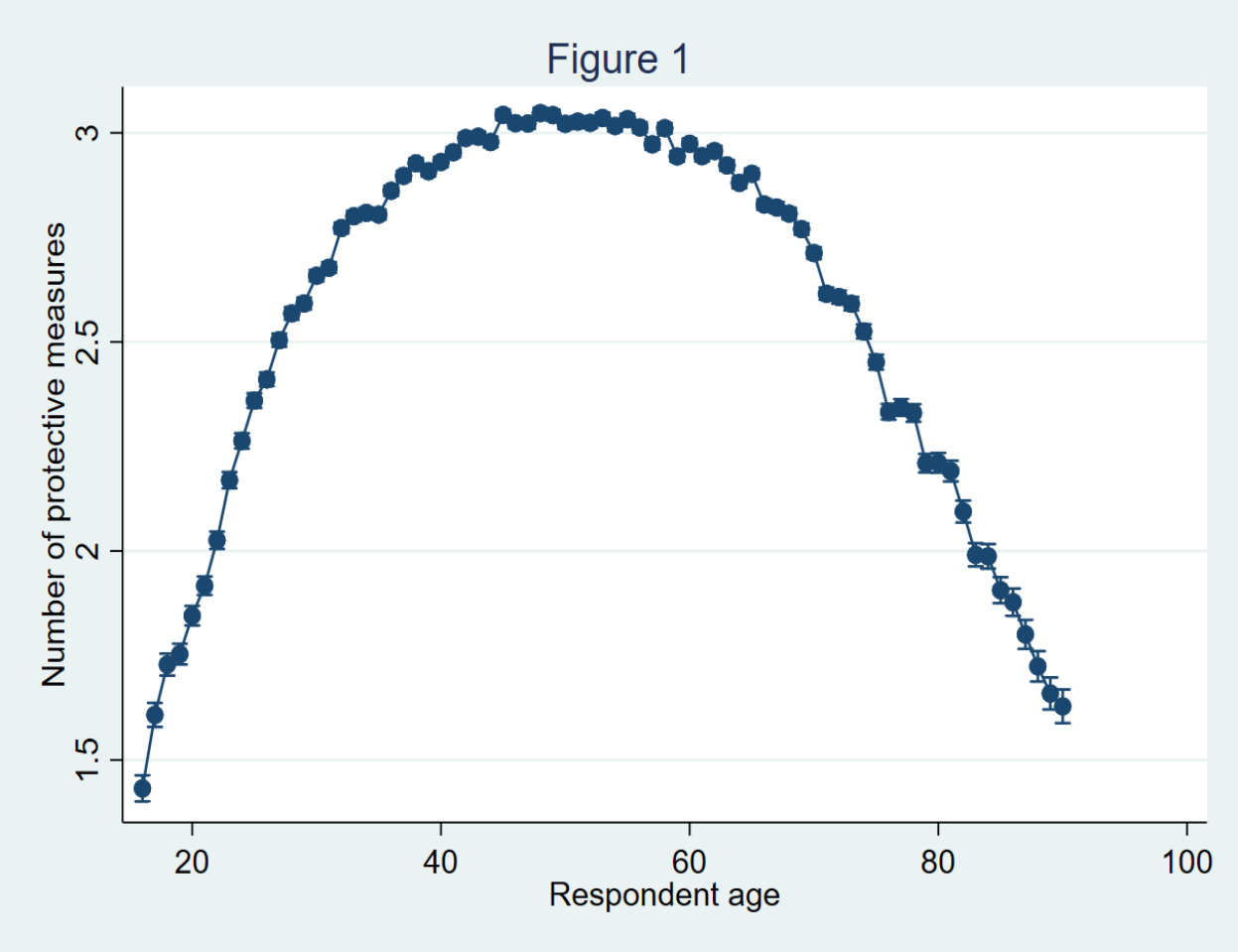

Table 3: OLS regression of # of protective measures for victims

Number of protective measures	Coef.	Std. Err.
Victimization (ref. single victim)		
Repeat victim	0.30***	0.03
Losses from victimization (ref. $0)		
$1-$50	-0.05	0.06
$51 - $100	-0.11	0.11
$101 - $500	-0.02	0.09
$501 - $1000	-0.03	0.12
$1001 - $4999	0.46***	0.11
$5,000 or more	0.48***	0.12
Other financial problems	0.13*	0.06
Type of identity theft (ref. existing bank theft)		
Existing credit card	0.07*	0.02
Other type of existing account	0.12*	0.05
New fraudulent account opened	0.14**	0.04
Misuse for other purpose	0.04	0.04
Multiple types of identity theft	0.07	0.08
Race (ref. white)		
Black	-0.08	0.04
Asian	-0.34***	0.06
Native American	-0.24*	0.14
Hispanic	-0.24***	0.04
Male	0.03	0.02
Age	0.05***	0.004
Age squared	-0.0005***	0.00004
Income (ref. less than $10,000)		
$10,000-19,999	0.09	0.07
$20,000-29,999	0.33***	0.07
$30,000-39,999	0.50***	0.06
$40,000-49,999	0.65***	0.07
$50,000-74,999	0.73***	0.06
$75,000+	0.84***	0.06
Years of education	0.06***	0.004

*p<.05, ** p<.01,*** p<.001 rounded to 3rd significant decimal except for age squared

Table 3 shows the severity of identity theft does matter when it comes to the number of protective measures a respondent uses. However, financial loss has a non-linear effect on number of protective measures practiced. There is not a substantial difference in use of protective measures between victims who lost nothing and those who lost less than $1000. Once that threshold is passed, financial losses have substantial positive effect on number of protective measures. Consequently, Hypothesis #3 has not been supported while Hypothesis #5 has. This

contradicts previous research because while it did not specifically test for linearity, the results suggested that the effect of financial loss was linear. Meanwhile, financial problems other than loss have a positive and statistically significant effect on number of protective measures practiced. Victims who have experienced them use .15 more protective measures than those who do not. Therefore, Hypothesis #4 has been supported. Finally, number of victimizations still has substantial positive effect on number of protective measures when variables of identity theft severity are included. Repeat victims still use more protective measures than single victims.

As for the control variables, most of the demographic effects observed in table 2 are still present albeit smaller in size. However, the type of identity theft has been included and it has yielded some interesting results that validates and contradicts previous research. It seems identity theft victimizations involving existing credit cards have smaller effects on number of protective measures than other types of identity theft which is in line with Gilbert and Archer (2012). However, while these effects are mostly statistically significant, most of them are not truly substantial.

Table 4: Multinomial regression of motivation for protection among victims

Victims only	**Coef.**	**S.E.**
No protective measures (base category)		
Due to victimization		
Victimization (ref. single victim)		
Repeat victim	1.70***	0.33
Losses from victimization (ref. $0)		
$1-$50	0.60	0.31
$51 - $100	1.97	1.02
$101 - $500	0.55	0.44
$501 - $1000	0.10	0.41
$1001 - $4999	0.90*	0.45
$5,000 or more	1.67*	0.74
Other financial problems	0.48	0.27
Type of id theft (ref. existing bank theft)		
Existing credit card	0.03	0.15
Other type of existing account	-0.29	0.25
New fraudulent account opened	-0.04	0.2
Misuse of information for other purpose	-0.53**	0.17
Multiple types of identity theft	-0.44	0.68
Male	-0.27*	0.11
Age	0.05*	0.02
Age squared	-0.0004*	0.0002
Race (ref. white)		

Black	-0.24	0.18
Asian	-0.70*	0.29
Native American	-0.23	0.52
Hispanic	-0.32	0.16
Income (ref. less than $10,000)		
$10,000-19,999	0.40	0.22
$20,000-29,999	0.87***	0.24
$30,000-39,999	1.07***	0.24
$40,000-49,999	1.44***	0.28
$50,000-74,999	1.39***	0.23
$75,000+	1.48***	0.22
Years of education	0.17***	0.02
For other reasons		
Victimization (ref. single victim)		
Repeat victim	0.85**	0.32
Losses from victimization (ref. $0)		
$1-$50	-0.08	0.31
$51 - $100	1.32	1.02
$101 - $500	-0.22	0.43
$501 - $1000	-0.95*	0.42
$1001 - $4999	-0.75	0.47
$5,000 or more	0.31	0.75
Other financial problems	-0.52	0.28
Type of id theft (ref. existing bank theft)		
Existing credit card	0.33*	0.14
Other type of existing account	-0.19	0.24
New fraudulent account opened	-0.34	0.2
Misuse of information for other purpose	-0.66***	0.16
Multiple types of identity theft	-0.52	0.67
Male	-0.15	0.11
Age	0.01	0.02
Age squared	-0.0001	0.0002
Race (ref. white)		
Black	-0.53**	0.17
Asian	-0.95***	0.28
Native American	-0.63	0.5
Hispanic	-0.66***	0.16
Income (ref. less than $10,000)		
$10,000-19,999	0.28	0.2
$20,000-29,999	0.83***	0.22
$30,000-39,999	1.18***	0.23
$40,000-49,999	1.48***	0.27
$50,000-74,999	1.45***	0.22
$75,000+	1.54***	0.2
Years of education	0.17***	0.02
Multiple reasons		

Victimization (ref. single victim)		
Repeat victim	1.68***	0.33
Losses from victimization (ref. $0)		
$1-$50	0.19	0.32
$51 - $100	1.81	1.02
$101 - $500	0.64	0.43
$501 - $1000	-0.34	0.43
$1001 - $4999	0.43	0.46
$5,000 or more	1.11	0.75
Other financial problems	0.27	0.28
Type of id theft (ref. existing bank theft)		
Existing credit card	0.13	0.15
Other type of existing account	-0.23	0.25
New fraudulent account opened	-0.29	0.2
Misuse of information for other purpose	-0.68***	0.17
Multiple types of identity theft	-0.73	0.68
Male	-0.15	0.11
Age	0.03	0.02
Age squared	-0.0004	0.0002
Race (ref. white)		
Black	-0.43**	0.18
Asian	-0.75**	0.28
Native American	-0.51	0.53
Hispanic	-0.64***	0.17
Income (ref. less than $10,000)		
$10,000-19,999	0.08	0.22
$20,000-29,999	0.80**	0.24
$30,000-39,999	1.06***	0.24
$40,000-49,999	1.49***	0.28
$50,000-74,999	1.51***	0.23
$75,000+	1.59***	0.22
Years of education	0.20***	0.02

*p<.05, ** p<.01,*** p<.001 rounded to 3rd significant decimal except for age squared

Table 4 shows results of the multinomial regression of motivation for use of protective measures. It largely upholds earlier conclusions reached from the OLS regressions though there are some noticeable departures. The first panel compares victims who only practice protective measures after they became identity theft victims to those who did not use protective measures. The results suggest that victimization severity matters for these individuals. Repeat victims are much more likely than single victims to practice identity theft protective measures after victimization versus doing nothing. Victims who experienced other financial problems are more likely to use protective measures because of victimization, although the effect is not statistically

significant. Hypothesis #7 has been supported. However, the effects of financial loss are somewhat inconsistent with the results from Table 3. Consistent with Table 3, victims are much more likely to say they use protective measures because of victimization when they experienced financial losses of over $1,000. However, contrary to the earlier results, financial losses of $1-100 also seem to make respondents substantially more likely to use protective measures because of victimization. This is problematic because if only financial losses exceeding $1000 had an effect, that would be further evidence towards the existence of a tipping point as observed in the OLS. Yet these results suggest that both very large and very small losses seem to make victims more likely to practice protective measures because of victimization. Nevertheless, the effect still does not appear to be linear. Therefore, hypothesis #6 has not been supported.

The second category, at least one measure for other reasons, contains victims who practiced protective measures prior to identity theft victimization and did not change their protective measures because of it. These respondents were meant to examine the discriminate predictability of the multinomial regression: Incidence and severity of victimization should have much weaker positive effects(or none at all) on use of protective measures for other reasons. The results seem to support this. Financial loss from identity theft victimization does not have a discernible effect on using protective measures for other reasons versus doing nothing. Furthermore, victims who suffered other financial consequences are less likely to use protective measures for other reasons versus doing nothing. Repeat victimization has a substantial positive effect on use of protective measures for other reasons, which is surprising. However, it is much smaller than the effect of repeat victimization for victims who only practice protective measures because of victimization.

The last category, at least one measure for both reasons, contains victims who practiced protective measures prior to victimization and adopted more after their victimization. The study did not have any expectations for these victims. Repeat victims are much more likely to use protective measures for both reasons versus doing nothing. Other financial consequences have a substantial positive effect even though it is not statistically significant. On the other hand, financial losses to do seem to have less of an impact here compared to victims who only practice protective measures because of victimization. Losses from victimization have no discernible effect for victims who practice protective measures for both reasons.

Finally, the effects of the demographic control variables in the multinomial regression are generally consistent with the OLS regression results.

Supplemental analyses

This study conducted a number of supplementary analyses which intended to answer some lingering questions readers may have. The first was if the impact of identity theft victimization and its consequences on protective behavior varied across respondent; race, gender, age, education, and household income. I found no evidence of any substantial interactions among any of these variables. Second, some readers may notice that the effect of other financial problems is relatively small compared to financial loss when both are included in the regression equation. However, this is no indication they are alternative measures of each other. Granted, the two measures are substantially correlated with each other, so I ran separate OLS regressions where one of the variables was excluded. It became apparent that they did eat into the effect of the other as the coefficient sizes of both increased slightly when the other was absent. Nevertheless, both variables maintain substantial and statistically significant effects when they are both included in the analyses. Therefore, there is merit in including both financial loss and other financial problems as separate variables.

Discussion

Identity theft is a major concern that affects millions of people each year and causes billions of dollars in financial losses. Police and other institutions are limited in their capacity to safeguard individuals from these crimes, so people are often responsible for protecting themselves. Surveys show there are noticeable disparities in knowledge and use of protective measures, but the current literature has been unable to fully explain them. Rational choice theory could clarify things to some degree. Based on the assumptions of the theory, individuals should base their use of protective measures on their self-perceived risk of victimization. The results from the current study seem to support that. Victims use more protective measures than non-victims. The effect of victimization is even stronger when identity theft occurred multiple times, they lost over $1000, and/or faced other financial problems. Furthermore, certain victims are more likely to practice protective measures because of their victimization when they experienced either financial loss or other financial problems. Consequently, this study uncovers evidence that

incidence of victimizations and the severity of their consequences play a role in a victim's use of protective measures.

These findings have implications for rational choice theory and how it may be applied to future research into victimization. Rational choice suggests that victims change their behaviors after victimization because they increase their estimations of being victimized and the costs associated with it. Victimization has a consistently positive and substantial effect on the use of protective measures, especially when it happens more than once. This can be interpreted as evidence that victims increase their estimations of becoming an identity theft victim, so they take more measures to prevent it. These findings on repeat victimizations are very much in line with rational choice theory. However, the implications for the effect of victimization severity are more complicated. The impact of other financial problems has been consistent; victims who have experienced them are more likely to use protective measures than those who did not. The findings for financial loss are not as consistent. The OLS regressions suggest that the effect of financial loss on protective measures is non-linear as only losses exceeding $1000 lead to victims using more protective measures. This suggests the existence of a tipping point around that amount. However, the results from the multinomial regression conflict with that. Both losses from $1-100 and losses over $1000 made victims more likely to practice protective measures because of victimization. Both analyses agree that large losses (over $1000) increase the use of protective measures while there is conflicting evidence on whether small losses($1-100) increase the use of protective measures. Consequently, while it is likely that financial loss from identity theft victimization increases the use of identity theft protective measures, it is uncertain what amount of loss is necessary to trigger the effect.

There are several ways future research can expand upon the present findings. This study treated all protective measures equally even though that is probably not the way they are viewed by most people. While all protective measures require some kind of input, some cost considerably more than others. It is cheaper to check credit statements and credit reports than it is to purchase identity theft protection or credit monitoring services. A subsequent study could potentially break down protective measures into different groups based on their relative cost and prevalence to see if financial loss and other negative consequences make victims more likely to adopt some types of protective measures over others. In fact, future studies can go even further

than that. The protective measures the ITS asked about are not the only forms of individual behavior that affect the risk of identity theft. Certain routine behaviors can increase an individual's exposure to identity theft such as shopping online or giving out personal information on websites or over the phone. Previous research on identity theft has found evidence that victimization does affect these behaviors to some degree. However, they were not included in the current study because they are not behaviors performed for the sole purpose of protection from identity theft. Moreover, the ITS does not possess much information about them. Subsequent studies can check if financial losses, other financial problems, or other negative consequences affect routine activities which affect exposure to identity theft.

Future studies could also compensate for some of the limitations of the current work. The above analyses only capture protective measures used during the last 12 months before the survey. The ITS does not have information on protective measures used during the time before that. This means it cannot control for how victimization during that period affects use of protective measures or vice-versa. However, it should not be a major issue because any effects found for use of protective measures in the past 12 months should generalize to any point in time. The other noteworthy limitation is that respondent self-control was not included in the analyses. Self-control has the potential to be a significant confounder because it may be associated with both the independent and dependent variables of the current study. Self-control can influence the degree to which individuals devalue costs and risks of events that occur in the future. Consequently, individuals with low self-control may be less inclined to practice protective measures. Moreover, individuals with low self-control may have a greater likelihood of becoming identity theft victims because they more willing to engage in risky behavior. Unfortunately, self-control could not be included in these analyses because the ITS does not have information on self-control or the personality characteristics it is linked to.

In spite of these limitations, the study has made clear contributions to the field of identity theft research. The observation that age may have a curvilinear effect on use of protective measures has never been reported before. It can help reconcile the disagreement within the literature about whether age has a positive or negative effect. The finding on age also identified that both very old and very young individuals practice relatively few protective measures, which puts both at higher risk of identity theft. More importantly, the study has found evidence that

rational choice can be used to partially explain an identity theft victim's response to victimization. The more times respondents experience identity theft, the more protective measures they will use. Therefore, victims respond to the incidence of victimization in a rational way. However, the effect of victimization severity is more complicated. The OLS and multinomial regression agree on the positive effect of other financial problems while they are inconsistent on the effect of financial loss. The OLS regressions imply that financial loss has a positive but non-linear relationship with number of protective measures which hints at the existence of a reservation price or a tipping point. The multinomial regression suggests that financial losses below the tipping point identified in the OLS regressions also make victims substantially more likely to use protective measures after victimization. Ergo, while financial loss does increase the use of protective measures in at least some cases, it is uncertain to what degree victims respond to it rationally. Therefore, future research should further explore how rational choice theory can be used to predict responses to victimization. It should attempt to parcel out what degree of financial losses leads to changes in victim behavior. Finally, future research should analyze what effect other facets of victimization severity have.

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