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Weerman, F.M.; Hoeve, M.

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Peers and delinquency among girls and boys: Are sex differences in delinquency explained by peer factors?

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Frank M. Weerman

Netherlands Institute for the Study of Crime and Law Enforcement (NSCR), The Netherlands

Machteld Hoeve

University of Amsterdam, The Netherlands

Abstract

In this article, we investigate sex differences in the relationship between peers and delinquency. We analyse to what extent peers have different effects on delinquency among girls and boys, and to what extent sex differences in the level of delinquency can be explained by differential exposure or vulnerability to criminogenic peer contexts. Data are used from the School Study of the Netherlands Institute for the Study of Crime and Law Enforcement, in which rich data about peers were collected, including measurements of peer delinquency as reported by nominated peers themselves, time spent with peers, peer attachment, peer pressure and the sex composition of peer networks. The results indicate that, although the characteristics of peer relationships differ in many respects between the sexes, the effects of peers on delinquent behaviour are remarkably similar for girls and boys. Further, it appears that the investigated peer variables explain a substantial part of the sex differences in delinquent behaviour.

Keywords

juvenile delinquency, peers, sex differences, social network data

Introduction

The relationship between peers and delinquent behaviour is one of the most researched and debated issues in criminology (Warr, 2002). Many studies have found associations between an individual's delinquent behaviour and delinquent behaviour among friends

Corresponding author:

Frank M. Weerman, Netherlands Institute for the Study of Crime and Law Enforcement (NSCR),

PO Box 71304, 1008 BH Amsterdam, The Netherlands

Email: Fweerman@nscr.nl

(for example, Elliott et al., 1985; Matsueda and Anderson, 1998; Patterson and Dishion, 1985) or other peer factors, such as time spent with peers (Osgood and Anderson, 2005; Svensson and Oberwittler, 2010). Recently, the use of social network data among youths has provided new insights into the relationship between peers and delinquency (Haynie, 2001; Weerman and Bijleveld, 2007).

Within this still growing body of research, limited attention has been paid to sex differences in the relationship between peer variables and delinquent behaviour. This is unfortunate because various studies have reported that the peer relationships of girls differ in various aspects from those of boys (Erwin, 1998; Rose and Rudolph, 2006; Waldrop and Halverson, 1975). Such differences may imply that the influence of peers on delinquency is different for girls compared with boys. For example, the effects of delinquent peers may be weaker for girls because they are less susceptible to them, or other aspects of peer relations may be more important for girls. It is also possible that the effects are similar for girls and boys, but that girls are differentially exposed to criminogenic influences from peers, leading to less delinquent behaviour.

Extensive study of the role of peers among girls and boys can contribute to understanding the so-called 'gender gap' in crime – the finding that, on average, females and girls are less involved in delinquency than are males and boys (see Mears et al., 1998; Moffitt et al., 2001). Studies that have been conducted on sex differences in the relationship between peers and delinquency have not been conclusive. Further, most of these studies have been confined to the United States. European studies focusing on the explanation of sex differences in delinquency are still scarce (for example, Junger-Tas et al., 2004; see, for a systematic review, Wong et al., 2010). Most of them do not include peer factors or employ only one peer measure, peer delinquency (as perceived by the respondents).

In this article, we focus on sex differences and the relationship between peer factors and delinquency. We use data from the School Study from the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR), which included a longitudinal survey and the collection of social network data among secondary school students. The study was aimed specifically at the relationship between peers and delinquency, and rich data about peer factors were collected, including measurements of peer delinquency as reported by the peers themselves, time spent with peers, peer attachment, peer pressure and the sex composition of peer networks. Together with measures of important other correlates of delinquency, these data enable us to investigate in detail the relationship between peers and delinquency among girls and boys.

We focus on the following research questions:

1. To what extent do girls differ from boys in their peer relations?
2. To what extent are peer variables differentially correlated with delinquent behaviour among girls and boys?
3. To what extent do girls and boys differ in the multivariate effects of peer variables on delinquent behaviour, independently from important other explanatory variables (bonds with parents and school, self-control and moral attitudes)?
4. To what extent are sex differences in the level of delinquency explained by peer variables?

The 'gender gap' in delinquency and potential sex differences in peer relations

Moffitt et al. (2001) addressed several general explanations for the 'gender gap' in crime, in particular the 'differential exposure hypothesis' and the 'vulnerability hypothesis'. The differential exposure hypothesis posits that the causes of delinquency are the same for males and females but that males are more exposed than females to risk factors. According to the vulnerability hypothesis, the aetiology of delinquency may differ for males and females. Males may be more vulnerable than females to certain risk factors (Moffitt et al., 2001).

Applying the differential exposure hypothesis to the relationship between peers and juvenile delinquency, an explanation of the gender gap could be that females simply have fewer peers who engage in delinquent behaviour than do males. This would imply that females are less exposed to the peer influences hypothesized in various criminological theories that are based on principles of social learning (Akers, 1973; Sutherland, 1947; Warr, 2002). Unfortunately, these theories do not provide much information about why these sex differences may exist. One of the explanations they do provide (see Warr, 2002) is that girls may be less exposed to peer influences because they experience higher levels of social control. Studies consistently find that parental supervision and monitoring are less intense for boys than for girls (Svensson, 2003).

Females may also be less exposed than males to deviant peer influences because adolescents tend to become friends with someone of the same sex (Benenson, 1990; Weerman and Smeenk, 2005). Very young girls display a preference to play with someone of the same sex as early as the age of 2; for boys this preference starts a little later. At the age of 6 or 7, both boys and girls play almost exclusively with someone of the same sex and this extends into adolescence (Erwin, 1998). As a consequence, female adolescents will get less exposure than male adolescents to delinquent peers (Moffitt et al., 2001).

Contrary to the differential exposure hypothesis, the differential vulnerability hypothesis suggests that the gender gap might be explained by differences between girls and boys in the relationship between peers and delinquency. According to this reasoning, females would be less influenced than males by their peers, even when they are also exposed to delinquent peers. The literature on peer relationships in adolescence reveals that this may be a plausible hypothesis. Although studies find several similarities between boys' and girls' friendships (for example, they both want to experience trust, authenticity and similar status), they also report substantial gender differences in the nature of friendships. According to Waldrop and Halverson (1975), females tend to concentrate on one or a few best friends more often than do males, and their peer relations tend to be characterized more strongly by intimacy, emotional involvement and confidentiality. Girls have also been found to be more prosocial towards their friends and to feel more empathy for their friends (Rose and Rudolph, 2006). Boys, on the other hand, find it difficult to talk about personal matters and have more friendships in groups. Their peer networks are characterized by more hierarchy (Rose and Rudolph, 2006).

Another reason for females to be less vulnerable to (deviant) peers is that they may be less sensitive to peer influences or group pressures. Male identities seem to place a stronger emphasis on competitiveness, whereas female identities are relatively more

concerned with relations to others and dependency (Agnew, 2009). These differences are partly caused by biological differences between the sexes but are enhanced by cultural role patterns and gender-specific social expectations (Eliot, 2010). Further, females' stronger moral beliefs may protect them from the negative influences of peers (Warr, 2002). Boys have a greater tendency to approve of delinquent behaviours in particular circumstances, for example in the context of conflicting loyalties (Agnew, 2009).

In summary, two hypotheses can be formulated about potential gender differences in the relationship between peers and delinquency: (1) delinquent behaviour of girls is influenced by peers in the same way as that of boys, but girls are less exposed than boys to peer influences for several reasons, including a preference for same-sex friendships (differential exposure hypothesis); (2) girls are less vulnerable to the influence of (deviant) peers, because they differ from boys in the quality of their peer relations, sensitivity to peer pressure and moral beliefs (differential vulnerability hypothesis). Separately or in concert, these two hypotheses may contribute to the explanation of why females engage less often in delinquency.

Earlier studies on sex differences in the relationship between peers and delinquency

Several studies have focused on sex differences in peer influences on delinquency. In order to measure delinquency in peers, most of these studies relied on reports by participants on the extent to which their peers engaged in delinquent behaviour (Hartjen and Priyadarsini, 2003; Laird et al., 2005; Mears et al., 1998; Piquero et al., 2005). Most of these studies report significant and similarly sized correlations between delinquent peers and individual delinquency for boys as well as for girls. Laird et al. (2005), in a longitudinal study, compared reports by almost 400 boys and girls and found relatively similar effects of delinquent peers. Several meta-analyses on gender differences in risk factors of delinquency also report that the effects of peer variables on delinquency in girls are comparable to the effects in boys (Hubbard and Pratt, 2002; Simourd and Andrews, 1994; Wong et al., 2010).

A limitation of the conventional method of measuring peer delinquency by asking respondents about their perception of their peers' behaviour is that adolescents have no full information about their peers and may project their own behaviour on them. Earlier studies (Kandel, 1996; Weerman and Smeenk, 2005) have suggested that respondents often misperceive the delinquency levels of their peers and overestimate similarity to their own behaviour. Until now, only a few studies on gender differences in the relationship between peers and delinquency have used social network methods by which peers report about themselves. Haynie and Osgood (2005) collected data on peer relations in a large sample of almost 9000 adolescents, and found only modest effects of mean levels of peer delinquency on individual delinquency, and these effects were found to be similar for males and females. In a smaller study using social network methods, Brendgen et al. (2000) found that peer delinquency mainly had a short-term effect on individual delinquency, and the findings were similar for males and females.

Whereas most studies report evidence that the influence of delinquent peers is relatively similar for both boys and girls, a few studies found gender differences in the

relationship between peer factors and delinquency. A cross-sectional study conducted by Mears et al. (1998) reported that boys were more strongly affected than girls by delinquent peers, and that delinquent peers had an effect only on girls who did not have a negative attitude towards delinquency. Otherwise, moral rejection of offending moderated the influence of peers among females but not among males. Using longitudinal data, Piquero et al. (2005) found that peer factors had stronger effects on delinquency in males than in females. They also found that peer influence was moderated by other factors, including disapproval of delinquency and legal sanctions.

The aforementioned studies on the relationship between peers and delinquency do not take the sex composition of peer relations into account. Recently, a few studies (Haynie et al., 2007; McCarthy et al., 2004) have investigated whether cross-gender peer relations are related to delinquent behaviour. These studies on the sex composition of peer relations revealed that girls seem to be more delinquent when they have a lot of male peers. The risk of delinquency in boys, on the other hand, seems to decrease if they have more friends of the opposite sex. Thus, cross-gender peers seem to have a different effect on males and females.¹

To summarize, previous studies have shown that the influence of peers on delinquency is relatively similar for males and females. A few studies, however, found that boys' delinquency is more strongly affected than girls' delinquency by peer factors. The vast majority of these studies have been conducted in North America. Only a few European studies exist that focus on explanatory factors for gender differences in delinquency (for a systematic review, see Wong et al., 2010). Most of the previous studies have focused on only one peer measure and used the conventional method of peer delinquency as perceived by the respondents instead of reported by the peers themselves. In the present study, we focus on several peer factors and we use a measurement of peer delinquency derived from the peers themselves. The sex composition of peer groups will also be taken into account. In addition, the study is longitudinal and controls for other important risk factors such as individual, family and school factors in order to analyse the unique contribution of peer factors to delinquency in males and females.

Method

Sample

In the present study, we used data from 1110 respondents, who participated fully in the first and second waves of the NSCR School Study (conducted in spring 2002 and 2003). The respondents were recruited in 10 secondary schools that participated in the full study in both waves.² The sampling procedure was intended to obtain a relatively 'high-risk' sample together with substantial variation in contexts. Therefore, students in lower vocational education in a major Dutch city (The Hague) were over-represented in the sample,³ but respondents from schools in smaller cities and towns in the region were also included. This procedure implies that the sample is not random, but that it should be considered as a fairly good representation of lower-educated youths in the urbanized south-west region of the Netherlands.

The sample is divided in two age cohorts: a younger cohort of students who were in the first grade of secondary school during the first wave of the study (mostly 13 years old), and an older cohort from students that were in the third grade during the first wave (mostly 15 years old). In total, 1561 respondents from the 10 schools participated in the first wave; in the second wave, 1156 students participated again, of whom 1110 provided usable network information in both study waves. This means that there was a total loss of 28.9 percent of students between the first wave and the second. Attrition analysis shows that respondents who fell out of the sample did not differ significantly in sex or ethnic background. However, they did differ significantly in their level of delinquent behaviour ($t = 4.94$; $p < .001$), indicating that relatively delinquent youths participated less often in the second wave. To investigate whether this might influence our conclusions, additional analyses were conducted in which respondents were weighted based on their delinquency level at wave 1. It appeared that results with these weights were similar to those reported in the paper, indicating that there is no reason to believe that the selective attrition biased our findings.

The final sample contained more boys than girls (57 percent versus 43 percent). Ages ranged from 11 to 18 years in the first wave but, owing to the cohort design of the study (first and third grades), respondents aged 13 and 15 years in the first wave dominated (respectively 37 percent and 22 percent; the mean age is 13.9). The majority of respondents (61 percent) went to school in the large city area of The Hague (about 500,000 inhabitants), a substantial number (27 percent) lived in a medium-sized city (about 120,000 inhabitants) and some respondents (12 percent) were recruited in a smaller town (about 15,000 inhabitants). More than one-third of the sample consisted of respondents with an immigrant background,⁴ but respondents with parents born in the Netherlands were in the majority (60 percent).

The questionnaires were group administered in the classroom setting during school hours and at least two members of the research team were present during the administration of the questionnaire. Computers were used instead of the usual paper and pencil method, to enhance completion of all questions and facilitate data entry. Parents were informed about the study and could refuse participation by their child (passive consent). Respondents received a reward when they completed the questionnaire (a €5 voucher).

Measures

Delinquent behaviour was measured using self-report questions about 12 different offences, ranging from painting graffiti and stealing small things to burglary and robbery. Respondents were asked whether (and how often) they committed these offences during the past school year, marked by the summer vacation, to provide respondents a reference point. The wordings of the delinquency items were based on existing national and international self-report instruments (such as the International Survey on Self-Reported Delinquency). Item responses were combined into a *total delinquency* scale, constructed by counting the number of offence types. This 'variety scale' of delinquent behaviour was preferred over a 'frequency scale' based on the total number of self-reported offences. The reason is that the 12 offences included in the questionnaire varied greatly in seriousness. Using frequencies would bias the score towards high

occurrences of relatively mild offences (for additional reasons to use variety indices instead of frequency ones, see Bendixen et al., 2003). Because self-report questions are retrospective in nature (referring to the previous year), we used delinquency at time 2 as the dependent variable in the present study to ensure the correct temporal ordering of the independent and dependent variables. Alpha of the total delinquency scale was .71 in the first wave and .69 in the second wave.

A relatively large number of peer-related variables were included. Most were based on reports by the respondents about their peers, but some were based on social network data about peer relations within the schools. To collect these network data, respondents were provided with a numbered list of all students in the same grade in their school. After that, they were asked to fill in the numbers of those fellow students they spend much time with at school, with a maximum of 10 possible nominations (see Weerman and Bijleveld, 2007, for details).

Mean delinquency level of peers was based on the reports by the peers from the school social network themselves. This scale was constructed by linking the social network data to self-reports by the peers themselves who were also participating in the study. We used the average scores of the respondents' peers in wave 1 and wave 2 to ensure that the timing of this variable precedes that of the dependent variable but not that of the other independent variables (which are all focused on the present situation).

Time spent with peers consists of five items indicating how often and how long respondents are in the company of their friends.⁵ Alpha of this scale was .78. *Bond with peers* consists of four items providing respondents with statements of their feelings towards their friends.⁶ This scale had a relatively low alpha of .54, implying that potential association may be suppressed by extra measurement error. *Deviant peer pressure* was measured by five statements enquiring whether the respondents' friends applied pressure and reinforcement to make them perform dangerous and illegal acts.⁷ Alpha of this scale was .73.

Finally, *proportion girls among peers* was measured by counting the number of female friends in the school networks of the respondents and dividing it by the total size of the network (total number of nominated friends).

Four additional control variables, covering major criminological perspectives, were included in the analyses. *Bond with parents* is a scale consisting of five items indicating whether respondents like their parents and have a positive relationship with them.⁸ Alpha was .78. *Bond with school* is a scale consisting of eight items, indicating whether students like school and try their hardest to achieve good results (alpha was .76).⁹ *Self-control* is a measure that consists of three subscales (impulsivity, risk-seeking, anger) adapted from Grasmick et al. (1993).¹⁰ It contains 12 items and had an alpha of .79.¹¹ *Moral attitude* consists of four items that indicate to what extent respondents are willing to bend the law;¹² alpha was .66.

Analytical strategy

Our analyses were conducted in five steps. First, we analysed to what extent there actually is a 'gender gap' in our data by comparing the prevalence of various offending types among girls and boys in the present study. Second, we used ANOVA analyses to explore

whether girls and boys differ in their peer relations (and the investigated control variables). Third, we used simple correlations to explore whether peer variables are differentially associated with delinquency among girls and boys. Fourth, we employed multivariate regression analyses to investigate whether the independent effects of peer variables were significant and similar or different among girls and boys. These analyses were conducted in two models, with and without the inclusion of previous levels of delinquency as an independent variable. To determine whether independent peer effects significantly differed between boys and girls, we accounted for the standard errors of coefficients in the regression analyses, using the formula provided in Paternoster et al. (1998). Finally, stepwise regression analyses were conducted to investigate to what extent the 'gender gap' in delinquency is mediated by peer (and other) variables.

For the regression analyses we used the negative binomial model instead of the more commonly used linear (OLS) regression model. The measure of our dependent variable – self-reported delinquency – has a skewed and over-dispersed distribution (with many 0's and 1's), which violates key assumptions of traditional OLS regression. Furthermore, it is not a linear measure but a count of the number of offence types, and the use of linear regression analysis for count outcomes can result in biased and inconsistent estimates of parameters (Long, 1997). The (increasingly popular) negative binomial model does apply to count variables and appears to be quite appropriate for the non-normal distribution of the dependent variable under study – self-reported delinquency. To facilitate comparison, all independent variables were standardized before entering the multivariate analyses.

Results

Table 1 compares involvement in delinquent behaviours among girls and boys in the sample. The first two rows of Table 1 show that a modest sex difference exists at a general level: more boys (47 percent) than girls (37.5 percent) reported at least one of the 12 investigated offences during the school year preceding wave 2, and also the average delinquency score of boys (1.04) is significantly higher than that of girls (0.75; $F = 10.81, p < .01$). The next 12 rows specify these differences. It appears that boys are more involved in aggressive acts (fighting and wounding someone) and vandalism and in certain property offences (stealing bikes/mopeds or cars; buying stolen goods). Girls, on the other hand, are certainly not absent among the offenders. They are actually more often involved in shoplifting and graffiti or writing on walls than boys.

Table 2 shows that there are many sex differences in mean scores on peer and control variables. There is a modest but strongly significant difference between the mean delinquency scores of peers nominated by the girls and those of peers nominated by the boys. The table further shows that boys spend somewhat more time with peers than do girls. Girls, on the other hand, report a stronger bond with their peers than do boys and substantially less deviant peer pressure. Girls and boys also differ with regard to the sex composition of their school networks. Not surprisingly, girls have many more girls than boys among their school friends.¹³

Table 2 further reveals that, on average, boys have a stronger bond than girls with parents, but the bond with school is relatively similar for both sexes. It appears that girls'

Table 1. Delinquent behaviour at T2 among girls and boys ($n = 1110$)

	Girls ($n = 493$)	Boys ($n = 617$)	Significance (χ^2 or F)
Percent any of the 12 offences	37.5	47.0	**
Average delinquency score	0.75	1.04	**
Percent writing on walls, graffiti	17.2	11.8	*
Percent destroying things	6.9	16.0	***
Percent shoplifting < €5	14.6	10.2	*
Percent shoplifting > €5	4.7	3.6	n.s.
Percent buying stolen goods	7.5	12.3	*
Percent stealing bike or moped	1.0	8.9	***
Percent stealing a car	0.2	1.9	**
Percent burglary	0.2	1.0	n.s.
Percent stealing in other ways	1.4	3.2	n.s.
Percent hitting or fighting	15.4	25.0	***
Percent wounding someone	3.9	8.4	**
Percent robbing someone	0.2	0.6	n.s.

n.s. not significant, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 2. Mean differences between girls and boys ($n = 1110$)

	Girls	Boys	F
Mean delinquency level of peers	0.93 (0.64)	1.14 (0.79)	23.35***
Time spent with peers	5.64 (2.59)	5.96 (2.59)	4.09*
Bond with peers	13.74 (2.60)	13.07 (2.69)	16.57***
Deviant peer pressure total	4.34 (4.19)	5.85 (4.84)	24.91***
Proportion girls among peers	0.86 (0.21)	0.07 (0.16)	5217.17***
Bond with parents	27.97 (4.93)	28.89 (3.81)	12.09**
Bond with school	21.62 (5.86)	21.28 (6.01)	0.79 n.s.
Self-control	21.67 (8.43)	20.09 (8.64)	9.43**
Moral attitude	11.60 (3.20)	10.52 (3.67)	27.10***
Delinquency score at T1	0.81 (1.32)	1.07 (1.70)	7.72**
Delinquency score at T2	0.75 (1.30)	1.04 (1.58)	10.81**

n.s. not significant, * $p < .05$, ** $p < .01$, *** $p < .001$

level of self-control is higher than that of boys and that they have stronger conventional moral attitudes than boys. The mean level of delinquency appears to be higher among boys than among girls in both the first and the second wave.

Table 3 explores whether the investigated peer and other variables are differentially associated with delinquency among girls and boys. Most of the reported correlations are significant for girls as well as for boys and are of similar magnitude, but some interesting differences can be detected. First of all, mean peer delinquency appears to be more strongly correlated with delinquency for girls than for boys. There are also differences

Table 3. Correlations between delinquency and peer and other variables among boys and girls ($n = 1110$)

	Girls	Boys
Delinquency score at T1	.528***	.519***
Mean delinquency of peers	.296***	.219***
Time spent with peers	.296***	.273***
Bond with peers	.033 ^{n.s.}	.085*
Deviant peer pressure total	.168***	.133**
Proportion girls among peers	-.096*	.046 ^{n.s.}
Bond with parents	-.133**	-.110**
Bond with school	-.276***	-.221***
Self-control	-.318***	-.264***
Moral attitude	-.298***	-.270***

^{n.s.} not significant, * $p < .05$, ** $p < .01$, *** $p < .001$

with regard to time spent with peers, bond with peers (significantly correlated for boys but not for girls) and deviant peer pressure, but these differences are relatively small. The proportion of girls in the network is significantly related to less delinquency among girls, but not among boys. Further, the associations between all four control variables and delinquency are somewhat higher among girls than among boys.

In Table 4, multivariate regression effects of peer and other variables are presented, separately for girls and boys. Model 1 presents the findings for a regression analysis without the inclusion of time 1 own delinquency; model 2 presents the findings for a regression analysis that included time 1 delinquency as a control variable.

Model 1 of Table 4 reveals that there are many similarities between girls and boys in the multivariate effects of peer and other variables. For both girls and boys, mean peer delinquency and time spent with peers have substantial and significant effects on delinquency. For girls, the effect of delinquent peers seems to be somewhat higher. However, although this difference is substantial, it appears to be only one-sided significant (according to the formula provided in Paternoster et al., 1998). For girls, but not for boys, deviant peer pressure is significantly related to delinquency; the difference in magnitude between the coefficients is, however, non-significant. Unlike the bivariate correlations suggest, bond with peers and proportion of girls among peers do not have a significant multivariate effect for both sexes. Three of the control variables have significant effects for both sexes: bond with school (though only one-sided significant for girls), level of self-control and conventional moral attitude. Bond with parents does not have a significant independent effect for either sex. Neither of the differences between girls' and boys' effect sizes appears to be statistically significant.

Model 2 of Table 4 shows that own delinquency at time 1 is strongly related to delinquent behaviour in the second wave, indicating continuity in delinquent behaviour. In this longitudinal model, many of the other effects disappear. The effect of mean peer delinquency remains for girls but not for boys. This difference in effect between girls

Table 4. The effects of peer and control variables on delinquent behaviour at T2: Negative binomial regression analysis ($n = 1110$)

	Model 1				Model 2			
	Girls		Boys		Girls		Boys	
	B	(SE)	B	(SE)	B	(SE)	B	(SE)
Constant	-.565	(.168)	-.138	(.117)	-.598	(.171)	-.309	(.122)
Own delinquency T1					.548	(.109) ***	.585	(.079) ***
Mean peer delinquency	.313	(.085) ***	.127	(.061)*	.253	(.087) **	.048	(.064) n.s.
Time spent with peers	.286	(.091) **	.293	(.074) ***	.177	(.095) n.s.	.235	(.076) **
Bond with peers	.078	(.094) n.s.	.110	(.076) n.s.	.092	(.096) n.s.	.100	(.078) n.s.
Deviant peer pressure	.195	(.099)*	.103	(.072) n.s.	.181	(.101) +	.106	(.073) n.s.
Proportion girls among peers	.184	(.192) n.s.	.035	(.159) n.s.	.100	(.196) n.s.	-.075	(.164) n.s.
Bond with parents	-.053	(.086) n.s.	-.007	(.074) n.s.	-.041	(.088) n.s.	-.023	(.076) n.s.
Bond with school	-.171	(.093) +	-.167	(.071)*	-.073	(.096) n.s.	-.056	(.073) n.s.
Level of self-control	-.241	(.098)*	-.144	(.072)*	-.227	(.099)*	-.070	(.074) n.s.
Moral attitude	-.239	(.099)*	-.155	(.074)*	-.132	(.103) n.s.	-.067	(.076) n.s.
Log likelihood		-522.56		-817.92		-509.58		-788.95
AIC		1065.12		1655.84		1041.15		1599.91
BIC		1107.13		1700.09		1087.36		1648.580

n.s. not significant, + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

and boys is one-sided significant. Time spent with peers has a significant effect on the delinquent behaviour of boys but not of girls (although the difference between the coefficients is not significant). Finally, there is a one-sided significant effect of deviant peer pressure for girls, but the effect size does not differ significantly from the effect size among boys. The other peer variables again have no significant effects on delinquency. Of the control variables, only self-control appears to remain related to delinquency, once controlled for earlier delinquency. The effect is significant only for girls (although the effects do not differ significantly in magnitude between boys and girls).

Table 5 presents the results of a stepwise regression analysis exploring whether the effect of the respondent's sex is mediated by the included peer and other variables. Model 1 shows the univariate effect of sex: being a girl has a significant and substantial negative effect on delinquency. In model 2, the peer variables are added to the model. Three of them appear to have significant effects: mean peer delinquency level, time spent with peers and deviant peer pressures. Interestingly, the effect of sex has decreased by more than one-third and is no longer statistically significant. This is an indication that peer variables are partly mediating the effect of sex on delinquent behaviour. In model 3, only the control variables are added to the effect of sex. Three of these variables have significant effects, and again the effect of sex is reduced substantially but now remains significant, suggesting that the control variables are not completely mediating the effect of sex. In the fourth model, the effects of all the independent variables are added to the effect of sex.

Table 5. Intermediating effects of peer factors and control variables on the association between sex and delinquent behaviour at T2: Negative binomial regression analysis ($n = 1110$)

	Model 1		Model 2		Model 3		Model 4	
	B	(SE)	B	(SE)	B	(SE)	B	(SE)
Constant	-.100	(.044)	-.250	(.048)	-.229	(.047)	-.284	(.049)
Sex (1 = being a girl)	-.242	(.066) ***	-.153	(.133) n.s.	-.170	(.070) *	-.156	(.136) n.s.
Mean peer delinquency			.258	(.047) ***			.195	(.048) ***
Time spent with peers			.431	(.053) ***			.294	(.057) ***
Bond with peers			.065	(.057) n.s.			.093	(.059) n.s.
Deviant peer pressure			.271	(.052) ***			.132	(.058) *
Proportion girls among peers			.008	(.115) n.s.			.011	(.117) n.s.
Bond with parents					-.033	(.055) n.s.	-.030	(.056) n.s.
Bond with school					-.238	(.053) ***	-.167	(.056) **
Level of self-control					-.280	(.055) ***	-.178	(.058) **
Moral attitude					-.255	(.056) ***	-.180	(.059) **
Log likelihood	-1460.29		-1371.53		-1377.11		-1345.17	
AIC	2924.59		2757.06		2766.23		2712.34	
BIC	2934.61		2792.15		2796.30		2767.47	

n.s. not significant, * $p < .05$, ** $p < .01$, *** $p < .001$

This results in similarly significant effects of peer and control variables as in models 2 and 3, but all seem to be reduced in magnitude. The effect of sex is again not significant, but is not further reduced in comparison with models 2 and 3. These findings indicate that the effects of peer and control variables partly overlap.¹⁴

Discussion

Summary of the main findings

Despite many investigations into peers and delinquency, limited attention has been paid to differences in the relationship between peers and delinquency among males and females. Focusing on potential sex differences in the influence of peers on delinquent behaviour is important because it may offer insights into the gender gap in crime. The current study investigated sex differences in delinquency and the relationship between delinquency and peer variables, using detailed data on peers in a Dutch school sample.

Modest sex differences in delinquency were found. We found that boys had higher levels of violent and serious offending than girls. However, girls had higher levels of shoplifting and graffiti and, moreover, the sex differences in delinquency that were found in the present study are smaller than those usually found in police data (Zahn, 2009). This may be owing to the less serious nature of most self-reported offences in comparison with those leading to arrest, but it may also be related to the earlier maturation of girls, which temporarily decreases sex differences in delinquency during early adolescence (Moffitt et al., 2001) and explains this finding by the fact that females mature slightly

earlier than males. The relatively small differences in delinquency levels between boys and girls in this study (ages 13 and 15) are in accordance with other studies (for example, Van der Laan and Blom, 2006).

We found many sex differences in mean scores on peer variables. For example, boys' peers reported higher levels of delinquency than did girls' peers, and boys spent more time with peers than did girls. In addition, the quality of girls' bonds with peers seems to be on average higher than that of boys: girls report a stronger bond with peers and less peer pressure. This is in accordance with literature suggesting that the quality of relations with peers is different for girls, in particular being less competitive and more focused on communication and intimacy (Eliot, 2010; Rose and Rudolph, 2006). Our findings suggest that the peer relations of girls are relatively less 'riskful' (or more protective) compared with those of boys.

Most peer variables were correlated with delinquency for both girls and boys, indicating that peer factors can be important in explaining delinquency in both sexes. The effects of several peer variables remained significant in multivariate analyses controlling for established etiological correlates of delinquency. Mean peer delinquency seems to be an important peer variable for both sexes. This finding is in line with studies showing relatively similar effects of peer delinquency on boys' and girls' own delinquency (Brendgen et al., 2000; Hartjen and Priyadarsini, 2003; Haynie and Osgood, 2005; Heinze et al., 2004; Hubbard and Pratt, 2002; Laird et al., 2005; Liu and Kaplan, 1999; Moffitt et al., 2001; Simourd and Andrews, 1994). It is remarkable that we found a significant effect of mean peer delinquency in the longitudinal model for girls only and not for boys, although the difference between the estimates was only one-sided significant. It may be that friends outside school still have an effect for boys – note that the mean peer delinquency variable relates only to the school friend network.

Adding to mean peer delinquency, time spent with peers also seems to be an important peer variable for boys as well as for girls: it has relatively strong multivariate effects for both sexes. Controlling for previous delinquency, the effect estimates were larger for boys, but the difference from girls is not significant. Deviant peer pressure seems to be less important, in particular for boys, which might be seen as surprising.

The sex composition of peer groups is correlated with less delinquency among girls but not among boys. This is only partly in line with previous studies, as several found that having girls as friends is related to less delinquency among boys as well (Haynie et al., 2007; McCarthy et al., 2004). The sex composition of peer groups, however, does not seem to have an effect on delinquent behaviour, once other variables are taken into account. Thus, from our study it seems that in the end the amount of time spent with peers and the behaviour of peers are what matters, not whether they are boys or girls.

The effect of the respondent's sex on delinquency is reduced by one-third once peer variables are added to the analyses. This suggests that peer factors explain at least part of the (modest) 'gender gap' in delinquency. Other variables also reduce the effect of sex, but do not diminish the effects of peer delinquency, time spent with peers and peer pressure.

With regard to the different perspectives on explaining the 'gender gap' in delinquency, our findings do not support the 'differential vulnerability' hypothesis with regard to peers.¹⁵ Although our results clearly suggest that the relation with peers has a different quality for girls than for boys, the effects of peers are at least similar in size and stronger

rather than weaker. Our results do provide evidence for the ‘differential exposure’ hypothesis. Girls seem to be less exposed to delinquent peers, spend less time with them and experience less pressure. At the same time, these peer variables seem to be mediating the effects of sex on delinquent behaviour.

Limitations

Several limitations of the present study may be noted. First, although we had many peer variables, measures were not perfect. Actual peer delinquency was related only to school friends, and it is possible that friends outside school have additional effects on delinquency, which may differ between boys and girls. Second, this study consisted of two measurement moments only. Given that the peak in girls’ delinquency differs from the peak for boys, it would be interesting to investigate whether links between peer factors and the delinquency of boys and girls change over time. Third, we did not explicitly investigate the time ordering of peer variables and delinquency. In criminology, a long-standing debate concerns whether the association between peers and delinquency is explained by the influence of peers or by the selection of peers who are similar in behaviour to the respondent (see, for example, Matsueda and Anderson, 1998; Warr, 2002). Analysis of this issue would require specialized social network analysis that goes beyond the scope of this article (see, for example, Weerman, 2011). Fourth, although we included many control variables, we may have missed some that are also important in explaining the ‘gender gap’. Wong et al. (2010), in a European review, found some evidence to suggest that females were more at risk of criminal behaviour if they were affected by negative life events and physical abuse by parents. Furthermore, females were found to have more internalizing problems. Fifth, we did not distinguish between boys and girls from different ethnic backgrounds in the study. It is known that sex differences in delinquency are not similar across ethnic groups. For example, a Dutch study has reported that boys and girls of Antillean and Cape Verdean descent differ less in their level of delinquency than boys and girls in other ethnic categories (Junger-Tas et al., 2004). It remains a pending question to what extent boys and girls from different ethnic backgrounds are differentially exposed and vulnerable to criminogenic peer contexts. Future studies based on large enough mixed samples within each ethnic category are needed to shed more light on this issue. Sixth, it is possible that the role of peers differs over age periods or that peers have different meanings for boys and girls in different countries. Wong et al. (2010) noted that findings about risk factors of delinquency in girls from studies in the US could not be generalized to Europe, and this may apply to the relationship between peers and delinquency among girls and boys.

Conclusion

Despite its limitations, our study has demonstrated that peer variables offer a promising avenue for explaining sex differences in delinquency during adolescence. It also suggests that girls are as sensitive to peers as are boys during the age period we investigated. This implies that policy makers and practitioners should consider peer influences for both boys and girls when designing prevention and intervention strategies.

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Notes

1. This is also in line with studies on the effect of romantic relationships on adolescent delinquency (for example, Haynie et al., 2005; Lonardo et al., 2009).
2. Originally, two more schools participated in the first wave. One school was left out because it was so large that it was not possible to study complete school year networks in this school (only a few classes). The other school was left out because it moved to a different location in wave 2, and the new head of the school refused further participation.
3. In the Netherlands as a whole, 60 percent of young people attend this type of school.
4. A substantial number of respondents of Turkish (9 percent), Surinamese (12 percent) and Moroccan (6 percent) origin were represented in the sample, together with respondents from a wide range of other ethnic backgrounds.
5. For example, 'How often do you spend time with your friends after school?'
6. For example, 'I feel good being with my friends' and 'I would like to have other friends'.
7. For example, 'My friends would ridicule me if I was afraid of something' and 'My friends would find it funny if I did something illegal'.
8. For example, 'My parents are nice to me', 'I don't like being with my parents' (reverse coded).
9. For example, 'I like going to school', 'I try hard to get high grades'.
10. The wording of the items was slightly adapted to enhance comprehension and understanding for Dutch students following lower levels of education.
11. Examples of items are: 'I say what I think immediately', 'I like to try out scary things', 'People better stay away from me when I am angry'.
12. For example, 'It's all right to do something that is illegal now and then, as long as you don't get caught'.
13. However, it also appears that girls nominate relatively more (almost twice as many) peers from the other sex than boys do. They also nominate slightly more fellow students as peers (on average about 7, boys on average about 6).
14. Adding time 1 delinquency to the regression models results in even further reductions in the sex effect. However, the effects of the significant peer variables remain in this model. The effects of the control variables seem to be reduced; only self-control continues to have a significant effect.
15. That does not mean that the vulnerability hypothesis cannot apply to other variables.

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