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What They Don't Know Says A Lot: Residents' Knowledge of Neighborhood Crime in Contemporary China

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Abstract

Objectives Our study questions the common assumption of random DK responses in criminology survey data and emphasizes the importance of understanding and handling DK for gaining substantive criminological knowledge. It examines the individual-level and neighborhood-level correlates of the propensity to give the DK response to questions on individual perception of neighborhood crime in Chongqing, China.

Methods We designed and conducted an original survey of 4839 residents from 100 urban neighborhoods in Chongqing, China in 2016. Random intercept hierarchical linear models were used to examine the effects of individual-level variables on uncertainty towards neighborhood crime and the effects of neighborhood social process variables, controlling for neighborhood composition.

Results At least in some instances, DK appears to be the most valid response, reflecting actual uncertainty and lack of knowledge about neighborhood crime. DK responses have substantive correlates at both the individual and neighborhood level. Of particular interest, neighborhood social cohesion is negatively associated with individual uncertainty about neighborhood crime, controlling for neighborhood composition. There is a significant interaction between neighborhood semi-public social control and neighborhood poverty in predicting DK.

Conclusions Understanding the meanings behind DK has important implications for whether to include the DK option in survey designs and how to handle DK responses in data analysis when they occur. When DK is a valid answer for many respondents, not including the DK option in the survey instrument forces respondents to choose a nonexistent answer, which can result in misleading interpretations.

Keywords Survey research · Item non-response · Perception of neighborhood crime · Neighborhood context · China

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Introduction

An important development in comparative criminology over the course of recent years has been the application of the Western "neighborhood effects" theoretical and analytic framework to understand variation in levels of crime across neighborhoods in contemporary urban China. Drawing upon the general social disorganization tradition, this framework directs attention to structural characteristics of neighborhoods (e.g., poverty, residential stability) and social process variables (e.g., social ties and collective efficacy) as predictors of variation in neighborhood crime (Sampson et al. 2002; Messner and Zimmerman 2012). Also similar to Western research, the studies of neighborhood crime in China have implemented survey designs that allow for multilevel analyses, with households nested in neighborhoods. Because data on crime in urban China are not readily available at the level of the neighborhood, researchers have relied on survey responses to operationalize neighborhood levels of crime. Examples of this research include studies by Zhang et al. (2009, 2017) in the city of Tianjin and the study by Jiang et al. (2013) in the city of Guangzhou. A notable feature of these studies for present purposes is that the survey items used to measure perceptions of crime in the neighborhood did not include a response category for "don't know" (DK).[1]

Survey researchers in the West have long debated the issues of whether to provide the DK option in survey instruments and how to handle DK responses in data analysis. In the survey design literature, the debates center on whether researchers should provide DK options so that respondents are not forced to offer non-existent attitudes and opinions, or whether this option simply encourages respondents to avoid thinking through an item (Converse 1976; Krosnick 1991; Krosnick et al. 2002). In data analysis, the debates center on whether to treat DK responses as missing data (perhaps to be imputed) or valid answers with substantive meanings (Zhu 1996; Young 2012; Grabosky et al. 2014).

The Western survey literature has also identified characteristics of both respondents and the survey context that tend to be associated with the probability of giving a DK response. The most commonly studied respondent factors include the respondent's interest in the topic, the salience of the topic to the respondent, and the respondent's socio-demographic characteristics (Francis and Busch 1975; Dillman et al. 2002; Young 2012; Grabosky et al. 2014). Among survey contextual factors, the likelihood of DK response has been shown to be associated with the survey mode (face to face interview, telephone interview, self-administered, etc.) (Dillman et al. 2002), the sequential position of the question in the entire survey (Young 2012), the sensitivity of the question (Dillman et al. 2002; Young 2012), and the level of accuracy required by the question or question difficulty (Dillman et al. 2002).

In contrast with the methodologically oriented research on surveys, limited attention has been given to DK issue within the Western "neighborhoods and crime" literature. DK is routinely included in the response set for questions on resident's perception of neighborhood crime, but DK responses are typically excluded from analysis, without any systematic examination of its relationship with other variables of interest. This lack of attention would be justified if it could be assumed that residents in Western settings are homogenously well

[1] The earlier Tianjin study (Zhang et al. 2009) measured perceptions of social disorder in the neighborhood, whereas the more recent Tianjin study (Zhang et al. 2017) included perceptions of both neighborhood crime and disorder. The study by Jiang et al. (2013) in Guangzhou analyzed perceptions of property crime in the neighborhood.

informed about neighborhood crime. However, research suggests that this is not necessarily the case.

A report from the U. S. Bureau of Justice Statistics (BJS) based on the 1998 Criminal Victimization and Perceptions of Community Safety in 12 U.S. Cities found substantial heterogeneity among cities in the proportion of residents who were well-informed of neighborhood crime. The data revealed that New York City and Chicago had the lowest percentage of residents saying that they were well informed of neighborhood crime (62% and 63% respectively). The highest percentages were observed in Savannah and Knoxville (79% and 80% respectively). The report also found that the most important source of information about neighborhood crime was conversations with neighbors, neighborhood organization's newsletters, and/or community meetings (BJS 1999). These findings indicate that residents' uncertainty about neighborhood crime is not trivial in US cities and that the level of uncertainty is shaped by neighborhood social processes. Most importantly, these data suggest that DK may very well be a valid response for a non-trivial proportion of respondents, thereby providing substantive information about the neighborhood.

With regard to the prevalence of DK responses to survey questions of neighborhood crime in US cities, there is considerable heterogeneity across different surveys, possibly due to difference in survey mode, difference in question (length of window asked, the type of crime asked, the accuracy of response required) and contextual/temporal differences between samples. Most importantly, DK responses to neighborhood crime questions are nontrivial in some major U. S. surveys and deserve further investigation. On the low end of the spectrum, the Seattle Neighborhoods and Crime Survey 2002–2003, the Detroit Area Study and the Chicago Area Study 2004 had less than 1% DK responses to questions on respondent's perception of neighborhood crime in general. The Chicago Community Adult Health Study (CCAHS), 2001–2003 had 2% to 4% respondents who were uncertain or DK about how often different types of violent crimes occurred in the neighborhood in the past 6 months. In contrast, the frequency of DK responses to the same set of questions as CCAHS ranges from 12 to 22% in the Project on Human Development in Chicago Neighborhoods Community Survey 1994–1995. The 1998 survey Criminal Victimization and Perceptions of Community Safety in 12 United States Cities found that roughly 16% of respondents did not know or were not aware of any serious crime in their neighborhoods in the past 12 months. A 2002 neighborhood survey of citizens residing in Mesa, Arizona found that over 22% of the respondents gave non-valid responses regarding the prevalence of different types of neighborhood crime, mostly "don't know" (Armstrong and Katz 2010).

We recently conducted a survey dealing with issues of neighborhood crime and disorder in the city of Chongqing, China. We asked respondents questions about their perceptions of different types of crime in their neighborhoods that were generally similar in wording to those used in other studies of criminal victimization in China (Jiang et al. 2013; Zhang et al. 2017) and in the Project on Human Development in Chicago Neighborhoods Community Survey. In contrast with these earlier Chinese studies, however, our instrument included the DK category in the response set. We discovered surprisingly high frequencies of DK answers to the perceived neighborhood crime items—ranging from 42 to 60%.

This high level of DK makes us wonder to what extent these DK responses capture respondent's genuine uncertainty about neighborhood crime. If so, is DK an important source of variation that reflects theoretically meaningful characteristics of the neighborhood? The purpose of the present paper is to examine systematically the DK responses to questions about perceptions of neighborhood crime in a multilevel framework. Our analyses at the individual and household level are directed toward assessing the extent to which

correlates of DK responses in our recent Chongqing survey replicate those that that have been observed in the West and in the limited Chinese research on public option. In addition, we explore whether there are other individual- and household-level correlates that reflect the distinctive context of contemporary urban China. At the neighborhood level, we investigate whether any systematic variation in the prevalence of DK responses, net of compositional differences, can be accounted for with reference to theoretically interpretable characteristics of the neighborhoods.

Previous Research

The Meaning of DK for Perceptual Questions

The perception of neighborhood crime is one's subjective understanding of conditions in the neighborhood. The criminological literature has shown that such perceptions are influenced by multiple factors beyond the actual levels of crime. These include gender, personal victimization experiences, visual signs of housing deterioration, neighborhood disorder and neighborhood racial composition (Perkins and Taylor 1996; Quillian and Pager 2001). Moreover, as noted above, respondents can be honestly uncertain about their perceptions or have limited understanding of actual conditions due to lack of information (BJS 1999).

The survey literature on non-substantive responses has mostly focused on public opinions towards political subjects and therefore questions measuring an attitude (such as 'do you favor the Iraq War?'). "Attitude is a latent, unobserved predisposition to respond along a positive or negative dimension toward an attitude object" (Alwin and Krosnick 1991, pp. 139). Despite the difference between perception and attitude, we can draw from this literature several reasons that are most relevant to the DK response toward questions on perception.

1. Methodological weakness

Methodological weakness is one shared reason for DK responses among questions asking about attitudes and perceptions. Ambiguity in questions can be especially consequential in increasing DK responses. If the respondents do not understand the question, and there is no interviewer on site to clarify the question, they are more likely to respond DK (Krosnick 2002). Moreover, restrictive response categories can also lead to more DK, as respondents have difficulty in matching the response options with their judgments precisely (Converse 1976). For example, using 334 questions with variety of subjectivity from 12 survey data sources, Young (2012) found that questions with a dichotomous response option have more DKs than those with more finely graded response options.

2. Passive refusal

DK responses can also be a form of passive refusal to sensitive questions, a safer alternative to refusing outright. In this scenario, the respondent has a substantive answer but is not willing to disclose it to the researcher because of social undesirability of the answers, invasion of privacy, or a concern about disclosure to third parties (confidentiality) (Tourangeau et al. 2000). The assessment of sensitivity of questions depends on respondents' need for social approval, their answer, the willingness to make personal

disclosures, concern about consequences of disclosure to third parties and the survey mode (Tourangeau et al. 2000). However, there are questions that elicit uneasiness for most people: masturbation, use of illegal drugs, sexual intercourse, stimulants and depressants, and intoxication (Bradburn et al. 1979). Young (2012) found that respondents are 7–11 times more likely to give a DK response when the question is sensitive.

3. Satisficing

DK responses can be used as one strategy of satisficing. Answering survey questions often requires a great amount of cognitive effort from the respondents, who typically receive modest or no reward from the process. To provide an optimal answer to a survey question, respondents need to carefully go through four stages of cognitive processing: "interpret the meaning of each question, search their memories extensively for all relevant information, integrate that information carefully into summary judgments, and report those summary judgments… clearly and precisely" (Krosnick 1991, pp. 214; Tourangeau 1984). Although respondents may be motived to give optimal answers in the beginning, they often get increasingly fatigued, bored and impatient as the survey goes on (the fatigue effect). Weak satisficing occurs when unmotivated respondents "settle for generating merely satisfactory answers" (Krosnick 1991, pp. 215). Strong satisficing occurs when respondents totally omit the searching and judging steps and provide the answer that seems reasonable (Krosnick 1991). The DK option is just such a reasonable answer that requires no retrieval of information and judgment. Krosnick (1991) hypothesized that DK responses are more likely when the task is difficult and the respondent lacks motivation or the ability to answer. Consistent with Krosnick's satisficing hypothesis, studies have found that DK responses are more likely to appear in the middle of a questionnaire than in the beginning (Young 2012); earlier DK responses in the questionnaire can predict later DK responses, as respondents learn to choose DK as an easy way out (Young 2012).

4. Do not know or uncertain

Lastly, people choose DK because they literally do not have a definite perception or are uncertain about their perception. This is why DK options are included in the first place. These DK responses are the valid answers to the perception questions and should not be interpreted as missing values or error. Interpreting DK responses as individual uncertainty, scholars have innovatively used DK responses to construct new variables for substantive research questions. For example, Meulemann (2004) used DK responses to two religious questions to measure religious uncertainty. Staff et al. (2010) used DK responses to measure uncertainty in occupational aspiration and found that youth with uncertain career ambitions during adolescence are less successful in the labor market during young adulthood. Swader (2017) constructed a "don't know anomie" index from 15 attitudinal questions to measure individual uncertainty towards the normative order.

In sum, the Western survey literature identifies reasons to anticipate that the DK response might in some instances reflect methodological flaws (deficiencies in the survey instrument) and/or respondents' dispositions that render this response uninterpretable. At the same time, the evidence indicates that the DK response might in other cases reflect just that—the respondent simply does not have a definite perception of the phenomenon under investigation.

DK Responses in China

Survey research in China differs from that in the U. S. and the West more generally, with implications for the levels and causes of non-substantive responses. Most Chinese surveys are implemented as self-administered questionnaires. A self-administered survey is similar to a mail survey in the U.S. in that respondents themselves take control of whether and how to go through the survey questions. However, self-administered surveys in China have a much lower "survey non-response" rate than mail surveys in the U.S. (Jiang et al. 2013; Zhang et al. 2009, 2017; Zhu 1996). A major reason is that many surveys are sponsored by official and semi-official institutions (such as universities). The legitimacy and power of those institutions in the Chinese context can make respondents more cooperative and to some extent strongly encourage them to participate (Tourangeau et al. 2000). Respondents' concern about negative consequences of disclosure of answers to the official institutions might also elevate the level of non-substantive responses to sensitive questions.

In our survey, it seems unlikely that fear of harmful repercussions that might ensue from reporting negative information could account for the high levels of DK responses to the items on neighborhood crime. The DK option was also provided for a series of questions about household criminal victimization in the neighborhood and individual deviant values (see the "Appendix" for the specific survey items). Only 6–10% of respondents gave the DK responses for these items. The data thus reveal that the strikingly high levels of DK are not generally associated with information that might reflect negatively on neighborhoods or respondents themselves. Accordingly, it is worth probing whether the DK items for neighborhood crime might be capturing genuine uncertainty about crime in the neighborhoods and conveying useful information about the respondents and their neighborhood environment.

There has been very little systematic research on non-substantive responses in Chinese surveys. An exception is the work by Zhu (1996). Pooling 14 Chinese self-administered surveys on public opinion in the 1980s, Zhu examined the individual and survey contextual correlates of non-substantive responses. Overall, the level of non-substantive responses was 14% in Zhu's study, slightly higher than 11–13% found in public opinion surveys in the U.S. (Converse 1976; Zhu 1996). However, political topics such as democracy, ideology, and general politics have substantially higher levels of non-substantive responses (including DK) than similar questions in the US.

Moreover, the time, location and sponsors of the survey were also associated with the propensity of non-substantive responses in China (Zhu 1996). Consistent with the fact that the political atmosphere in China became more relaxed throughout the 1980s, the rate of non-substantive responses declined in a linear fashion (Zhu 1996). Shanghai, the most economically developed and politically open city in China, had a lower rate of non-substantive responses than Beijing (the political center) (Zhu 1996). Moreover, surveys sponsored by the government had the highest rate of non-substantive responses, followed by surveys sponsored by government and academic institutions, and surveys sponsored by academic institutions alone (Zhu 1996). These associations all suggest the importance of political sensitivity in the propensity of DK responses in China.

Among individual correlates of DK, the Western survey literature shows that gender, age and education are consistently associated with the propensity to give DK responses. In general, female, older respondents, and less educated respondents are more likely to give the DK response (Francis and Busch 1975; Dillman et al. 2002; Young 2012; Grabosky et al. 2014). Consistent with the Western survey literature, Zhu (1996) found that older,

female, and less-educated respondents were more likely to give non-substantive responses in public opinion surveys in China. These associations may reflect variation in the interest or salience of the question topic to the respondent along other factors associated with these socio-demographic characteristics (Converse 1976; Young 2012).

The Current Study

Our study is based on the premise that the DK responses for neighborhood crime questions reflect, to an appreciable extent, the lack of a definite perception of neighborhood crime, rather than the other reasons for a DK response that we elaborated in the literature review. Our reasoning is as follows. First, our questions and response categories are standard in the literature on perception of crime in the US and in China. Methodological weakness is unlikely to contribute to such high levels of DK responses. Second, if neighborhood crime is a sensitive topic that arouses passive refusal, we should find comparable levels of DK responses in questions of similar topic. However, as noted above, only 6–10% of respondents give DK responses for any question about household victimization in the neighborhood and individual deviant values. Therefore, it is unlikely that the 42–60% of respondents answered DK due to the sensitivity of the questions.

With respect to satisficing as a possible interpretation of the DK responses, we note that all ten questions on neighborhood crime are listed together on the fourth page of the eight-page questionnaire. Respondents may be experiencing the fatigue effect in the middle of the survey (Young 2012) and therefore choose DK as an effortless answer. To the extent that this does in fact occur, the possibility that DK responses reflect at least to some extent satisficing cannot be dismissed, which could contribute to the high levels for the items under investigation. Although we cannot directly control for any tendency for satisficing, we include an indicator of general "uncooperativeness" of the respondent (explained in measurement). In addition, it seems unlikely that satisficing could account for any significant variation in DK responses across neighborhoods in the multilevel analyses with the statistical controls for individual-level variables.

One of the objectives of our research is to examine the extent to which the socio-demographic correlates of DK responses observed in the West and in Zhu's pioneering research emerge in our recent survey of perceptions of neighborhood crime. We hypothesize that older, female, and less educated respondents will be more likely to give the DK response than will their demographic counterparts.[2] In addition, given the satisficing interpretation of DK responses, we constructed a measure of uncooperative disposition and hypothesize that respondents who are uncooperative in answering survey questions in the middle part of the survey will be more likely to give DK responses to neighborhood crime questions afterwards than cooperative respondents.

[2] The evidence for some other socio-demographic correlates is less consistent. Two studies found a weak relationship between non-substantive response and the number of adults in the household (Ferber 1966; Francis and Busch 1975). There is little evidence that marital status, employment status, and income have any significant relationship with non-substantive responses (Craig and McCann 1978; Grabosky et al. 2014). In analyses not reported but available upon request, we included measures of household size, marital status, employment status, and income in the regression models predicting DK responses. These variables exhibited no significant effects.

We also examine additional individual-level and household-level correlates of DK responses that are potentially important given the context of contemporary urban China and the specific domain of questioning (i.e., neighborhood crime). The survey literature has found that the salience of the topic to the respondents reduces DK responses (Grabosky et al. 2014). Household victimization is likely to increase the salience of neighborhood safety to respondents personally. Therefore, we hypothesize that respondents who have experienced household victimization in the neighborhood will be less likely to give DK responses. Home ownership can also increase the salience of neighborhood crime to the respondents because neighborhood safety is key to property values, and property owners cannot easily move away like renters. We accordingly hypothesize that respondents who own their housing will be less likely to give DK responses.

Length of residence is hypothesized to be negatively associated with the propensity to give DK responses. Residents who have lived in the neighborhood for a long time are more likely to have developed an understanding of neighborhood conditions and be more certain about their perceptions than residents who have moved into the neighborhood more recently. The number of relatives and the number of friends in the neighborhood are hypothesized to reduce DK responses. The more social ties the respondents have in the neighborhood, the more likely they will have indirect exposure to crime in the neighborhood through social networks.

The perception of rural migrants living in the neighborhood may increase DK responses on neighborhood crime. Due to China's huge rural–urban socio-economic disparity, rural migrants are often perceived as poor, uneducated and high in criminality, not only among their urban neighbors, but also among migrants themselves (Zhong 2009, pp. 196). Residents who perceive many rural migrant neighbors may restrict daily interactions to a small number of native residents and hence be more likely to have limited knowledge about neighborhood crime (Wang et al. 2016). It is unclear whether migrant status of the respondent will be related to the perception of neighborhood crime. Newcomers may be less integrated in the neighborhood than local residents (those with local urban household registration status "Hukou") and therefore more likely to give DK responses. However, one study found that migrants are no different from local working population in their sense of neighborhood attachment and social participation in the neighborhood, after controlling for social-demographic characteristics (Wu 2012). Accordingly, we include an indicator of respondents' Hukou status without stipulating the presence of any effect.

In contrast with the extensive theorizing about neighborhood-level determinants of crime, there is little theory to offer guidance about potential determinants of variability in levels of DK reporting on perceived crime across neighborhoods. One study on DK about police performance based on data in Australia found that salience of crime in the neighborhood, percent home ownership, and percent part-time employment decreased the likelihood of DK responses to police performance questions (Grabosky et al. 2014). We are unaware of any research that has examined the neighborhood-level correlates of DK responses in China, or any theoretical arguments on the topic. Accordingly, our hypotheses must be regarded as speculative ones to inform exploratory analyses.

It seems reasonable to anticipate that social cohesion in the neighborhood will decrease the prevalence of DK responses, insofar as these responses do in fact reflect at least to some extent genuine lack of knowledge about conditions in the neighborhood. Presumably, information about conditions in the neighborhood is transmitted more readily in socially cohesive neighborhoods. It is also plausible to hypothesize that the level of crime in the neighborhood will be negatively associated with DK

responses. In addition to any negative effect of personal experience with victimization, as noted above, general knowledge about crime is more likely when crimes frequently occur in the neighborhood.

Our final set of hypotheses pertains to the "neighborhood committees" (*Jü Wei Hui)*. The neighborhood committee is the semi-official organization that performs informal social control of crime in Chinese neighborhoods. The neighborhood committee is usually made up from five to nine elected local residents of the community and is required to distribute and promote policies and regulations from all higher levels of government (Jiang et al. 2013). With regard to neighborhood safety, it has the dual function of controlling neighborhood crime and disorder, while also raising residents' awareness of these undesirable neighborhood conditions (Zhong 2009).

In pursuit of these responsibilities, the activities of the neighborhood committees might have complex and possibly countervailing effects on the likelihood that survey respondents give DK responses. On the one hand, an active neighborhood committee is more likely to educate residents about safety issues and alert residents to recent neighborhood crimes. To the extent that this function is fulfilled, the prevalence of DK responses is likely to be reduced, reflecting greater community awareness. On the other hand, an active neighborhood committee can also decrease the salience of neighborhood crime to respondents by reducing signs of deterioration, disorder, and crime. Insofar as the neighborhood committee successfully fulfills this function, the frequency of DK responses might be increased because crime in the neighborhood is not at the forefront of residents' consciousness. It is also possible that any positive effect of the level of activity of a neighborhood committee on crime reflects "passive refusal." Neighborhood committees are closely aligned with the local government. An active neighborhood committee can signal comparatively intense political supervision, and the DK response might be seen as a "safer" one to offer than appraisal of crime in the neighborhood. We thus pose the range of logically possible hypotheses about the potential effects of the level of activity of neighborhood committees on DK responses—positive, negative, or no effects.

Our final hypothesis extends some of the above reasoning to predict an interactive relationship between level of activity of the neighborhood committee and neighborhood poverty. China has gone through rapid marketization of urban housing in the past two decades,followed by commercialization of neighborhood security services (Zhang 2012). "In the up-market commercial housing developments, many services that would otherwise be the responsibility of the community organization are instead undertaken by professional property management companies, which collect monthly service fees from all residents" (Bray 2006, pp. 539). The more well-off neighborhoods can afford high property management fees and enjoy services such as 24-h security guards that question every visitor,night patrols,electronic access control system and CCTV cameras. In such neighborhoods, the neighborhood committee will have less of a disorder-control function than in poor neighborhoods with meager private security services. Therefore, our interaction hypothesis stipulates that a high level of neighborhood committee activity will reduce DK responses in well-off neighborhoods, where its communication function is more consequential than its disorder-reduction function. In contrast, we expect that the level of neighborhood committee activity will have a weaker (or non-significant) effect on DK in poor neighborhoods because its communication function and its disorder-control function will tend to counterbalance (Table 1).

Table 1 Summary of hypotheses

Individual level hypotheses	Neighborhood level hypotheses
Age (+)	Social cohesion (−)
Female (+)	Neighborhood crime (−)
Education (−)	Neighborhood committee activity (+)/(−)/(ns)
Uncooperative disposition (+)	Neighborhood committee activity * poverty (+)
Household victimization (−)	
Home owner (−)	
Length of residence (−)	
Number of relatives in the neighborhood (−)	
Number of friends in the neighborhood (−)	
Perception of migrants (+)	
Local urban Hukou (?)	

Data and Methods

The data are drawn from the survey "Collective Efficacy and Neighborhood Social Organization in Chongqing," conducted in collaboration with Southwest University and the Chongqing Police College in 2016.[3] Chongqing is Southwest China's biggest industrial and commercial center, with a population of over 33 million. It is one of the four municipalities directly under the leadership of the central government in the People's Republic of China. Despite its status in the hierarchy of Chinese cities, it is a novel site for neighborhood crime research in urban China. Previous neighborhood studies have been conducted predominantly in Guangzhou in Southeast China (Jiang et al. 2010, 2013) and in Tianjin in Northeast China (Zhang et al. 2007a, b, c, 2017). Given the substantial difference in social economic development, ecology and neighborhood social organization among Chinese cities, collecting data in Chongqing opens up a new window to observe neighborhood social order in urban China.

Incorporating a multilevel framework, we adopted a four-stage cluster sampling design with a target of 5000 households nested in 100 urban neighborhoods in Chongqing. The first stage selected four urban districts (Yuzhong, Shapingba, Yubei and Beibei) among the nine urban districts of the city. They reflect a representative variation of major demographic and socioeconomic characteristics. Yuzhong District is the economic and political hub of Chongqing, with the highest population density. Shapingba District is the cultural center, with mid-level economic development and population density. Yubei District represents the area in the process of urbanization, where rural counties and urban areas coexist. Beibei District is the back garden of Chongqing and represents the relatively underdeveloped urban areas.

The second step of the sampling involved choosing 10 "street offices" (government offices) from the 4 districts. Street offices are the lowest level of government in China. They are subordinate to the district government and in charge of multiple neighborhoods.

[3] The survey was sponsored and administered by the Chongqing Police College. We recognize that while the "semi-official" sponsorship has the advantage of encouraging survey participation, the level of non-substantive responses to individual questions might be increased, perhaps reflecting passive refusal as discussed above.

There are a total of 74 street offices in the city of Chongqing. We selected three street offices from Shapingba District, three from Yubei District, two from Yuzhong District, and two from Beibei District according to population size.

The third stage of the sampling was to randomly select 10 neighborhoods from each street office. In the West, there has been an ongoing debate on how to delineate neighborhoods for research purposes mainly because neighborhoods have no official or formal status (see, for example, Bursik and Grasmick 1993, pp. 5–6; Zhang et al. 2017, pp. 632). In comparison, there is less ambiguity in identifying neighborhoods in China. Neighborhoods are officially recognized units of social organization that are managed by semi-official "neighborhood committees" (*Jü Wei Hui)* (Messner et al. 2017).

Using the household roster provided by the neighborhood committee in each selected neighborhood, the research team conducted systematic sampling of households in the final stage of sampling. A starting point was randomly determined, and every eighth household from each neighborhood was selected until 50 households were obtained for each neighborhood. For neighborhoods where the completed questionnaires were below 40, the research team randomly selected 15 new households again from the household roster for replacements visits.

Within each household, we selected the head of the household listed in the household registration to answer the questionnaire. They are typically most knowledgeable about the neighborhood and their family. When the head of the household was not available, we randomly selected one household member who was 18 or above. Anonymous self-administered questionnaires were administered in respondents' homes. The final number of effective questionnaires from each neighborhood ranged from 41 to 58, resulting in 4839 valid questionnaires in total. Statistical analyses in this paper are based on the individuals that responded DK or substantive answers to all ten questions of neighborhood perception of crime (N = 4556 cases with an average of 46 cases per neighborhood).

Measures

Dependent Variable

Our dependent variable is uncertainty about neighborhood crime. In our survey, respondents were asked ten questions pertaining to how often criminal activities occur in their neighborhoods within the last 12 months (the response set was: 1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = don't know, 6 = refused). The neighborhood crimes include stealing motorcycles or electric bicycles, stealing by breaking the car's windows, using or selling drugs, stealing children or abducting children, throwing objects from a height and hurting people, fraud, robbery or mugging, burglary, sexual assault or rape, and gang fights. Respondents who did not answer or refused to answer any of the ten questions were dropped from the analytical sample. To measure the uncertainty about neighborhood crime, we first recoded the original variables into dummy variables for each neighborhood crime (1 = don't know, 0 = substantive answers). Second, we used exploratory factor analysis to examine whether the dummy variables of "DK" all loaded high on the same factor, using a polychoric correlation matrix. The loadings for the ten indicators ranged from .84 to .95 on one factor. We generated factor scores in a way that the higher the factor score, the greater the propensity of the respondents to answer "DK" to questions on neighborhood crime.

Individual-Level Independent Variables

Uncooperativeness The respondent's uncooperative disposition is measured using seven consecutive questions on the same page of the questionnaire as the neighborhood crime questions and also listed before them: "Not counting those who live with you, (1) how many of your relatives live in your neighborhood and (2) how many friends do you have in your neighborhood?" (1 = none, 2 = one or two, 3 = three to five, 4 = six to nine, 5 = ten or more, 6 = don't know, 7 = refused). "About how often do you and people in your neighborhood (1) do favors for each other, (2) watch over each other's house and property, (3) ask each other advice about personal things such as child rearing or job opportunities, (4) host parties and invite other residents, and (5) visit in each other's homes?" (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = don't know, 6 = refused).

These questions are not sensitive in Chinese context, and the "DK" option is provided for those who really do not know the answer. Therefore, refusing to answer these questions might be seen as reflecting uncooperativeness of the respondent. We first recoded the original variables into seven dummy variables with 1 = refused and 0 = substantive answers or DK. Second, we used exploratory factor analysis to examine whether all the dummy variables loaded high on the same factor, using a polychoric correlation matrix. The loadings of the seven indicators ranged from .84 to .91 on one factor. Given that not every respondent answered all seven questions, we measure uncooperativeness by the number of refusals divided by the total number of questions in this set of seven items that were answered. Mean imputation is used for the five cases that did not answer any of these questions.

Gender is measured by a dummy variable (1 = female, 0 = male). Age is measured by two dummy variables "Aged 65+" and "Aged 55–64". In China, retired residents are more likely to socialize in the neighborhood than younger residents. We use 55 and 65 as the cut-off points for age because they are the legal retirement age of women and men. Education is measured in six categories with 1 = primary school or lower, 2 = middle school, 3 = high school, 4 = two years certification, 5 = bachelor's degree, and 6 = graduate's degree or higher.

Household victimization—Respondents were asked whether they or their family members have ever been the victims of violent crimes or property crimes in the neighborhood. Household victimization is measured by a dummy variable with 1 = ever victimized in the neighborhood, and 0 = no or DK. Home ownership is measured by a dummy variable (1 = own the housing, 0 = rent the housing). Length of residence is measured by the number of months respondents have lived in the neighborhood. It is then standardized to be at the same scale as other variables. Number of friends in the neighborhood and Number of relatives in the neighborhood are both measured in five categories (1 = none, 2 = one or two, 3 = three to five, 4 = six to nine, 5 = ten or more). Perception of the number of migrant workers in the neighborhood is measured by the question "How many rural migrant workers are living in your neighborhood?" (1 = none, 2 = some, 3 = many, 4 = a lot). Hukou status (registered residency status) is measured by a dummy variable with 1 = local urban Hukou, and 0 = non-local urban Hukou.

Neighborhood-Level Independent Variables

Neighborhood social cohesion is measured by the following eight questions on respondents' relationships with neighbors. "If I had to borrow 100 yuan in an emergency, I could

borrow it from my neighbor." "When I'm away from home, I know that my neighbors will pay attention to my residence to avoid accident." "If I were sick, I could count on my neighbors to shop for food and groceries for me." (The response set for these items is: 1 = strongly disagree; 2 = disagree; 3 = neither disagree or agree, 4 = agree, 5 = strongly agree). "About how often do you and people in your neighborhood (1) do favors for each other, (2) watch over each other's house and property, (3) ask each other advice about personal things such as child rearing or job opportunities, (4) host parties and invite other residents, and (5) visit each other's homes?" (The response set is: 1 = never, 2 = rarely, 3 = sometimes, 4 = often). These indicators all loaded highly on the same factor. We first standardized the scores for each item and calculated the average z-score for each respondent. Then, we created the neighborhood average score for social cohesion based on all cases in each neighborhood.

Neighborhood crime is measured by the proportion of households victimized in the past 12 months in each neighborhood. This measure is a proxy of the level of neighborhood crimes because official crime statistics at the neighborhood level are not available. Respondents were asked whether they or their family members have ever been the victims of violent crimes or property crimes in the neighborhood in the past 12 months. The proportion of household victimization is the number of respondents reporting household victimization in the last year divided by the total number of cases in each neighborhood.

Neighborhood committee activity is measured by questions on the frequency of a wide range of neighborhood committee activities: (1) called neighborhood meetings; (2) provided employment assistance to neighborhood members; (3) sponsored entertainments like singing, dancing, exercise; (4) organized meetings with the local police to enhance public safety; (5) offered guidance in life; (6) organized residents to help clean up the neighborhood; (7) organized mediation for neighbor and family problems; (8) organized Bang-Jiao groups; (9) sponsored neighborhood watch groups; (10) assisted lonely elderly people and unattended children; (11) helped and educated troubled adolescents (1 = Never, 2 = Rarely, 3 = A few times, 4 = Often, 5 = Very often). These indicators all loaded highly on the same factor. We first standardized the scores for each item and calculated the average z-score for each respondent. The measure for neighborhood committee activities is the average score among all respondents in each neighborhood.

Neighborhood poverty is measured by the proportion of respondents in the neighborhood with annual household income below 19,999 yuan. The lowest annual income for full time employment in Chongqing in 2016 is approximately 20,000 yuan. Hence, we define households with annual income lower than 19,999 yuan as deprived households. The higher the proportion of deprived households in the neighborhood, the higher the level of neighborhood poverty.

Methods

Our data has a nested structure where individual respondents are nested in neighborhoods. Therefore, we use hierarchical linear models to account for the non-independence of observations within neighborhoods. Two equations are estimated simultaneously: one for within-neighborhood model and the other for between-neighborhood model (Raudenbush and Bryk 2002; Hox et al. 2017).

The first model of our multilevel analysis is an intercept-only model, with no explanatory variables. This model decomposes the total variance in the dependent variable into two independent components: within-neighborhood variance and between neighborhood

variance. We assess the extent to which individual uncertainty about neighborhood crime varies by neighborhood.

In the second model, the within neighborhood model regresses the uncertainty of neighborhood crime on all the grand-mean-centered individual level explanatory variables. The within-neighborhood model equation[4] can be written as:

$$(Uncertainty)_{ij} = \beta_{0j} + \Sigma\, \beta_{q*} X_{qij} + e_{ij}, \tag{1}$$

where β_{0j} is the intercept; X_{qij} is the value of the individual-level independent variable q for respondent i in neighborhood j; β_q is the partial effect of that independent variable on individual uncertainty of neighborhood crime; e_{ij} is the individual level error term. With grand-mean centered individual level independent variables, the β_{0j} is the mean level of uncertainty in each neighborhood, adjusted for all differences in neighborhood compositions. We can test whether there is still significant amount of variance in the uncertainty about neighborhood crime between neighborhoods. If so, our third multilevel model adds in neighborhood level explanatory variables to the between-neighborhood model:

$$\begin{aligned}\beta_{0j} = \gamma_{00} + \gamma_{01}(neighborhood\ crime) + \gamma_{02}(neighborhood\ social\ cohesion) \\ + \gamma_{03}(neighborhood\ poverty) + \gamma_{04}(neighborhood\ committee\ activities) + u_{0j},\end{aligned} \tag{2}$$

where γ_{00} is the average uncertainty about neighborhood crime; γ_{01} to γ_{04} are regression coefficients of the effects of neighborhood level variables on the adjusted neighborhood average uncertainty about crime; u_{0j} is the neighborhood level error term.

The final model extends the previous between-neighborhood model by adding an interaction term between neighborhood poverty and neighborhood committee activities to it. The final between-neighborhood model equation can be written as:

$$\begin{aligned}\beta_{0j} = \gamma_{00} + \gamma_{01}(neighborhood\ crime) + \gamma_{02}(neighborhood\ social\ cohesion) \\ + \gamma_{03}(neighborhood\ poverty) + \gamma_{04}(neighborhood\ committee\ activities) \\ + \gamma_{05}(neighborhood\ committee\ activities) * (neighborhood\ poverty) + u_{0j}\end{aligned} \tag{3}$$

To make the coefficient of the interaction term meaningful for interpretation, we mean-centered neighborhood committee activities and neighborhood poverty in this model.

Before generating the neighborhood-level variables and estimating the models, we accounted for missing data in the individual level independent variables and in all the items composing neighborhood-level measures with a multiple imputation strategy and registered the dependent variable and neighborhood id as covariates in the imputation models (Rubin 1987).[5] The multiple imputation strategy assumes missing at random (MAR) rather than

[4] Our main interest is to examine the effects of individual-level variables on uncertainty of neighborhood crime and the effects of neighborhood social process on neighborhood average uncertainty of neighborhood crime, adjusting for compositional effects. Therefore, we constrain all within-neighborhood slopes to be constant across neighborhoods.

[5] We used the multiple imputation by chained equations (MICE) in STATA to perform the imputations. We included in the imputation model all individual-level independent variables with missing values, individual items that constitute our neighborhood level measures, auxiliary variables possibly related to the missing values, and a variable indicating respondents' neighborhood. Thus, the imputation model included: gender, age, education, marital status, employment status, home ownership, hukou status, length of residence, household victimization, number of friends in the neighborhood, number of relatives in the neighborhood, perception of migrant workers in the neighborhood, household poverty, individual items for neighborhood

Table 2 Summary statistics for original individual- and neighborhood-level variables

	Mean	SD	Min	Max
Individual level[a] (N = 4556)				
Uncertainty about crime	−0.000	1.127	−1.477	1.348
Age 55–64[b]	0.088	0.284	0	1
Age 65+[b]	0.096	0.295	0	1
Female	0.470	0.499	0	1
Education	3.686	1.295	1	6
Uncooperativeness	0.034	0.131	0.000	1.000
Household victimization	0.121	0.326	0	1
Home owner	0.827	0.378	0	1
Length of Residence	58.359	48.814	0	300
Number of relatives	1.744	1.129	1	5
Number of friends	2.401	1.351	1	5
Perception of migrants	2.265	0.778	1	4
Local urban Hukou	0.706	0.456	0	1
Neighborhood level[c] (N = 100)				
Neighborhood social cohesion	−0.032	0.221	−0.656	0.933
Neighborhood crime	0.062	0.052	0.000	0.242
Neigh committee activity	.002	0.287	−0.726	1.460
Neighborhood poverty	0.185	0.106	0.021	0.583

[a]The percentage of missing values in individual level independent variables ranges from 3.1% for female to 13% for household income

[b]The reference category for the dummy variable is age younger than 55

[c]In the original data, the average number of valid cases in each neighborhood used to generate the neighborhood level measures ranges from 40 for neighborhood poverty to 45 for neighborhood social cohesion

missing completely at random (MCAR) in listwise deletion. By imputing twenty data sets, we are able to combine the results with appropriate standard errors to take into account the variability both within and across imputed data sets (Rubin 1987; Schafer 1997). Descriptive statistics are reported in Table 2.

Results

Table 3 presents four nested hierarchical linear models of uncertainty towards neighborhood crime. The dependent variable is scored so that a higher value indicates greater uncertainty towards neighborhood crime. Model 1 is the intercept-only multilevel

Footnote 5 (continued)

social cohesion and neighborhood committee activities, uncertainty of neighborhood crime, and neighborhood id. MICE does not assume a joint multivariate normal distribution but uses a separate conditional distribution for each imputed variable. For example, an ordinal variable is imputed with ologit and a binary variable is imputed with logit.

Table 3 Hierarchical linear models of uncertainty towards neighborhood crime

	Model 1	S.E.	Model 2	S.E.	Model 3	S.E.	Model 4	S.E.
Intercept	−.000	.035	−.000	.032	0.086	.065	0.002	.044
Individual level (N = 4556)								
Age 55–64			.142*	.060	0.148*	.060	0.148*	.060
Age 65+			.305***	.060	0.312***	.060	0.308***	.060
Female			.143***	.033	0.146***	.033	0.147***	.033
Education			.069***	.014	0.066***	.014	0.065***	.014
Uncooperativeness			.766***	.123	0.770***	.123	0.766***	.123
Household victimization			−.135**	.051	−0.134**	.051	−0.136**	.051
Home owner			−.073	.049	−0.064	.049	−0.066	.049
Length of residence			−.058**	.021	−0.050*	.021	−0.049*	.021
Number of relatives			−.075***	.017	−.071***	.017	−.071***	.017
Number of friends			−.059***	.014	−.052***	.014	−.052***	.014
Perception of migrants			.088***	.022	.083***	.022	.083***	.022
Local urban Hukou			−.037	.039	−0.034	.039	−0.034	.039
Neighborhood level (N = 100)								
Social cohesion					−0.678***	.141	−0.606***	.144
Neighborhood crime					0.047	.536	0.004	.526
Neighborhood committee activity					−0.042	.108	−0.100	.111
Poverty					−.480^{+}	.272	−.322	.280
Poverty * neighborhood committee activity							1.515*	.754
Variance components								
Between neighborhood[a]	.095		0.076		0.052		.049	
Within neighborhood	1.177		1.131		1.131		1.131	
ICC	.074		0.063		0.044		0.042	

All variables at the individual level are grand-mean centered. In model 5, neighborhood percent poverty and neighborhood committee activities are mean centered for meaningful interpretation

$^{+}p < .1$; $*p < .05$; $**p < .01$; $***p < .001$

[a]All the neighborhood level variance components are significantly different from 0

model. This model reveals statistically significant variation between neighborhoods regarding uncertainty (Chi square = 458.271, $p < .001$). The estimate of the intraclass correlation (ICC) indicates that about 7.4% of the variance in uncertainty lies between the neighborhoods.

This moderate level of between neighborhood variation is similar to previous studies examining neighborhood and school contexts (Raudenbush and Bryk 2002). It should be noted that even large effect sizes of contextual variables translate into small proportions of variance between neighborhoods (Liska 1990). Moreover, small intraclass correlation can be theoretically rich, especially in testing micro theory and in linking micro and macro theories (Liska 1990).

Model 2 is a random-intercept model with all the grand-mean centered individual-level independent variables. Variance components show that this set of individual level variables explains 4 percent of within neighborhood variance and 20 percent of between

neighborhood variance. There is still significant difference in uncertainty between neighborhoods, after controlling for compositional effects (Chi square = 142.654, $p < .001$).

Consistent with Western research in DK responses and Zhu's study on non-substantive responses in Chinese public opinion surveys, the elderly (b = .305) and female respondents (b = .143) are more likely to give the DK response than their demographic counterparts. Being age 65 or older has a substantial effect on uncertainty. Compared to those under age 55, respondents aged 65 and over are .3 standard deviation higher in uncertainty about neighborhood crime. The higher uncertainty towards neighborhood crime among those aged 65 and over could be due to discontinuous involvement in neighborhood life as a result of health challenges associated with aging.

Females have .13 standard deviation more uncertainty about neighborhood crime than males, controlling for neighborhood contexts and other individual variables. The impact of gender norms might have paradoxical consequences for uncertainty. A previous study on neighborhood social participation in Chinese cities found that on one hand, women typically exhibit higher levels of informal social participation in the neighborhood; on the other hand, women are less likely to participate formally in neighborhood affairs such as by attending neighborhood committee meetings or home owners' committee meetings (Li 2014). Despite women's higher informal social participation in the neighborhood, gender inequality in formal participation in neighborhood affairs might contribute to women's greater uncertainty about neighborhood crime.

In contrast to Western and Zhu's research, one standard deviation increase in higher education is expected to increase uncertainty about neighborhood crime by .08 standard deviation (b = .069). This finding is consistent with several neighborhood studies that found a negative or inverted U-shape relationship between respondent's education and social participation with neighbors in urban China (Li 2014; Southwest University of Finance 2018). A plausible interpretation is that respondents with higher education are more likely to spend time outside the neighborhood for work and for leisure. Their lower commitment to neighborhood life might compromise their perception of neighborhood crime. In addition, and in line with our argument that DK can be a thoughtful, valid answer, another interpretation is that the more educated respondents are more cautious about giving their perception of neighborhood crime given the difficulties in making accurate judgements.

As hypothesized, being uncooperative in answering the middle part of the survey is positively associated with uncertainty about neighborhood crime (b = .766). A one standard deviation increase in uncooperativeness is associated with .09 standard deviation increase in uncertainty. This finding implies that although satisficing increases DK responses, it is far from the most important reason behind uncertainty about neighborhood crime (assuming that our measure of uncooperativeness is in fact capturing satisficing).

We hypothesized that household victimization and home ownership can increase salience of crime to the respondent, which would be likely to reduce DK responses. In model 2, only household victimization has a significant negative relationship with uncertainty (b = − .135). Respondents who have ever experienced household victimization in the neighborhood are .12 standard deviation lower in uncertainty about neighborhood crime. The coefficient for home ownership, in contrast, is not significant (b = − .073). Consistent with our hypotheses, respondents who have stayed longer in the neighborhood (b = − .058), have more relatives (b = − .075) and friends (b = − .059) in the neighborhood are less likely to be uncertain about neighborhood crime. However, these effect sizes are modest.

Our hypothesis that perception of rural migrants living in the neighborhood may increase DK responses on neighborhood crime is also supported (b = .088). A one standard deviation increase in perception of rural migrant neighbors is associated with a .06

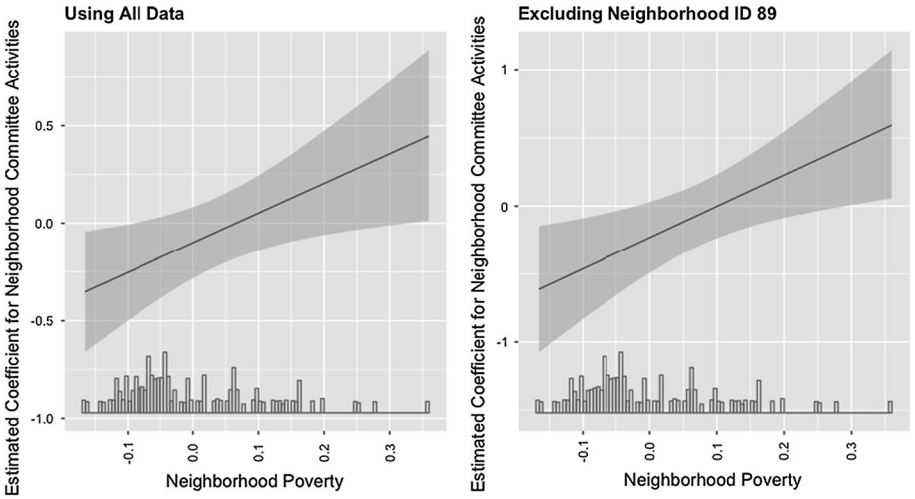

Fig. 1 Coefficient of neighborhood committee activity by neighborhood poverty

standard deviation increase in uncertainty. Hukou status of the respondent is not associated with their uncertainty about neighborhood crime (b = − .037). This is consistent with past findings that migrants are not different from local working population in their sense of attachment and social participation in the neighborhood, after controlling for social-demographic characteristics (Wu 2012).

Model 3 introduces neighborhood context into the picture. The relationship between individual-level independent variables and uncertainty remains virtually unchanged. This indicates that there is no substantial confounding relationship between individual-level socio-demographic characteristics and the neighborhood context. Among contextual factors, neighborhood social cohesion has a significant negative relationship with uncertainty (b = − 0.678), controlling for compositional differences and differences in the measured crime level across neighborhoods. One standard deviation increase in neighborhood social cohesion is expected to reduce uncertainty toward neighborhood crime by .13 standard deviation. Neighborhood poverty has a marginally significant relationship with uncertainty (b = − .480). However, the effect size is modest. One standard deviation increase in poverty is associated with a .05 standard deviation decrease in uncertainty. Neighborhood committee activity is not significantly associated with uncertainty, which can be due to the countervailing effects it might have on perception of neighborhood crime discussed above: controlling crime and communicating neighborhood safety issues to residents.

Model 4 tests the interactive relationship between the level of activity of the neighborhood committee and neighborhood poverty. As hypothesized, there is a significant positive coefficient for the interaction term (b = 1.515, $p < .05$). Figure 1 illustrates how the estimated coefficient of neighborhood committee activity changes with the level of neighborhood poverty, with the 95% confidence interval. The neighborhood poverty is measured by the percent low income households among all households surveyed in the neighborhood.

After centering, the mean level of neighborhood poverty is 0. In the left panel, the interaction plot is generated using all the data. For neighborhoods with 10% and fewer low-income households than the average, there is a significant negative association between neighborhood committee activity and uncertainty about neighborhood crime. For

neighborhoods with two standard deviation below the mean poverty, one standard deviation increase in neighborhood committee activity is expected to reduce uncertainty by .11 standard deviation. This finding is consistent with our argument that in more well-off neighborhoods, the neighborhood committee's communication function is more consequential than its disorder-reduction function. Therefore, the more active the neighborhood committee, the more likely residents perceive neighborhood crime. In less well-off neighborhoods, neighborhood committee's communication function and its disorder-control function will tend to counterbalance. As expected, for neighborhoods with 10% below the average level of poverty to 30 percent above the average poverty, there is no significant relationship between neighborhood committee activity and uncertainty.

To assess the robustness of our finding on the neighborhood-level interaction, we use Cook's distance to identify any neighborhood that has a particularly large influence on the final multilevel model. Neighborhood ID 89 stands out from all the other neighborhoods, with Cook's distance around .25. We then re-estimate model 4, excluding this most influential neighborhood. The interaction between neighborhood committee activity and neighborhood poverty becomes even more prominent ($b = 2.298$, $p = .009$). The new interaction plot is presented in the right panel of Fig. 1. For neighborhoods below average level of poverty, the more active the neighborhood committee, the more likely residents learn about neighborhood crime. For neighborhoods with the average level of poverty to 30 percent above the average poverty, there is no significant relationship between neighborhood committee activity and uncertainty. We are not as confident about the significant positive effect of neighborhood committee activity on uncertainty among the most impoverished neighborhoods, given that we only have one such neighborhood (the far right-hand observation in Fig. 1, where the confidence interval is completely in the positive range).

Our final model reveals a neglected reality in the survey methodology literature that DK about neighborhood crime is ecologically structured. Overall, our contextual variables in the final model have explained 28 percent of the variance among neighborhoods in uncertainty towards neighborhood crime.

Conclusions and Implications

"Don't know" (DK) responses are common in criminological survey data and social science surveys more generally. It is in turn common to view such responses as a nuisance—eager for substantive findings, criminologists typically interpret DK as an undesirable "item non-response error." With little attention and interest, the resulting urge is to push for a minimum amount of DK responses in variables of interest and assume they are randomly distributed. But what if DK means something substantive? Akin to variation in responses to collective efficacy items within neighborhoods that tells us about consensus (Brunton-Smith et al. 2018), this paper has argued that the variation in DK responses taps a meaningful property of neighborhoods.

Our study therefore sought to question the common assumption of random DK responses and emphasizes instead the importance of understanding and handling DK for gaining substantive criminological knowledge. This approach stands in contrast with most prior approaches in the survey methodology literature that have examined individual factors, item factors, and survey contextual factors related to DK responses (e.g., Francis and Busch 1975; Zhu 1996; Dillman et al. 2002; Young 2012; Grabosky et al. 2014). Using a multilevel framework with original data collected in the Chinese city of Chongqing,

our findings indicate that DK responses have substantively meaningful correlates at both the individual and neighborhood level. Indeed, our findings suggest that at least in some instances, DK is the most valid response, reflecting actual uncertainty and lack of knowledge about neighborhood crime.

Of particular importance are the neighborhood-level correlates and predictors of DK. Neighborhood social cohesion is negatively associated with individual uncertainty about neighborhood crime, controlling for neighborhood composition. This finding supports our hypothesis that in more cohesive neighborhoods, information of crime is more widely spread among residents. It is also consistent with previous findings that neighborhood social cohesion is positively associated with a higher perception of homicide victimization risk, controlling for homicide rates (Villarreal and Silva 2006). Discovering the association between neighborhood social cohesion and uncertainty about neighborhood crime can further generate additional interesting research questions. For example, can neighborhood social cohesion increase fear of crime by facilitating residents' exposure to crime narratives? What is the implication for neighborhood collection action when residents are more likely to be uncertain about neighborhood issues in less socially integrated neighborhoods?

Another interesting result of our study concerns neighborhood organizations. We found a significant interaction between neighborhood committee activity (semi-public social control) and neighborhood poverty in predicting DK. Among the more well-off neighborhoods, the more active the neighborhood committee, the more likely respondents know about neighborhood crime. This pattern is consistent with a previous study of perceived neighborhood disorder in Tianjin, China, where neighborhood committee activity is positively related to the level of neighborhood disorder perceived by respondents, controlling for neighborhood crime and disorderly conditions (Zhang et al. 2017). The interaction effect in our study suggests the order maintenance and the communication functions of the neighborhood committee can have a differential influence depending on neighborhood economic conditions. Consider that modern well-off neighborhoods in Chongqing exhibit new forms of market-based social control that have taken over part of the disorder-control functions traditionally performed by neighborhood committees. Moreover, comprehensive security services such as 24-h security guards, electronic access control system, CCTV cameras can substantively enhance residents' sense of security. The lack of visible disorder and a strong sense of security can reduce salience of crime to respondents in well-off neighborhoods. Under such neighborhood conditions, the neighborhood committee's crime communication function is likely to be much more prominent than its order maintenance function.

Our findings have methodological implications for further research in both China and the West. First, it would be fruitful for criminological studies to explore whether our substantive findings can be generalized: does the prevalence of DK response vary by substantive characteristics of respondents and social context? In addition, given that survey satisficing is more likely to occur in the latter part of the survey, the position of survey items with the DK option could be randomly permuted to examine the effect of satisficing on the level of DK responses. Future research should also examine how question wording affect the level of DK responses, and the implication for using DK to measure uncertainty. Lastly, it is important to study how the exclusion of DK in the response set changes the distribution of substantive responses. Pilot studies to understand meanings of DK responses would be highly illuminating.

More generally, understanding the meaning behind DK has important implications for whether to include the DK option in survey designs and how to handle DK responses in data analysis when they occur. When DK is a valid answer for many respondents, *not* including the DK option in the survey instrument will force respondents to choose a non-existent substantive answer. Without the DK option, then, researchers are not able to distinguish between accurate measurements and false positives in data analysis. When DK responses are allowed explicitly, as in our survey instrument, we still cannot determine conclusively whether it means uncertainty, passive refusal or satisficing. But, as we have done, researchers can at least examine the level and correlates of DK for clues. Moreover, DK response as a reflection of uncertainty can also be innovatively used to construct substantively interesting variables such as uncertainty towards neighborhood social order. If researchers prefer to treat DK as missing values, multiple imputation techniques can produce unbiased estimates and efficient standard error when the independent variable have DK responses due to satisficing or uncertainty (Young 2012). It is important to stress that methods and substance are linked in determining the best course of action. When DK is selected to withhold the true answer from the researchers, no method can produce unbiased estimates.

Appendix

See Table 4.

Table 4 DK responses in items of household victimization and deviant values

Survey items	Frequency of DK (%)
19. While you have lived in this neighborhood, has anyone ever used violence, such as in a mugging, fight, or sexual assault, against you or any member of your household anywhere in your neighborhood?	8.7
20. While you have lived in this neighborhood, has your home ever been burglarized	5.8
21. While you have lived in this neighborhood, have you or another member of your household had a motorbike or electric bicycles stolen from outside of your home in your neighborhood?	9.6
22. While you have lived in this neighborhood, have you or another member of your household had property damaged in your neighborhood, including damage of vehicles parked in the neighborhood or other personal property (such as motorcycles or electric bicycles)?	8.1
37. The following are some statements people sometimes make. For each, please tell me whether you strongly agree, agree, disagree, or strongly disagree with each.	
a. Laws were made to be broken	10.2
b. It's ok to do anything you want as long as you don't hurt anyone	6.8
c. To make money, there are not right or wrong ways anymore, only easy ways and hard ways	8.2
d. Fighting between friends or within families is nobody else's business	8
e. Nowadays a person has to live pretty much for today and rather than for tomorrow	7.7

The question number represents the original order of questions in the questionnaire. The percentage of DK responses is the percentage of all respondents who answered DK, without excluding missing values or Refused.

References

Alwin DF, Krosnick JA (1991) The reliability of survey attitude measurement: the influence of question and respondent attributes. Sociol Methods Res 20(1):139–181

Armstrong T, Katz C (2010) Further evidence on the discriminant validity of perceptual incivilities measures. Justice Q 27(2):280–304

Bradburn NM, Sudman S, Blair E, Locander W, Miles C, Singer E, Stocking C (1979) Improving interview method and questionnaire design: Response effects to threatening questions in survey research. Jossey-Bass, San Francisco

Bray D (2006) Building 'community': new strategies of governance in urban China. Econ Soc 35(4):530–549

Brunton-Smith I, Sturgis P, Leckie G (2018) How collective is collective efficacy? The importance of consensus in judgments about community cohesion and willingness to intervene. Criminology. https://doi.org/10.1111/1745-9125.12180

Bursik RJ, Grasmick H (1993) Neighborhoods and crime: The dimensions of effective social control. Lexington, New York

Converse JM (1976) Predicting no opinion in the polls. Pub Opin Q 40(4):515–530

Craig CS, McCann JM (1978) Item nonresponse in mail surveys: extent and correlates. J Market Res 15:285–289

Dillman, D. A., Eltinge, J. L., Groves, R. M., & Little, R. J. (2002). Survey nonresponse in design, data collection, and analysis. *Survey Nonresponse*, 3–26

Ferber R (1966) Item nonresponse in a consumer survey. Pub Opin Q 30(3):399–415

Francis JD, Busch L (1975) What we now know about" I don't knows". Pub Opin Q 39(2):207–218

Grabosky P, Liu J, Hinds L (2014) What does "don't know" mean? Explaining citizen don't know responses in police surveys. In: Herausgegeben Von (ed) Current problems of the penal law and criminology. Wydawnictwo C.H.Beck, Warszawa, pp 401–418

Hox JJ, Moerbeek M, van de Schoot R (2017) Multilevel analysis: techniques and applications. Routledge, Abingdon

Jiang S, Wang J, Lambert E (2010) Correlates of informal social control in Guangzhou, China neighborhoods. J Crim Justice 38(4):460–469

Jiang S, Land KC, Wang J (2013) Social ties, collective efficacy and perceived neighborhood property crime in Guangzhou, China. Asian J Criminol 8(3):207–223

Krosnick JA (1991) Response strategies for coping with the cognitive demands of attitude measures in surveys. Appl Cognit Psychol 5(3):213–236

Krosnick JA (2002) The causes of no-opinion responses to attitude measures in surveys: They are rarely what they appear to be. *Survey Nonresponse*, 87–100

Krosnick JA, Holbrook AL, Berent MK, Carson RT, Hanemann WM, Kopp RJ, Mitchell RC, Presser S, Ruud PA, Smith VK, Moody WR, Green MC, Conaway M (2002) The impact of "no opinion" response options on data quality: non-attitude reduction or an invitation to satisfice? Pub Opin Q 66(3):371–403

Li H (2014) China social development report. China Social Science Press, Beijing

Liska AE (1990) The significance of aggregate dependent variables and contextual independent variables for linking macro and micro theories. Soc Psychol Q 53:292–301

Messner, S. F., & Zimmerman, G. M. (2012). Community-level influences on crime and offending. *The Oxford handbook of crime prevention*, 155-172

Messner SF, Zhang L, Zhang SX, Gruner CP (2017) Neighborhood crime control in a changing China: Tiao-Jie, Bang-Jiao, and neighborhood watches. J Res Crime Delinq 54(4):544–577

Meulemann H (2004) Enforced secularization—Spontaneous revival? Religious belief, unbelief, uncertainty and indifference in East and West European countries 1991–1998. Eur Soc Rev 20(1):47–61

Perkins DD, Taylor RB (1996) Ecological assessments of community disorder: their relationship to fear of crime and theoretical implications. In: Revenson TA, D'Augelli AR, French SE, Hughes D, Livert DE, Seidman E, Shinn M, Yoshikawa H (eds) Ecological research to promote social change. Springer, Berlin, pp 127–170

Quillian L, Pager D (2001) Black neighbors, higher crime? The role of racial stereotypes in evaluations of neighborhood crime. Am J Sociol 107(3):717–767

Raudenbush SW, Bryk AS (2002) Hierarchical linear models: Applications and data analysis methods, vol 1. Sage, Thousands Oaks

Rubin DB (1987) Multiple imputation for nonresponse in surveys. Wiley, New York

Sampson RJ, Morenoff JD, Gannon-Rowley T (2002) Assessing "neighborhood effects": social processes and new directions in research. Ann Rev Sociol 28(1):443–478

Schafer JL (1997) Analysis of incomplete multivariate data. CRC Press, Boca Raton
Southwest University of Finance (2018) Report on life satisfaction in capital cities of China. Southwest University of Finance Press, Chengdu
Staff J, Harris A, Sabates R, Briddell L (2010) Uncertainty in early occupational aspirations: role exploration or aimlessness? Soc Forces 89(2):659–683
Swader CS (2017) Modernization, formal social control, and anomie: a 45-society multilevel analysis. Int J Comp Sociol 58(6):494–514
Tourangeau R (1984) Cognitive sciences and survey methods. Building a Bridge between Disciplines, Cognit Asp Surv Methodol, pp 73–100
Tourangeau R, Rips LJ, Rasinski K (2000) The psychology of survey response. Cambridge University Press, Cambridge
Villarreal A, Silva BF (2006) Social cohesion, criminal victimization and perceived risk of crime in Brazilian neighborhoods. Soc Forces 84(3):1725–1753
Wang Z, Zhang F, Wu F (2016) Intergroup neighbouring in urban China: implications for the social integration of migrants. Urban Stud 53(4):651–668
Wu F (2012) Neighborhood attachment, social participation, and willingness to stay in China's low-income communities. Urban Affairs Review 48(4):547–570
Young RL (2012) Don't know responses in survey research. The Pennsylvania State University, State College
Zhang L (2012) In search of paradise: middle-class living in a Chinese metropolis. Cornell University Press, Ithaca
Zhang L, Messner SF, Liu J (2007a) A multilevel analysis of the risk of household burglary in the city of Tianjin, China. Br J Criminol 47(6):918–937
Zhang L, Messner SF, Liu J (2007b) An exploration of the determinants of reporting crime to the police in the city of Tianjin, China. Criminology 45(4):959–984
Zhang L, Messner SF, Liu J (2007c) Bicycle-theft victimization in contemporary urban China: a multilevel assessment of risk and protective factors. J Res Crime Delinq 44(4):406–426
Zhang L, Messner SF, Liu J, Zhuo YA (2009) Guanxi and fear of crime in contemporary urban China. Br J Criminol 49(4):472–490
Zhang L, Messner SF, Zhang S (2017) Neighborhood social control and perceptions of crime and disorder in contemporary Urban China. Criminology 55(3):631–663
Zhong L (2009) Communities, crime and social capital in contemporary China. Routledge, Abingdon
Zhu JH (1996) 'I don't know'in public opinion surveys in China: individual and contextual causes of item non-response. J Contemp China 5(12):223–244