APPENDIX B

HOW TO READ A RESEARCH ARTICLE

The discussions of research articles throughout the text may provide all the guidance you need to read and critique research on your own. But reading about an article in bits and pieces to learn about particular methodologies is not quite the same as reading an article in its entirety to learn what the research discovered. The goal of this appendix is to walk you through an entire research article, answering the review questions introduced in Appendix A. Of course, this is only one article, and our "walk" will take different turns from one taken by a review of other articles, but after this review, you should feel more confident when reading other research articles on your own.

For this example, we will use an article by Yi-Fen Lu, Yi-Chun Lu, Ling Ren, and Ineke Marshall that provides a test of self-control theory with a sample of Chinese adolescents. It contributes to our understanding of the power and efficacy of self-control theory. This theory specifies that the impact of self-control variables should not be affected by culture, but very few studies exist that have tested the theory in non-Western contexts generally or in China specifically. Moreover, the article is published in a reputable criminological journal, the *Journal of Contemporary Criminal Justice*, indicating the article makes an important contribution to what is known about the causes and correlates of delinquent behaviors.

The questions you need to answer for any article or research monograph are as follows:

1. What is the basic research question or problem? Try to state it in just one sentence. (Chapter 2)
2. Is the purpose of the study explanatory, evaluative, exploratory, or descriptive? Did the study have more than one purpose? (Chapter 1)
3. Was the theoretical framework presented? What was it? Did it seem appropriate for the research question addressed? Can you think of a different theoretical perspective that might have been used? (Chapter 2)
4. What prior literature was reviewed? Was it relevant to the research problem? To the theoretical framework? Does the literature review appear to be adequate? Are you aware of (or can you locate) any important omitted studies? (Chapter 2)
5. How well did the study live up to the guidelines for science? Do you need additional information in any areas to evaluate the study? To replicate it? (Chapter 2)
6. Did the study seem consistent with current ethical standards? Were any trade-offs made between different ethical guidelines? Was an appropriate balance struck

between adherence to ethical standards and use of the most rigorous scientific practices? (Chapter 2 and in each methods chapter)

7. What were the major concepts in the research? How, and how clearly, were they defined? Were some concepts treated as unidimensional that you think might best be thought of as multidimensional? (Chapter 3)
8. Were any hypotheses stated? Were these hypotheses justified adequately in terms of the theoretical framework? In terms of prior research? (Chapter 2)
9. What were the independent and dependent variables in the hypothesis or hypotheses? Did these variables reflect the theoretical concepts as intended? What direction of association was hypothesized? Were any other variables identified as potentially important? (Chapter 2)
10. Did the instruments used—the measures of the variables—seem valid and reliable? How did the author attempt to establish this? Could any more have been done in the study to establish measurement validity? (Chapter 3)
11. What were the units of analysis? Were they appropriate for the research question? If some groups were the units of analysis, were any statements made at any point that are open to the ecological fallacy? If individuals were the units of analysis, were any statements made at any point that suggest reductionist reasoning? (Chapter 4)
12. Was the study design cross-sectional or longitudinal, or did it use both types of data? If the design was longitudinal, what type of longitudinal design was it? Could the longitudinal design have been improved in any way, as by collecting panel data rather than trend data, or by decreasing the dropout rate in a panel design? If cross-sectional data were used, could the research question have been addressed more effectively with the longitudinal data? (Chapter 5)
13. Were any causal assertions made or implied in the hypotheses or in subsequent discussion? What approach was used to demonstrate the existence of causal effects? Were all three criteria for establishing causal relationships addressed? What, if any, variables were controlled in the analysis to reduce the risk of spurious relationships? Should any other variables have been measured and controlled? How satisfied are you with the internal validity of the conclusions? (Chapters 5, 6)
14. Was a sample or the entire population of elements used in the study? What type of sample was selected? Was a probability sampling method used? Did the authors think the sample was generally representative of the population from which it was drawn? Do you? How would you evaluate the likely generalizability of the findings to other populations? (Chapter 4)
15. Was the response rate or participation rate reported? Does it appear likely that those who did not respond or participate were markedly different from those who did participate? Why or why not? Did the author(s) adequately discuss this issue? (Chapters 4, 6)
16. Was an experimental, survey, participant observation, or some other research design used? How well was this design suited to the research question posed and the specific hypotheses tested, if any? Why do you suppose the author(s) chose this particular design? How was the design modified in response to research constraints? How was it modified in order to take advantage of research opportunities? (Chapters 6–10)
17. Was an evaluation research design used? Which type was it? What was the primary purpose of the evaluation? (Chapter 11)

18. Were multiple methods used? Were findings obtained with different methods complementary? (Chapter 11)
19. Was any attention given to social context? To biological processes? If so, what did this add? If not, would it have improved the study? Explain. (Chapter 5)
20. Summarize the findings. How clearly were statistical and/or qualitative data presented and discussed? Were the results substantively important? (Chapters 9, 13)
21. Did the author(s) adequately represent the findings in the discussion and/or conclusions sections? Were conclusions well grounded in the findings? Are any other interpretations possible? (Chapter 14)
22. Compare the study to others addressing the same research question. Did the study yield additional insights? In what ways was the study design more or less adequate than the design of previous research? (Chapters 2, 10, 13)
23. What additional research questions and hypotheses are suggested by the study's results? What light did the study shed on the theoretical framework used? On social policy questions? (Chapters 2, 10, 13)

Below we have reproduced these questions followed by our answers from the review of the Lu et al. (2013) article. You can also follow our review by reading through the article itself and noting our comments.

1. *What is the basic research question or problem? Try to state it in just one sentence.* (Chapter 2)

   Is low self-control associated with misbehavior among juveniles in China? Is any impact of this variable independent of an effect of measures of social bond theory and individual demographic variables?

2. *Is the purpose of the study explanatory, evaluative, exploratory, or descriptive? Did the study have more than one purpose?* (Chapter 1)

   The study is explanatory. The authors wish to establish the potential impact of one (set of) variable(s) on another—measures of self-control and the social bond on the incidence of deviant behavior in juveniles in a specific cultural context.

3. *Was the theoretical framework presented? What was it? Did it seem appropriate for the research question addressed? Can you think of a different theoretical perspective that might have been used?* (Chapter 2)

   Two different theoretical frameworks are specifically being tested in this article—Gottfredson and Hirschi's self-control theory and Hirschi's social bond theory. This study is designed as a test of those theories as applied in an under-researched context (China). It would certainly be possible to examine the accuracy of other Western theories of delinquency with this population as well.

4. *What prior literature was reviewed? Was it relevant to the research problem? To the theoretical framework? Does the literature review appear to be adequate? Are you aware of (or can you locate) any important omitted studies?* (Chapter 2)

   In the section called "Theory and Prior Research," Lu et al. (2013) discuss the basics of self-control and social bond theories and cite a variety of other studies that have tested both of these theories. In addition, they provide a discussion of studies that have applied concepts from either theory in non-Western—specifically East Asian—contexts. Given the purpose of the study—to establish the efficacy of either or both

of these theoretical frameworks in a non-Western context—the review of these areas of research appear to be appropriate and adequate. We leave it to you to decide if any important studies were omitted.

5. *How well did the study live up to the guidelines for science? Do you need additional information in any areas to evaluate the study? To replicate it?* (Chapter 2)

   The study clearly involves a test of ideas (two formal theories) against empirical reality (measures of behavior among Chinese adolescents). The "Methods" section of the article clearly tells us how the investigation was systematically carried out—there's a careful (and well-specified) research design. This design is well documented and clear (and obviously publicly disclosed as the article has been published). They clarify their assumptions in the "Theory and Prior Research" section of the paper. There is a full section in the paper devoted to discussion of "Measures" that is, the ways in which key concepts in the study were defined and measured. The authors are building on other empirical research and attempting to replicate these studies but in a very different cultural context. They clearly maintain an interest in theory—this paper is a deductive approach to knowledge that presents a test of specific theories. They do not make any assumptions about what they will find—for example, they write that the analysis examines what effect of self-control measures—"if any"—remains after considering the effect of measures of social bond theory and demographic controls. They clearly have no assumptions about the potential impact of those social control measures. Their goal is to search for patterns of regularities in the data—"Are there predictable and discernible patterns that emerge in an examination of the delinquent behaviors of Chinese teenagers?" Thus, this study seems to exemplify adherence to basic scientific guidelines.

6. *Did the study seem consistent with current ethical standards? Were any trade-offs made between different ethical guidelines? Was an appropriate balance struck between adherence to ethical standards and use of the most rigorous scientific practices?* (Chapter 3)

   The authors make no specific references to adherence to ethical standards, nor is there a specific citation for approval by an internal review board for their study methodology. However, given that all four authors are employed at major American universities, it is likely safe to assume that such a review by a human subjects board did take place. The questionnaire used in the study asked adolescents about deviant behavior, and the authors do tell us that this questionnaire was anonymous. Although there is no reason to assume that ethical standards were not upheld, the authors might have been more specific in their description of the methodology in this respect.

7. *What were the major concepts in the research? How, and how clearly, were they defined? Were some concepts treated as unidimensional that you think might best be thought of as multidimensional?* (Chapter 4)

   The following concepts were used in the research: risky behavior, minor delinquency, self-control, attachment, school commitment, involvement, belief, age, gender, family structure, and delinquent peers. The definitions of the key concepts linked with the two theories (self-control, attachment, school commitment, involvement, and belief) receive special attention. Several of the variables used in the study are multidimensional. For example, the operationalization of the key concept of self-control utilizes an index designed to tap into various dimensions of this measure. Three of the four aspects of social bonds (attachment, involvement, and belief) were measured with multiple items. The fourth (school commitment) was operationalized as the response to a single item on the survey ("How well do you

do in school compared with other students in your class?"). This measure of school commitment might have been more complex, although the strategy the authors use is not inconsistent with the way this concept has been operationalized in other research.

8. *Were any hypotheses stated? Were these hypotheses justified adequately in terms of the theoretical framework? In terms of prior research?* (Chapter 2)

   The authors offer no specifically stated set of hypotheses about the ways in which self-control theory and social bond theory will perform in predicting the delinquent behaviors in this population of Chinese youth. They certainly do identify the results of previous research with regard to the study of these measures in various contexts but do not express any expectations about the relationships that might be found in this cultural context.

9. *What were the independent and dependent variables in the hypothesis(es)? Did these variables reflect the theoretical concepts as intended? What direction of association was hypothesized? Were any other variables identified as potentially important?* (Chapter 2)

   There are two dependent variables—prevalence of risky behavior and of minor delinquency. Independent variables are self-control, attachment, school commitment, involvement, and belief. Demographic control variables include age, gender, family structure, and delinquent peers. These variables are all directly related to the theories being tested.

10. *Did the instruments used—the measures of the variables—seem valid and reliable? How did the author attempt to establish this? Could any more have been done in the study to establish measurement validity?* (Chapter 4)

    Because both self-control and social bond theories have been widely tested in the field, there are certain agreed-upon operationalizations of concepts relevant for these theories that exist (all of which are discussed in the article). With regard to the survey instrument used to collect the data, the authors note that the "validity and reliability of the . . . core questionnaire have been examined and found to be quite satisfactory." Standardized measures (such as "Grasmick et al.'s . . . self-control scale, including 12 items on impulsivity, risk-seeking, self-centeredness, and temper") were also used. It appears that the authors made use of established measures, which have been previously subject to examination for reliability and validity, in their own work.

11. *What were the units of analysis? Were they appropriate for the research question? If some groups were the units of analysis, were any statements made at any point that are open to the ecological fallacy? If individuals were the units of analysis, were any statements made at any point that suggest reductionist reasoning?* (Chapter 5)

    The unit of analysis in this study was an individual—a student in a school in China. This unit of analysis is appropriate for this research question as the theories being tested here are ones that predict individual-level behavior. There are no statements that suggest reductionist reasoning.

12. *Was the study design cross-sectional or longitudinal, or did it use both types of data? If the design was longitudinal, what type of longitudinal design was it? Could the longitudinal design have been improved in any way, such as by collecting panel data rather than trend data or by decreasing the dropout rate in a panel design? If cross-sectional data were used, could the research question have been addressed more effectively with the longitudinal data?* (Chapter 6)

    This study was cross-sectional. Data were collected from the Chinese students at a single point in time.

13. *Were any causal assertions made or implied in the hypotheses or in subsequent discussion? What approach was used to demonstrate the existence of causal effects? Were all three criteria for establishing causal relationships addressed? What, if any, variables were controlled in the analysis to reduce the risk of spurious relationships? Should any other variables have been measured and controlled? How satisfied are you with the internal validity of the conclusions?* (Chapters 5, 6)

    Although the authors do not specifically say that they are in pursuit of causal relationships, there is some evidence that might be used to suggest the existence of a causal relationship. They establish association between the independent and dependent variables. They also address issues of spuriousness directly—the impact of self-control measures is examined both with and without the addition of measures of social bonds. The four control variables used (age, gender, family structure, and delinquent peers) are also appropriate in an effort to address spuriousness. These measures might be expected to be associated with both the independent and the dependent variable, so including them as controls is a wise move. There are potentially more problems with the time order element. Because data were only collected at a single point in time, it might be difficult to ascertain, for some measures, the direction of the causal relationship. For example, it is possible that a low level of school commitment (measured with a question that asked how well the respondent was doing in school) might have a causal association with deviant behavior (as predicted in social bond theory). It is also possible, however, that engaging in some risky behaviors (such as drinking alcohol) could have an effect on school performance (the measure of school commitment). Therefore, whereas association between the variables can be demonstrated, time order and nonspuriousness are not entirely established.

14. *Was a sample or the entire population of elements used in the study? What type of sample was selected? Was a probability sampling method used? Did the authors think the sample was generally representative of the population from which it was drawn? Do you? How would you evaluate the likely generalizability of the findings to other populations?* (Chapter 5)

    A probability sample is used in the study. The authors utilized a multistage cluster technique to randomly select middle schools in the city of Hangzhou and then randomly selected one class of seventh-, eighth-, and ninth-grade students in each school. All students in that randomly selected class were then asked to participate in the research. The site selected for the study was chosen because "[t]he city is a vivid reflection of the social and demographic changes in the coastal area in China where the economic boom has been the most noticeable." Consequently, the youth randomly selected from this population should be representative of a part of China that is of special interest. The random selection of participants should have ensured that the findings were generalizable.

15. *Was the response rate or participation rate reported? Does it appear likely that those who did not respond or participate were markedly different from those who did participate? Why or why not? Did the author(s) adequately discuss this issue?* (Chapters 5, 7)

    The response rate was quite high—96%. Lu et al. note that this very high response rate might be attributed in part to cultural factors. Response rates to self-administered surveys in China are routinely this high, whereas studies done in the United States with comparable methodologies have seen response rates in the area of 75%. The high response rate is a good thing, of course, with regard to the confidence a reader can have in the results of the study. It is also significant that Lu et al. provide context for this (perhaps seemingly inordinately) high response rate.

16. *Was an experimental, survey, participant observation, or some other research design used? How well was this design suited to the research question posed and the specific hypotheses tested, if any? Why do you suppose the author(s) chose this particular design? How was the design modified in response to research constraints? How was it modified in order to take advantage of research opportunities?* (Chapters 7, 8)

    The study employed a survey methodology. A great deal of other research (cited in the paper) that has tested both self-control theory and social bond theory with adolescents in the West has also used survey methodologies. The fact that survey research is established as a vehicle for examining the types of questions that are of interest here was likely a factor in the selection of this methodology for this study. The survey used in this study is based on a previously used instrument (the International Self-Report Delinquency Study). In writing about this survey, the authors state, "[t]he validity and reliability . . . have been examined and found to be quite satisfactory." The site of the study, China, did require a translation of this instrument. Lu et al. note that the translated survey was pretested with a group of Chinese exchange students "to make the questionnaire better fit the Chinese social, cultural, and language contexts."

17. *Was an evaluation research design used? Which type was it? What was the primary purpose of the evaluation?* (Chapter 10)

    No, this study is not an evaluation design.

18. *Were multiple methods used? Were findings obtained with different methods complementary?* (Chapter 11)

    This study used only survey methodology. Given the fact that the impact of cultural context was a variable of interest here, it is possible that this research question could also be effectively addressed with a more qualitative methodology in the future—one that would allow for the discovery of context and the application of meaning on the part of the subjects.

19. *Summarize the findings. How clearly were statistical and/or qualitative data presented and discussed? Were the results substantively important?* (Chapter 12)

    The authors include a discussion and conclusions section where they clearly summarize the major findings of the analysis. They found that the results of the study in this Chinese context were comparable to those found with Western (primarily American) samples. Self-control was found to be inversely related to measures of both risky behavior and minor delinquency. The effects of the self-control measure remained even after including social bond measures and the demographic variables in the model, and the self-control variables had a stronger effect than did the social bond measures. Among the social bond measures, only belief and family attachment were found to have a significant effect on the dependent variables. Self-control was found to be more strongly related to minor delinquency than to risky behaviors.

20. *Did the author(s) adequately represent the findings in the discussion and/or conclusion sections? Were conclusions well grounded in the findings? Are any other interpretations possible?* (Chapter 12)

    Lu et al. have extensive "Discussion" and "Conclusion" sections in which they summarize and review the major findings of their analysis and also offer some insight into the significance, and potential problems, with the research. First, it is a significant step to find confirmation of the predictions of self-control and social bond theories in a non-Western population of children. The authors made it clear

that this was a primary goal of the study, and the fact that these theories perform as predicted in a very different cultural context adds to the evidence supporting the universality of these relationships. There are also some notable limitations in the study, which Lu et al. point out. For example, only a small amount of the total variance in risky behaviors or delinquency is accounted for by the variables used in this study. Thus, the authors recommend that other "theoretical explanations, such as general strain theory, may be considered for future investigations." They also suggest that more direct comparison of the data from this study with that obtained with the same (or similar) instruments in other countries would be useful—"the ISRD-2 survey has been implemented in 30 countries (and) future research may explore the comparative aspect of self-control across different cultures to examine the explanatory power of self-control theory."

21. *Compare the study to others addressing the same research question. Did the study yield additional insights? In what ways was the study design more or less adequate than the design of previous research?* (Chapters 2, 12)

    The most significant thing about this study was its confirmation of the findings of many other studies regarding the impact of self-control and social bond variables on delinquency. The fact that these data came from a very different cultural context—China—was the main point of the research. In their explication of the theory, Gottfredson and Hirschi "pointed out (that) 'culture variability is not important in the causation of crime and we should look for constancy rather than variability in the definition of and causation of crime'" (1990, p. 33). The application and testing of the theory in other cultural contexts—as done in this article—can therefore be considered a necessary part of testing this popular and powerful approach to explaining delinquency and crime.

    Lu et al. do call attention to some measurement issues with their study that might have been problematic. In measuring the key variable of self-control, they use an established index (Grasmick et al.'s self-control scale) but only make use of the short version (with 12 items) of this widely tested instrument.

22. *What additional research questions and hypotheses are suggested by the study's results? What light did the study shed on the theoretical framework used? On social policy questions?* (Chapters 2, 12)

    The results of this study definitely contribute to the validation of self-control and social bond theories, offering a test of the theories in a non-Western context. To establish that the impact of self-control measures on the likelihood of the occurrence of criminal or delinquent behaviors is universal, the theory should be tested in more cultural contexts. This successful application in China also only involved students in one province of this very large country—more data from within China, as well as from other Asian countries, would also be useful. Lu et al. also argue that additional theoretical perspectives (e.g., strain theory) should also be tested in the cultural context of China.

Exploring the Utility of Self-Control Theory for Risky Behavior and Minor Delinquency Among Chinese Adolescents

Journal of Contemporary Criminal Justice
29(1) B-8–52
© 2013 SAGE Publications
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/1043986212471240
ccj.sagepub.com
SAGE

Yi-Fen Lu[1], Yi-Chun Yu[1], Ling Ren[1], and Ineke Haen Marshall[2]

Abstract

Although scholarly interest in empirically assessing Gottfredson and Hirschi's (1990) self-control theory continues to grow, there is little research available on evaluating its utility in China. The current study examines the power of self-control theory as an explanation of juvenile minor risky behavior as well as minor delinquent behaviors in China, while simultaneously considering the role of social bonds. The data were collected from a probability sample of 7th, 8th, and 9th graders in Hangzhou, China (N = 1,043) using the second International Self-Report Delinquency (ISRD-2) survey instrument. The results from the logistic regression analyses show that self-control is associated with both measures of Chinese youth deviance in the expected direction, suggesting that the youth with low self-control have a higher likelihood to report minor risky and delinquent behavior. The effects of self-control remain when controlling for social bonding measures. Among the social bonding factors, beliefs (pro-violence attitude) and family bonding were found to be the significant predictors of risky behavior and minor delinquency, respectively.

Keywords

self-control, social bonding, Chinese adolescents, International Self-Report Delinquency survey

Introduction

Gottfredson and Hirschi's self-control theory (1990), known as "the general theory of crime," has been one of the most influential and most empirically scrutinized criminological theories in recent decades (Cheung & Cheung, 2008; Cretacci, Rivera, & Ding, 2009). An abundance of research has been generated to test the proposition that low self-control is the main cause of crime, delinquency, and numerous analogous behaviors (Arneklev, Grasmick, Tittle, & Bursik, 1993; Cochran, Wood, Sellers, Wilkerson, & Chamlin, 1998; Gibbs, Giever, & Martin, 1998; Gibson, Wright, & Tibbetts, 2000; Junger, West, & Timman, 2001; Keane, Maxim, & Teevan, 1993; Marshall & Enzmann, 2012; Wood, Pfefferbaum, & Arneklev, 1993). Its robustness is evidenced in the meta-analytic review of 21 empirical studies by Pratt and Cullen (2000), who found that low self-control is an important predictor of crime and of analogous behaviors across different measurements and types of samples. An important feature of self-control theory is that it departs from the culture-difference approach in the analysis of comparative criminology (Cheung & Cheung, 2008). As

[1]College of Criminal Justice, Sam Houston State University, Huntsville, TX, USA
[2]Department of Sociology & Anthropology and School of Criminology and Criminal Justice, Northeastern University, Boston, MA, USA

Corresponding Author:
Yi-Fen Lu, College of Criminal Justice, Sam Houston State University, Huntsville, TX 77341, USA.
E-mail: yxl007@shsu.edu

Source: Lu, Yi-Fen, Yi-Chun Yu, Ling Ren, and Ineke Haen Marshall. 2013. "Exploring the utility of self-control theory for risky behavior and minor delinquency among Chinese adolescents." *Journal of Contemporary Criminal Justice* 29(1): 32–52.

Gottfredson and Hirschi (1990) pointed out, "culture variability is not important in the causation of crime and we should look for constancy rather than variability in the definition of and causation of crime . . . " (p. 175). In other words, the predictive power of self-control on delinquency can be manifested across different cultural settings.

The empirical assessments of self-control theory, however, have been disproportionally conducted in American samples (Pratt & Cullen, 2000), with only a modest number in other Western nations (e.g., Caspi et al., 1994; LaGrange & Silverman, 1999; Marshall & Enzmann, 2012; Romero, Gomez-Fraguela, Luengo, & Sobral, 2003; Tittle & Botchkovar, 2005; Vazsonyi, Clifford Wittekind, Belliston, & Van Loh, 2004; Vazsonyi, Pickering, Junger, & Hessing, 2001), and even fewer in Asian countries (Cheung & Cheung, 2008; Cretacci, Ding, & Rivera, 2010; Cretacci et al., 2009; Hwang & Akers, 2003; Vazsonyi et al., 2004; Wang, Qiao, Hong, & Zhang, 2002). Researchers have highlighted the paucity of research on self-control in China, a nation where self-control appears to be more emphasized due to its collectivistic feature of traditional culture (e.g., Cheung & Cheung, 2008; Cretacci et al., 2009). As opposed to the emphasis on individualism in the West, the philosophy of Confucianism has been the prominent belief in China. The major Confucian concepts related to personal traits particularly stress self-discipline and suppression of individual autonomy for the purpose of facilitating collective interests (Chan & Lee, 1995; Yang, 1995). Children are taught to be disciplined from a very early age in the family and school. As a result, we would hypothesize that self-control may be more likely to develop among Chinese youth which in turn restrains them from delinquency.

To date, only three quantitative studies published in English could be found to inform this study on the utility of self-control theory in mainland China. They are Wang et al. (2002) on the relationship between two dimensions of self-control (impulsivity and persistency) and Chinese adolescences' substance abuse and delinquency; Cretacci et al. (2009) investigation of effects of the traditional Grasmick et al.'s self-control scale and Hirschi's revised self-control measure on deviance among Chinese college students; and Cretacci et al.'s (2010) expanded work based on the previous piece on Hirschi's social-bond-type measure of self-control. One similar finding across these three studies is that self-control variables measured partially or fully by Grasmick et al.'s scale did not demonstrate significant effects on various delinquent behaviors. At the same time, it is worth noting that social bond measures (e.g., family attachment, parental supervision, and educational commitment) included in these three studies showed noticeable predictive power in explaining Chinese deviance. Wang et al. (2002) and Cretacci and his associates (2009, 2010) made a strong argument for the importance of the inclusion of social bonding while testing self-control theory in the Chinese context. In the current article, we respond to this need.

The recent socioeconomic change in China has been astronomical by any standard. After 30 years of nonabating economic growth, China is officially the world's second largest economy, next to the United States. Behind these dazzling economic miracles are the unbalanced distribution of quickly accumulated wealth and disintegration of traditional values (Cao, 2007). Not surprisingly, Wang (2006) reported that the crime rate among juveniles was on the rise from 1980 to 2004 and identified a primary cause of this increase as associated with problems such as broken families, social disorder, and unemployment that "threaten the normal socialization of juveniles" (p. 5). In addition, China's rapid social changes have obvious implications for increasing adolescent problem behavior, including cigarette smoking and drinking (Jessor et al., 2003). Therefore, it seems imperative to investigate if self-control holds strong among adolescents in the large Chinese cities at the time when major social changes are taking place. Equally important, we are interested in examining the explanatory power of self-control theory for various forms of adolescent delinquency and analogous behaviors in comparison to the social bonding perspective.

Theory & Prior Research

Self-Control Theory & Social Bond Theory

Grounded on the perspective of classical school, both self-control and social bond theories assume "that humans had free will and that behavior was guided by hedonism" (Lilly, Cullen, & Ball, 2007, p. 15). Gottfredson and Hirschi (1990) posit that the propensity to engage in any crime, delinquency, and "analogous" behaviors (i.e., drinking, smoking, and substance use) is a result of low self-control in conjunction with the presence of opportunity. Low self-control is manifested by impulsivity, a preference for simple tasks and physical activity, risk-seeking, self-centeredness, and volatile temper (pp. 89-90). These elements, either constructing a unidimensional (Piquero & Rosay, 1998) or multidimensional latent trait (Longshore, Turner, & Stein, 1996), have been found significantly

associated with all forms of crime as well as other types of behavior among adolescents and adults (Arneklev et al., 1993; Baron, 2003; Brownfield & Sorenson, 1993; Burton, Cullen, Evans, Alarid, & Dunaway, 1998; Cochran et al., 1998; De Li, 2004; Evans, Cullen, Burton, Dunaway, & Benson, 1997; Gibbs et al., 1998; Gibson et al., 2000; Grasmick, Tittle, Bursik, & Arneklev, 1993; Polakowski, 1994; Vazsonyi et al., 2001; Wood et al., 1993).

In contrast, Hirschi's earlier (1969) social bond theory premises that people are naturally criminal and bonding to conventional society (i.e., family, school, and peers) acts to restrain these natural tendencies to be criminal. Delinquency results "when an individual's bond to society is weak or broken" (Hirschi, 1969, p. 16). Arguing in support of the primary importance of low self-control, Gottfredson and Hirschi (1990) argued that the weakness or absence of social bonds is not the cause of crime; rather, it is the *consequence* of low self-control. Individuals with low self-control are more likely to have weak bonds with families and teachers than those with higher self-control. Empirical studies that have attempted to disentangle the link between social bonding, self-control, and delinquency have provided mixed findings in this regard (Baron, 2003; Brownfield & Sorenson, 1993; Burton et al., 1998; Evans et al., 1997; Grasmick et al., 1993; Mason & Windle, 2002; Polakowski, 1994; Pratt & Cullen, 2000; Wright, Caspi, Moffitt, & Silva, 1999). Wright et al. (1999), for example, tested three theoretical models: a social-selection model, a social-causation model and a mixed selection-causation model. They found that in support of the social-selection model, the respondents with low self-control tend to possess weaker bonds to family and school as well as demonstrated through lower work achievement. Meanwhile, in support of the social-causation model, social bonds significantly predict criminal offending later in life. They also found the effects of self-control on crime are largely mediated by social bonds. Finally, in support of the mixed selection-causation model, despite partial attenuation, the correlation between the social bonds and the measure of delinquent behaviors remained statistically significant while controlling for childhood and adolescent self-control.

Empirical Studies From East Asia

One of the most daring theoretical propositions of self-control theory is that the low self-control-deviance relationship persists across cultural and national boundaries. Gottfredson and Hirschi devoted one entire chapter of their influential book in 1990 to culture and crime, where they explained why self-control should be applicable across cultures. Gottfredson (2006) reemphasized this notion by providing empirical support and explicating that self-control "should predict rate differences everywhere, for all crimes, delinquencies, and related behaviors, for all times, among all groups and countries" (p. 83). Empirical research conducted in Western countries support the conclusion that the effect of self-control on deviance is invariant across national boundaries (Caspi et al., 1994; Keane et al., 1993; LaGrange & Silverman, 1999; Romero et al., 2003; Tittle & Botchkovar, 2005; Wright et al., 1999). It is, however, worth noting that there has been scant and inconsistent empirical evidence derived from East Asian samples to support their claim that the self-control-deviance relationship is persistent across cultures.

Recently, researchers have extended the scope to East Asia to examine the culture-free propositions of self-control theory (e.g., Cheung & Cheung, 2008; Cretacci et al., 2009, 2010; Hwang & Akers, 2003; Vazsonyi et al., 2004; Wang et al., 2002). Yet the number of studies conducted in East Asia is rather small, including one in Japan by Vazsonyi and his colleagues (2004), Hwang and Akers's (2003) study in South Korea, one in Hong Kong by Cheung and Cheung (2008), and three in mainland China by Wang et al. (2002) and Cretacci et al. (2009, 2010). These studies not only assessed the effect of self-control but also gauged the relative importance of various social factors (i.e., social bonding, social learning, strain, and labeling).

For example, Hwang and Akers (2003) gathered data using a self-report questionnaire from a sample of 1,012 adolescents in Pusan, South Korea, in 1999. They found that the effects of self-control and social bonding on alcohol and tobacco use among South Korean youth disappeared when social-learning variables were considered. In addition, Wang et al. (2002), utilizing a 1997 sample of 527 adolescents, residing in the capital city of a province in Southern China, investigated the predictive power of self-control on illicit substance use (tranquilizer, opium, and heroine) and on deviant behavior (fighting, stealing, and telling lies). The results revealed that adolescent impulsivity (one dimension of self-control) was not directly related to either substance abuse or deviant behavior. The second dimension of self-control, persistency, was found to be positively related to substance abuse, which contradicts self-control predictions although it was indirectly associated with substance abuse and deviance, mediated by social bonding. They further argued that self-control theory might not be applicable in China. In Wang et al.'s (2002) study, however, only six items forming two dimensions (impulsivity and persistency) of self-control measure were included in the analysis. Similarly, Cheung and

Cheung (2008) failed to find evidence that self-control had an impact on delinquency, except violent delinquency, in a sample of 1,015 adolescents in Hong Kong after social bonds and peer influence were weighed in. Drawing upon multidimensional self-control measures, Vazsonyi et al. (2004) found that low self-control was consistently associated with diverse measures of Japanese late adolescent deviance, ranging from trivial to more serious norm-violating behaviors such as school misconduct and assault. Their results also suggested that there was no statistically significant relationship between low self-control and alcohol use among Japanese youth in the sample. More recently, recognizing the paucity of self-control research in mainland China, Cretacci and his associates (2009, 2010) collected data in a large Chinese university located in Beijing in the fall of 2007. In their first study published in 2009, Cretacci et al. employed both Grasmick et al.'s (1993) self-control scale and Hirschi's (2004) revision that reflects a one-dimensional, social bond type measure. They found that the significant effect of the Grasmick et al.'s scale disappeared when Hirschi's (2004) revised scale was added to the logistic regression model. They further suggested that self-control theory simply is not an important contributor to Chinese deviance models if Grasmick et al.'s scale is determined to be the better measure of self-control. Using the same data set, Cretacci et al. (2010) focused on Hirschi's revised scale and formulated three separate factors (maternal relationship, school attachment, and school authority). Their findings were largely in line with their previous study (2009). That is, the Grasmick model may have little impact on Chinese deviance and the Hirschi's revised "bond type" measure of self-control was significantly predictive of deviance in their sample. It is important to note that the external validity of Cretacci et al. (2009, 2010) might be weakened due to the convenience sample with only 150 university students.

The limited body of research on self-control in East Asian countries brings into question the applicability of self-control theory to appreciably different cultures. Of these studies discussed above, Vazsonyi et al. (2004) is the only study that demonstrated a significant relationship between self-control and various delinquent behaviors, but they did not investigate if the effect of self-control would remain when other competing theories were taken into consideration. In contrast, the findings from mainland China, Hong Kong, and South Korea were at odds with the propositions of self-control theory that have been largely supported in multiple Western societies. It has been argued that the cultures of Japan, Hong Kong, and South Korea generally are viewed as a broad development of Chinese-oriented culture. Compared with the United States or other Western countries, the societies of Chinese-oriented culture place greater interests on the collectivistic context. That is, in Chinese society, individuals are encouraged to control themselves and put societal interests above individual desires. At the same time, because of the close-knit Chinese culture socialization can be very effective in reinforcing or deterring youth delinquency (Wang et al., 2002).

The Current Study

The current study represents an attempt to expand the body of research on the assessment of self-control theory through analysis of a large probability sample drawn from a city with 5.5-million residents on the east coast of China. In addition to the measure of self-control, social bond factors, including family, school, and neighborhood bonds, school commitment, involvement in conventional activities, and attitudes toward violence are included to assess the variations in Chinese adolescent misbehavior. The adolescent misbehaviors include minor risky behaviors (smoking and drinking) and minor delinquency (vandalism, weapon carrying, and group fighting).[1] The analysis begins by determining if low self-control itself is associated with Chinese juvenile misbehavior. Then, it proceeds to examine whether or not the effect of self-control, if any, remains significant while the social conditions measured by the social bonding perspective and individual demographic variables are taken into consideration.

Method

Survey Instrument

The current study used the second International Self-Report Delinquency survey instrument (ISRD-2). This instrument is based on the one used in first large-scale International Self-Report Delinquency Study (ISRD-1) (For more information, please see Introduction to this Special Issue). The validity and reliability of the ISRD core questionnaire have been examined and found to be quite satisfactory (see Bruinsma, 1994; Marshall & Webb, 1990, 1994; Zhang, Benson, & Deng, 2000).

Sample & Data Collection

The research site for the Chinese study is Hangzhou, the capital city of Zhejiang province, which is about 150 miles southwest of Shanghai. Hangzhou has been a rapidly growing city and according to the city official website (http://eng.hangzhou.gov.cn/), the population of long-term residents (not including the migrant population) in urban districts is 5.5 million based on survey results from 2008. The city is a vivid reflection of the social and demographic changes in the coastal area in China where the economic boom has been the most noticeable.

Due to the large student population and complexity of its demographics in Hangzhou, a multistage cluster sampling technique was employed for the sample selection. This type of sampling approach is suitable when it is impractical to compile a complete sampling frame. As a result, nine middle schools located in five core urban districts in the city were selected. In each of the selected schools, one class each was randomly selected from the 7th to 9th grades. In collaboration with the Zhejiang Provincial Juvenile Delinquency Institute (ZPJDI), we gained access to these nine schools selected for the sample. The translated ISRD-2 instrument was pretested using 16 Chinese exchange students at Sam Houston State University (SHSU) to make the questionnaire better fit the Chinese social, cultural, and language contexts. Data were gathered in late December 2009 and early January 2010 by means of anonymous, self-report questionnaires (paper-and-pencil) administered during a class period. The Chinese school year is different from the United States; the winter break usually starts in the middle of January before the Chinese Lunar New Year. Researchers from SHSU worked closely with the trained members of the research staff from ZPJDI for data collection. At least two researchers were present in one classroom to administer the surveys and teachers and school administrators were asked to leave before the questionnaires were distributed. Questionnaires were filled out by 96% of the sample, resulting in 1,043 useable surveys.[2]

Measures

Dependent Variables. Two dependent variables were employed in the current study, the lifetime prevalence of risky behavior and of minor delinquency. Risky behavior was measured through three separate questions: (a) Did you ever drink beer, breezers, or wine? (b) Did you ever drink strong spirits (gin, rum, vodka, whiskey)? and (c) Did you ever smoke? All items were coded as 1 if the answer was "yes" and 0 otherwise. An additive scale was calculated so the total score ranged from 0 to 3. A higher score represents a higher number of minor risky behaviors reported. This variable was subsequently recoded into a dichotomous measure of having ever engaged in any minor risky behavior (0 = *No*; 1 = *Yes*). To measure the second dependent variable, minor delinquency, respondents were asked three questions: (a) Did you ever participate in a group fight on the school playground, a football stadium, the streets or in any public place? (b) Did you ever carry a weapon, such as a stick, knife, or chain (not a pocket-knife)? and (c) Did you ever damage something on purpose, such as a bus shelter, a window, a car, or a seat in the bus or train? The variable transformation was identical to the variable of risky behavior.

Independent Variables

Self-Control. The current study used a shortened version of the Grasmick et al.'s (1993) self-control scale, including 12 items on impulsivity, risk-seeking, self-centeredness, and temper (see appendix). The results of both exploratory factor analysis and confirmatory factor analysis suggest that the 12 items form a single latent trait.[3] The unidimensional model of the self-control measure is consistent with prior studies (Baron, 2003; Cochran et al., 1998; Gibson et al., 2000; Marshall & Enzmann, 2012, p. 319; Piquero & Rosay, 1998). Scores of the items were used to form a composite self-control scale that is calculated by dividing the sum of total scores by 12 and multiplying the quotient by 100. A lower score of the scale indicated a lower level of self-control. The Cronbach's alpha of this scale was 0.852 with an Eigenvalue of 4.776, which is compatible with Grasmick et al.'s scale (approximate .80; Grasmick et al., 1993; Piquero, Mackintosh, Inosh, & Hickman, 2000).

Attachment. Similar to prior research on testing social bond theory (Cheung & Cheung, 2008; De Li, 2004), we followed Hirschi's (1969) original classification of four components of the bond: attachment, commitment, involvement, and belief. Attachment was measured based on family bonding, school bonding, and neighborhood bonding. Family bonding scale was captured by the three items asking "How do you usually get along with the

man you live with (father, stepfather . . .)?," "How do you usually get along with the woman you live with (mother, stepmother . . .)?," and "Do your parents (or the adults you live with) know whom you are going out with when you go out every time?" The scale was calculated as the sum of scores of three items divided by three and multiplied the product by 100. A higher number indicated a higher level of family bonding (α = .590, Eigenvalue = 1.682). School bonding scale was measured using a 4-point Likert-type scale (1 = *not at all true*, 2 = *not true*, 3 = *true*, 4 = *very true*) on the questions: "If I had to move, I would miss my school," "Teachers do notice when I am doing well and let me know," "I like my school," and "There are other activities in school besides lessons." The scale was formed by dividing the sum of scores of the four items by four and multiplied the quotient by 100. A higher score suggested a higher level of school bonding (α = .751, Eigenvalue = 2.314). Neighborhood bonding scale was measured by six items led by the questions: "If I had to move, I would miss the neighborhood," "I like my neighborhood," "There is a lot of space for children to play," "People around here are willing to help their neighborhood," "There is a close-knit neighborhood," and "People in this neighborhood can be trusted." It was calculated as the sum of scores of the six items divided by six and multiplied the quotient by 100. A higher score reflected that respondents live in a neighborhood with a higher level of bonding (α = .881, Eigenvalue = 3.854).

School Commitment. Due to the limitation of the data, self-evaluated school achievement is employed as a proxy measure for school commitment. Some previous studies have tapped into this concept by using a similar measure. For example, Gibson et al. (2000) employed a student's average grade (one of three items) to measure the adolescents' commitment to school. In addition, family commitment to education as well as the intensely competitive education system in China puts greater *emphasis* on *academic success* than any other aspect of school life (Chen, Lee, & Stevenson, 1996). It is, therefore, plausible to argue that the youths with higher school achievement are more likely to put forward an effort to commit to education. School commitment was assessed by using a 3-point Likert-type scale (1 = *below average*, 2 = *average*, 3 = *above average*) on the question: "How well do you do in school compared with other students in your class?" A higher number indicated a higher level of school commitment.

Involvement. Involvement in conventional activities was gauged by asking respondents how much time they spend on an average school day on each of the activities: reading a book, reading magazines or comic strips, playing sports, playing a music instrument, and doing housework. Each item was measured by an ordinal variable and coded into 6 groups: (1) none; (2) ½ hr; (3) 1 hr; (4) 2 hr; (5) 3 hr; (6) 4 hr or more. The involvement scale was constructed as the sum of the five items divided by five and multiplied the quotient by 100. A higher score indicated that respondents spent more time on the conventional activities on an average school day (α = .637, Eigenvalue = 2.065).

Beliefs. Because the data set does not have a direct measure of "beliefs" as defined by Hirschi, in this study, belief (that one should obey the rules of society) was measured inversely by asking respondents' attitudes toward the use of violence. Thus, youth who responded that they have a positive attitude toward violence are considered to have a lower level of belief in traditional moral values. Respondents were asked how strongly they agree or disagree with the following statements of violent behavior done by young people: "A bit of violence is part of the fun," "One needs to make use of force to be respected," "If somebody attacks me, I will hit him/her back," "Without violence, everything would be much more boring," and "It is completely normal that boys want to prove themselves in physical fights with others." The responses range from 1 = *fully disagree* to 4 = *fully agree*. The belief scale was constructed as the sum of scores of five items divided by five and multiplied the quotient by 100. A higher score of the scale reflected a more pro-violence attitude (α = .719, Eigenvalue = 2.445).

Control Variables. Four additional variables are considered as control variables, including age, gender, intact family, and delinquent friends. Age was measured by actual years, ranging from 12 to 17. Gender was coded as 0 for female and 1 for male. Family structure was a dichotomous measure indicating 0 for broken family and 1 for intact family. Finally, a key control variable is delinquent friends. To measure this, we created a measure of delinquent friends adding four items into an index based on the following questions whether they have friends who stole something from a shop or department store, who entered a building with the purpose to steal something, who threatened somebody with a weapon or to beat him up just to get money or other things from him/her, and who beat someone up or hurt someone badly with something like a stick or a knife. A higher score indicated that respondents had more delinquent friends.

Results

The current study includes two dependent variables, the lifetime prevalence of self-reported minor risky behaviors and minor delinquency. Table 1 presents the descriptive statistics for all the variables employed in this study. For the prevalence of minor risky behavior, more than half of respondents (52.5%) reported having ever had beer, breezers or wine, strong spirits, or smoked in their lifetime. Further breakdowns for each category show that slightly more than half of respondents (51.8%) reported ever drinking beer/wine and 10.7% reported ever drinking strong spirits, which echoes the finding of the alcohol consumption pattern in China by Li, Fang, Stanton, Feigelman, and Dong (1996). Li et al. (1996) found that 63% and 54% of the 6th, 8th, and 10th graders in a sample of 1,040 reported that at least one time in their lifetime they have had beer and wine, respectively, and 11% have had hard liquor. The prevalence of teenage smoking reported in this study (6.3%), however, is lower than those in prior studies conducted in China (Li, Fang, & Stanton, 1999; Unger et al., 2001). Li and colleagues (1999) found that about 15% of the 7th to 9th grade students ($N = 323$) in Beijing reported ever having smoked, and Unger et al. (2001) found more

Table 1. Descriptive Statistics ($N = 1{,}043$).

Variables	Percentage (%)	Min	Max	Mean	Standard deviation
Dependent variables					
Minor risky behavior					
0 = *No*	47.5				
1 = *Yes*	52.5				
Minor delinquency					
0 = *No*	93.1				
1 = *Yes*	6.9				
Independent variables					
Self-control		0.00	100.00	82.77	15.63
Family bonding		16.67	100.00	88.96	16.42
School bonding		0.00	100.00	77.40	21.76
Neighborhood bonding		0.00	100.00	72.18	25.77
School commitment		1.00	3.00	2.15	0.52
Involvement		0.00	68.00	18.84	13.48
Belief		0.00	100.00	19.17	16.78
Control variables					
Age group					
12	8.3				
13	27.5				
14	29.4				
15	27.1				
16	7.3				
17	0.5				
Gender					
0 = *Female*	47.5				
1 = *Male*	52.5				
Intact family					
0 = *No*	14.1				
1 = *Yes*	85.9				
Delinquent friends					
0 = *0 Delinquency friend*	93.7				
1 = *1 Delinquent friend*	3.9				
2 = *2 Delinquent friends*	2.1				
3 = *3 Delinquent friends*	0.3				

Table 2. Logistic Regressions on the Prevalence of Minor Risky Behavior.

	Model 1				Model 2			
Variables	*b*	*b**	*SE*	*Odds Ratio*	*b*	*b**	*SE*	*Odds Ratio*
Intercept	3.615***	—	0.418	37.165	3.124***	—	0.764	22.744
Independent variables								
Self-control	–0.042***	–.295	0.005	0.959	–0.026***	–0.171	0.006	0.974
Family bonding					–0.007	–0.048	0.005	0.993
School bonding					–0.002	–0.018	0.004	0.998
Neighborhood bonding					–0.004	–0.043	0.003	0.996
School commitment					–0.072	–0.016	0.137	0.930
Involvement					–0.006	–0.034	0.005	0.994
Belief					0.018***	0.128	0.005	1.019
Control variables								
Age					0.108	0.050	0.065	1.114
Gender					0.118	0.025	0.142	1.125
Intact family					–0.386	–0.056	0.210	0.680
Delinquent friends					0.534*	0.086	0.238	1.706
–2 Log Likelihood	1,335.545				1,197.015			
Overall fit (Chi-Square)	88.423***				128.231***			
R_L^2	0.0621				0.0968			

Note: Logistic regression coefficients (*b*), standardized coefficient (*b**), standard errors (*SE*), and odds ratios are presented. R_L^2 is the likelihood ratio R^2, indicating the proportional reduction in the *-2LL* statistic. Asterisks represent statistically significant effects at the following levels: $*p < .05$. $**p < .01$. $***p < .001$.

than 30% of the same grade range students ($N = 6{,}992$) in Wuhan reported having tried smoking ever. In contrast to the overall high level of drinking and smoking, a much lower prevalence of self-reported minor delinquency was observed in the sample. That is, only about 7% of respondents reported having participated in a group fight (2.4%), carried a weapon (2.7%), or damaged something on purpose (3.9%) in their lifetime. This seems consistent with other reports of comparatively low levels of juvenile delinquency in China by using self-report data collection method (Greenberger, Chen, Beam, Whang, & Dong, 2000; Jessor et al., 2003; Wei, Homel, Prichard, & Xu, 2004).

For the independent variables, the mean value of the self-control scale was 82.77 with a standard deviation 15.63. As to the attachment measures, the respondents reported a high level of family bonding as being 88.96 with a standard deviation 16.42, while the average scores for school bonding and neighborhood bonding were comparatively lower, being 77.40 and 72.18, respectively. With respect to school commitment, the mean value was 2.15 with 1 indicating below average and 3 above average in the self-evaluated school performance. In addition, the average time the respondents spent on various conventional activities was about 18.84 with a standard deviation 13.48. Finally, the respondents as a whole reported a low level of positive attitudes toward violence ($M = 19.17$).

In terms of the demographic variables, the vast majority of the respondents (84%) fell within the age range 13 to 15 and slightly more than half of them identified themselves as male (52.5%). About 86% of the survey participants came from an intact family, and approximately 94% of the sample subjects reported they did not have friends who involved in shoplifting, burglary, extortion, and assault.

The results of the bivariate logistic regressions on the two dependent variables are partitioned into two tables (see Model 1 in Table 2 & Model 3 in Table 3). In the bivariate logistic regressions, the self-control scale was entered as the only independent variable to examine its effect on both risky behavior and minor delinquent behavior when other social factors were not considered. Then, multivariate logistic regressions were performed to assess the conditional

Table 3. Logistic Regressions on the Prevalence of Minor Delinquency.

	Model 3				Model 4			
Variables	*b*	*b**	*SE*	*Odds Ratio*	*b*	*b**	*SE*	*Odds Ratio*
Intercept	1.299**	—	0.506	3.667	0.716	—	1.173	2.046
Independent variables								
Self-control	–0.050***	–0.275	0.007	0.951	–0.030**	–0.160	0.009	0.970
Family bonding					–0.017*	–0.095	0.007	0.983
School bonding					–0.009	–0.066	0.007	0.991
Neighborhood bonding					–0.003	–0.026	0.006	0.997
School commitment					0.008	.001	0.240	1.008
Involvement					–0.016	–0.074	0.010	0.984
Belief					0.012	0.069	0.008	1.012
Control variables								
Age					0.160	0.060	0.130	1.174
Gender					0.960**	0.164	0.304	2.612
Intact family					0.213	0.025	0.405	1.237
Delinquent friends					0.588*	0.077	0.243	1.801
–2 Log Likelihood	461.599				396.007			
Overall fit (Chi-Square)	54.473***				89.219***			
R_L^2	0.1056				0.1839			

Note: Logistic regression coefficients (*b*), standardized coefficient (*b**), standard errors (*SE*), and odds ratios are presented. R_L^2 is the likelihood ratio R^2, indicating the proportional reduction in the *-2LL* statistic. Asterisks represent statistically significant effects at the following levels: $*p < .05$. $**p < .01$. $***p < .001$.

effect of self-control after taking into account the various measures of social bonding (controlling for the demographic variables as well as delinquent friends). The outcomes from the multivariate logistic regressions are reported in the second portion of Table 2 and Table 3.

As can be seen in Model 1 (Table 2), the self-control scale was a statistically significant predictor of minor risky behavior involvement ($b = –.042$, $p < .001$), and it alone explained 6.21% of variation in the dependent variable. More specifically, a one-unit increase in the self-control measure was associated with a reduction of .042 in the log odds of ever having minor risky behaviors. Respondents who scored lower in the self-control scale were approximately 1.04 times more likely than those who scored higher to report having ever used alcohol and/or tobacco. When the social bonding variables were included in Model 2 (Table 2), self-control remained statistically significant ($b = –.026$, $p < .001$) and had the strongest effect ($b^* = –.171$) on youths' minor risky behavior. Among the social bond variables added to the model, the only significant predictor was the belief scale ($b = .018$, $p < .001$), suggesting that a one-unit increase in the belief scale was associated with an increase of .018 in the log odds of ever committing the minor risky behaviors. Respondents who reported having had pro-violence attitudes were 1.019 times more likely to have reported the use of alcohol and/or tobacco. It is interesting to note that having more delinquent friends was positively associated with minor risky behavior. Specifically, those who reported having more delinquent friends were 1.706 times more likely to involve in drinking and/or smoking ($b = .534$, $p < .05$). Among these three significant predictors, the self-control scale carried the most weight in explaining the dependent variable. Model 2 explained 9.68% of variation in the youth minor risky behaviors, a slight increase of 3.47% from Model 1.

With the same model specification, Table 3 displays the effects of self-control alone and with the social bonding measures on the second dependent variable, adolescent minor delinquency measured by group fight, carrying a weapon, and vandalism. As shown in Model 3, self-control was associated with youth minor delinquency ($b = –.050$, $p < .001$), and it alone explained 10.56% of variation. Specifically, the youth who had a lower score in the self-control scale were 1.052 times more likely to be involved in minor delinquent behavior than those with a higher self-control score. When including the

social bonding factors (Model 4), the effects of self-control did not disappear; instead, it remained statistically significant ($b = -.030$, $p < .01$) and was found as the second strongest predictor in terms of the relative predictive power ($b^* = -.160$), next to gender ($b^* = .164$). Among the social bonding measures, family bonding stood out as the only significant predictor of the involvement of minor delinquency ($b = -.017$, $p < .05$). Specifically, in comparison with the respondents who were closely attached to their parents, the youth with the lower family bonding were 1.017 times more likely to admit having committed the minor delinquency. As to the control variables, gender ($b = .960$, $p < .01$) and delinquent friends ($b = .588$, $p < .05$) manifested sizable effects on the dependent variable. Male respondents were 2.612 times more likely than their female counterparts to be delinquent. At the same time, the youth who reported having more delinquent friends were 1.801 times more likely to report having committed the minor delinquency such as group fight, carrying a weapon and vandalism. Finally, Model 4 explained 18.39% of variation in the Chinese youth minor delinquency, increasing by 7.83% compared with the self-control-alone model (Model 3).

Discussion & Conclusion

Although scholarly interest in empirically assessing self-control theory continues to grow, one shortcoming of the literature is that it has rarely been tested utilizing international data (Cretacci et al., 2009; Teasdale & Silver, 2009; Vazsonyi & Huang, 2010). To the best of our knowledge, there has been little literature available on evaluating the utility of the perspective in the distinctive Chinese culture. In this regard, only three empirical studies were conducted in mainland China. Based on a large school-based sample collected in Hangzhou, China, the current study joins this line of research to explore the generalizability of self-control in explaining adolescent risky behavior and minor delinquency. Specifically, the present study focuses on the explanatory power of respectively self-control theory (Gottfredson & Hirschi, 1990) and social bonding (or social control) theory (cf. Hirschi, 1969). Although we attempted to operationalize Hirschi's original (1969) four dimensions of social control (social bonding) theory, using measures for, respectively, attachment (family, school and neighborhood), involvement (in conventional activities), commitment (to school), and beliefs (support of pro-violent values), it is possible that the operationalization of these concepts was less than optimal for the Chinese context. Nonetheless, our results appear sufficiently robust to warrant a number of observations.

Our first noteworthy observation pertains to the empirical findings regarding the measure of self-control. The dimensionality of Grasmick et al.'s self-control measure has been an ongoing debate that continues to generate a fair amount of discussion in the literature. The existing empirical evidence has supported both unidimensional and multidimensional models. For example, Longshore, Turner and Stein (1996) found support for multidimensionality—six dimensions or factors as originally hypothesized and specified by Gottfredson and Hirschi. Similarly, using a sample of 335 late adolescents from a medium city in Japan, Vazsonyi et al. (2004) tested both unidimensional and multidimensional models in their investigation and found that self-control was best represented as a multidimensional construct. In contrast, the results reported by Piquero and Rosay (1998) on survey data provided evidence supporting unidimensionality. In addition, Longshore, Chang and Messina (2005) argued that self-control can defensibly be analyzed as a unidimensional construct. Similar results were reported by Marshall and Enzmann (2012) in their analysis of the dimensionality of the Grasmick et al. self-control scale for the 30-country ISRD-2 sample.

In the current study, the short version of Grasmick et al.'s self-control measure was utilized. More specifically, 12 items tapping into impulsivity, risk-seeking, self-centeredness, and temper were included in the survey questionnaire. The results from both exploratory factor analysis (data-driven) and confirmatory factor analysis (theory-driven) suggest that the one-factor model was a better fit to the data than the four-factor model. Stated differently, respondents in the sample did not make a distinction between impulsiveness, risk-seeking, self-centeredness, and short temper; it seems to them that all 12 items collectively reflect a unitary measure of self-control.

Our second noteworthy observation concerns the hypothesized relationship between self-control measure and various forms of adolescent problem behaviors. According to Gottfredson and Hirschi (1990), the self-control construct holds a central place of importance in explaining crime and deviance across different cultural contexts. Our findings suggest that self-control has a significant inverse relation with both adolescent minor risky behavior (smoking and drinking) and minor delinquency (weapon carrying, group fighting, and vandalism) in China, a nation that is sharply different from the Western countries in terms of culture, tradition, and social settings. It is important to note that the finding here is consistent with prior studies conducted in Western countries, including the analysis of ISRD-2 data

(Junger-Tas, Enzmann, Steketee, & Marshall, 2012). Furthermore, the self-control-deviance relationship detected in our sample is in line with Vazsonyi et al.'s (2004) findings derived from a sample in Japan, whereas it is a contradiction with the three studies conducted in mainland China (e.g., Cretacci et al., 2009, 2010; Wang et al., 2002). In addition, the effects of self-control remain strong, even after adding the social bonding factors and controlling for the demographics. It is interesting to note that only two social bond measures, namely beliefs and family attachment, stood out as significant predictors of risky behavior and minor delinquency, respectively. The comparison of the standardized coefficients between self-control and social bond factors (beliefs and family attachment) indicates that self-control scale carried more weight than social bond measures in its relative predictive power.

Finally, self-control is more powerful in explaining delinquency than risky behavior such as drinking and smoking. The variance explained was almost doubled in the minor delinquency model compared with the risky behavior model (18.39% vs. 9.68%). We speculate that this might be explained by culturally related factors. It has been observed that small-to-moderate amounts of alcohol consumption by male teens on social and ceremonial occasions are generally not considered as risky behavior in China. Parents often hold permissive attitudes toward underage drinking in family gatherings. The widespread cultural acceptance of underage drinking might have weakened the predictive power of self-control on alcohol consumption among teens. In spite of the fact that the Chinese government banned underage drinking in 2006, the influence of this cultural acceptance has not yet faded away.

This study contributes to our understanding of the generalizability of self-control theory in China, but it does have some noteworthy limitations. First, as previously mentioned, the self-control items employed in the current study are from the shortened version of Grasmick et al.'s (1993) scale. It will be interesting to have the full version of 24 items to examine if the unidimensional model remains valid by using the technique of confirmatory factor analysis. Second, in addition to the dimensionality issue, a second topic related to self-control theory that generates a fair amount of debates in the literature is the gender issue (e.g., Vazsonyi et al., 2004). In the current study, the dimensionality issue by gender was not examined. In other words, it is unclear if there is any difference between male and female students in the dimensionality of self-control measure. Third, the results derived from our sample indicated that only moderate amount of variation in the dependent variables is explained by self-control and social bond perspectives. More theoretical explanations, such as general strain theory, may be considered for future investigation. Finally, the current study is based on a school sample from Hangzhou, China and no comparative tasks were carried out with the data collected in the Western countries. Given the fact that the ISRD-2 survey has been implemented in 30 countries, future research may explore the comparative aspect of self-control across different cultures to examine the explanatory power of self-control theory.

APPENDIX: Measurement of Self-Control

Self-Control Items

- I act on the spur of the moment without stopping to think
- I do whatever brings me pleasure here and now, even at the cost of some distant goal
- I'm more concerned with what happens to me in the short run than in the long run
- I like to test myself every now and then by doing something a little risky
- Sometimes I will take a risk just for the fun of it
- Excitement and adventure are more important to me than security
- I try to look out for myself first, even if it means making things difficult for other people
- If things I do upset people, it's their problem not mine
- I will try to get the things I want even when I know it's causing problems for other people
- I lose my temper pretty easily
- When I am really angry, other people better stay away from me
- When I have a serious disagreement with someone, it's usually hard for me to talk calmly about it without getting upset

Acknowledgment

The authors would like to thank the Zhejiang Provincial Juvenile Delinquency Institute for its generous support and assistance with data collection in Hangzhou, China.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Notes

1. The minor delinquent conducts are chosen as the dependent variables because there is a lack of sufficient variations among the more serious delinquency (e.g., illegal drug use, drug dealing, car theft, and robbery).
2. The high return rates of self-report surveys are commonly seen in school-based studies on juvenile delinquency conducted in China. For example, in their comparative study on adolescent problem behavior in China and the United States, Jessor et al. (2003) found that the response rate of 98% obtained from the Chinese sample was much higher than that of the U.S. sample (74%). Similar numbers were also reported by Greenberger, Chen, Beam, Whang and Dong (2000). We do not know the extent to which this difference in the response rates leads to biased responses.
3. In response to the debate of unidimensional versus multidimensional latent trait of self-control, additional analyses were performed by using confirmatory factor analysis to examine if a single-factor model or a 4-factor model would fit the data of 12-item measure of self-control. The results indicated that a single-factor model fit better than a 4-factor model based on the model fit indices (i.e., TLI [the Tucker Lewis Index], CFI [the comparative fit index], and RMSEA [the root means square error of approximation]). In addition, according to the model modification indices in the 4-factor model, some indicators of self-centeredness can be loaded on impulsiveness, risk-seeking, and temper, suggesting that the 12 indicators in this study virtually represent a single, unidimensional latent trait of self-control. Confirmatory factor analysis was conducted by using the Mplus version 6.

References

Arneklev, B. J., Grasmick, H. G., Tittle, C. R., & Bursik, R. J. Jr. (1993). Low self-control and imprudent behavior. *Journal of Quantitative Criminology*, *9*, 225–247.

Baron, S. W. (2003). Self-control, social consequences, and criminal behavior: Street youth and the general theory of crime. *Journal of Research in Crime and Delinquency*, *40*, 403–425.

Brownfield, D., & Sorenson, A. M. (1993). Self-control and juvenile delinquency: Theoretical issues and an empirical assessment of selected elements of a general theory of crime. *Deviant Behavior*, *4*, 243–264.

Bruinsma, G. I. N. (1994). *The test-retest reliability of the ISRD self-report instrument*. Paper presented at the Annual Conference of the American Society of Criminology, Miami, FL.

Burton, V. S. Jr., Cullen, F. T., Evans, T. D., Alarid, L. F., & Dunaway, R. G. (1998). Gender, self-control, and crime. *Journal of Research in Crime & Delinquency*, *35*, 123–147.

Cao, L. (2007). Returning to normality: Anomie and crime in China. *International Journal of Offender Therapy and Comparative Criminology*, *51*, 40–51.

Caspi, A., Moffitt, T. E., Silva, P., Stouhamer-Loeber, M., Krueger, R. F., & Schmutte, P. S. (1994). Are some people crime prone? Replications of the personality-crime relationship across countries, genders, races, and methods. *Criminology, 32,* 163–195.

Chan, H. M., & Lee, R. P. L. (1995). Hong Kong families: At the crossroads of modernism and traditionalism. *Journal of Comparative Family Studies*, *26*, 83–99.

Chen, C., Lee, S., & Stevenson, H. W. (1996). Academic achievement and motivation of Chinese students: A cross-national perspective. In S. Lau (Ed.), *Growing up the Chinese way: Chinese child and adolescent development* (pp. 69–91). Hong Kong: The Chinese University.

Cheung, N. W. T., & Cheung, Y. W. (2008). Self-control, social factors, and delinquency: A test of the general theory of crime among adolescents in Hong Kong. *Journal of Youth Adolescence*, *37*, 412–430.

Cochran, J. K., Wood, P. B., Sellers, C. S., Wilkerson, W., & Chamlin, M. B. (1998). Academic dishonesty and low self-control: An empirical test of a general theory of crime. *Deviant Behavior*, *19*, 227–255.

Cretacci, M. A., Ding, F., & Rivera, C. J. (2010). Traditional and bond measures

of self-control and their impact on deviance among Chinese university students. *International Journal of Criminal Justice Sciences*, *5*, 220–238.

Cretacci, M. A., Rivera, C. J., & Ding, F. (2009). Self-control and Chinese deviance: A look behind the bamboo curtain. *International Journal of Criminal Justice Sciences*, *4*, 131–143.

De Li, S. (2004). The impacts of self-control and social bonds on juvenile delinquency in a national sample of midadolescents. *Deviant Behavior*, *25*, 351–373.

Evans, T. D., Cullen, F. T., Burton, V. S. Jr., Dunaway, R. G., & Benson, M. L. (1997). The social consequences of self-control: Testing the general theory of crime. *Criminology*, *35*, 475–501.

Gibbs, J. J., Giever, D., & Martin, J. (1998). Parental-management and self-control: An empirical test of Gottfredson and Hirschi's general theory. *Journal of Research in Crime and Delinquency*, *35*, 42–72.

Gibson, C. L., Wright, J. P., & Tibbetts, S. G. (2000). An empirical assessment of the generality of the general theory of crime: The effects of low self-control on social development. *Journal of Crime and Justice*, *23*, 109–134.

Gottfredson, M. R. (2006). The empirical status of control theory in criminology. In F. T. Cullen, J. P. Wright, & K. R. Blevins (Eds.), *Taking stock: The status of criminological theory* (pp. 77–100). New Brunswick, NJ: Transaction.

Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.

Grasmick, H. G., Tittle, C. R., Bursik, R. J. Jr., & Arneklev, B. J. (1993). Testing the core empirical implications of Gottfredson and Hirschi's general theory of crime. *Journal of Research in Crime and Delinquency*, *30*, 5–29.

Greenberger, E., Chen, C., Beam, M., Whang, S., & Dong, Q. (2000). The perceived social contexts of adolescents' misconduct: A comparative study of youths in three cultures. *Journal of Research on Adolescence*, *10*, 365–388.

Hirschi, T. (1969). *Causes of delinquency*. Berkeley: University of California Press.

Hirschi, T. (2004). Self-control and crime. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-Regulation: Research, theory, and applications* (pp. 537–552). New York, NY: Guilford Press.

Hwang, S., & Akers, R. L. (2003). Substance use and Korean adolescents: A cross-cultural test of social learning, social bonding, and self-control theories. In R. L. Akers & G. F. Jensen (Eds.), *Social learning theory and the explanation of crime* (pp. 39–63). New Brunswick, NJ: Transaction.

Jessor, R., Turbin, M. S., Costa, F. M., Dong, Q., Zhang, H., & Wang, C. (2003). Adolescent problem behavior in China and the United States: A cross-national study of psychosocial protective factors. *Journal of Research on Adolescence*, *13*, 329–360.

Junger, M., West, R., & Timman, R. (2001). Crime and risky behavior in traffic: An example of cross-situational consistency. *Journal of Research in Crime and Delinquency*, *38*, 439–459.

Junger-Tas, J., Enzmann, D., Steketee, M., & Marshall, I. Haen (2012). Concluding observations: The big picture. In J. Junger-Tas, I. Haen Marshall, D. Enzmann, M. Killias, M. Steketeee & B. Gruszczynska, *The many faces of youth crime. Contrasting theoretical perspectives on juvenile delinquency across countries and cultures* (pp.329–353). New York, NY: Springer.

Keane, C., Maxim, P. S., & Teevan, J. J. (1993). Drinking and driving, self-control, and gender: Testing a general theory of crime. *Journal of Research in Crime and Delinquency*, *30*, 30–46.

LaGrange, T., & Silverman, R. A. (1999). Low self-control and opportunity: Testing the general theory of crime as an explanation for gender differences in delinquency. *Criminology*, *37*, 41–72.

Li, X., Fang, X., & Stanton, B. (1999). Cigarette smoking among schoolboys in Beijing, China. *Journal of Adolescence*, *22*, 621–625.

Li, X., Fang, X., Stanton, B., Feigelman, S., & Dong, Q. (1996). The rate and pattern of alcohol consumption among Chinese adolescents. *Journal of Adolescent Health*, *19*, 353–361.

Lilly, J. R., Cullen, F. T., & Ball, R. A. (2007). *Criminological theory: Context and consequences* (4th ed.).Thousand Oaks, CA: SAGE.

Longshore, D., Chang, E., & Messina, N. (2005). Self-control and social bonds: A combined control perspective on juvenile offending. *Journal of Quantitative Criminology*, *21*, 419–437.

Longshore, D., Turner, S., & Stein, J. (1996). Self-control in a criminal sample: An examination of construct validity. *Criminology*, *3*, 209–228.

Mason, W. A., & Windle, M. (2002). Gender, self-control, and informal social control in adolescence: A test of three models of the continuity of delinquent behavior. *Youth and Society, 33*, 497–514.

Marshall, I. H., & Enzmann, D. (2012). The generalizability of self-control theory. In J. Junger-Tas, I. H. Marshall, D. Enzmann, M. Killias, M. Steketee, & B. Gruszczynska, *The many faces of youth crime: Contrasting theoretical perspectives on juvenile delinquency across countries and cultures* (pp. 285–326). New York, NY: Springer.

Marshall, I. H., & Webb, V. J. (1990). *Omaha IRSD Pilot Study*. Paper presented at the meeting of International Self-report Delinquency Project, The Hague, The Netherlands.

Marshall, I. H., & Webb, V. J. (1994). Self-reported delinquency in a midwestern American city. In J. Junger-Tas, G. Terlouw & M. W. Klein (Eds.), *Delinquent behavior among young people in the Western world: First results of the International Self-report Delinquency Study* (pp. 319–342). Amsterdam, The Netherlands: Kugler Publications.

Piquero, A. R., MacIntosh, R., & Hickman, M. (2000). Does self-control affect survey response? Applying exploratory, confirmatory, and item response theory

analysis to Grasmick et al.'s self-control scale. *Criminology*, *38*, 897–929.

Piquero, A. R., & Rosay, A. B. (1998). The reliability and validity of Grasmick et al.'s self-control scale: A comment on Longshore et al. *Criminology*, *36*, 157–173.

Polakowski, M. (1994). Linking self- and social control with deviance: Illuminating the structure underlying a general theory of crime and its relation to deviant activity. *Journal of Quantitative Criminology*, *10*, 41–78.

Pratt, T. C., & Cullen, F. T. (2000). The empirical status of Gottfredson and Hirschi's general theory of crime: A meta-analysis. *Criminology*, *38*, 931–964.

Romero, E., Gomez-Fraguela, A. J., Luengo, M. A., & Sobral, J. (2003). The self-control construct in the general theory of crime: An investigation in terms of personality psychology. *Psychology Crime & Law, 9,* 61–86.

Teasdale, B., & Silver, E. (2009). Neighborhoods and self-control: Toward an expanded view of socialization. *Social Problems, 56,* 205–222.

Tittle, C. R., & Botchkovar, E. V. (2005). Self-control, criminal motivation and deterrence: An investigation using Russian respondents. *Criminology*, *43*, 307–353.

Unger, J. B., Yan, L., Chen, X., Jiang, X., Azen, S., Qian, G., & Johnson, A. (2001). Adolescent smoking in Wuhan, China, Baseline data from the Wuhan smoking prevention trial. *American Journal of Preventive Medicine*, *21*, 162–169.

Vazsonyi, A. T., Clifford Wittekind, J. E., Belliston, L. M., & Van Loh, T. D. (2004). Extending the general theory of crime to "The East:" Low self-control in Japanese late adolescents. *Journal of Quantitative Criminology*, *20*, 189–216.

Vazsonyi, A. T., & Huang, L. (2010). Where self-control comes from: On the development of self-control and its relationship to deviance over time. *Developmental Psychology*, *46*, 245–257.

Vazsonyi, A. T., Pickering, L. E., Junger, M., & Hessing, D. (2001). An empirical test of a general theory of crime: A four-nation comparative study of self-control and the prediction of deviance. *Journal of Research in Crime and Delinquency*, *38*, 91–131.

Wang, D. (2006). The study of juvenile delinquency and juvenile protection in the People's Republic of China. *Crime and Justice International*, *22*, 4–14.

Wang, G. T., Qiao, H., Hong, S., & Zhang, J. (2002). Adolescent social bond, self-control, and deviant behavior in China. *International Journal of Contemporary Sociology*, *39*, 52–68.

Wei, Z., Homel, R., Prichard, J., & Xu, J. (2004). Patterns of juvenile offending in Shanghai and Brisbane. *Australian and New Zealand Journal of Criminology*, *37*, 32–51.

Wood, P. B., Pfefferbaum, B., & Arneklev, B. J. (1993). Risk-taking and self-control: Psychological correlates of delinquency. *Journal of Criminal Justice*, *16*, 111–130.

Wright, B. R. E., Caspi, A., Moffitt, T. E., & Silva, P. A. (1999). Low self-control, social bonds, and crime: Social causation, social selection, or both? *Criminology*, *37*, 479–514.

Yang, K. S. (1995). Chinese social orientation: An integrative analysis. In T. Y. Lin, W. S. Tseng & E. K. Yeh (Eds.), *Chinese societies and mental health* (pp. 19-39). Hong Kong, Oxford University Press.

Zhang, S., Benson, T., & Deng, X. (2000). A test-retest reliability assessment of the International Self-report Delinquency Instrument. *Journal of Criminal Justice*, *28*, 283–295.

Author Biographies

Yi-Fen Lu is a doctoral student in the College of Criminal Justice at Sam Houston State University. She earned her MA in Criminal Justice from Sam Houston State University in 2010. Her research interests include public perceptions of crime and criminal justice, biosocial criminology, gene-environmental interactions, and quantitative methodology.

Yi-Chun Yu is a doctoral student in the College of Criminal Justice at Sam Houston State University. She earned her MA in Criminal Justice from Sam Houston State University in 2010. Her areas of research interests are criminological theory, crime mapping, policing, and quantitative methodology.

Ling Ren is an associate professor in the College of Criminal Justice at Sam Houston State University. She earned her PhD from University of Nebraska at Omaha in 2006. Her research interests include policing, cross-national research on crime and delinquency, and the applications of quantitative methodology.

Ineke Haen Marshall is a professor at the School of Criminology and Criminal Justice and the Department of Sociology and Anthropology at Northeastern University. Her research interests are comparative criminology, self-report survey research, criminal careers, and comparative penal policy.