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Official Crime Rates and Residents' Sense of Security Across Neighborhoods in Tokyo, Japan

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Introduction

From the end of World War II to 1980, the number of annual crimes reported in Japan ranged between 1.3 and 1.5 million. However, crime began to surge in 1995, a year in which 6,434 people lost their lives in the Great Hanshin Earthquake and a sarin gas attack was carried out on the Tokyo subway. These events, coupled with a general mood of stagnation following the bursting of the “economic bubble,” led to a sudden drop in the nation’s sense of security. Reported crimes reached a peak of 2.85 million in 2002 (Ministry of Justice 2014), and in September 2003, the Ministerial Conference on Measures against Crimes, which comprises all cabinet members and is led by the Prime Minister, was established to formulate an “Action Plan for Realizing a Powerful Society against Crime.” This action plan intended not only to reduce crime, but also to improve citizens’ sense of security (Hino & Schneider 2013). As a result, by 2012, the number of reported crimes had decreased to less than half the peak number reported in 2002. Japan has a lower crime rate (number of recorded crimes per 100,000 people) for homicide and theft than France, Germany, the UK and the US. The theft rate in Japan is less than one-third that of the US, while the homicide rate is around one-sixth (Ministry of Justice 2014).

However, the nation’s sense of security with regard to crime remains low. In an opinion poll conducted by the Cabinet Office in 2012, 3,000 members of the general public aged 20 years and over were asked, “How do you rate public security in Japan now compared with 10 years ago?” In spite of the fact that crime had decreased by half, more than 80% of the respondents selected “worse” or “rather worse” (Cabinet Office 2012). Therefore, as part of the political

agenda in Japan, improving citizens' sense of security seems to be just as important as reducing crime. Another opinion poll conducted annually by the Tokyo Metropolitan Government asks 3,000 members of the general public aged 20 years and over to select five among 28 separate political agendas that should be ranked highest in terms of priority. For 7 consecutive years between 2004 and 2010, "crime prevention" was identified as the highest-priority issue for the government. Although "disaster prevention" has been consistently ranked as the highest-priority issue since the Great East Japan Earthquake in 2011, "crime prevention" was identified as the second highest (48%) in 2014, outpacing both "medical care and sanitation" and "public finance" (Tokyo Metropolitan Government 2014). However, Hiroshi Kubo, a retired manager of the Office for Youth Affairs and Public Safety of the Tokyo Metropolitan Government, suggested that the government takes advantage of this weakening sense of security in order to promote policies that favor the government, and that the lowered sense of security reflects factors other than crime (Kubo 2006). In other words, the boundary between sense of security and other kinds of anxiety and concern has become blurred (Sparks et al. 2001). Therefore, whether the actual crime rate in the real world affects sense of security among residents remains unclear.

To address this issue, it is first necessary to distinguish "sense of security" from "fear of crime." "Sense of security" (or "perceived crime"), a cognitive judgment, is fundamentally different from fear, which is more affective or emotive in character (Ferraro 1995). Although females and older persons typically have more fear of crime (Zhao et al. 2015), individual attributes affect fear of crime and sense of security differently (for example, see LaGrange &

Ferraro 1989). Rountree and Land (1996a) pointed out similarities between fear of crime and perceived risk, such as a positive association with neighborhood incivility, but also dissimilarities such as neighborhood integration, which has a negative association with perceived risk and a positive association with fear of burglary. In relation to spatial scale, risk perception varies across tracts and neighborhoods, while burglary-specific fear varies only across neighborhoods (Rountree & Land 1996b). Similarly, Hinkle (2015) reported that while physical disorder in a neighborhood appears to serve as a visual cue that helps residents determine their level of safety, it does not appear to drive an emotional fear of crime, and Skogan (1990) reported that the relationship between disorder and fear was not significant when controlling for crime conditions.

Many studies have investigated the relationship between fear of crime and objective crime, but relatively few have investigated the relationship between perceived and objective crime. Among these, Wilcox et al. (2003) examined the effects of the built environment on subjective community crime risk, Drakulich (2013) predicted perceived crime with observed disorder, and Russo et al. (2013) reported that a high crime rate had a positive effect on perception of crime risk. In addition, Hipp (2007b, 2010b) investigated the relationship between official crime rates and residents' perception of crime in census tracts over a 25-year period, and found that residents' perception of crime was most strongly related to official rates of violent crime. However, because all of these studies were based on a large scale sampling units such as census tracts, likely because of data constraints, more attention should be paid to the appropriate level of aggregation when estimating neighborhood effects (Hipp

2007a), and relevant neighborhood size and boundaries should be determined to test specific theories that could inform area-based policy (Lupton 2003). One such example is the study by Brunton-Smith and Sturgis (2011), which focused on the Crime and Disorder Reduction Partnership.

Some factors other than objective crime have been reported to affect sense of security or perceived crime. The first such factor is social capital, which has been shown to have a significant positive relationship with sense of security¹. Based on responses to a public health survey in Malmo, Sweden, Lindström et al. (2003) suggested that neighborhood social capital, measured as electoral participation, partially explained an individual's sense of security. Sampson et al. (1997) focused on collective efficacy, a measure of "informal social control" and "social cohesion and trust" similar to social capital, and showed that it was strongly negatively associated with perceived violent crime, even after controlling for social composition. Hirschfield and Bowers (1997) reported finding lower levels of crime in disadvantaged areas with high levels of social cohesion, and Messner and Baumer (2004) found that there was a reciprocal relationship between social trust and homicide rates; these studies suggest that social capital even affects actual crime rates. In Japan, social capital has been shown to affect local capabilities of disaster management (Maruo 2012) and progress toward sustainability (Kusakabe 2013). The present study is expected to add important information regarding the effects of social capital on sense of security in Japan.

A second factor is the mass media². Mohan et al. (2011) reported that newspaper readership had a strong association with perceptions of national crime rates, and created a gap between

perceptions of national and local crime rates. Lowry et al. (2003) reported that television news had a four-fold greater effect than actual crime rates on public perception of crime. In addition to the mass media, police and municipalities frequently disclose crime statistics to the public, and these reports may cause an information gap and lead to a substantial difference in sense of security based on individual attributes.

A third factor is the spatial scale for aggregation, as noted above³. Hanyu et al. (2009) reported that sense of security is influenced not only by individual attributes, but also by a “scale bias.” In other words, sense of security at the city or prefectural level is perceived to be worse than that at the neighborhood level, and that at the national level is thought to be even worse. This suggests that sense of security at the metropolitan or national level is separate from that at the neighborhood level. A scale bias was observed in a survey conducted on 2,028 Japanese adults by the Nikkoso Foundation for Safe Society in 2014. In that survey, around 70% of the respondents answered that security in their neighborhood had “remained constant,” whereas more than 50% answered that security in Japan had “worsened” (Nikkoso Foundation for Safe Society 2015). Duffy et al. (2008) also pointed out that people were generally much less pessimistic about local than national crime rates. Additionally, sense of security affected neighborhood satisfaction when aggregated to the micro-neighborhood, but not when aggregated to census tracts (Hipp 2010a).

The final factor is nationality. Quillian and Pager (2001) confirmed the presence of a relationship between neighborhood racial composition and residents’ perception of crime after controlling for crime rates and other neighborhood characteristics. Although race can be

an important factor in relation to perception of crime, Japan is a racially homogeneous country. Therefore, in this study, instead of racial composition, we focused on characteristics specific to the Japanese. Using data obtained from General Social Surveys conducted in the US and Japan, Sakaguchi (2008) pointed out that a higher risk of crime was perceived among younger people and those in higher economic and educational classes in Japan; these characteristics are specific to the Japanese.

Based on these studies, the aim of the present study was to explain residents' sense of security with official crime rates (objective crime), individual attributes, and social capital at the neighborhood level in the 23 special wards of Tokyo⁴. To achieve this, we have formulated the following three hypotheses:

1. Official crime rates are related to residents' sense of security in their neighborhood, and the relationship at the neighborhood *cho* (a basic administrative area in Japan usually consisting of a few city blocks) level is different from that at the larger (school district) level due to a scale bias⁵.
2. The relationship between residents' sense of security and official crime rates differs depending on individual attributes such as sex and age. Namely, residents of any sex or age group can be more sensitive to actual crime rates.
3. Social capital is related to sense of security. In addition, official crime rates are related to residents' sense of security in their neighborhood, even when controlling for individual attributes and social capital.

The uniqueness of the present study is as follows: we investigated the relationship between

residents' sense of security (not "fear of crime") and official crime rates in consideration of a scale bias, individual attributes, and social capital; we treated various crimes separately and aggregated them into two spatial scales corresponding to areas of safety activities; and, while most previous studies have targeted cities in the US or EU, we focused on Tokyo, a city in Asia with a low crime rate. A summary of the variables used in the present and previous studies to investigate the relationship between fear/perception of crime and objective crime is shown in Table 1.

Data

Sense of security at the neighborhood level was based on responses to an item regarding satisfaction with "security and crime prevention" of the living environment in a questionnaire survey (Jyu-seikatsu Sogo Chosa [Comprehensive Survey on Housing Life]) conducted by the Ministry of Land, Infrastructure, Transport and Tourism in 2008. The objective of that survey, which comprises a home-visit questionnaire and is conducted every 5 years, is to obtain basic information for designing policies on residence and living environments. Samples are selected from households all over Japan using two-stage stratified random sampling. In the 2008 survey, questionnaires were distributed to 96,845 households in late November and collected from 83,292 in early December.

Neighborhood social capital was assessed by respondents' satisfaction with "interaction with neighbors and the community" from the same questionnaire. The Organization for Economic Co-operation and Development (OECD; 2007) defined social capital as "networks together

with shared norms, values and understandings that facilitate co-operation within or among groups” and rephrased it as “real-world links between groups or individuals.” Therefore, we thought responses to this question could be regarded as a proxy variable for social capital. These two questions were answered by 2,413 households in 511 of 3,140 neighborhoods (and in 434 of 851 school areas) in the 23 special wards of Tokyo.

Official crime rates in the neighborhoods of the respondents were based on the natural logarithms of numbers of felonies (homicide, robbery, arson and rape), violent crimes, home burglaries and non-burglaries (theft of/from motor vehicles and purse snatching)⁶ per 10,000 people plus one. The numbers of crimes were based on the total number of crimes reported by the Metropolitan Police Department from 2006 to 2008 and arranged by Amemiya and Iwakura (2012). The populations were based on the average values for the same 3 years (as of January 1) in the residential basic book system of the Tokyo Metropolitan Government.

Methods

(1) Sense of security and scale bias

The Kruskal-Wallis test was used in place of one-way analysis of variance because the data of official crime rates did not show a normal distribution. All respondents were divided into four groups based on sense of security, and then ranked by the crime rates in their neighborhood and school district. To identify differences among groups, we compared the median ranks and then conducted post-hoc analysis using the Mann-Whitney U test with Bonferroni correction.

(2) Association with individual attributes

The Kruskal-Wallis test was used to compare median ranks according to sex and age. Based on the results of (1), the crime rate at either the neighborhood or school district level was selected as the explanatory variable for each crime.

(3) Association with social capital

Multivariate and categorical regression was then used to identify the relative effect of explanatory variables on residents' sense of security (1 = satisfactory, 2 = rather satisfactory, 3 = rather unsatisfactory, 4 = unsatisfactory), which was used as the outcome variable. Categorical regression quantifies categorical data by assigning numerical values to categories, resulting in an optimal linear regression equation for the transformed variables. Numeric categories are treated as ordered and equally spaced (interval level) (IBM Corporation 2014); therefore, the crime rate was divided into four categories, the same number of categories as sense of security. We then created three models. The explanatory variables in Model 1 were the crime rates, selected in the same way as described in (2). In Model 2, individual attributes were added, and in Model 3, social capital, ranked between 1 (satisfactory) and 4 (unsatisfactory), the same as sense of security, was added as an explanatory variable. All statistical analyses were conducted using IBM SPSS Statistics 23 (IBM Corp., Armonk, NY).

Results

Questionnaire responses regarding sense of security and social capital are aggregated in

Tables 2 and 3, respectively. In terms of the demographic characteristics of the respondents, no significant sex- or age-based differences were found in relation to satisfaction with sense of security or social capital. This result was contrary to findings from a survey conducted in Italy (Russo 2013) reporting that being a woman or an older person was predictive of having an increased perception of crime risk. Although the differences were not statistically significant, younger respondents tended to be more satisfied with security, while older respondents tended to be more satisfied with social capital. Descriptive statistics and a correlation matrix of crime rates are shown in Tables 4 and 5, respectively.

(1) Sense of security and scale bias

Significant relationships were found between residents' sense of security and all crime rates, except that for violent crime. This finding suggests that residents' perceptions of crime risk in their neighborhood are in line with actual crime rates. When comparing crime rates between neighborhood and school district, the chi-squares for violent crimes and home burglaries were higher for neighborhood, whereas that for non-burglaries was higher for school district, despite the expected scale bias. Regarding felonies, the chi-square was slightly higher at the school district level, but the relationship between the median rank and level of satisfaction was accurate at the neighborhood level (Table 6 and Figure 1).

(2) Association with individual attributes

The effect of respondents' sex and age on the relationship between official crime rates and

residents' sense of security at the neighborhood level was also analyzed. Considering the results from (1), crime rates regarding felonies, violent crimes, and home burglaries were based on the neighborhood level, while the crime rate regarding non-burglaries was based on school district.

Sex

As seen in Table 7 and Figure 2, regarding men, the median rank increased, and a significant relationship was evident between three crime rates and residents' sense of security. Regarding women, a significant relationship was only seen between violent crime and sense of security. This suggests that women are only more sensitive than men to violent crime, and that they perceive their situation better, possibly because women are a more vulnerable population.

Age

All respondents were divided into the following four age groups: <35, 35–49, 50–64 and ≥ 65 years. No significant relationship was found between any of the crime rates and residents' sense of security in the <35 and 50–64 age groups. Regarding the 35–49 age group, significant relationships were observed between home burglaries and non-burglaries and sense of security (Table 8 and Figure 3). Regarding the ≥ 65 group, the only significant relationship found was that between violent crime and sense of security, possibly because older residents tend to be less resilient to violent crime.

(3) Association with social capital

The results of categorical regression are shown in Tables 9 and 10. The outcome variable was

residents' sense of security. Crime rates, as explanatory variables, were categorized into four levels, except the crime rate for felonies, which was binarized as zero or as more than zero because no felonies were reported in 47% of the respondents' neighborhoods.

In Model 1, the crime rates for felony, burglary, and non-burglary were significantly related to residents' weakened sense of security ($p < 0.01$); the effect of the non-burglary crime rate was largest, which is consistent with the results from (1), and the regression was significant.

In Model 2, respondents' attributes, including sex, age, and parental status, and one interaction term (Parent*male) were added as explanatory categorical variables; the regression was also significant, and adjusted R^2 values were slightly improved. The crime rates for felony, burglary, and non-burglary that were significant in Model 1 were also significant ($p < 0.01$) in Model 2, even when considering the effect of individual attributes.

Moreover, the interaction term (Parent*male) was significant, which suggests that being male has a positive effect on sense of security, whereas being a male parent has a negative effect.

In Model 3, for which social capital was added as an explanatory variable, social capital had a significant positive relationship with sense of security, and adjusted R^2 values were greatly improved. The standardized coefficient of social capital was the largest (0.348), yet the crime rates for felonies, home burglaries, and non-burglaries maintained a significant effect, even though the effect of home burglaries was less significant ($p < 0.10$). These results suggest that these three crime rates have a robust effect on residents' sense of security in their neighborhood, even when controlling for both individual attributes and social capital. The interaction term (Parent*male) was significant, which was similar to Model 2. The interaction

effect of parental status and sex on sense of security shown in Figure 4 indicates that sense of security in men decreases after they have children, whereas that in women remains nearly the same.

Discussion and conclusion

The present study showed that crime rates affect residents' sense of security in their neighborhoods, and that these effects differ by the type of crime and spatial scale, which confirms the presence of a scale bias (Hanyu et al. 2009). Regarding violent crimes and home burglaries, crime rates for neighborhoods had a stronger effect on residents' sense of security than those for school districts. This suggests that perceived crime rates are more in line with actual crime rates in smaller neighborhoods. Residents' voluntary crime prevention activities in Japan are generally carried out in each neighborhood to promote a sense of security (Van Houwelingen 2012), and the results of the present study are expected to directly benefit these activities and the supporting public authorities. Regarding non-burglaries, crime rates for school districts had a stronger effect on residents' sense of security than those for neighborhoods. This may be because information on non-burglaries is usually posted by police on bulletins such as neighborhood signboards at the site of the crime, and is therefore more widely disseminated. As shown in Table 1, numerous studies have investigated the association between sense of security and violent crime, with some finding a significant relationship (for example, see Drakulich 2013). No significant relationship was found in this study; this may have been because violent crime is defined differently in Japan, or because

the respondents tended to be older than the age group at the highest violent crime risk.

The size of the relationship between official crime rates and residents' sense of security in their neighborhood differed depending on individual attributes. Regarding sex, sense of security was more in line with crime rates among men; this may be because traditionally, men are expected to bear the primary responsibility for the safety of their family. This resembles the altruistic fear that people have for their loved ones whose safety they value such as their children, spouses, and friends (Warr & Ellison 2000). Regarding age, sense of security was more in line with actual property crime (burglary and non-burglary) rates among the 35–49 age group, which may be because this group is primarily concerned with increasing their financial assets, and thereby most sensitive to property crime. The fact that women and the elderly (≥ 65 years) were only more sensitive to violent crime was likely due to their relatively higher vulnerability.

Based on the results from categorical regression, social capital had a strong positive effect on residents' sense of security. This could be because neighborhoods with strong social capital tend to have more active residential patrol programs, which could promote an increased sense of security among residents. Nevertheless, three types of crime rates had significant and robust relationships with sense of security among neighborhood residents, even when controlling for social capital and individual attributes. These results support those from previous studies on US cities (Drakulich 2013; Ferraro 1995; Rountree & Land 1996a) and show international similarities. On the other hand, the result that the youngest group (<35 years) had a significantly positive sense of security contradicts previous studies (Wilcox et al.

2003; Drakulich 2013; Russo 2013). As international similarities and dissimilarities have to be examined to generalize the findings, the present study is expected to be helpful.

Regarding the difference between fear of crime and sense of security, domestic research from Japan showed that women and individuals in their thirties and forties had more fear of crime, whereas individuals over 60 years of age had less (Nikkoso Foundation for Safe Society 2015). In the present study, in terms of sense of security, individuals <35 years of age evaluated public safety relatively positively when controlling for social capital. The fact that younger people had more fear of crime and a greater sense of security suggests a difference between the affective fear of crime and the cognitive sense of security. The differences observed based on individual attributes may have been due to the degree of exposure to crime information, as well as the traditional values noted above. The effect of the mass media, such as television news (Lowry et al. 2003; Weitzer & Kubrin 2004) and newspapers (Brunton-Smith & Sturgis 2011; Hanslmaier 2013), on sense of security and fear of crime has been discussed in previous studies. As new media, such as email services that deliver notifications to parents of schoolchildren, are becoming increasingly widespread, the effect of different forms of media cannot be ignored. Although being a man has a positive effect on sense of security, we found that being a father has a negative effect, which is a unique result of this study. This finding may be because fathers collect crime information for their families via these types of email services. The relationship between official crime rate, sense of security, fear of crime, individual and family attributes, and neighborhood attributes is shown in Figure 5. Official crime rates affect fear of crime via sense of security (Ferraro 1995;

Lagrange & Ferraro 1989). The effect of neighborhood attributes varies by individual attributes (Rountree & Land 1996b; Hinkle 2015). The present study provided supporting evidence to the presence of a relationship between official crime rates, sense of security, individual and family attributes, and social capital.

The OECD (2011), which regards Japan as one of the safest among its 34 member countries, has pointed out weaknesses in relation to the social capital of Japanese people. To improve sense of security, various policies that aim to build social capital are needed, as well as improved crime prevention by the police. The Adachi Ward, which is located in the northeastern part of Tokyo, has a population of 678,000 and is known for undertaking serious efforts to reduce crime and improve its image (Hino & Schneider 2013). It has recently introduced various measures to strengthen social ties or bonds and prevent vulnerable populations, especially the elderly, from becoming isolated. These types of measures are also expected to be useful in improving sense of security in the ward.

This study did have some limitations. We cannot deny the existence of confounding factors that have a correlation with both sense of security and crime rate. The well-known “broken windows” theory (Wilson & Kelling 1982) notes that disorder has an effect on crime, and Taylor (1999) quantitatively refers to neighborhood-level correlations between crime rates and perceived incivilities. Regarding the effect on perception, Innes (2004) proposed that people tend to construct their perceptions of criminogenic risk around certain “signal” incidents, including not only signal crimes, but also signal disorders. Hinkle (2015) reported that physical disorder indicates that an area might be unsafe, or that criminal activity is likely

to occur. Wyant (2008) analyzed the relationship between fear of crime and perceived risk, noting that the effect of incivilities on fear at the individual level is not completely mediated by perceived risk.

The findings of the present study are expected to be valuable because they show the effects of each type of crime on residents' sense of security. To the best of our knowledge, no other studies in Japan have targeted detailed crime types classified according to a spatial scale from the district to the neighborhood level. However, the effect of disorder and incivility on residents' sense of security in Japan, which is a relatively orderly country, should be investigated in a future study.

Notes

1. Some studies have investigated the relationship between fear of crime and neighborhood integration using four questions about interaction with neighbors (Schafer et al. 2006) and social integration/collective efficacy (Gibson et al. 2002; Zhao et al. 2015). Pearson et al. (2015) reported that the effect of violent and drug/alcohol-related crime on fear of crime among individuals differed depending on the level of social fragmentation in their neighborhood, thereby insisting on the importance of the broader neighborhood social context.
2. Some studies have reported a significant relationship between fear of crime and exposure to the mass media (Brunton-Smith & Sturgis 2011; Weitzer & Kubrin 2004; Hanslmaier 2013).

3. Some studies on fear of crime refer to a scale bias in which crime within an individual's own neighborhood influences their fear of crime, but crime occurring within neighboring communities has little or no effect on feelings of safety and security (Breetzke & Pearson 2014). In addition, based on a German survey (Hanslmaier 2013), increases in the local crime rate lead to increases in fear of crime; however, the county crime rate has no significant impact.
4. Tokyo Metropolis consists of 23 special wards, 26 cities, five towns, and eight villages. The 23 special wards constitute the central and the most populous area of Tokyo.
5. Each school district is located in one of Tokyo's 23 special wards. About two-thirds of the neighborhoods are located in one school district, while the rest span across two or more school districts. The average populations of school districts and neighborhoods in the 23 special wards of Tokyo are about 9,740 and 2,650, respectively.
6. The crime categories used in this study were based on those of the Japanese National Police Agency (NPA). Felonies include homicide, robbery, arson, and rape. Violent crimes include assault, bodily injury, intimidation, extortion, and unlawful assembly with dangerous weapons. Theft is classified as burglary, non-burglary, or vehicle theft. Regarding non-burglary, we selected crimes that we suspected would be relevant to residents' sense of security.

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Table 1. Summary of the variables used in the present and previous studies to investigate the relationship between fear/perception of crime and objective crime

Study	Area	Scale	Objective variable		Explanatory variable				
			Fear (emotional)	Perception, risk (cognitive)	Total crime	Violent	Property	Burglary	Social capital
Present study	Tokyo, Japan	Neighborhood, school district		X		X	X	X	X
Breetzke & Pearson (2014)	NZ	Census areal unit (lag1, 3, 10)	X		X				
Brunton-Smith & Sturgis (2011)	UK	MSOA, CDRP	X		X				
Drakulich (2013)	Seattle, WA, US	Census tract		X		X		X	X
Ferraro (1995)	US	County		X	X				X
Hanslmaier (2013)	Germany	County	X		Street crime				
Hipp (2010, 2013)	US	Census tract		X		X	X	X	
Lewis & Salem (1986)	US	Neighborhood	X		X				
Pearson et al. (2015)	NZ	Census area unit	X		X	X	X		
Quillian & Pager (2001)	Seattle, WA, US	Census tract		X	X				
Rountree & Land (1996a, 1996b)	Seattle, WA, US	Pair of blocks, census tract	X	X				X	X
Russo et al. (2013)	Italy	County		X	X				
Schafer et al. (2006)	US	Police beats	X		Personal crime				X
Taylor (2001)	Baltimore, MD, US	Block, neighborhood	X				Robbery		
Weitzer & Kubrin (2004)	Washington DC, US	Police district	X			X	X		
Wilcox et al. (2003)	Seattle, WA, US	Census tract		X		X	X		
Wyant (2008)	Philadelphia, PA, US	PHMC neighborhood	X			X			
Zhao et al. (2015)	Houston, TX, US	0.1-, 0.5-, 1-mile radius	X		X	X	X		X

Note: MSOA = Middle Super Output Area; CDRP = Crime and Disorder Reduction Partnership; PHMC = Philadelphia Health Management Corporation

Table 2. Satisfaction with “security and crime prevention” at the neighborhood level

	Total	Sex		Age				Parent	
		Men	Women	<35	35-49	50-64	≥65	No	Yes
Satisfactory	6%	6%	8%	9%	6%	5%	8%	10%	5%
Rather satisfactory	51%	51%	49%	54%	51%	50%	49%	51%	50%
Rather unsatisfactory	37%	37%	37%	32%	38%	38%	38%	34%	39%
Unsatisfactory	6%	6%	6%	5%	6%	7%	5%	5%	6%
N	2406	1841	565	243	640	688	756	736	1670

Source: “Comprehensive Survey on Housing and Living Environment” conducted by the Ministry of Land, Infrastructure, Transport and Tourism in 2008.

Table 3. Satisfaction with “interaction with neighbors and the community” at the neighborhood level

	Total	Sex		Age				Parent	
		Men	Women	<35	35-49	50-64	≥65	No	Yes
Satisfactory	10%	9%	11%	6%	10%	8%	13%	8%	11%
Rather satisfactory	59%	60%	57%	63%	61%	60%	57%	55%	61%
Rather unsatisfactory	26%	26%	26%	24%	25%	27%	27%	30%	24%
Unsatisfactory	4%	4%	5%	7%	4%	5%	4%	6%	4%
N	2393	1835	558	243	639	687	746	730	1663

Source: “Comprehensive Survey on Housing and Living Environment” conducted by the Ministry of Land, Infrastructure, Transport and Tourism in 2008.

Table 4. Descriptive statistics of the crime rate

	Neighborhood				School District			
	Min	Max	Ave	SD	Min	Max	Ave	SD
Felony	0	4.22	0.93	0.97	0	3.61	1.16	0.66
Violent crime	0	7.47	2.74	1.13	1.43	6.77	3.05	0.78
Home burglary	0	4.79	2.83	1.03	0	4.33	3.04	0.67
Non-burglary	0	5.86	3.81	0.66	2.76	6.16	3.92	0.47

Note: N=2,413 respondents

Min = Minimum; Max = Maximum; Ave = Average; SD = Standard Deviation

Table 5. Correlation matrix of crime rates

		Neighborhood				School District			
		Fel	Vio	Hom	Non	Fel	Vio	Hom	Non
Neighborhood	Felony	1							
	Violent crime	0.294	1						
	Home burglary	0.066	0.018	1					
	Non-burglary	0.303	0.395	0.146	1				
School District	Felony	0.534	0.299	0.101	0.314	1			
	Violent crime	0.219	0.554	0.048	0.238	0.530	1		
	Home burglary	0.114	0.021	0.687	0.111	0.177	0.058	1	
	Non-burglary	0.177	0.256	0.157	0.714	0.480	0.454	0.128	1
Social capital		0.053	0.031	0.065	0.088	0.044	0.014	0.049	0.094

Note: N=2,413 respondents

Fel = Felony; Vio = Violent crime; Hom = Home burglary; Non = Non-burglary

Table 6. Results of the Kruskal-Wallis test comparing crime rates among four groups with different senses of security

Scale	Neighborhood			School District		
	Chi-square	Differences between groups ($\alpha = 0.05$)		Chi-square	Differences between groups ($\alpha = 0.05$)	
Felony	6.494	*		6.766	*	
Violent crime	5.896	ns		3.667	ns	
Home burglary	12.796	***	2<3, 2<4	8.204	**	2<3
Non-burglary	16.680	***	1<4, 2<3, 2<4	22.827	***	1<4, 2<3, 2<4

Note: ***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.10$, ns: not significant.

Table 7. Results of the Kruskal-Wallis test comparing crime rates among four groups with different senses of security by sex

Sex	Men			Women		
	Chi-square	Differences between groups		Chi-square	Differences between groups	
Felony	12.585	***	2<3	2.731	ns	
Violent crime	3.091	ns		8.930	**	2<4, 3<4
Home burglary	12.651	***	2<3	4.975	ns	
Non-burglary	19.168	***	2<3, 2<4	4.706	ns	

Note: Significance level testing differences between groups was set at 0.05.

Felony, violent crime, and home burglary crime rates were based on neighborhood, and the non-burglary crime rate was based on school district.

***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.10$, ns: not significant.

Table 8. Results of the Kruskal-Wallis test comparing crime rates among four groups with different senses of security by age

Age (years)	<35	35–49		50–64	≥65	
	Chi-square	Chi-square	Differences between groups	Chi-square	Chi-square	Differences between groups
Felony	5.141 ns	0.509 ns		3.246 ns	2.360 ns	
Violent crime	4.646 ns	0.887 ns		1.954 ns	8.716 **	2<4, 3<4
Home burglary	5.673 ns	9.225 **	2<3	3.147 ns	6.478 *	
Non-burglary	5.871 ns	21.611 ***	1<3, 2<3	2.071 ns	2.459 ns	

Note: Significance level testing differences between groups was set at 0.05.

Felony, violent crime, and home burglary crime rates were based on neighborhood, and the non-burglary crime rate was based on school district.

***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.10$, ns: not significant.

Table 9. Results of categorical regression

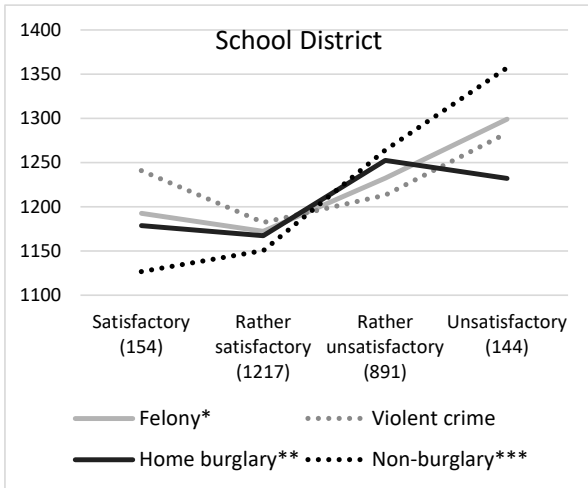
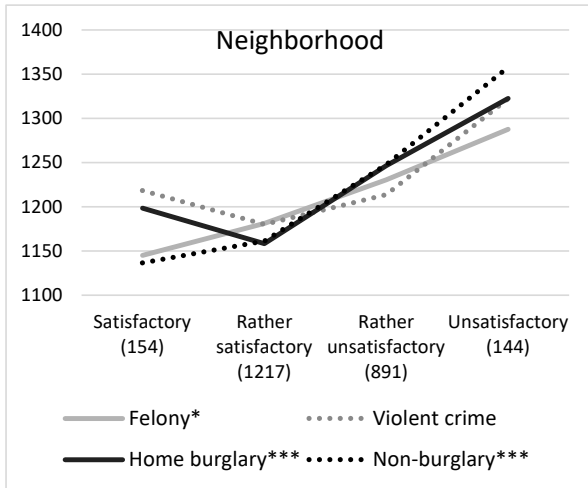
	Model 1			Model 2			Model 3		
	B	p	Importance	B	p	Importance	B	p	Importance
Felony	.052	.010	.208	.057	.007	.136	.055	.007	.022
Violent crime	.007	.732	.014	.008	.722	.007	-.011	.600	-.001
Home burglary	.071	.002	.345	.074	.004	.200	.037	.090	.012
Non-burglary	.078	.000	.433	.079	.000	.253	.063	.005	.034
Sex				.100	.008	-.032	.067	.053	-.017
Age				.053	.000	.103	.055	.000	.027
Parent				.057	.132	-.121	.016	.561	.010
Parent*male				.177	.001	.449	.132	.014	.092
Social capital							.348	.000	.822
p		0.000			0.000			0.000	
Adjusted R ²		0.016			0.027			0.139	

Note: Felony, violent crime, and home burglary crime rates were based on neighborhood, and the non-burglary crime rate was based on school district.

Violent crime, home burglary, and non-burglary crime rates were categorized into four levels. Only felony was binarized.

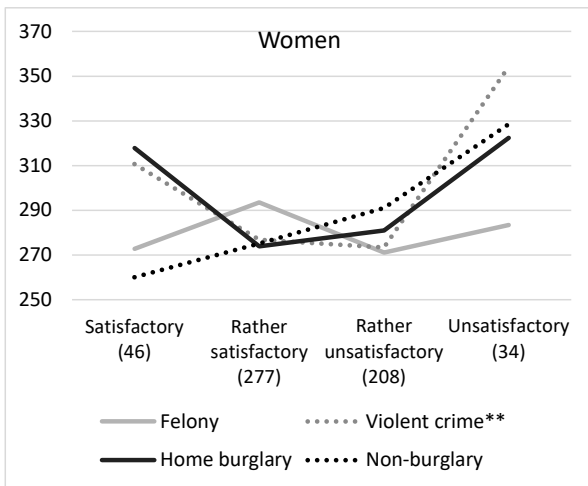
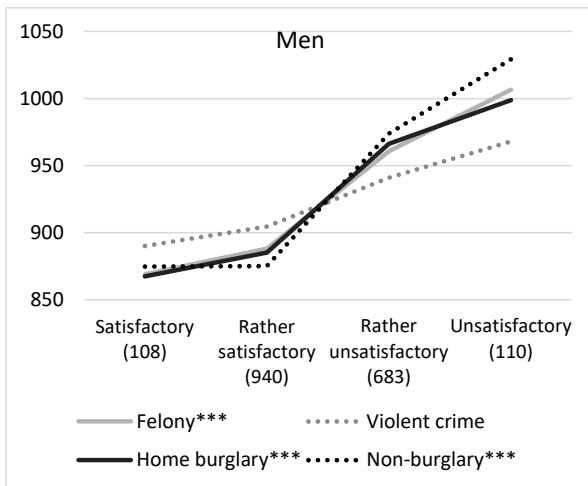
Table 10. Quantification of categorical variables (Model 3)

Variables	Categories	N	Quantification
Sense of security	Satisfactory	149	-3.309
	Rather satisfactory	1167	-0.218
	Rather unsatisfactory	860	0.654
	Unsatisfactory	134	1.380
Felony	0	1076	-1.071
	>0	1234	0.934
Violent crime	.00 - 1.61	297	-1.739
	1.79 - 2.71	842	-0.575
	2.77 - 3.83	904	0.589
	3.85 - 7.47	267	1.753
Home burglary	.00 - 1.79	333	-1.797
	1.95 - 2.77	585	-0.658
	2.83 - 3.83	1116	0.481
	3.85 - 4.79	276	1.619
Non-burglary	2.76 - 3.45	388	-1.554
	3.46 - 3.92	808	-0.495
	3.92 - 4.37	760	0.564
	4.38 - 6.16	354	1.623
Sex	Male	977	-0.545
	Female	226	1.835
Age	<35	1381	-2.448
	35-49	601	0.598
	50-64	102	0.822
	≥65	744	-0.475
Parent	Yes	1624	0.650
	No	686	-1.539
Parent*male	Yes	1333	0.856
	No	977	-1.168
Social capital	Satisfactory	226	-2.757
	Rather satisfactory	1381	-0.014
	Rather unsatisfactory	601	0.887
	Unsatisfactory	102	1.080



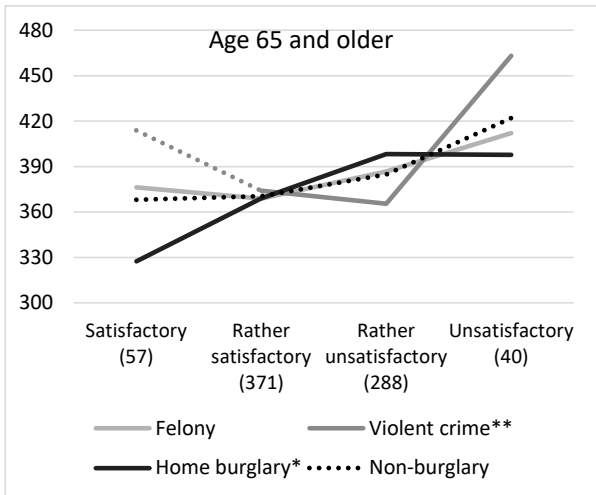
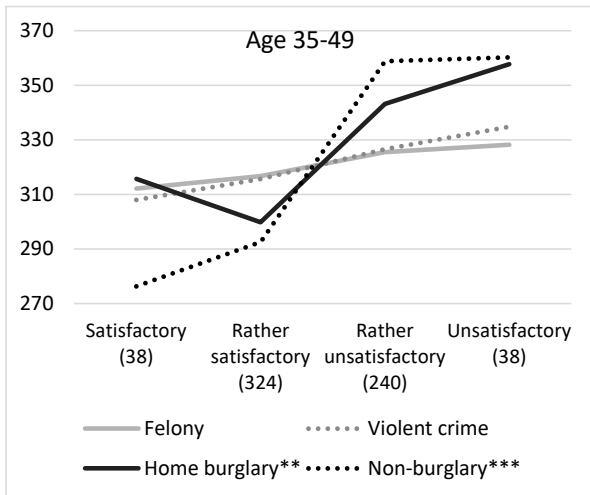
Note: ***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.10$.

Figure 1. Median rank of crime rates by groups with different senses of security (Left: Crime rates based on neighborhood, Right: Crime rates based on school district)



Note: ***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.10$.

Figure 2. Median rank of crime rates by groups with different senses of security (Left: Men, Right: Women)



Note: ***: $p < 0.01$, **: $p < 0.05$, *: $p < 0.10$.

Figure 3. Median rank of crime rates by groups with different senses of security (Left: 35–49 years, Right: ≥ 65 years)

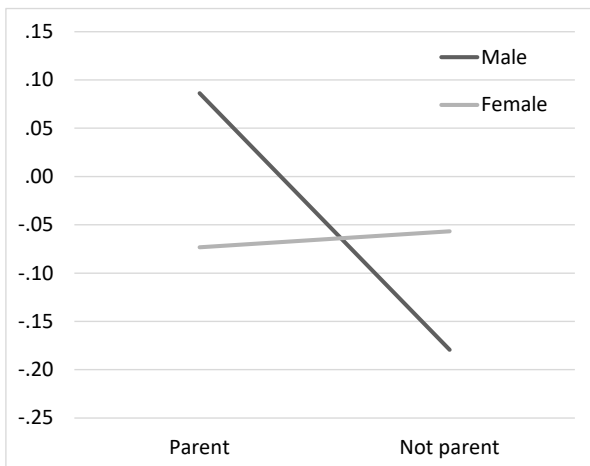


Figure 4. Interaction effect of parental status and sex on sense of security

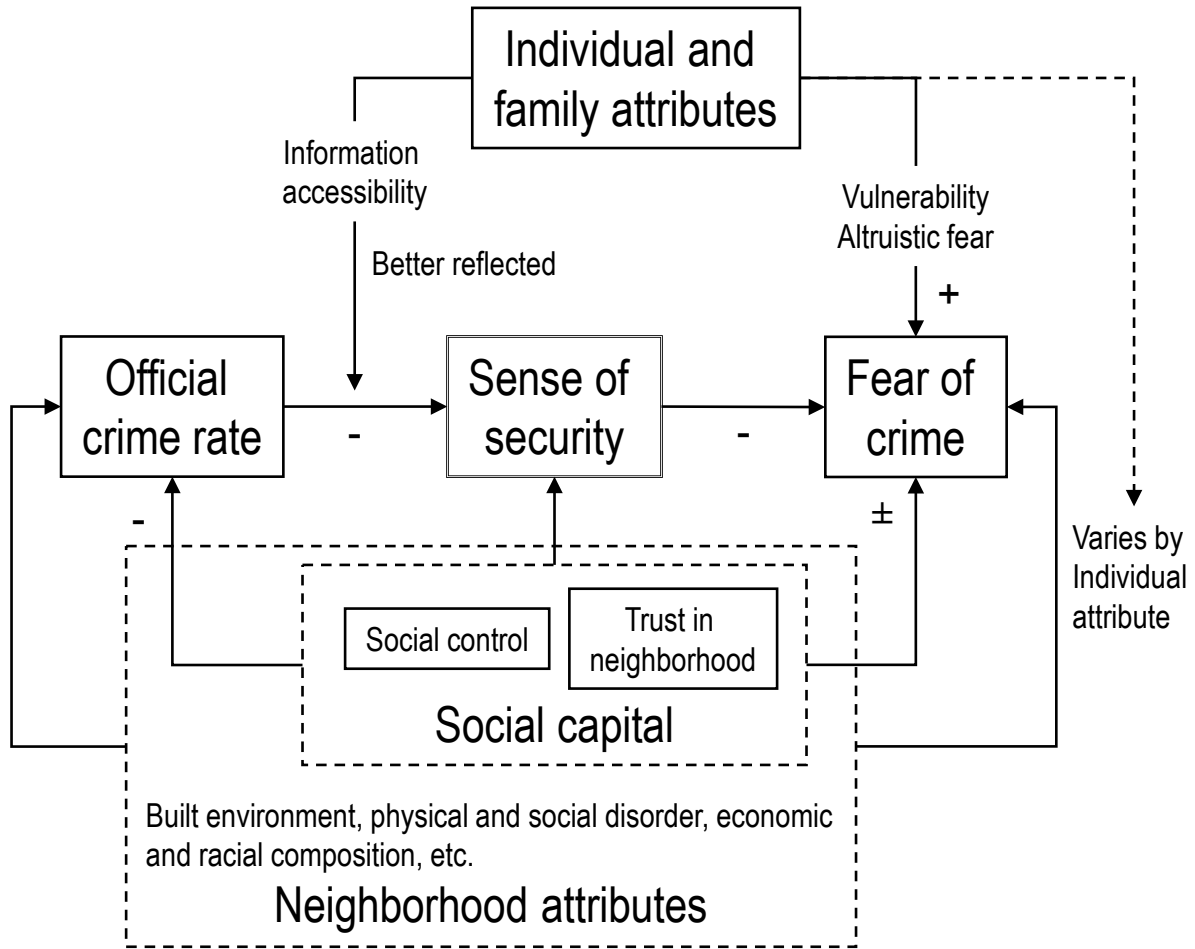


Figure 5. Relationship between official crime rate, sense of security, fear of crime, individual and family attributes, and neighborhood attributes