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**The Longitudinal Association Between Family Structure and Adolescent Delinquency:
Moderated by Perceived Peer Pressure**

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Education can open the doors to a new future
Why do you not want to learn?
It's satisfactory to be smart and intelligent
You don't have to look to others for things
Strive on your own use your skills and knowledge to succeed
Stay in school until you have achieved your goals
There's nothing better than having a mind full of knowledge
With knowledge you can change the world
With knowledge you can lead the world

Alisha Ricks

Abstract

According to the *broken homes hypothesis* (Kierkus & Baer, 2002), adolescents from non-intact family structures are more likely to engage in delinquent behavior than adolescents from an intact family structure. The present study examined the longitudinal association between family structure and adolescent delinquency, and tested whether this association was moderated by perceived peer pressure. Data of the longitudinal SNARE (Social Network Analysis of Risk behavior in Early Adolescence) project was used. Participants were 1,167 Dutch first and second grade secondary school students, aged 11 to 15 years ($M = 13.19$) and lived in intact-, single-parent-, and reconstituted families. Self-reports were obtained to measure family structure, delinquent behavior and perceived peer pressure. Results of a multivariate linear regression analysis indicated that family structure and perceived peer pressure were not related to adolescent delinquency over time, controlling for gender, education level and delinquent behavior measured on a preceding wave. Finally, no interaction effect was found of family structure and perceived peer pressure on adolescent delinquency. Findings of the present study do not support the *broken homes hypothesis* and suggest that statements about the potential negative influence of non-intact family structures on adolescent delinquency should be made more cautiously.

Keywords: family structure, adolescents, delinquency, peer pressure

Samenvatting

Volgens de *broken homes hypothese* (Kierkus & Baer, 2002) hebben adolescenten uit een niet-intacte familie structuur een grotere kans om delinquent gedrag te vertonen dan adolescenten uit een intacte familie structuur. De huidige studie onderzocht de longitudinale relatie tussen familie structuur en delinquentie onder adolescenten en toetste of deze relatie werd gemodereerd door ervaren druk van leeftijdsgenoten. Gegevens van het longitudinale SNARE (Social Network Analysis of Risk behavior in Early Adolescence) project werden gebruikt. Participanten waren 1167 Nederlandse eerste en tweede klas middelbare scholieren, van 11 tot 15 jaar ($M = 13.19$) en woonden in intacte-, alleenstaande ouder-, of samengestelde gezinnen. Familie structuur, delinquent gedrag en ervaren druk van leeftijdsgenoten werden gemeten door zelf-rapportages. Resultaten van een multivariate lineaire regressie analyse toonden aan dat familie structuur en ervaren druk van leeftijdsgenoten niet gerelateerd waren aan delinquent gedrag over tijd, gecontroleerd voor geslacht, opleidingsniveau en delinquent gedrag gemeten tijdens een eerder meetmoment. Ten slotte werd er geen interactie-effect gevonden van familie structuur en ervaren druk van leeftijdsgenoten op delinquentie onder adolescenten. Bevindingen van de huidige studie ondersteunen de *broken homes hypothese* niet en suggereren dat uitspraken over de mogelijke negatieve invloed van niet-intacte familie structuren op delinquent gedrag onder adolescenten voorzichtig moeten worden gedaan.

Trefwoorden: familie structuur, adolescenten, delinquentie, druk van leeftijdsgenoten

Introduction

Delinquency rates peak in middle adolescence (White, Moffitt, Earls, Robins, & Silva, 1990). According to the age-crime curve, youth show more delinquent behavior during their teens, which declines when they get older (Farrington, 1986). In recent years, adolescents have committed more (serious) delinquent behavior at an increasingly younger age (De Groot et al., 2007). Compared to 2002, in 2007 delinquent acts against public order and acts of violence against others committed by Dutch 12 to 17 year olds increased sharply. Furthermore, the largest increase in adolescent delinquency was seen in the youngest age group, 12 to 15 year olds, with an increase of 40% in 2007 compared to 2002 (Van der Laan, Blom, Tollenaar, & Kea, 2010). As most of adolescents' delinquent acts are committed in peer groups (De Groot et al., 2007), perceived peer pressure is often mentioned as a risk factor for adolescent delinquency (Gardner & Steinberg, 2005; Steinberg, 1987). A second frequently mentioned risk factor for adolescent delinquency is family structure (Kierkus & Baer, 2002). Adolescents from single-parent family structures commit significantly more delinquent behavior than adolescents from an intact (living with both biological parents) family structure (e.g., Anderson, 2002; Cookston, 1999; Demuth & Brown, 2004; Kierkus & Baer, 2002). This finding is worrisome, since the number of single-parent families in the Netherlands increases annually. In 2012, the Netherlands counted 510,894 single-parent families (CBS, 2013). Thus, both family structure and perceived peer pressure are two major risk factors for adolescent delinquency. Therefore, it is important that research addresses both aspects when examining adolescent delinquency.

Given that both peer pressure and family structure are environmental conditions and both play an important role during adolescence (Arnett & Hughes, 2012), they may potentially reinforce each other, with the result that some adolescents are more vulnerable to committing delinquent behavior than others. However, no empirical research has yet focused on the moderating effect of perceived peer pressure on the association between family structure and adolescent delinquency. Therefore, the present study will provide insights for understanding the effect of perceived peer pressure on the aforesaid association. This would be of interest for developing interventions that are tailored to the needs of a vulnerable group of adolescents, in order to prevent or reduce adolescent delinquency, since peer pressure may affect adolescents from certain family structures more than others. Therefore, the aim of the present study is to examine whether the association between family structure and adolescent delinquency is moderated by perceived peer pressure.

Family Structure and Adolescent Delinquency

The association between family structure and adolescent delinquency has been a research subject for decades, yet empirical results are inconsistent since some studies have found a significant association when others did not (Wells & Rankin, 1991). Most cross-sectional and longitudinal studies found a moderate to strong association between family structure and adolescent delinquency. According to these cross-sectional studies, adolescents from non-intact (not living with both

biological parents) family structures have a significantly higher risk of committing delinquent acts than adolescents from an intact family structure (e.g., Anderson, 2002; Cookston, 1999; Kierkus & Baer, 2002; Manning & Lamb, 2003; Price & Kunz, 2003; Rankin, 1983; Steinberg, 1987). Similar results were found in the few existing longitudinal studies. Demuth and Brown's (2004) study among 16,304 adolescents found that adolescents from single-parent families are significantly more likely to engage in delinquent behavior than adolescents from an intact family. Rebellon (2002) and Juby and Farrington (2001) found comparable results.

The aforesaid cross-sectional and longitudinal findings are in line with the *broken homes hypothesis* (Kierkus & Baer, 2002). The *broken homes hypothesis* states that adolescents from non-intact family structures are more likely to commit delinquent behavior than adolescents from an intact family structure and is supported by the *social control theory* (Hirschi, 1969). The *social control theory* implies that adolescents are less inclined to engage in delinquent behavior when their parent-child bond, based on attachment, commitment, involvement and belief, is strong (Hirschi, 1969). Subsequently, Hirschi (1969) suggests that adolescents from non-intact family structures are more likely to commit delinquent behavior compared to adolescents from an intact family structure because they experience lower levels of parental attachment caused by damaging effects of parental separation. This indicates a weakened parent-child bond. In contrast to the aforementioned studies, a small minority of cross-sectional studies did not find an association between family structure and adolescent delinquency. Van Voorhis, Cullen, Mathers, and Garner (1988) showed that bivariate tests of the association between non-intact family structures and adolescent delinquency were not significant. Cernkovich and Giordano (1987) also found non-significant results.

Inconsistencies in the empirical findings concerning family structure and adolescent delinquency may be caused by methodological discrepancies. Research differs in the way family structure is being operationalized. Several aforementioned studies (e.g., Canter, 1982; Van Voorhis et al., 1988) operationalized family structure as a dichotomous variable (*intact family*; living with both biological parents and *non-intact family*; consisting of all other family structures). However, scholars criticize the use of a dichotomous variable as being analytically inadequate, since the influence of family structure on adolescent delinquency may vary depending on the composition of the family (Johnson, 1986; Kierkus & Baer, 2002). Other research included more than two categories to cover the concept of family structure, although the number and content of categories differ between these studies (Wells & Rankin, 1991). Wells and Rankin (1986) investigated the various ways that family structure was measured in prior research and the additional problems with such measurements. As a result, Wells and Rankin developed a classification of four categories (intact-, single-parent-, reconstituted- and neither natural parent family structure), which is necessary in order to measure all possible family structures and their association with adolescent delinquency. Kierkus and Baer (2002) have included the aforementioned operationalization in their cross-sectional study and found that adolescents from single-parent-, reconstituted- and neither natural parent family structures committed

significantly more delinquent behavior than adolescents from an intact family structure. Given the aforementioned, the operationalization as developed by Wells and Rankin (1986) is used in the present study.

Perceived Peer Pressure and Adolescent Delinquency

Perceived peer pressure refers to the degree to which adolescents perceive being encouraged or urged by peers to act in certain ways (Brown, Clasen, & Eicher, 1986). Previous research mainly focused on peer pressure from deviant peers on adolescent delinquency. Little empirical research has been done on the association between perceived peer pressure of non-deviant peers and adolescent delinquency. The few existing cross-sectional studies showed that perceived peer pressure is positively related to adolescent delinquency. Adolescents who perceive more peer pressure are more likely to participate in delinquent behavior than adolescents who do not perceive peer pressure (Brown et al., 1996; Santor, Messervey, & Kusumakar, 2000). Sullivan's (2006) longitudinal study, containing 1,389 adolescents, supported these findings. The aforementioned studies measured whether adolescents perceived peer pressure to engage in delinquent behavior. However, research suggests that one's vulnerability to peer pressure can be best measured by investigating perceived peer pressure that is not specifically aimed at certain behavior (Brown, 2004). Therefore, the present study focuses on the extent to which adolescents perceive non-specific peer pressure.

A possible explanation for the association between perceived peer pressure and adolescent delinquency is the *social identity theory* (Tajfel & Turner, 1986). According to this theory, adolescents develop a social identity in their early adolescence. A social identity is a person's self-concept that is based on group membership since being a group member leads to an increased sensitivity of adolescents on how their peers view them (Grusec & Hastings, 2007; Tajfel & Turner, 1986). Within peer groups peer pressure is exerted in order to make members conform to group norms (Newman & Newman, 1976). Adolescents tend to give in to perceived peer pressure and to conform to group norms out of fear of being rejected by their peers (Dishion & Tipsord, 2011). This is in line with the *Solomon Asch paradigm* (Asch, 1956), which states that people tend to conform to group norms when they perceive pressure from group members. Thus, wanting to conform to group norms due to perceived peer pressure plays an important role in explaining adolescent delinquency (Patacchini & Zenou, 2009).

Perceived Peer Pressure as Moderator

Although there is a vast amount of empirical literature on the association between family structure and adolescent delinquency, no studies have been conducted on the moderating effect of perceived peer pressure on this or a comparable association. The suggestion that perceived peer pressure might be an important moderator on the association between family structure and adolescent delinquency can be partially explained by Hirschi's (1969) *social control theory*. As previously

mentioned, Hirschi suggests that adolescents from non-intact family structures experience a weaker parent-child bond than adolescents from an intact family structure. Adolescents who experience weakened parental bonds are more likely to commit delinquent acts when giving some kind of motivation to engage in delinquent behavior (Hirschi, 1969; Kierkus & Baer, 2002). Perceived peer pressure may be a motivational factor, since adolescence is the period in life in which youth's orientation shifts from parents to peers (Arnett & Hughes, 2012). Moreover, adolescents are most vulnerable to perceiving peer pressure during early adolescence (Steinberg & Monahan, 2007). In sum, perceived peer pressure may be able to amplify the association between family structure and adolescent delinquency.

The Present Study

In the present longitudinal study, three research questions will be examined (see Figure 1). The first research question that will be examined is whether family structure (i.e., intact-, single-parent-, reconstituted-, and neither natural parent families) is related to adolescent delinquency over time. Family structure is operationalized according to the operationalization developed by Wells and Rankin (1986). Consistent with most previous research, the *broken homes hypothesis* (Kierkus & Baer, 2002) and the *social control theory* (Hirschi, 1969), a moderate to strong association between family structure and adolescent delinquency over time is expected. Adolescents living in non-intact family structures commit significantly more delinquent behavior than adolescents living in an intact family structure. The second research question that will be examined is whether perceived peer pressure is related to adolescent delinquency. Based on prior research, the *social identity theory* (Tajfel & Turner, 1986) and the *Solomon Asch paradigm* (Asch, 1956), a positive association between perceived peer pressure and adolescent delinquency is expected. The more peer pressure adolescents perceive, the more will they engage in delinquent behavior. The third research question that will be examined is whether the association between family structure and adolescent delinquency is moderated by perceived peer pressure. Based on the *social control theory* (Hirschi, 1969), it is hypothesized that the association between family structure and adolescent delinquency is moderated by perceived peer pressure. The association between family structure and adolescent delinquency will be stronger for adolescents who perceive peer pressure compared to adolescents who do not.

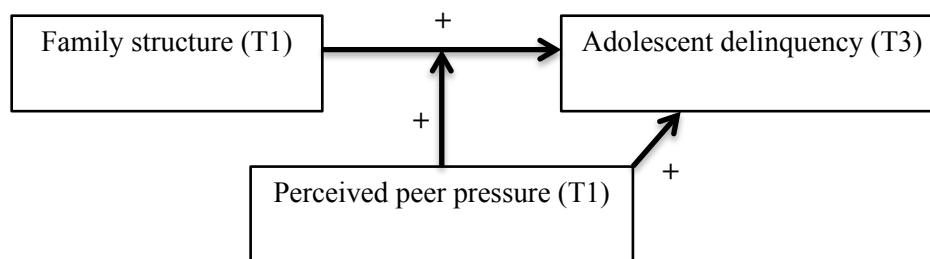


Figure 1. Theoretical model for the association between family structure, perceived peer pressure and adolescent delinquency.

Method

Research Design and Procedure

The present study used data of the SNARE (Social Network Analysis of Risk behavior in Early Adolescence) project. The SNARE-project is a longitudinal study on the social development of adolescents and their involvement in risk behavior. Two secondary schools, one in the middle and one in the northern region of the Netherlands, were approached to participate in the study in which all first and second grade students filled in (online) questionnaires. Parents received an information letter and had the opportunity to submit an enclosed reply card with which they made clear that they refused their child from participating in the study (i.e., informed passive consent). In total, 21 students and/or parents refused participation for various reasons, including not being interested, having dyslexia ($n = 13$), being chronically ill ($n = 7$) and emigration ($n = 1$).

The students participated in the study for two consecutive years, consisting of seven measurement points. The baseline measurement (T0) took place in September 2011, followed by the first measurement (T1) in October 2011, the second measurement (T2) in December 2011 and the third measurement (T3) in March 2012. The fourth, fifth and sixth measurement took place in respectively October 2012, December 2012 and April 2013. Data from waves T1 and T3 were used in the present study. Under the supervision of at least one or multiple researchers/research assistants and a teacher, the students filled out a questionnaire on a computer. Filling in the questionnaires took place during regular classes and took about 45 minutes. For conducting the questionnaire a special software program called Socio TM Software was developed, which made it possible to measure sociometric (peer-rated) questions. Students who were absent during the completion of the questionnaires were given the opportunity to complete the questionnaire within one month. Both the anonymity and privacy of the students were guaranteed by changing their names into numbers after completing the questionnaire.

Sample

A total of 1,283 students participated in the SNARE-project. After removing respondents who did not participate at both T1 and T3, 1202 students remained. The remaining sample was subjected to analysis. Respondents were between 11 and 15 years old at times of the questionnaire conducted at T1 ($M = 13.19$, $SD = 0.71$). The majority (50.9%) of the sample was female. Furthermore, 45% of the students attended lower-level education (LWOO, VMBO-B, VMBO-T) compared to 55% of the students who attended middle/high-level education (HAVO, HAVO/VWO, VWO). Most students (81.4%) were of Dutch origin, based on country of birth of the student and both parents.

Measures

Delinquency (T3). A composite scale of 18 items, containing items from different questionnaires, measured delinquency during the past month (De Haan, Overbeek, Nijhof, & Engels, 2010; Loeber & Schmaling, 1985; Moffitt & Silva, 1988). The items can be divided into violence, theft, weapon possession, vandalism and healing. For example, participants were asked: ‘How often have you stolen something from a store in the past month?’ and ‘How often have you used or threatened someone with a weapon during an argument in the past month?’. Participants had to rate their behavior on a scale from 1 to 5 (1 = 0 times; 2 = 1-3 times; 3 = 4-6 times; 4 = 7-12 times and 5 = more than 12 times). A high score implied a high rate of delinquent behavior. The Cronbach’s alpha of the scale is .98.

Family structure (T1). Family structure was measured to give insight on how the participants’ family is structured. Participants were asked to indicate with whom they live in the house they live in most of the time (e.g., *father* and/or *stepmother* and/or *sister(s)*). In the present study, family structure is recoded, consistent with the operationalization as developed by Wells and Rankin (1986), into four categories. Respondents were classified as living in: an ‘intact family’ (living with both biological parents and with or without siblings), a ‘single-parent family’ (living with just one biological parent and with or without siblings, plus the missing biological parent has not been replaced), a ‘reconstituted family’ (living with a biological parent, a step-parent and with or without siblings) and a ‘neither natural parent family’ (living with neither biological parents). The last three are considered to be non-intact family structures. Intact family structure is the reference category.

Perceived peer pressure (T1). In the present study, perceived peer pressure is defined as perceived vulnerability to pressure from a peer group. Six items from a self-developed scale measured perceived peer pressure based on items from different questionnaires (Santor et al., 2000; Steinberg & Monahan, 2007). For example, the scale contained the following item: ‘Young people sometimes do things they otherwise would not do, because their friends incited them.’ The participants were able to answer whether the item applies to them on a five-point Likert scale ranging from ‘*Definitely does not apply to me*’ to ‘*Often applies to me*’. Planned missingness was applied on this variable in order to shorten the amount of time necessary to complete the questionnaire (Palmer & Royall, 2010). Instead

of the six original questions, the scale is based on three questions that were consistently submitted to all respondents. A high score implied a high rate of perceived peer pressure. The Cronbach's alpha of the scale is .87 on T1.

Covariates (T1). Research has shown that adolescent boys and the lower educated show significantly more delinquent behavior than adolescent girls and the higher educated (Weijters, Scheepers, & Gerris, 2007). Therefore, gender and education level were included as covariates in the analysis, to control for their potential effect on adolescent delinquency. Gender was coded as a dichotomous variable (girls = 0; boys = 1) and education level was recoded as a dichotomous variable, indicating LWOO, VMBO-B, VMBO-T as 0 = 'low' and HAVO, HAVO/VWO, VWO as 1 = 'middle/high'. Furthermore, adolescent delinquency measured on T1 was also included as a covariate to control for stability in delinquent behavior over time. Delinquency on T1 was measured the same way as delinquency on T3. The Cronbach's alpha of the scale is .91.

Data Analysis

Data analyses were conducted using SPSS Statistics version 20. Respondents who did not participate at both waves T1 and T3 ($n = 81$) were removed from the dataset. The remaining dataset ($N = 1,202$) was checked for outliers. No data was found to be implausible nor did it contain outliers or extreme values. In total, 3.8% of the values were missing. As a result, these missing's in the dataset were imputed using the *expectation maximization algorithm* (Dempster, Laird, & Rubin, 1977), which yielded a total sample size of 1,202 respondents. Initially, family structure consisted of four categories: intact-, single-parent-, reconstituted-, and neither natural parent families. However, the fourth category (neither natural parent family) contained too few respondents ($n = 35$) to be used in further analyses and therefore was not included in the analyses (Field, 2013). The remaining three categories (intact-, single-parent-, and reconstituted family structure) were used in further analyses. Therefore, the following analyses were based on $N = 1,167$ respondents. Categories single-parent- and reconstituted family structures were recoded into two dummy variables (intact-family structure is the reference category). Descriptive statistics (means, percentages and standard deviations) were obtained and analyzed regarding family structure (predictor), perceived peer pressure (predictor and moderator) and adolescent delinquency (dependent variable). To examine the association between family structure (two dummy variables), adolescent delinquency and perceived peer pressure (continuous variables) point-biserial correlation coefficients were obtained for family structure (both dummy variables were jointly entered into the matrix), since these coefficients quantify the relationship between a continuous variable and a dichotomous variable (Field, 2013). Subsequently, Pearson correlation coefficients were obtained to examine the association between the other (continuous) variables. Assumptions of linear regression analysis, linearity and homoscedasticity, were met. However, a normal distribution of residuals was lacking. Nevertheless, according to the central limit theorem it can be assumed that residuals are normally distributed within a large sample-size (Field,

2013), which was the case in the present study. Subsequently, a multivariate linear regression analysis was conducted to examine the association between the independent and the dependent variables, while controlling for covariates (adolescent delinquency at T1, gender and education level). Regarding the interaction term, the continuous variable perceived peer pressure was centered in order to avoid multicollinearity. Firstly, a model containing covariates, main effects and two interaction terms (one for each family structure dummy variable*perceived peer pressure) was analyzed, in order to investigate whether the association between family structure and adolescent delinquency differs between adolescents who perceive peer pressure and adolescents who do not. Secondly, depending on whether the interaction terms were significant, main- and covariate results were interpreted from the model without interaction terms. Effect sizes up to .30, .50 and .80 were considered to be respectively weak, moderate and strong (Cohen, 1988). Results were found to be significant at $p < .05$.

Results

Descriptive Statistics

For the total sample of 1,167 respondents, means and standard deviations were calculated for variables adolescent delinquency and perceived peer pressure. On a scale from 1 to 5, analysis results on adolescent delinquency showed low mean scores at T1 and T3, indicating that respondents reported committing little to no delinquent behavior during the past month ($M = 1.06$, $SD = 0.18$ at T1 and $M = 1.12$, $SD = 0.48$ at T3). Nevertheless, the increase in adolescent delinquency between T1 and T3 was shown to be significant, $t(1166) = -4.54$, $p < .001$. Furthermore, mean scores on perceived peer pressure at T1 indicated that, on a scale from 1 to 5, respondents reported perceiving (absolutely) no peer pressure ($M = 1.51$, $SD = 0.67$). Subsequently, frequency analysis on the variable family structure showed that 80.4% of respondents reported living with both biological parents (intact family), 12.7% reported living solely with either their biological mother or biological father (single-parent family) and 6.9% reported living with their biological mother or biological father along with their stepmother or stepfather (reconstituted family) at T1.

Correlations between adolescent delinquency, perceived peer pressure and family structure are presented in Table 1. The following correlations are most important for answering this study's research question. Delinquency at T1 is significantly positively correlated to delinquency at T3, meaning that high rates of adolescent delinquency at T1 is related to high rates of adolescent delinquency at T3. Similarly, a significant positive correlation was found between perceived peer pressure at T1 and adolescent delinquency at T3. Adolescents who perceive more peer pressure at T1 show more delinquent behavior at T3. Furthermore, no significant correlation was found between family structure at T1 and adolescent delinquency at T3 ($p = .783$ for dummy single-parent family; $p = .532$ for dummy reconstituted family). However, it should be noted that although most of the aforementioned correlations are significant, they are considered to be weak since coefficients fluctuate between .06 and .20 (Field, 2013).

Table 1

Summary of Intercorrelations for Delinquency, Perceived Peer Pressure and Family Structure

Measure	1	2	3	4	5
1. Delinquency (T1)	–				
2. Delinquency (T3)	.20**	–			
3. Perceived peer pressure (T1)	.12**	.06*	–		
4. Single-parent family ^a (T1) (reference = intact family)	.07*	-.01	.02	–	
5. Reconstituted family ^a (T1) (reference = intact family)	-.01	-.02	.00	–	–

Note. $N = 1,167$.

^aPoint-biserial correlation coefficient since family structure consists of dichotomized variables.

* $p < .05$. ** $p < .01$.

The Multivariate Effects of Family Structure and Perceived Peer Pressure

A model containing covariates (delinquency at T1, gender and education level), main effects and two interaction terms (one for each family structure dummy variable*perceived peer pressure) was analyzed using a multivariate linear regression analysis. No two-way interaction effects were found for the two interaction terms ($\beta = .01, p = .840$ for dummy single-parent family*perceived peer pressure; $\beta = -.01, p = .794$ for dummy reconstituted family*perceived peer pressure), meaning that perceived peer pressure (T1) has no moderating effect on the association between family structure (T1) and adolescent delinquency (T3). Given the aforementioned, the interaction terms were excluded from the model. The model containing merely main- and covariate results was interpreted and depicted in Table 2.

Table 2

Multivariate Linear Regression Analysis Predicting Adolescent Delinquency From Family Structure and Perceived Peer Pressure, Controlled for Covariates Delinquency T1, Gender and Education Level

Predictor	<i>B</i>	<i>SE</i>	β
Delinquency T1	.50	.08	.18***
Gender (reference = girls)	.09	.03	.09**
Education level T1 (reference = lower educated)	-.02	.03	-.02
Single-parent family T1 (reference = intact family)	-.04	.04	-.03
Reconstituted family T1 (reference = intact family)	-.03	.06	-.02
Perceived peer pressure T1	.02	.02	.03

Note. $N = 1,167$. $R^2 = .05$.

** $p < .01$. *** $p < .001$.

No significant main effect was found of family structure (T1) on adolescent delinquency (T3) ($p = .349$ for dummy single-parent family; $p = .537$ for dummy reconstituted family), meaning that family structure does not predict adolescent delinquency over time. Furthermore, in comparison to the aforementioned correlations, perceived peer pressure (T1) is no longer significantly related to adolescent delinquency (T3) after controlling for covariates ($p = .267$). Thus, adolescents who perceive peer pressure are not more likely to engage in delinquent behavior than adolescents who do not perceive peer pressure. In contrast to the absence of main effects, the results did show some effects of the covariates. Adolescent delinquency at T1 seemed to be a significant positive predictor for adolescent delinquency at T3. Hence, although the effect is weak, the occurrence of adolescent delinquency at T1 predicts higher rates of adolescent delinquency at T3. Similarly, gender (T1) appeared to be significantly, yet weakly, positively related to adolescent delinquency (T3). Adolescent boys show more delinquent behavior than adolescent girls. The remaining covariate education level was not significantly related to adolescent delinquency ($p = .598$).

Additional Analyses

Several previous studies on family structure and adolescent delinquency operationalized family structure as a dichotomous variable (intact vs. non-intact) and did show significant findings. Therefore, additional analyses were conducted to determine whether results between family structure and adolescent delinquency differ when family structure is operationalized as a dichotomous variable¹, instead of a categorical operationalization as used in the original analyses of the present study.

To assess the size and direction of the association between family structure and adolescent delinquency, correlation coefficients² were obtained. As with original results of the present study, no significant correlation was found between family structure at T1 and adolescent delinquency at T3 ($r_{pb} = -.02$, $p = .432$). Furthermore, according to the multivariate linear regression analysis, and in accordance with this study's original multivariate linear regression results, no two-way interaction effect was found ($\beta = -.01$, $p = .916$). This means that perceived peer pressure (T1) has no moderating effect on the association between family structure (T1) and adolescent delinquency (T3). Given the aforementioned, the interaction term was excluded from the model. Hence, main effects were interpreted and depicted in Table 3. Identical to the original analysis, no significant main effect was found of family structure (T1) on adolescent delinquency (T3) ($p = .196$), meaning that family structure does not predict adolescent delinquency over time. In sum, results from the additional

¹ Family structure was recoded into a dichotomous variable (intact family vs. non-intact family). The category 'intact family' remained the same (= intact family). Categories 'single-parent family', 'reconstituted family' and the originally excluded category 'neither natural parent family' were taken together (= non-intact family). Intact family was indicated as reference category (in total, $N = 1,202$).

² Point-biserial correlation coefficients were obtained for family structure since family structure is a dichotomous variable.

analyses indicate that operationalizing family structure as a dichotomous variable does not lead to different outcomes as compared to a categorical operationalization.

Table 3

Multivariate Linear Regression Analysis Predicting Adolescent Delinquency From Family Structure and Perceived Peer Pressure, Controlled for Covariates Delinquency T1, Gender and Education Level

Predictor	<i>B</i>	<i>SE</i>	β
Delinquency T1	.34	.07	.15***
Gender (reference = girls)	.09	.03	.09**
Education level T1 (reference = lower educated)	-.02	.03	-.02
Family structure (T1) (reference = intact family)	-.04	.03	-.04
Perceived peer pressure (T1)	.03	.02	.04

Note. $N = 1,202$. $R^2 = .04$.

** $p < .01$. *** $p < .001$.

Discussion

The aim of the present study was to examine the longitudinal association between family structure and adolescent delinquency, and to test whether this association was moderated by perceived peer pressure. Findings indicated that family structure is not related to adolescent delinquency over time. Furthermore, no interaction effects were found, meaning that perceived peer pressure has no moderating effect on the association between family structure and adolescent delinquency.

Family Structure and Adolescent Delinquency

As already stated, no significant effect of family structure was found for adolescent delinquency. Thus, coming from a non-intact family structure has little to no impact on showing delinquent behavior. This finding is in contrast to this study's hypothesis, the *social control theory* (Hirschi, 1969), the *broken homes hypothesis* (Kierkus & Baer, 2002) and the few existing longitudinal studies, which showed that adolescents from non-intact family structures are significantly more likely to engage in delinquent behavior than adolescents from an intact family structure (Demuth & Brown, 2004; Juby & Farrington, 2001; Rebellon, 2002). Differences between the current study and prior research might be caused by disparities in the operationalization of family structure as these previous longitudinal studies operationalized family structure as a dichotomous variable. In contrast to previous studies, the present study operationalized family structure into three categories (intact- single-parent- and reconstituted families) to look for differences between several family structures and adolescent delinquency. Operationalizing family structure as a dichotomous variable allows for greater power than using a categorical operationalization (Field, 2013). Although

differences in operationalization might explain contrasting findings, additional analyses conducted by the present study, in which family structure was recoded into a dichotomous variable, also failed to find a significant association between family structure and adolescent delinquency.

A second explanation for the contradicting findings is the time frame used to measure adolescent delinquency. In the few existing longitudinal studies (Demuth & Brown, 2004; Juby & Farrington, 2001; Rebellon, 2002) respondents were asked to estimate how often they engaged in delinquent behavior during the year prior to each wave of data collection. However, the present study measured delinquency during the past month prior to each wave of data collection. The use of a shorter time frame, especially in early adolescence in which the prevalence of delinquency is low (Moffitt, 1993), may be the reason for reporting lower levels of delinquency and therefore the absence of significant effects of family structure on adolescent delinquency in the current study. An adjoining statement is that the non-significant findings may also be explained by the relatively low age of participants in the current sample (ages 11 to 15). Most of the aforementioned longitudinal studies that did find significant results also included older participants (ages 11 to 18) (Demuth & Brown, 2004; Rebellon, 2002). Previous longitudinal research argued that parental separation might have different effects on delinquency at different developmental trajectories (Rebellon, 2002). Therefore, future research should investigate a wider age range by following participants from their childhood through early, middle and late adolescence in order to acquire a more detailed life-course analysis to examine whether findings differ between adolescent life stages.

Perceived Peer Pressure and Adolescent delinquency

In contrast to expectations, the *social identity theory* (Tajfel & Turner, 1986) and the *Solomon Asch paradigm* (Asch, 1956), findings of the present study showed that perceived peer pressure was not significantly related to adolescent delinquency. Thus, adolescents who perceived more peer pressure were not more likely to engage in delinquent behavior than adolescents who did not perceived peer pressure. These findings are in contrast with the significant results found by Sullivan (2006), who conducted the single existing longitudinal study as far as known. A possible explanation for the different findings may be found in controlling for previous delinquency. The present study controlled for delinquent behavior measured on a preceding wave during the multivariate linear regression analysis, whereas Sullivan (2006) did not control for previous delinquency. Without controlling for delinquent behavior measured on a preceding wave, the current multivariate linear regression analysis showed, in line with the findings by Sullivan (2006), a significant association between perceived peer pressure and adolescent delinquency over time. The present study complements the few cross-sectional and longitudinal studies that have examined this association, since it is the first to control for preceding delinquent behavior as far as known. Controlling for preceding delinquency is of importance to control for stability in delinquent behavior over time.

Finally, inconsistent findings between Sullivan's (2006) study and the present study may be caused by differences in the ways in which perceived peer pressure was measured. Sullivan (2006) measured perceived peer pressure that focused specifically on deviant behavior (e.g., 'Feel pressure to commit crime'). However, the present study measured perceived peer pressure that was not focused on specific behaviors (e.g., 'Some young people *do things* they otherwise would not do, because they are encouraged by their peers'). It is possible that participants in the current study reported not to perceive peer pressure because they were less able to link the general questions to specific situations in which they perceived peer pressure. Maybe the effect is only found for peer pressure that directly addresses delinquent behavior, which suggests that questions in the current study were too general to measure peer pressure, which may have caused the non-significant findings.

In contrast to most previous research that almost exclusively focused on the negative impact of peer pressure on risk behaviors, it can be argued that peer pressure can also be positive. For example, it is shown that peer pressure in early adolescence is more focused on discouraging rather than encouraging participation in delinquent behavior, thereby potentially preventing or reducing delinquency (Brown et al., 1986). Thus, investigating the positive aspects of peer pressure may be interesting for future research.

Perceived Peer Pressure as Moderator

In contrast to expectations, no significant moderating effect of perceived peer pressure on the longitudinal association between family structure and adolescent delinquency was found. Hence, adding perceived peer pressure as a moderator does not influence the non-significant association between family structure and adolescent delinquency. Since the present study is the first to investigate the interaction effect of family structure and perceived peer pressure, no comparisons can be made with previous studies. Despite the non-significant interaction effect, this is still a meaningful finding regarding the *social control theory* (Hirschi, 1969), which suggests that adolescents with a weakened parent-child bond are more likely to engage in delinquent behavior when given some kind of motivation. Current findings suggest that perceiving peer pressure is not a motivational factor for adolescents who experience a weakened parent-child bond to engage in adolescent delinquency.

Although perceived peer pressure has no moderating effect, it may be that the association between family structure and adolescents delinquency is mediated by perceived peer pressure. A previous cross-sectional study by Steinberg (1987) showed that adolescents from intact families appear to be less susceptible to peer pressure to engage in delinquent behavior than adolescents from non-intact families. A possible explanation is that adolescents from non-intact family structures may perceive lower levels of parental monitoring than adolescents from an intact family structure due to parental separation (Matsueda & Heimer, 1987). A prior cross-sectional study showed that adolescents who perceive low levels of parental monitoring tend to be more oriented towards peers than adolescents who perceive high levels of parental monitoring. Furthermore, these adolescents are

more likely to do whatever it takes to maintain peer-relationships (Fuligni & Eccles, 1993), which suggests that these adolescents are more susceptible to peer pressure to engage in certain behaviors (Matsueda & Heimer, 1987). Whether or not the association between family structure and adolescent delinquency is indeed mediated by perceived peer pressure would be an interesting question for future research.

Strengths and Limitations

The present study has several strengths. In the first place, the longitudinal design of the study offers the possibility to establish an association between two variables over a period of time. In the second place, the present study is the first to investigate the interaction between family structure and adolescent delinquency. Lastly, family structure was operationalized into three categories, instead of the more customary dichotomous (intact vs. non-intact) operationalization. Therefore, this study provides information about the association between the most common family structures and adolescent delinquency over time. Nonetheless, some limitations of this study should be addressed.

First, adolescent delinquency was measured using self-reports. The use of self-reports may lead to socially desirable answers and therefore underreporting of delinquent behavior, which in turn may lead to validity problems. Nonetheless, most previous research that examined adolescent delinquency also exclusively used self-reports to gain insight on adolescents' delinquent behavior (e.g., Demuth & Brown, 2004; Rebellon, 2002; Kierkus & Baer, 2002). Since the use of self-reports can be seen as a solid tool to measure adolescents' social behavior (Levine, 2013), it makes it exceptional to reason that it has influenced the current findings. To further extend the current findings, adolescent self-reports should be combined with parent- and teacher reports.

Second, the representativeness of the sample used in the present study is limited by the fact that it only contains students in their early adolescence, from two secondary schools in two specific regions of the Netherlands. Therefore, even though it was not an objective of the present study, current findings may not be generalizable to all Dutch adolescents (apart from early adolescents), for example adolescents in their middle or late adolescence or adolescents living in other regions of the Netherlands. A study by Wilkinson (1980) has shown that there may be essential regional disparities in the influence of family structure on adolescent delinquency. Subsequently, family structure initially consisted of four categories (intact-, single-parent-, reconstituted- and neither naturel parent families). However, the fourth category (neither naturel parent family) was not included in the analyses due to insufficient power. Given that it was not possible to investigate the excluded group, no generalizing statements can be made to the entire population about this type of family structure. The other three categories in the study population deviate slightly from the actual population (CBS, 2012), therefore generalizing statements need to be made cautiously.

Conclusion and Implications

In conclusion, the present study shows that family structure and perceived peer pressure are not related to adolescent delinquency over time. Moreover, adding perceived peer pressure as a moderator does not influence the non-significant association between family structure and adolescent delinquency. Current results complement the few existing longitudinal studies examining the association between family structure and adolescent delinquency, since it is the first study to include results based on both a dichotomous as a categorical operationalization of family structure as far as known. Based on these results, implications should be considered. The question arises whether family structure truly is such an important aspect in explaining adolescent delinquency. The present findings urge a reconsideration of the role of family structure in adolescent delinquency and recommend a more cautious approach concerning non-intact family structures as a causal factor of adolescent delinquency. Since no differences between family structures and adolescent delinquency were found within the present study, current findings seem to suggest that interventions specifically targeting certain family structures are not required.

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