

# Sex Differences in the Predictors of Juvenile Delinquency: Females Are More Susceptible to Poor Environments; Males Are Influenced More by Low Self-Control

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## Abstract

The goal of the article is to investigate whether well-established risk factors for delinquency among adolescents are equally important for males and females. The risk factors discussed here are derived from four theoretical approaches: social bonding/social control theory, self-control theory, routine activities/opportunity theory, and social disorganization theory. Data are drawn from the International Self-Reported Delinquency study (ISRD-2). The results show that the risk factors proposed by social bonding theory, social disorganization theory, routine activities/opportunity theory, and self-control theory are not equally related to delinquent behavior among males and females. When all the theoretically relevant factors are combined together, three interaction terms are found to be statistically significant; *family disruption* and *deviant behavior of friends* have more influence on delinquent behavior of females, whereas the *lack of self-control* is more strongly related to delinquency among males.

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<sup>3</sup>Josine Junger-Tas passed away on January 22, 2011. She wrote the first version of this article. As her friend and her daughter, both involved in her work, we decided to finish this article after her death and prepare it for publication.

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delinquency theory, gender differences, adolescents, self-report delinquency, ISRD-2

Since at least as far back as the 1970s, when female delinquency developed into an important field of study, it has been widely acknowledged that males are more often involved in criminal behavior than females. Although some authors have argued that this sex gap would slowly diminish over time (e.g., Adler, 1975), the difference between male and female delinquency has remained relatively stable. It should be noted though that somewhat larger increases in crime over time have been noted for females as compared to males during the recent decade in official figures and self-reported delinquency (Wong, 2012).

Three possible explanations exist for explaining sex-related differences in delinquency: exposure hypothesis, vulnerability hypothesis, and the threshold hypothesis (Wong, 2012). The *exposure* hypothesis stipulates that the same theoretical approaches apply when explaining delinquent behavior in both males and females. However, females are less often exposed to risk factors and more often exposed to protective factors than males. Thus, they are less at risk of becoming juvenile delinquents. For instance, socialization methods are related to delinquent behavior; specifically, studies suggest that mothers tend to employ a more authoritative approach when raising their daughters, whereas they express more leniencies toward their sons (Hoeve, Van der Laan, Gerris, & Dubas, 2009; Wall & Barth, 2005). According to Wong (2012), females, in comparison to males, are also more candid with their mothers about their personal lives (disclosure), and mothers often know more about their daughters (solicitation). Both disclosure and solicitation have protective effects on delinquency. Alternatively, fathers have a very important role in the lives of their sons. Males are more likely to exhibit delinquent behavior throughout adolescence when their fathers use a neglectful approach during that stage of their upbringing. Females, however, are more likely to develop delinquent behavior when their fathers are more lenient (Hoeve et al., 2009). In addition, males are more likely to be exposed to delinquent friends, which is also a significant risk factor for delinquency.

The second explanation, the *vulnerability* hypothesis, states that males and females harbor different levels of sensitivity when it comes to risk factors (Moffit, Caspi, Rutter, & Silva, 2001). In other words, the factors that may be relevant for females are not necessarily relevant for males (and vice versa). These factors are also known as sex-sensitive indicators. Testing this theory has resulted in many different outcomes. For example, Carter, Donnemeijer, and Phillips (1982) found that a weak parent–child bond was more strongly associated with delinquent behavior in males than females. In addition to the parent–child bond, studies concerning differential socialization indicate that a lack of parental control predicts delinquency (Hagan, Gillis, & Simpson, 1985; Junger-Tas, Marshall, & Ribeaud, 2003; Rankin & Kern, 1994). Worldwide, parents are more inclined to exert control over females, a notion also supported by the first International Self-Reported Delinquency (ISRD) study and a large British self-report

study (Graham & Bowling, 1995; Junger-Tas, Cruyff, van de Looij-Jansen, & Reelick, 2003). Wong (2012) found that maternal support, as expected, has a stronger protective effect on females in comparison to males. However, while maternal control has a protective effect on males, it functions as a risk factor for females. Furthermore, the degree of delinquency of a best friend is a higher risk factor for females than males. Thus, it seems that females are influenced by more risk factors than males, and they also have more protective factors than males.

The final hypothesis, the *threshold* hypothesis, states that females have a higher threshold of risk than males (i.e., they are more risk-averse than males). Generally, the female threshold is presumed to be higher due to the sex-role socialization of females against aggression at the cultural level. Some researchers argue, however, that it is not the higher threshold of risk but instead that female delinquency is the result of the fact that females are more often victims of sexual abuse or family conflicts that can result in problematic behavior such as running away from home or premature sexual experimentation. This may lead directly to police intervention and the early institutionalization of females, in turn leading to higher statistics of female delinquent behavior (Chesnay-Lind & Shelden, 2004; Corrado, Odgers, & Cohen, 2000).

The present study will examine the vulnerability hypothesis by investigating whether four theoretical approaches explaining delinquent behavior apply equally to both males and females. We examine whether factors drawn from four theoretical perspectives apply in equal measure to the explanation of male and female delinquency. In this article, we use data collected as part of the ISRD-2 conducted among youth in 30 European and American countries (Enzmann et al., 2010; Junger-Tas et al., 2010; Junger-Tas, Marshall et al., 2012). In the ISRD-2, a central focus was to determine whether there are similarities or differences between the 30 countries in terms of incidence and prevalence of crime and victimization and—importantly—whether variables derived from four theoretical perspectives (social control, self-control, social disorganization, and opportunity/routine activity theory) were equally applicable as predictors of delinquency. As reported in the concluding chapter of *The Many Faces of Youth Crime* (Junger-Tas, Enzmann, Steketee, & Marshall, 2012), the ISRD-2 survey findings show some support for all four perspectives: social bonding and social control (mostly through school-related variables followed by parental supervision), self-control (including the interaction between self-control and opportunities), routine activities (lifestyle and delinquent friends), and social disorganization (mostly neighborhood disorganization). In this article, we elaborate on the analyses reported in *The Many Faces* and investigate whether the different theoretical variables are related equally strongly to delinquent behavior among males and females.

In the interest of preserving space, we do not discuss these four perspectives here. The basic premises of social control theory, self-control theory, social disorganization, and routine activities/opportunity theory are well-known (Bursik, 1988; Cohen & Felson, 1979; Gottfredson & Hirschi, 1990; Hirschi & Gottfredson, 1994; Sampson & Groves, 1998; Wortley & Mazerolle, 2008). Additional discussion of these

perspectives may also be found in *The Many Faces of Youth Crime* (Junger-Tas, Marshall et al., 2012, in particular chapters 1 and 12).

## Sex Differences

Most evidence suggests that girls are raised differently than boys. Thus, we can speak of “differential socialization.” Specifically, if boys and girls are not raised identically, they will not form an equally strong bond with society, which can perhaps explain sex differences in delinquent behavior. The volume of research on the differential socialization of boys and girls is enormous. Here, it may suffice to briefly discuss a few studies that support this premise. According to Giordano, Cernkovitch, and Pugh (1986), girls are more likely to develop intimate relationships, which is why girls do not influence each other’s behavior in the same way that boys do. In addition, the behavioral norms of girls encourage others to be open and therefore to develop more intimate relationships. Parents are also more likely to exert direct control over their daughters, in comparison to their sons (Graham & Bowling, 1995; Hagan et al., 1985; Junger-Tas, Marshall et al., 2003; Rankin & Kern, 1994). For instance, in the Netherlands, in 1990, twice as many boys than girls went out on the weekends, while girls spent the majority of their time carrying out household chores and babysitting younger children (Junger-Tas & Terlouw, 1991). Furthermore, in a small Dutch city, one study showed that before the age of 6, girls were only allowed to play within the direct vicinity of their homes, while boys of the same age were allowed to venture out much further (Masson, Kayotis, & de Jong, 2002).

It appears, then, that girls and boys differ in terms of the extent to which they bond with their parents, teachers, and friends, as well as the manner in which they function at school and how they spend their free time. Given this sex disparity, we may make the assumption that these factors do not relate to delinquent behavior in the same way for both sexes. The question is: To what extent does the evidence suggest that the factors associated with delinquent behavior are equal in strength for girls and boys? The literature provides no consensus on this subject.

A number of studies found no differential effect of risk factors on delinquency by sex. A slightly dated meta-analysis found that the same factors predict delinquent behavior in boys and girls (Rothbaum & Weisz, 1994). The results of a large study of sex differences by Moffit et al. (2001) also stated that “the overarching conclusion [is] that female antisocial behavior obeys the same causal laws as males” (p. xvi).

Other studies indicated that girls and boys follow different paths to delinquency. A more recent meta-analysis revealed that boys and girls displayed differences in regards to the relationship between parents and delinquent behavior (Hoeve et al., 2009). The study indicated that parental support is strongly associated with delinquent behavior within the “same-sex dyads” and only slightly associated within “cross-gender relations.” In other words, “fatherly support–delinquent behavior son” and “motherly support–delinquent behavior daughter” are much stronger relationships than “fatherly support–delinquent daughter” and “motherly support–delinquent son” (Hoeve et al.,

2009). In regards to other parental factors (including parenting styles, psychological control, general socialization), no differences were detected.

There are also sex differences with regard to school factors. Interestingly, higher school grades and a positive self-image are linked to lower levels of delinquent behavior in girls; however, for boys, these factors actually are associated with a higher level of delinquent behavior (Heimer, 1995). Nonetheless, many studies that look at differences between boys and girls are descriptive in nature and do not fully explain how these differences manifest themselves (Rutter, Caspi, & Moffitt, 2003).

## The Current Study

The present study has two goals. First, we examine the extent to which sex differences in delinquency are found in the 30 ISRD-2 participating countries. Second, we investigate, for the total sample and using a country-clustering approach (see below), whether variables derived from, respectively, social control, self-control, social disorganization, and routine activities/opportunity theory are equally relevant predictors of both male and female delinquency. We build on earlier analyses of the ISRD2 data to select the strongest predictors of delinquency (Junger-Tas, Enzmann et al., 2012) to investigate whether these factors are equally important to predict male and female delinquency.

## Research Methods

The data in the current study are based on the ISRD-2, which was carried out among adolescents in 25 European countries and 5 countries in North and South America. The details of the data collection method and sampling approach are discussed in the Introduction to this special volume and also may be found in Enzmann et al. (2010) and Marshall and Enzmann (2012).

Consistent with recommended “good practice” by the ISRD-2 project, two different datasets will be used to accommodate the mixed sampling strategy (i.e., national and city-based samples; see Introduction to the special issue for more details). For the description of the sex differences in prevalence rates per country, we limited the analysis to the data collected on medium and large cities only ( $N = 43,141$ ). This provides for a greater level of comparability between countries. For the second analysis, we have used the total dataset ( $N = 57,940$ ) because this analysis investigates relationships and is not concerned with descriptions.

Delinquent behavior was measured by asking questions about 12 different offenses ranging from shoplifting to robbery and assault. Students were asked whether they had “ever” committed the offense and whether they committed the offense during the “past year.” For all our analyses, we only used “last year” measures. Our main dependent variable was “versatility,” which comprised the sum-total of the number of “yes” responses to each of the 12 individual items, scores ranging from 0 (*never committed an offense*) to 12.

**Table 1.** Description of the Variables (*N* = 57,940).

	Sores Ranging	Females		Males		Chronbach Alpha
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Versatility	0 to 12	0.24	0.00	0.57	0.01	
Strong family bonding	1 to 100	80.4	0.10	82.1	0.09	0.55
Parental supervision (base no)	1 to 3	2.60	0.00	2.46	0.00	
Family disruption	1 to 100	14.5	0.13	11.6	0.12	
Strong bonding with school	1 to 100	70.8	0.12	67.3	0.14	0.61
High school disorganization	1 to 100	36.0	0.14	39.3	0.15	0.75
Truancy (base no)	1 to 3	1.34	0.00	1.40	0.00	
High neighborhood disorganization	1 to 100	19.1	0.13	23.2	0.15	.85
Peer-oriented lifestyle	1 to 100	0.54	0.01	0.69	0.01	0.63
Deviant group behavior	1 to 100	0.57	0.01	0.84	0.01	.66
Delinquent friends (base no)	1 to 5	0.72	0.01	0.87	0.01	.70
High self-control	1 to 100	62.8	0.11	58.9	0.12	.81
Positive attitude toward violence	1 to 100	28.4	0.11	39.0	0.14	.71

Table 1 provides an overview of the main variables used in the present study. The independent variables that were selected were those that have been found to be related to delinquency in a previous analysis of the data reported by Junger-Tas, Marshall et al. (2012), with an additional three variables we considered to be important (i.e., family disruption, bonding with school, and attitudes toward violence). For the scales used in the multivariate analysis, standardized scores were used. This means that for each scale, scores were converted to POMP (percent of maximum possible) scores ranging from 1 to 100 (see Enzmann et al., 2010, for more information) (see Table 1).

The basic postulate of social control theory is that strong bonds to the major social institutions will prevent delinquency. The family is viewed as the most significant institution in this view. As reported by Junger-Tas, Enzmann et al. (2012), two robust ISRD measures of family that are related to delinquent behavior are the family bonding scale and one item indicating parental supervision (see Table 1). The Family Bonding Scale is a composite of four questions: frequency of family doing things together, frequency of eating dinner together, attachment to father, and attachment to

mother. However, the literature conveys that family disruptions also play an important role when it comes to girls and delinquent behavior (Junger-Tas, Marshall et al., 2012); thus, we added this variable to the analysis. Family disruption is measured by a scale comprising answers to three questions on the Life Events Scale: problems of one of your parents with alcohol or drugs, repeated serious conflicts or physical fights between parents, and separation/divorce of parents.

The school is also of crucial importance in social control theory. Analysis of the ISRD-2 data suggested that both school disorganization and truancy were important variables (Junger-Tas, Marshall et al., 2012), and given that there could be a gender difference in regard to school attachment (or bonding), we added this third school-related variable to be included in our analysis. The School Bonding Scale was constructed using four items ("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 School Disorganization Scale comprises four items ("There is a lot of stealing in my school"; "There is a lot of fighting in my school"; "Many things are broken or vandalized in my school"). Truancy was measured by asking if the student ever stayed away from school for at least a whole day without a legitimate excuse in the past year.

Earlier analyses of the ISRD-2 data showed that neighborhood disorganization had an influence on the behavior of youths, whereas attachment to the neighborhood or social cohesion had no influence. Therefore, we only include neighborhood disorganization in our analysis. The Neighborhood Disorganization Scale uses five items from a question to measure the youth's perception of his or her neighborhood (Sampson, Morenoff, & Earls, 1999; Sampson, Raudenbush, & Earls, 1997).

The routine activities/opportunity perspective, broadly defined (including lifestyle theory), stresses the importance of situational factors to explain delinquency. Our analysis includes a number of variables, including "peer-oriented lifestyle" (types of leisure time activities), engaging in "deviant group behavior," and "having delinquent friends." The Peer-Oriented Life Style Scale comprised four questions: frequency of going out at night, time spent hanging out with friends, most free time spent with large group of friends, and having groups of friends who spend a lot of time in public places. Deviant group behavior was measured by a subscale created from four items asking what kind of activities usually were happening when hanging out with one's friends (drinking a lot of alcohol, smashing or vandalizing for fun, shoplifting just for fun, frighten and annoying people for fun). Delinquent friends was measured by asking about the number of friends one has who are involved in drug use, shoplifting, burglary, extortion, or assault.

Self-control was measured with 12 items from the Grasmick (1993) Self-Control Scale, including impulsiveness, seeking risks, self-control, and temper. Although not part of one of the four theoretical perspectives, we decided to also include the attitude of youths in regards to the use of violence (Olweus, 1979). Previous research has shown a high level of correlation between self-control and valorization of violence (see, for example, Galvray, Vettenburg, Pauwels, & Rubens, in this issue). Positive



attitude toward violence was measured by asking respondents to agree or disagree with five items.

Consistent with the analytical approach used by Junger-Tas et al. (Junger-Tas et al., 2010; Junger-Tas, Marshall et al., 2012), we used the country-clustering approach based on an adoption of the national welfare system approach (Esping-Andersen, 1990, 1999; Saint-Arnaud & Bernard, 2003; see also Introduction to this special issue). The clusters are as follows: Anglo-Saxon, West-European, North-European, South-European, Post Socialist countries, and Latin American countries.<sup>1</sup>

In our multivariate analyses, we controlled for grade (seventh, eighth, or ninth) and migration status (native vs. nonnative).

## Findings

### *Prevalence of Delinquent Behavior and Sex Differences*

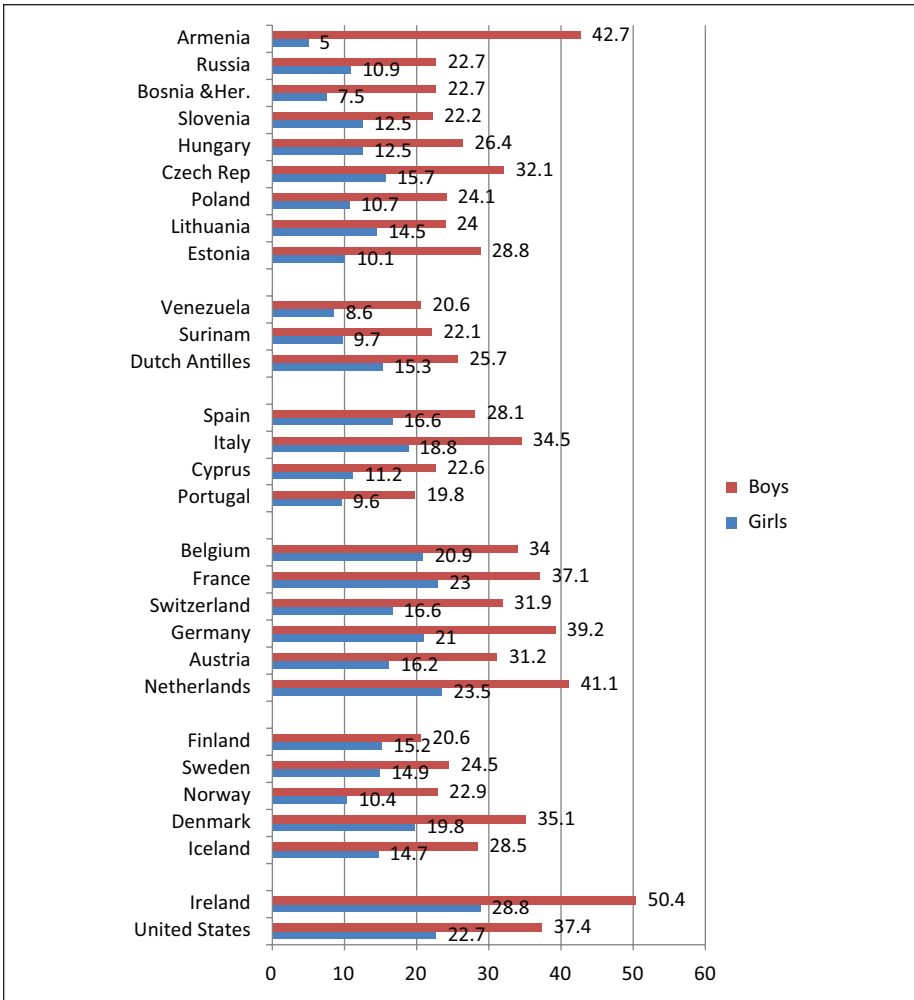
There are significant sex differences in delinquent behavior in all ISRD-2 countries (Figure 1). The sex difference was the smallest in Finland, where 15% of the females and 25% of the males had committed an offence at least once. In Armenia, the difference was much larger, as only 5% of the females committed an offence in the last year, compared to 43% of the males.

We then conducted logistic regression analysis, to describe and test the sex differences in the six clusters, for four types of offenses (committed last year): serious and minor property offenses, and serious and minor violent offenses. The likelihood (expressed in odds ratios [ORs]) of males exhibiting delinquent behavior was higher than females for most types of crime (see Table 2). If males and females commit an offense equally often, then  $OR = 1$ . If males commit an offense more often than females, the  $OR > 1$ , and as females commit an offense more often than males, the  $OR < 1$ . For instance, in Latin American countries, the sex difference was the largest and applied to all types of offences. The likelihood that males will display more criminal behavior than females was also prominent in the former Socialist countries such as Russia, Armenia, Estonia, and Poland. When it comes to less serious offences such as shoplifting, sex differences were not that large. In fact, in West-European countries, there were no sex differences at all in regards to minor property offences, and the South-European cluster only showed a minor sex difference.

### *Predictors of Sex Differences in Youth Delinquency*

The second part of our analysis tries to determine if there are sex differences with regard to the relative importance of the predictors of delinquency. Because versatility is a count variable, independent variables are related to delinquent behavior using a negative binomial regression analysis. The negative binomial regression calculates Risk Ratios (RRs). To find out whether factors related to delinquency are equally strong for females and males, we used the following procedure. First, RRs were





**Figure 1.** The Percentage of Males and Females Who Committed an Offense in the Last Year, in Large- and Medium-Sized Cities ( $N = 43,141$ ).

calculated for each of the groups of independent variables (family, school, neighborhood, lifestyle, self-control). Then interaction terms were constructed by multiplying all selected factors with sex. To illustrate, to measure the importance of family, three items were used—namely, bonding with parents, parental control, and disruption of the family—and three interaction terms were calculated. When an interaction term is statistically significant, it means that the relationship between the specific variables is stronger for males or for females.

**Table 2.** Logistic Regression for the Relationships: Males and Delinquency Versus Females and Delinquency, in the Last Year (Odds Ratios) ( $N = 57,940$ ).

	Females (%)	Males (%)	Minor Property Offences	Serious Property Offences	Minor Violent Offences	Serious Violent Offences
Anglo-Saxon	49.4	50.6	1.51***	2.63***	2.77***	1.82***
North-European	52.2	47.8	1.48***	2.72***	2.71***	1.83***
West-European	50.5	49.5	1.12 (ns)	4.09***	3.09***	2.64***
South-European	52.2	47.8	1.31*	4.34***	2.51***	2.99***
Former Socialist countries	52.3	47.7	1.64***	3.91***	2.71***	2.06***
Latin American countries	52.4	47.6	1.59***	4.44***	4.29***	3.65***

\* $p < .01$ . \*\*\* $p < .0001$ .

The results indicate that there is a stronger interaction effect between males and positive parent-child bonding, in comparison to females ( $RR = 1.08$ ). Parental supervision plays a significant role in the prevention of youth delinquent behavior, even more so than parent-child bonding ( $RR = 0.64$  compared to  $0.78$ ). Here, the gender difference is less significant. There is a lower interaction effect between gender and parental supervision. For both males and females, it is important that parents know with whom their children spend their time and what they do outside the home.

The three interaction terms were statistically significant in the family model, but only the interaction of Sex  $\times$  Family Disruption remained significant in the full model. The relationship between family disruption and delinquency was stronger for females than for males ( $RR = 0.96$ ).

Bonding to school, disorganization at school, and truancy are linked to delinquency ( $RR = 0.79$ ,  $1.57$ , and  $2.11$ , respectively; Table 3). Young people with a strong bond with school where little crime takes place and who are not frequently truant commit less crime than younger people with a weak bond to school, where the school is not perceived as disorganized, and who are not likely to be truant. All interactions are significant. Bonding to school was found to be more important for males than for females ( $RR = 1.06$ ). The effect of disorganization at school on delinquency was stronger for females than for males ( $RR = .92$ ). The relationship between truancy was stronger for females than for males ( $RR = .85$ ). However, in the full model, none of the interactions remained statistically significant.

The perception of physical negligence and destruction of the neighborhood is clearly associated with criminal behavior among youth ( $RR = 1.82$ ). However, this correlation was stronger for females in comparison to males ( $RR = 0.92$ ), but once again, in the full model, this difference is no longer significant.

Engaging in "deviant group behavior" seems to be related to delinquent behavior, primarily among females ( $RR = 0.85$ ). Having a lifestyle that involves spending a lot

**Table 3.** Negative Binomial Regression of Versatility and Variables, Controlled for Sex, Grade, and Migration Status ( $n = 57,882$ ).

Variables Included, by Step	Risk Ratios Family	Risk Ratios School	Risk Ratios Neighborhood	Risk Ratios Lifestyle	Risk Ratios Individual	Risk Ratios Total
Family bonding	0.78*** (0.75 to 0.81)					-.97*** (0.94 to 1.00)
Parental supervision	0.64*** (0.62 to 0.72)					0.94*** (0.91 to 0.97)
Family disruption	1.29*** (1.24 to 1.33)					1.08*** (1.05 to 1.10)
Interaction between sex and family bonding	1.08*** (1.03 to 1.13)					1.04 (0.99 to 1.07)
Interaction sex and parental control	1.05** (1.01 to 1.10)					0.99 (0.96 to 1.07)
Interaction between sex and family disruption	0.90*** (0.87 to 0.94)					0.96** (0.92 to 0.99)
School bonding		0.79*** (0.76 to 0.81)				0.92*** (-0.90 to 0.96)
School disorganization		1.57*** (1.51 to 1.63)				1.08*** (1.05 to 1.12)
Truancy		2.11*** (2.01 to 2.21)				1.19*** (1.14 to 1.25)
Interaction between sex and school bonding		1.06** (1.01 to 1.10)				1.02 (0.98 to 1.05)
Interaction between sex and school disorganization		0.92** (0.88 to 0.97)				0.96 (0.92 to 1.00)
Interaction between sex and truancy		0.85*** (0.80 to 0.90)				0.96 (0.94 to 1.04)
Neighborhood disorganization			1.82*** (1.76 to 1.88)			1.09*** (1.06 to 1.12)

(continued)

**Table 3. (continued)**

Variables Included, by Step	Risk Ratios Family	Risk Ratios School	Risk Ratios Neighborhood	Risk Ratios Lifestyle	Risk Ratios Individual	Risk Ratios Total
Interaction between sex and neighborhood disorganization			0.92*** (0.87 to 0.94)			0.97 (0.93 to 1.00)
Peer-oriented lifestyle				1.39*** (1.33 to 1.45)		1.27*** (1.22 to 1.32)
Deviant group behavior				1.77*** (1.71 to 1.82)		1.43*** (1.38 to 1.48)
Delinquent friends				1.67*** (1.61 to 1.72)		1.44*** (1.40 to 1.49)
Interaction sex and lifestyle				0.99 (0.94 to 1.04)		0.99 (0.95 to 1.04)
Interaction between sex and deviant group behavior				0.85*** (0.94 to 1.04)		0.90*** (0.86 to 0.93)
Interaction between sex and delinquent friends				0.91*** (0.88 to 0.94)		0.97 (0.94 to 1.00)
Self-control						
Positive attitude toward violence					0.49*** (0.47 to 0.52)	0.76*** (0.73 to 0.79)
Interaction between sex and self-control					1.59*** (1.52 to 1.66)	1.17*** (1.12 to 1.21)
Interaction sex attitude toward violence					1.22*** (1.15 to 1.28)	1.11*** (1.05 to 1.17)
					0.94 (0.90 to 1.00)	0.99 (0.88 to 0.95)

\*\*\* $p < .001$ . \*\* $p < .0001$ .

of time outside the home also influences delinquent behavior among youth ( $RR = 1.39$ ), although there was no difference in regards to gender. For both females and males, the influence was about equal. Having delinquent friends also increased the likelihood that a youth committed an offence in the last year ( $RR = 1.67$ ). Here, we can also observe a gender difference, as the risk that females will commit an offence if they have delinquent friends is higher in comparison to males ( $RR = 0.91$ ). However, the situation changed in the full model. Only one interaction with sex remained significant: Having friends involved in deviant behavior was related more strongly to female-perpetrated delinquent behavior ( $RR = 0.90$ ).

The analysis shows that having self-control is a strong protective factor, whereby the effect is most obvious for males ( $RR = 1.22$ ). A positive attitude toward violence is a risk factor for delinquent behavior, whereby the risk is equally high for both sexes ( $RR$  interaction between sex and attitude toward violence =  $0.99$ , *ns*). In the full model, the relationship between self-control and delinquency was stronger among males than among females.

## Discussion

The first conclusion is that females not only commit fewer offences but also commit less serious offences. This concurs with literature, which shows that females are less often involved in aggressive behavior (Archer, 2004; Card, Stucky, Sawalani, & Little, 2008), commit fewer crimes, and are less often involved in serious crimes (Moffit et al., 2001; Owens, 2002).

Although there are clear sex differences in delinquent behavior, there are also some similarities. It is evident that males commit more crimes than females. However, the rank order of offenses that are committed usually is similar for both sexes. Minor violations such as fighting, vandalism, shoplifting, and the carrying of weapons are most common among both males as well as females, whether they live in Venezuela, Russia, Italy, or the Netherlands. The consistency of these findings across countries shows that sex differences in delinquent behavior hold all over the world.

The question is: Why do sex differences in delinquent behavior exist? The current study focused on the vulnerability hypothesis, which states that among males and females there are different associations between risk factors and delinquency—that is, both sexes are differentially vulnerable to risk factors (Wong, 2012). To investigate this hypothesis, 12 concepts, derived from social bonding theory, social disorganization theory, opportunity factors, self-control, and attitudes towards violence, were used as explanatory factors for delinquent behavior. Also, interaction terms of these 12 risk factors with sex were related to delinquent behavior. The results support the vulnerability hypothesis only to some extent: 8 of the 12 interaction terms were non-significant. Among the family risk factors, strong family bonding and parental supervision had the same relationship with delinquent behavior among males and females. Each of the three school risk factors was related to delinquency to the same degree in males and females. Also, neighborhood disorganization, peer-oriented lifestyle, delin-

quent friends, and positive attitude toward violence were related to delinquent behavior to the same degree among males and females.

Three interaction terms were significant. First, the relationship between family disruption and delinquency was stronger among females than among males. When the family was disrupted, females were more likely to engage in delinquent behavior than males. Second, the relationship between deviant group behavior and delinquency was stronger for females than for males: Being in groups that are involved in nuisance behavior leads to delinquent behavior more often in females than in males. These results correspond with previous research. In a review of the literature, Loeber and Keenan (1994) concluded that, usually, females had lower scores on risk factors for delinquency. However, when they scored high, it seemed that they were affected more strongly, leading to relatively higher delinquency rates in females in comparison with males who were subjected to the same level of risk. Other studies reported (Fagan, Lee Van Horn, Antaramian, & Hawkins, 2011; Kroneman, Loeber, & Hipwell, 2004) that the same level of risk can lead to a disproportional increase in negative outcomes such as delinquency in females in comparison with males. In line with these previous reports, the results of this analysis of ISRD-2 data suggest that females are more sensitive to specific negative "crime-promoting" environments. However, as mentioned above, several other risk factors, within the family, school, and the neighborhood, are not in line with this statement.

In contrast with previous findings, one risk factor was related more strongly to delinquency among males: The relationship between self-control and delinquent behavior was stronger for males than for females. Interestingly, Burton, Cullen, Evans, Alarid, and Dunaway (1998) also found a sex difference in the relationship between self-control and delinquent behavior. They reported that self-control was related to delinquent behavior among males but not among females. In the ISRD-2 data, the relationship between self-control with delinquent behavior is stronger in males but does not disappear in females. Possibly, the large sample size in the present study leads to our findings being statistically significant more often, and this might explain the difference between the present study and Burton et al. (1998).

Limitations of the current study should be mentioned. The present study has a cross-sectional design. All data are measured on a single measurement point. It is not possible to produce causal conclusions in such a design. An example is the effect of neighborhoods on children's behavior. It is possible that families in neighborhoods end up in their particular neighborhood by self-selection. Families with little individual and social skills may choose to or have nowhere else to go than to deprived neighborhoods (Kling, Ludwig, & Katz, 2005; Kroneman et al., 2004). Experimental research is needed to examine the effects of the factors identified in the current study to determine with certainty.

Also, measurement of the concepts is based on a single informant, the young person. With regard to delinquency, studies show that young people generally provide relevant information about their behavior (Jolliffe et al., 2003; Junger-Tas & Marshall, 1999). However, apparently the perception about the extent of crime in one's

neighborhoods is different for males than for females. In the current study, we found (Table 1) that females reported less crime in their neighborhood than males within the same neighborhoods. Assuming that generally speaking, male and female respondents live in the same neighborhoods, these findings may reflect response bias in the study. Possibly, females perceive or know less about the crime going on in their own neighborhood or males exaggerate the level of crime. Possibly both mechanisms play a role.

Despite these limitations, the present study is important for describing the differences in delinquency between males and females. The advantages of the present study are its high sample size, its international aspect, and the use of theoretically relevant concepts. The results show that most elements of the social bond, social disorganization, routine activities/opportunity, and attitudes towards violence are equally related to delinquent behavior among males and among females. However, two important concepts (family disruption and deviant group behavior) are more strongly related to delinquency in females, while self-control is more strongly related to delinquency in males. Taken together, these findings suggest that females are more vulnerable to poor external environments and males are more vulnerable to a low score on a personality characteristic, namely self-control.

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### Note

1. The Anglo-Saxon countries include the United States of America and Ireland. The West-European countries include Germany, the Netherlands, Belgium, Switzerland, Austria, and France. The North-European countries include Iceland, Sweden, Norway, Denmark, and Finland. The South-European countries include Cyprus, Italy, Spain, and Portugal. The former socialist countries include Estonia, Lithuania, Hungary, Czech Republic, Slovenia, Bosnia Herzegovina, Russia, and Armenia. The Latin American cluster includes Venezuela, Aruba, Suriname, and the Antilles.

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