



Traditional and bond measures of self-control and their impact on deviance among Chinese University students

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Abstract

Extensive research has indicated that self-control theory is a significant explanation of crime but a number of debates about the theory remain. Primary among those is the argument that the key variable of self-control has not been measured properly. Moreover, Hirschi (2004) stated that not only are the prior cognitive and behavioral measures of self-control mistaken but self-control is in reality, a social bond concept. Additionally, others have also pointed out that cross-national testing of the theory is lacking. Taken together, these two concerns are critical to the central claim of the theory: that it can explain all crime in all locations. To address these matters, this study examines the construction of both traditional and bond measures of self-control and their impact on deviance in a sample of students in a Chinese university. Results indicate support for prior research in that both conceptualizations of self-control can be considered single constructs, even though multiple components were extracted for each. However, the traditional measure of self-control failed to attain significance in either of the models where it or its individual components were included. Conversely, the bond measurement was a strong correlation of deviance. Although, of the three components that made up this construct, school attachment was the only one that attained significance. The implications of these results are also discussed.

Key Words: Self Control; Hirschi; Chinese University; students; self-constructs.

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Introduction

Since its creation in 1990, self-control theory, vicariously known as “the general theory of crime,” has attracted an enormous amount of scholarly attention (Williams et al., 2007). Scholarship examining the theory is broad in scope as investigators have tested whether or not offenders can perceive future sanctions (Piquero, Gomez-Smith, & Langton, 2004), the root causes of low self-control (Latimore, Tittle, & Grasmick, 2006; Wright & Beaver, 2005), and the impact of the theory on various forms of deviance and crime (Higgins & Tewksbury, 2006; Miller, Jennings, Alvarez-Rivera, Lanza-Kaduce, 2009; Moon, McCluskey & Perez-McClusky, 2010).

Briefly, the authors of the perspective claim that it can explain all crime, regardless of location and occurrence in time (Gottfredson & Hirschi, 1990) although, some have found that this claim is exaggerated (Cretacci, 2008). Gottfredson and Hirschi also claim that those who suffer from low self-control tend to be “insensitive, physical, risk-seeking, short-sighted, and nonverbal” (Hirschi, 2004, p. 541) and have difficulty in controlling their desire for immediate gratification. The theory capitalizes on this argument by asserting that low self-control is invariant, so once a person acquires the trait, that individual will remain more likely to engage in criminality than someone who does not (Williams et al., 2007). Interestingly, some are beginning to argue that low self-control can vary over time (Turner & Piquero, 2002).

While most research supports the basic principles of the perspective, important concerns in the literature still have not been adequately addressed. First, scholars have declared that measures of self-control as currently constructed are problematic. In truth, the debate that pertains to the measuring of self-control is still germane since Hirschi has taken it upon himself to alter what self-control is (Hirschi, 2004). Therefore, the revision alone is one reason for re-examining how self-control is operationalized. However, an additional rationale for revisiting this matter is that others have argued that the traditional cognitive measures of self-control are deeply flawed (Turner & Piquero, 2002). These concerns gain further merit when one considers that scholars are also beginning to instruct that the two different measures of self-control (cognitive/behavioral and the bond-type revision) may not be the same, but are different constructs that explain different crimes (Cretacci, 2009). Third, while much of the literature testing the theory has utilized data collected in the United States, it is surprising to note that given the increasing interconnectedness of modern society, that a comparatively small number of studies test the theory in the international context (Miller, Jennings, Alvarez-Rivera, & Lanza-Kaduce, 2009). In fact, of the cross-cultural tests of the perspective, only three (Kobayashi, Vazsonyi, Chen, & Sharp, 2010; Marcus, 2003; Williams et al., 2007) state that the measurement of low self-control is the rationale for conducting the study.

Because of these gaps in the literature, this article contributes to the understanding of self-control theory in a number of ways. First, by utilizing data collected in China, this study extends the understanding of the perspective in the general international context. Second, since only two studies dealing with self-control theory have been published utilizing data collected in China (Cheung & Cheung, 2008; Cretacci, Rivera, & Ding, 2009), this study is also important as it serves to clarify the explanatory power of the theory in that country. Additionally, this study also contributes to the debate about whether or not self-control is a multi or uni-dimensional concept (Kobayashi et al., 2010). Moreover, none of the cross-national studies have discussed the possibility that the measurement of low self-control may have characteristics unique to Chinese data. As a

result, this article is the only one that uses Chinese data to estimate the measurement of low self-control.

Literature Review

Gottfredson and Hirschi's main argument is that those that acquire low self-control are more susceptible to criminal activity throughout their lives than those that do not (Gottfredson & Hirschi, 1990). Not only have researchers found that the theory explains various forms of deviance but they also have begun to apply the principles of the theory to criminal justice risk assessment (Krauss, Sales, Becker, & Figueredo, 2000), the perception of future negative consequences by offenders (Piquero, Gomez-Smith, & Langton, 2004), and the construction of personality scales (Romero, Gómes-Fraguela, Luengo, & Sobral, 2003). In a nod to the creativity in which investigators are finding new ways to apply the theory, researchers have also recently used self-control as a control in developing theories that emphasize the role of genetics in explaining crime (Beaver, Wright, & DeLisi, 2008; Beaver, Wright, DeLisi, & Vaughn, 2008; Boutwell, & Beaver, 2008; DeLisi, Beaver, Wright, & Vaughn, 2008).

Additionally, scholars have also explored new ways to apply the theory to traditional criminal behaviors and outcomes. For example, DeLisi (2001) found that self-control theory was predictive of felony convictions and prison sentences. Moreover, Delisi and Berg (2006) discovered that self-control was also related to probation and parole violation. Another creative application of the theory is Moon et al. (2010) where the authors report that self-control significantly explained both the illegal download of software and the illegal use of others' personal identification online in a sample of Korean youths. In an acknowledgement to personality theory, Vaughn, DeLisi, Beaver, Wright and Howard (2007) assert that low self-control is rooted in psychopathology.

While acknowledging that the theory remains popular (Seipel & Eifler, 2010), an important debate is whether low self-control is uni or multi-dimensional (Marcus, 2004). For example, Arneklev, Grasmick, and Bursik, (1999) utilize factor analysis and discover that low self-control is not only multi-dimensional but that it is also invariant. Additionally, Longshore, Chang, Hsieh, and Messina, (2004) utilize several multi-item indices to operationalize self-control and found that the concept is negatively related to social bonds and positively related to drug use. Further, Tittle, Ward, and Grasmick (2003) acknowledged that even though they utilized a single factor solution for low self-control, their data supported the multi-dimensional nature of the construct. Further, by concluding the discussion, Piquero and Rosay (1998) and Piquero, MacIntosh and Hickman (2000) asserted that their evidence indicated that low self-control is uni-dimensional.

Unfortunately, clarity on the measurement problem does not get better when studies utilize cross-national data. More specifically, Williams, Fletcher, and Ronan (2007) found that a measure of self-control tested on two differing samples from New Zealand also proved to be multi-dimensional. Additionally, Vazsonyi, Pickering, Junger, and Hessing (2001) and Vazsonyi, Wittekind, Belliston, and Van Loh (2004) found the concept to be multi-dimensional in European and Japanese samples. More recently, Özbay and Köksoy, (2009) found that low self-control was multi-dimensional in a Turkish dataset while Kerley, Xu, and Sirisunyaluck (2008) found the same in data collected in Thailand. Even more confusing though are Tittle and Botchkovar (2005a; 2005b) which indicate support for both uni and multi-dimensionality while Cheung and Cheung (2008) found support for uni-dimensionality.

A second measurement issue that is currently being discussed in the literature is the type of items that researchers are using to measure low self-control. That is, some have utilized cognitive items when Gottfredson and Hirschi (1990) called for behavioral ones (Tittle, Ward, & Grasmick, 2003). Further, investigators have also asserted that item type makes no difference in terms of the predictive power of low self-control (Tittle et al., 2003, p. 333). In addition, scholarship has also determined that some of the current measures of low self-control have poor alpha scores (Turner & Piquero, 2002) and other specification problems (Schultz, 2004). On the other hand, researchers have also found that the popular Grasmick et al. (1993) scale is a stable and reliable measure of low self-control (Williams et al., 2007).

Given that the specification of the central variable of the theory has generated such broad discussion, it may be that Hirschi has been influenced by it, since he has revised what self-control is (Hirschi, 2004). Interestingly, Hirschi now states that prior measures of low self-control are incorrect due to a number of errors that he and Gottfredson made by generating the famous “list” of characteristics (Hirschi, 2004, p. 542). In fact, he now asserts that low self-control and the social bond are the same things (Hirschi, 2004, p. 543). As a result, Hirschi now claims that to reconcile the two theories and their central components, low self-control should be operationalized as a singular social bond type measure (Hirschi, 2004, p. 545).

Gottfredson and Hirschi (1990) boldly claimed that low self-control explained crime across time and space. However, only a small number of studies have tested the hypothesis utilizing cross-national data (Cretacci et al., 2009; Kobayashi et al., 2010; Moon et al., 2010; Teevan & Dryburgh, 2000; Tittle & Botchkovar, 2005a; Tittle & Botchkovar, 2005b; Vazsonyi, Clifford-Wittekind, Belliston & Van Loh, 2004; Vazsonyi et al., 2001). This is an important oversight by scholars, given that the available evidence suggests that the theory is a relevant correlate or predictor of criminal behavior. More specifically, self-control has partially explained vandalism, drug use, and theft in Japan (Vazsonyi et al., 2004). Moreover, Vazsonyi et al. (2001) also found that self-control was a significant explanation of deviance among males and females of different age groups in other countries. Additionally, self-control has also been a significant predictor of Russian theft (Tittle & Botchkovar, 2005a; Tittle & Botchkovar, 2005b). Given the contradictions as to how self-control should be measured, and the fact that relatively few international investigations have been conducted, this study addresses two narrow empirical questions: First, are the two recognized measures of self-control (the “traditional” and “revised” models) uni-dimensional or multi-dimensional in a sample of Chinese youth? Second, is either of the two measures a significant correlate of crime in the same Chinese sample?

Methodology

Data Collection and Sample

One of the co-authors assisted with the construction and administration of a survey to students in both the law and social work departments at a university in Beijing, PRC (China) during the Fall 2007 semester. The institution has an enrollment of approximately 17,000 students and provides opportunities for students to study traditional academic disciplines. The instrument was administered in English and during its construction, the authors ensured that no complicated terms would be included. The English version of the instrument was utilized primarily because American students were involved in the data cleaning process. While many have concerns about the use of the English questionnaire,

our confidence in utilizing it was supported by a number of additional factors. Most importantly, one of the co-authors had engaged in extensive interaction with the potential respondents in English. In addition, the potential respondents were also required to take classes as part of their degree program in English as well. Given the simple nature of the questions and the fact that the survey was short in length, the authors were confident that the respondents would understand the questionnaire. For a more detailed description of the sample, data collection, and measures, please see Cretacci et al., (2009). Descriptive statistics for the items and measures are included in the Appendix of this paper.

Measures

Self-control

Since one of the central questions under study is to determine whether self-control is multi-dimensional or not, we examined both the popular Grasmick et al. (1993) scale and the Hirschi (2004) revision. This approach makes sense given that others have highlighted the paucity of research on self-control in China (Cretacci et al., 2009). In the current study, the Grasmick et al. (1993) self-control scale was measured with the common list of 24 statements to which the subjects were asked to indicate their level of agreement or disagreement. It is predicted that the Grasmick et al. (1993) measure will be positively associated with deviance.

The revised measure consisted of the nine questions that Hirschi (2004) asserted make up self-control. This article uses all nine in an attempt to ascertain the propriety of the measure ($\alpha = .68$). Some examples of the items and their responses include "How much do you like school?" and "Do you care what teachers think of you?" each with a response set of (1 = not at all, 2 = very little, 3 = somewhat, 4 = quite a bit, 5 = very much). Since the response sets were not identical, responses to the items were standardized and averaged together to arrive at an overall score for the scale. In addition, a constant of 2.94 was added to each score so the new scale minimum would equal zero. It is predicted that it will be inversely associated with deviance.

Deviance

Deviant behavior was measured with 14 items that were summed into a scale of general deviance ($\alpha = .90$). Each of the items asked how often in the past twelve months the respondent had engaged in a particular behavior. However, due to the skewed distribution of this variable, it was dichotomized to reflect whether the respondent engaged in any deviance (0 = No; 1 = Yes). As a result, logistic regression was utilized to predict the prevalence of deviant behavior. Controls for actual age, gender (0 = Male, 1 = Female), and geographic area where each respondent is from (1 = Rural, 2 = Suburban, 3 = Urban) were also included.

Results indicate that the respondents possess enough of both measures of self-control that warrant further analysis. The mean for gender (.78) indicates that the number of males in the sample is somewhat smaller than what one might find in the United States. The mean for geographic area (3.1) reveals that most of the sample is from an urban setting. The average age of the respondents is approximately twenty years old and finally, enough deviance exists to allow for further study.

Plan of Analysis

Initially, descriptive statistics were computed for the items in both self-control measures and for the items that make up the deviance index. Principle Components Analysis (PCA) was utilized to determine if the items that comprised both the Grasmick et al. (1993) scale and the revised measure posited by Hirschi (2004), reflected multi or uni-dimensional solutions. While others might disagree with the utilization of this technique for this type of an analysis and as a result might criticize our use of it here, a number of scholars have employed this procedure for this purpose. Following prior research (Williams et al., 2007), we utilized techniques that were allowed to extract as many factors as were present as well as a forced, single factor model to assess if there was any difference in the two methodologies. Additionally, alpha scores for the final scales were also computed in a bid to determine reliability and as an indirect assessment of the appropriateness of the final measures. Further, bi-variate correlation coefficients were also calculated in an effort to further ascertain if any components extracted were highly correlated with the forced factor solution. Here, the presence of such variables in a correlation matrix would indicate that the components are important parts of the overall construct.

Fourth, the explanatory power of four models was estimated by regressing the deviance index on the measures of self-control and the demographic variables. The first model includes only the forced factor Grasmick et al. (1993) scale, while the second utilizes only the several components derived from the Grasmick items. The third equation estimates the impact of only the forced factor solution for the revised self-control measure, while the final model includes the components of the revised self-control measure extracted from those items.

Results

Single, forced factors

The factor loadings for the Grasmick et al. (1993) items are presented in Table 1. The range for the loadings for the Grasmick scale was about .30 to .57, an indication that they were part of an overall concept. However, a few items were below that range. For example, item #14 "I seem to have more energy and a greater need for activity than most other people my age" had the smallest loading at .15. Item #23, "The things in life that are easiest to do bring me the most pleasure" loaded at .19. Moreover, "When things get difficult or complicated, I tend to quit or withdraw" loaded at .20. Further, "I dislike really hard tasks that stretch my abilities to the limit" loaded at .23. Of the underperforming items, "I'm not very sympathetic to other people when they are having problems" loaded the highest at .25. The highest loading (.57) was calculated for item #2, "I often do what brings me pleasure here and now, even at the cost of some distant goal." To further buttress the notion that these items can be thought of as a single factor, the eigen value for this solution was 14.24, with a corresponding alpha of .78.

Table 1. Factor loadings for the Grasmick single-factor self-control scale

Grasmick Items	Sample (N = 150)	Eigenvalue	Cronbach's Alpha
<i>Single factor</i>		14.24	.78
1. Lack of preparation.	.44		
2. Pleasure here and now.	.57		
3. Concerned with short run.	.55		
4. Avoid difficult projects.	.39		
5. Tend to quit or withdraw.	.20		
6. Dislike hard tasks.	.23		
7. Rather do physical.	.44		
8. I like risk.	.34		
9. Sometimes take risk for fun.	.47		
10. Exciting to get into trouble.	.52		
11. Excitement and adventure.	.47		
12. Feel better on the move.	.51		
13. Get out and do things.	.54		
14. Have more energy.	.15		
15. Look out for myself first.	.37		
16. Not very sympathetic.	.25		
17. Upset other people.	.46		
18. Get things I want.	.50		
19. Spur of the moment thinking.	.47		
20. Lose temper easily.	.44		
21. Feel like hurting others.	.54		
22. When angry, stay away.	.29		
23. Easiest things bring pleasure.	.19		
24. Hard to talk calmly.	.32		

Note. Response set for each item was: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree.

Multiple component factors

The factor loadings for the eight factor components that were extracted from the Grasmick et al. (1993) items are presented in Table 2. Results indicate that six of the eight components are the same as those discovered by others (Arneklev et al., 1999). Interestingly, two additional components (*anger* and *moodiness*), manifested by single items ("When I'm really angry, other people better stay away from me" and "When I have a serious disagreement with someone, it's usually hard for me to talk calmly about it.") also were found. The eigen values for these two components were 1.15 and 1.07 respectively. The other six components are *risk*, *self-centeredness*, *impulsivity*, *physical pursuits*, *simple activities* and *temper*.

The factor loadings for the Hirschi revised self-control items are presented in top panel of Table 3. As was the case for the Grasmick items, the loadings overall are robust except for item #5, "It is not the school's business if students want to smoke outside of class" (.04). For the other 8 items, the loadings varied from .32 ("How much do you like school?") to .81 ("Does your mother know where you are when you are away from home?"). The eigen value for the single-factor solution for the Hirschi measure was 5.43, with an alpha of .68.

Table 2. Factor loadings for the Grasmick Item self-control components

Cronbach's Grasmick items	Sample (N = 150)	Eigen Value	Alpha
<i>Factor 1: Risk</i>			
1. I like risk.	.60	4.24	.71
2. Sometimes take risk for fun.	.70		
3. Exciting to get into trouble.	.72		
4. Excitement and adventure.	.75		
<i>Factor 2: Self-centered</i>			
5. Look out for myself first.	.69	2.47	.67
6. Not very sympathetic.	.60		
7. Upset other people.	.78		
8. Get things I want.	.55		
<i>Factor 3: Impulsivity</i>			
9. Lack of preparation.	.68	2.14	.68
10. Pleasure here and now.	.75		
11. Concerned with short run.	.74		
<i>Factor 4: Physical pursuits</i>			
12. Feel better on the move.	.74	1.59	.69
13. Get out and do things.	.75		
14. Have more energy.	.73		
<i>Factor 5: Simple activities</i>			
15. Avoid difficult projects.	.46	1.41	.58
16. Tend to quit or withdraw.	.65		
17. Dislike hard tasks.	.77		
18. Rather do physical.	.53		
19. Easiest things bring pleasure.	.51		
<i>Factor 6: Temper</i>			
20. Spur of the moment thinking.	.67	1.17	.64
21. Lose temper easily.	.78		
22. Feel like hurting others.	.66		
<i>Factor 7: Anger</i>			
23. When angry, stay away.	.83	1.15	--
<i>Factor 8: Moodiness</i>			
24. Hard to talk calmly.	.72	1.07	--

Note. Response set for each item was: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree.

Table 3 . Factor loadings for the single and multi-dimensional measure of the revised self-control scale

Revised self-control items	Sample (N = 147)	Eigen Value	Cronbach's Alpha
<i>Single factor</i>			
		5.43	.68
1. How much do you like school?	.32		
2. How important is getting good grades to you personally?	.36		
3. Do you finish your homework?	.54		
4. Do you care what teachers think of you?	.60		
5. It is not the school's business if students want to smoke outside of class.	.04		
6. Does your mother know where you are when you are away from home	.81		
7. Does your mother know who you are with when you are away from home?	.73		
8. Do you share your thoughts and feelings with your mother?	.66		
9. You would like to be the kind of person your mother is.	.56		
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Revised self-control items	Sample (N = 147)	Eigen Value	Cronbach's Alpha
<i>Factor 1: Maternal relationship</i>			
		2.81	.76
1. Does your mother know where you are when you are away from home?	.73		
2. Does your mother know who you are with when you are away from home?	.76		
3. Do you share your thoughts and feelings with your mother?	.78		
4. You would like to be the kind of person your mother is.	.75		
<i>Factor 2: School attachment</i>			
		1.48	.60
5. How much do you like school?	.50		
6. How important is getting good grades to you personally?	.71		
7. Do you finish your homework?	.64		
8. Do you care what teachers think of you?	.78		
<i>Factor 3: School authority</i>			
		1.14	--
9. It is not the school's business if students want to smoke outside of class.	.92		

As with the single factors, the range of the loadings, eigen values, and alphas are provided for each of the components. For *risk*, the loadings range from .60 to .75, with item #1, "Sometimes I will take a risk just for the fun of it" loading at .60 and "Excitement and adventure are more important to me than security" (.75). The eigen value for this component was 4.24 with an alpha of .71. For *self-centeredness*, the loadings range from .55 ("I will try to get things I want even when I know it's causing problems for other people") to .78 ("If things I do upset other people, it's their problem not mine"). The eigen value for this component was 2.47 with an alpha of .67. The results for *impulsivity* indicate a range of .68 ("I don't devote much time and effort to preparing for the future" to .75 ("I often do what brings me pleasure here and now, even at the cost of some distant goal"). This factor was composed of three items and had an eigen value of 2.14 and an alpha of .68. The fourth component *physical pursuits*, also had three items with a range of .73 ("I seem to have more energy and a greater need for activity than most other people my age") to .75 ("I like to get out and do things more than I like to read or contemplate ideas") for the loadings. The eigen value for this component was 1.59 with an alpha of .69. In addition, the loadings for *simple activities* ranged from .46 ("I frequently try to avoid projects that I know will be difficult") to .77 ("I dislike really hard tasks that stretch my abilities to the limit") with an eigen value of 1.41 and an alpha of .58. The sixth component, *temper* was comprised of 3 items with "Often, when I'm angry at others, I feel more like hurting them than talking to them about why I am angry" having the

smallest loading (.66) and "I lose my temper pretty easily" having the largest (.78). The eigen value was 1.17 with an alpha of .64.

The factor loadings for the three components that were extracted from the Hirschi revised items are presented in the bottom panel of Table 3. The components are *maternal relationship*, *school attachment*, and *school authority*. *Maternal relationship* is comprised of four items and has a range of .73 ("Does your mother know where you are when you are away from home?") to .78 ("Do you share your thoughts and feelings with your mother?") for its factor loadings. The eigen value for this component was 2.81 with a corresponding alpha of .76. *School attachment* is also comprised of four items and has a range of .50 ("How much do you like school?") to .78 ("Do you care what teachers think of you?") for its factor loadings. The eigen value for this component is 1.48 with a corresponding alpha of .60. The final component *school authority* is comprised of, "It is not the school's business if students want to smoke outside of class" and has an eigen value of 1.14.

Bi-variate correlations

Correlation coefficients for both the Grasmick and Hirschi revised components along with their respective forced factors are presented in Tables 4 and 5. As expected, all eight components of the Grasmick et al. (1993) scale are significantly correlated with the single factor solution. The range for those correlations is .29 to .66 and indicates that the components are part of an overall self-control concept. In addition, both *maternal relationship* (.90) and *school attachment* (.68) are significantly correlated to the single, revised factor.

Table 4. Zero-order correlations for the Grasmick self-control measure and its components

Variables	1	2	3	4	5	6	7	8	9
1. Self-control	1.00								
2. Risk	.61**	1.00							
3. Self-centered	.55**	.24**	1.00						
4. Impulsivity	.66**	.19*	.16	1.00					
5. Physical pursuits	.51**	.27**	.07	.29**	1.00				
6. Simple activities	.47**	.03	.06	.41**	.24**	1.00			
7. Temper	.63**	.27**	.35**	.25**	.17*	.14	1.00		
8. Anger	.29**	.20*	.23**	.13	-.09	.00	.20*	1.00	
9. Moodiness	.32**	.06	.17*	.17*	-.01	.05	.29**	.35**	1.00

* Correlation is significant at 0.05 level.

** Correlation is significant at 0.01 level.

Table 5. Zero-order correlations for the Revised self-control measure and its component

Variables	1	2	3	4
1. Revised self-control	1.00			
2. Maternal relationship	.90**	1.00		
3. School attachment	.68**	.29**	1.00	
4. School authority	.04	.01	.08	1.00

* Correlation is significant at 0.05 level.

** Correlation is significant at 0.01 level.

Unexpectedly, the simple activities component from the Grasmick et al (1993) items was not significantly correlated to *risk* or *self-centeredness*. Further, *anger* did not attain significance with *impulsivity*, *physical pursuits* and *simple activities*. Additionally, *moodiness* was not significantly correlated with *physical pursuits* and *physical activities*. For the revised components, *school authority* was not significantly correlated with either of the others.

Multi-variate logistic regressions

Table 6 presents the results of the deviance index and its regression on the four models of self-control plus the demographic variables. In Model 1, only the single factor, Grasmick et al. (1993) scale is used as the measure of self-control. As the table indicates, self-control was not a significant contribution to the model. In fact, in Model 2 where only the components of the Grasmick et al. (1993) scale are included in the model, none of the measures attains significance either. Interestingly, things change in Model 3 where the Hirschi revised factor is included in the model. This measure of self-control is responsible for an approximate 59% (.41) reduction in the likelihood of involvement in future deviance. This model accounted for 26% of the variance in future deviance. Model 4 had some mixed findings. When the three components of Hirschi's revised self-control measure are included in the equation, it is found that the school attachment measure is the one that attains significance, accounting for a 29% (.71) decrease in the likelihood of involvement of Chinese students in deviance in the near future.

Table 6. Multivariate Logistic Regression Models Predicting Prevalence of Deviance^d

Variable	Model 1 (n = 148)	Model 2 (n = 148)	Model 3 (n = 146)	Model 4 (n = 146)
Grasmick et al. scale	0.79	--	--	--
Risk	--	1.10	--	--
Self-centered	--	0.85	--	--
Impulsivity	--	0.84	--	--
Physical pursuits	--	0.92	--	--
Simple activities	--	0.92	--	--
Temper	--	1.02	--	--
Anger	--	1.53	--	--
Moodiness	--	1.09	--	--
Revised scale	--	--	.41**	--
Maternal relationship	--	--	--	0.91
School attachment	--	--	--	0.71**
School authority	--	--	--	0.84
Age	1.74*	2.02*	1.76 ^b	1.90*
Sex	0.77	0.77	0.73	0.77
Urbanity	0.90	0.80	0.93	0.82
Constant	0.00	0.00*	0.00	0.00*
Model χ^2	10.19*	16.34	19.10***	22.70***
Nagelkerke R	14.30	23.00	26.00	31.00

* p<.05; ** p<.01, *** p<.001.

^dDependent variable is whether or not the respondent reported any delinquent acts (0 = no, 1 = yes). Odds ratios are presented.

^b p<.10.

Discussion and Conclusion

The two questions that were addressed in this study are, whether or not the Grasmick and revised measures of self-control are uni or multi-dimensional measures in a sample of Chinese university students and whether either or both measures were significant predictors of the probability of involvement in deviance by those students. The results suggest that while the eigen values and alphas for the forced factors are quite robust, it is not too hard to see why one could assert that the best solution is the single factor model. The factor loadings were relatively strong and seemed to indicate that the individual items coalesced around a single latent structure. Further, the components that were extracted provided further evidence that the Grasmick scale could be construed as a unitary measure since most of the components proved to be moderate to strong correlates with the Grasmick scale. However, while it may seem that the single factor solution is significant for these students, it is important to point out that of the two single factors modeled, the Grasmick measure failed to reach significance.

This result is important because it also replicates the findings reported by Cheung and Cheung (2008). Although, it is also possible that this particular modeling of self-control could be improved given that several of the items that loaded on the factor were lower than expected. Alternatively, a couple of other possibilities could be driving the results. First, it could be that modeling self-control in this way is not the course to pursue with Chinese university students. On the other hand, it could also be that Chinese university students simply do not possess some of the important traits relevant to the Grasmick scale.

If true, then self-control may take a different form in China (Cretacci et al., 2009; Kobayashi et al., 2010).

Additionally, the fact that "bond type" factor is what attained significance in the regressions, begs a couple of questions. First, are the Grasmick and revised scales both measuring self-control? One could assert that the Grasmick scale is not because Hirschi now claims that the Grasmick measures are inaccurate (Hirschi, 2004). If the revised measure is self-control, then it may have an impact on deviance and crime in China, among university students. We can also very tentatively say, based on these results and those of Cheung and Cheung (2008) that the Grasmick model may have little impact on Chinese deviance.

However, based on these results, one could also make a case that self-control is multi-dimensional. For both sets of items that were used to measure self-control, a number of components were extracted that could serve as an argument that it is made up of several others. For the Grasmick items, eight separate factors were realized and while it is true that they were all significantly correlated to the overall scale, the correlations for two of those components (anger and moodiness) were not impressive. Further, each component had an eigen value above 1. Moreover, six components were composed of multiple items that had significant alphas, save for simple activities (.58). Another important point in support of multi-dimensionality among these Chinese students is that of the four models that were tested, the revised model with only the components included, had both the largest χ^2 (22.70) and greatest amount of explained variance (31%). In fact, *school attachment* was the most important variable in the model.

The second question that was addressed here was the relative significance of the self-control models on Chinese deviance. Unexpectedly, neither the Grasmick scale nor any of its components proved to be a significant predictor of deviance among the Chinese students. A number of important explanations could be important. For example, Chinese university students may not mirror their American counterparts behaviorally. It is well known that university students in the U.S. consume large amounts of alcohol and drugs. In China, drug possession is considered is a very serious offense, which, in some instances, can result in the imposition of the death penalty upon conviction. Further, while alcohol is popular in China, students are less likely to engage in the misuse of the substance than British and Koreans (Luczak, Wall, Shea, Byun, & Carr, 2001). However, that is likely not the case since the revised "bond type" measure of self-control was significantly predictive of deviance for these students.

The interpretation for this finding is that deviance in this sample is either a function of planning and not impulsivity, which critics argue is a good way of thinking of low self-control (Arneklev, 1999), or it is a function of deteriorating social bonds (Cretacci et al., 2009). One could cogently argue that deteriorating social bonds are important here, given that the revised measure and then the "school attachment" component of that measure were the only variables that were important in the equations. Following this line of reasoning, one could tentatively conclude that cultural differences play a role in which measure of self-control is significant. More specifically, (Kobayashi et al. (2010) point out that scholarship on Asian societies, such as Japan, has found that the Japanese refrain from emphasizing personal differences and independence and that their behavioral controls are tied to a complex network of social obligations (p. 116). However, this is not the case in the U. S. and others too have reported that Chinese families are more cohesive (Silverstein, Cong, & Li, 2006) and traditional (Waters, 2002) than Western families. If

these points are true, then they may be why the revised measure is significant within this Chinese sample and why the Grasmick scale is not. In conclusion, given that little research has been conducted on the impact of self-control on Chinese samples, future studies should focus on: whether or not to test the revised measure, how self-control should be operationalized, and the consideration of the impact of Chinese culture on the measure.

Limitations

While these results are certainly important and serve to advance knowledge in the area of the applicability of self-control in the international context, it is understood that like every piece of research, limitations of this investigation do exist. Primarily is the sample size. While 150 cases is enough to analyze and make statements concerning outcomes, such a sample it is not sufficient to make broad generalizations about the results. Moreover, the sample size can also be a point of contention concerning the legitimacy of the factor analysis as well. More specifically, some have argued that one must adhere to the 10 subjects to 1 item rule. The current study does not follow this admonition and so could be subject to criticism on this point. Secondly, the population for the sample was drawn from one university, in one Chinese city. Additionally, while it was not the focus of this study, others have pointed out that it is important to also empirically examine the differential impacts of the components of self-control (Williams et al., 2007). While the current study examined alternative ways to model self-control in a sample of Chinese university students and then tested those measures on indicators of deviance, we did not attempt further empirical analysis of the self-control components.

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APPENDIX

Descriptive Statistics for Grasmick Self-Control Items

Table A.1

Items	M	SD	N
1. I often act on the spur of the moment without thinking.	2.53	1.05	150
2. I don't devote much time and effort to preparing for the future.	2.33	0.97	150
3. I often do what brings me pleasure here and now, even at the cost of some distant goal.	2.71	0.94	150
4. I am more concerned with what happens to me in the short run than in the long run.	2.65	0.98	150
5. I frequently try to avoid projects that I know will be difficult.	2.95	0.90	150
6. When things get difficult or complicated, I tend to quit or withdraw.	2.55	0.90	150
7. The things in life that are easiest to do bring me the most pleasure.	2.53	0.99	150
8. I dislike really hard tasks that stretch my abilities to the limit.	2.63	1.00	150
9. I like to test myself every now and then by doing something a little risky.	3.41	0.98	150
10. Sometimes I will take a risk just for the fun of it.	2.81	1.12	150
11. I sometimes find it exciting to do things for which I might get into trouble.	2.52	1.03	150
12. Excitement and adventure are more important to me than security.	1.97	0.96	150
13. If I had a choice, I would almost always rather do something physical than something mental.	2.59	0.96	150
14. I almost always feel better when I am one the move than when I am sitting and thinking.	2.63	1.05	150
15. I like to get out and do things more than I like to read or contemplate ideas.	2.64	1.10	150
16. I seem to have more energy and a greater need for activity than most other people my age.	2.79	1.04	150
17. I try to look out for myself first, even if it means making things difficult for other people.	2.17	0.91	150
18. I'm not very sympathetic to other people when they are having problems.	2.07	0.92	150
19. If things I do upset other people, it's their problem not mine.	1.74	0.76	150
20. I will try to get things I want even when I know it's causing problems for other people.	2.17	0.95	150
21. I lose my temper pretty easily.	2.52	1.07	150
22. Often, when I'm angry at others, I feel more like hurting them than talking to them about why I am angry.	2.01	1.00	149
23. When I'm really angry, other people better stay away from me.	2.92	1.20	150
24. When I have a serious disagreement with someone, it's usually hard for me to talk calmly about it.	2.56	1.03	150

Note. Response set for each item was: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree.

Descriptive Statistics for Revised Self-Control Items, with Response Sets

Table A.2

Items	M	SD	N
1. How much do you like school? (1 = not at all, 2 = very little, 3 = somewhat, 4 = quite a bit, 5 = very much).	3.15	0.75	150
2. How important is getting good grades to you personally? (1 = not important at all, 2 = fairly unimportant, 3 = fairly important, 4 = very important).	3.29	0.68	147
3. Do you finish your homework? (1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time, 5 = always).	4.35	0.83	150
4. Do you care what teachers think of you? (1 = not at all, 2 = very little, 3 = somewhat, 4 = quite a bit, 5 = very much).	3.55	1.07	150
5. Does your mother know where you are when you are away from home? (1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time, 5 = always).	3.97	0.97	150
6. Does your mother know who you are with when you are away from home? (1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time, 5 = always).	3.72	1.03	150
7. Do you share your thoughts and feelings with your mother? (1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time, 5 = always).	3.60	1.02	150
8. You would like to be the kind of person your mother is. (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).	3.00	1.12	150
9. It is not the school's business if students want to smoke outside of class. (1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, 5 = strongly disagree).	2.88	1.19	150

Descriptive Statistics for General Deviance Items

Table A.3

<i>Items</i>	<i>M</i>	<i>SD</i>	<i>N</i>
1. Did you paint graffiti or signs on someone else's property or in public?	.55	.68	150
2. Did you deliberately damage property that didn't belong to you?	.19	.56	150
3. Did you take something from a store without paying for it?	.07	.40	150
4. Did you get into a serious physical fight?	.11	.47	150
5. Did you hurt someone enough to need bandages or medical care?	.07	.38	150
6. Did you drive a car without its owner's permission?	.07	.34	150
7. Did you steal something worth more than 1,000 Yuan?	.06	.39	150
8. Did you go into a house or building to steal something?	.06	.35	150
9. Did you use or threaten to use a weapon to get something from someone?	.01	.12	149
10. Did you sell marijuana or other drugs?	.05	.34	150
11. Did you steal something worth less than 1,000 Yuan?	.07	.39	150
12. Did you engage in a fight where your friends were against another group?	.06	.35	150
13. Were you loud, rowdy, or unruly in a public place?	.18	.54	150
14. Did you use marijuana or other drugs?	.06	.39	150

Note. Each item was prefaced by, "In the past 12 months, how often..." with the following responses set: 0 = never, 1 = 1 or 2 times, 2 = 3 or 4 times, 4 = 5 or more times. Due to skewness, the items were dichotomized for the analysis.