J Child Fam Stud (2017) 26:3452–3463
DOI 10.1007/s10826-017-0851-0

ORIGINAL PAPER

Effect of Child Gender on the Bidirectional Relationships between Parental Monitoring and Delinquent Behavior

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Published online: 22 August 2017

Abstract This study examined the effect of child gender on the bidirectional relationships between perceived parental monitoring and self-reported delinquent behaviors from childhood to adolescence, using data from the Korean Youth Panel Study. In this longitudinal study, different age cohorts for childhood (ages 9–12; $N = 2283$) and adolescence (ages 13–16; $N = 2722$) were analyzed. The findings from cross-lagged path analyses showed that the parent–child relationships differed for boys and girls. For girls, delinquency had a stronger effect on parental monitoring in childhood, whereas parental monitoring had a stronger effect on delinquency in the childhood–adolescence transition and adolescence. Boy's delinquency similarly had a stronger effect in childhood. Parental monitoring, however, did not affect boy's delinquency at any age. This study highlights the importance of considering gender when developing interventions to support families with delinquent children and adolescents.

Keywords Gender difference · Delinquent behavior · Parental monitoring · Bidirectional relationship

Introduction

A developmental perspective on delinquent behavior has suggested that poor parental monitoring and delinquent behavior may influence each other. But empirical studies have yielded inconsistent findings on this bidirectional relationship. Some studies reported reciprocal influences (Laired et al. 2003; Pardini et al. 2008; Willoughby and Hamza 2011), but others found a unidirectional effect (Fite et al. 2006; Gault-Sherman 2012; Kerr and Stattin 2003). Many theorists and researchers have suggested that this inconsistency may be due to differences in child gender, because parental monitoring and delinquent behavior may vary by child gender (Miller et al. 2009; Petti and Arsiwalla 2008; Racz and McMahon 2011).

Surprisingly, there has been limited examination of the role of gender in the bidirectional relationship between parental monitoring and child delinquency. Most studies have considered child gender as a covariate in their analyses (Gault-Sherman 2012; Kandel and Wu 1995; Willoughby and Hamza 2011), not as a moderating factor. Many studies did not even include girls in their analyses (Burke et al. 2008; Fite et al. 2006; Pardini et al. 2008; Vuchnich et al. 1992). This is a serious oversight because girls have become increasingly involved in juvenile delinquency in the last two decades. For instance, girls' arrest rate has increased noticeably from 22% up to 30% between 1990 and 2009 in the USA, whereas the overall rate of juvenile arrest slightly decreased during this period (Chesney-Lind and Shelden 2014; Miller et al. 2009; Snyder 2008, 2011). Likewise, girls' arrest rate for violence has jumped from 4% up to 20% between 1990 and 2010 in South Korea (Kim 2007; Lee et al. 2016). In addition, theories on development suggest there may be a shift in the parent–child relationship during child development (Scarr and McCartney 1983;

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Shaw and Bell 1993), although few empirical study has examined these shifts in boys and girls. Clearly, there is a need for a longitudinal study to assess gender differences in the bidirectional relationship that considers major developmental transitions.

Parental monitoring has been identified as one of the most important factors affecting child delinquency. Early theories on delinquency, such as social control theory, posited that parental monitoring is one of the key controlling factors that restrain children and adolescents from committing delinquent or antisocial acts (Gottfredson and Hischi 1990; Hirschi 1969). In this theory, children who are consistently monitored by their parents are less likely to engage in delinquent behaviors, because they know that a parent knows where they are and who they are with, even when the parent is not there. The theory assumes a unidirectional relationship; that is, parental monitoring influences children's later delinquent behavior but it is not affected by the children's prior delinquent acts. Although empirical studies strongly support this theory (Barnes et al. 2006; Griffin et al. 2000), such theoretical and empirical studies have had several critical shortcomings. In particular, they failed to consider a bidirectional influence between parental monitoring and child delinquency. These studies also tended to ignore changes during development, by assuming that the link of parental monitoring with delinquency is static during development.

In contrast to the traditional view that poor parenting can cause delinquent behaviors in children, developmental perspective on delinquent behavior in recent decades has proposed that parental behavior and child behavior can influence each other. Belsky's (1984) ecological model of parenting suggests that children's characteristics—especially behavior styles—impact the quality of parenting they receive. Patterson's coercion model provides a theoretical framework for understanding the reciprocal influence between parenting and child behavior (Patterson 1982; Patterson et al. 1992). According to this theory, a child's deviant and delinquent behavior often elicits poor parenting (e.g., harsh parenting), which inadvertently could increase delinquent behavior as the delinquent child may more actively resist parental control. As the parent–child conflict intensifies during this negative reciprocal interaction, parents tend to reduce or withdraw their monitoring efforts to avoid further conflict, which as a result may lead to even more delinquent behaviors. This theory assume that children actively impact parents during parent–child interactions just as much as they are influenced by their parents (Pardini et al. 2008). Despite the theoretical appeal of this model, empirical evidence for this bidirectional relationship has been inconsistent. Some studies reported a bidirectional influence between parental monitoring and child delinquency (Laired et al. 2003; Pardini et al. 2008; Willoughby and Hamza 2011; Yoo 2017), whereas other studies found only unidirectional effects of child delinquency on parental monitoring (Fite et al. 2006; Gault-Sherman 2012; Kerr and Stattin 2003; Wertz et al. 2016). Many theorists and researchers pointed out that this inconsistency might be due to the influence of factors such as child gender (Hoeve et al. 2009; Petti and Arsiwalla 2008; Racz and McMahon 2011), but there has been little examination of the effect of gender on this bidirectional parent–child relationship.

Child gender is one of the strongest correlates of delinquency in that boys are more likely to engage in delinquent behaviors than girls (Heimer 1996; Liu and Kaplan 1999; Svensson 2003). Social control theory suggests that the gender difference in delinquency may be attributable to differences in parental monitoring and supervision for boys and girls (Hirschi 1969; Gottfredson and Hischi 1990). Learning-based theory, such as gender role socialization, explains why parents exert different levels of monitoring for boys and girls. According to this theory, girls may be socialized to have more traditionally feminine characteristics (empathy, caution, submissiveness), whereas boys may be socialized to have more traditionally masculine characteristics (competitiveness, daring, strength) (Heimer 1996; Rebellon et al. 2016). In response to this gender role expectation, parents may treat girls and boys differently; that is, parents may have greater general concerns for girls, may more closely monitor girls, and may impose more restrictions on girls (Fagan et al. 2011; Heimer 1996; Pomerantz and Ruble 1998). This theory argues that the greater parental control of girls may be a key factor in their reduced delinquency. However, the empirical evidence is ambiguous. Some studies found that, despite differences in the mean-level of parental monitoring of boys and girls, parental monitoring had a similar effect on delinquency in both genders (Farrell et al. 2000; Martens 1997). Other studies found that parental monitoring had a stronger effect on girls (Bowman et al. 2007; Fagan et al. 2011; Svensson 2003). Although the evidence is equivocal and limited to the unidirectional influence of parental monitoring on delinquency, these prior studies suggest that a child's gender may affect the nature of the parent–child relationship, and thereby affect the probability of delinquency.

Previous researchers have only rarely performed empirical tests of the effect of child gender on the bidirectional relationship between parental monitoring and delinquency. Many studies have only included boys, and have largely ignored girls (Burke et al. 2008; Fite et al. 2006; Pardini et al. 2008; Vuchnich et al. 1992). This is surprising because many theorists and researchers in the past decade have called for the empirical examination of gender dynamics in greater detail (Miller et al. 2009; Petti and Arsiwalla 2008; Racz and McMahon 2011). A few studies

used gender-balanced samples, but only included gender as a covariate in their analyses (Gault-Sherman 2012; Kandel and Wu 1995; Wertz et al. 2016; Willoughby and Hamza 2011). Only one study has tested the moderating role of child gender in the bidirectional relationship (Laired et al. 2003). Laired et al. (2003) in their study of adolescents (ages 14–17) found significant gender difference; parental monitoring had a similar effect on delinquency in girls and boys, but delinquency by boys had a stronger effect on parental monitoring. But, their study focused only on adolescents (high school students), and may therefore underestimate potential gender differences, given that parental monitoring behaviors and delinquent behaviors change as boys and girls develop (Sampson and Laub 1993; Shaw and Bell 1993). Thus, more research is needed to investigate the effect of child gender on this bidirectional relationship during different periods of child development.

Developmental theory suggests that the parent–child relationship may change as the child develops. Genetically-based theories suggest that parental effects decrease and child effects increase as children enter adolescence and begin to assert their autonomy (Scarr and McCartney 1983). However, other theories suggest that parental effects continue to be important during adolescence, because children face new challenges in broad social domains (e.g., changes in school, peers, or social roles) and undergo neurobehavioral changes during puberty (Haynie 2003; Shaw and Bell 1993). In addition, some studies suggest that parental effects can be important in adolescence, particularly for girls, because simultaneous puberty and social changes are more stressful for girls, and this may elicit stronger responses from parents (Haynie 2003; Pomerantz and Ruble 1998). Pomerantz and Ruble (1998) showed that parents may exert greater behavioral control and grant less autonomy to girls as they enter puberty. Conversely, parents may grant greater autonomy to boys during puberty, because they view boys' changing behaviors as normative during this period. These different parental approaches towards boys and girls may increase the possibility of gender differences in the bidirectional relationship. However, no empirical studies have examined the effect of child gender on the bidirectional parent–child relationship during different periods of development. Gender-specific analyses across different developmental periods are needed to more fully understand the nature of bidirectional relationship.

The present study examines the role of child gender on the bidirectional relationship between parental monitoring and delinquency from childhood to adolescence, using a large, longitudinal sample of Korean youths in different age cohorts. More specifically, this study analyzed boys and girls in childhood (ages 9– 12) and adolescence (ages 13–16) to investigate the role of gender in the bidirectional parent–child relationship over time.

Method

Participants

The current study used data from the Korean Youth Panel Study (KYPS), a nationally representative, school-based longitudinal study of youths in different age cohorts that began in 2003. The subjects were children in fourth-grade of elementary school (age 9) and adolescents in the second grade of middle school (age 13). The KYPS was supported by the National Youth Policy Institute of South Korea, and considered as one of the most comprehensive national dataset on youth's delinquent behavior in South Korea (Lee and Randolph 2015; Cho 2017; Yun et al. 2016). The panel study was primarily designed to provide a wide range of information on the conditions of everyday life for Korean children and youths, such as career paths, cultural activities, use of mass media, the parent–child relationship, and problematic behaviors. To generate a nationally representative sample of two age cohorts, a stratified multi-stage cluster sampling approach was used (Kim and Kim 2009; Lee et al 2007). First, districts were selected using a stratified random sampling procedure (15 regions for childhood cohort and 12 regions for adolescence cohort). Then, schools were randomly selected from each district using proportionate probability sampling (84 elementary schools and 104 middle schools). Lastly, one class was randomly selected from each school and all students from the chosen class participated in the survey. The eligible samples contain 2884 fourth graders of elementary school and 3449 second graders of middle school.

Procedure

The initial interviews with children and adolescents were conducted in school by well-trained interviewers individually, and follow-up face-to-face interviews were conducted in places chosen by the respondents every year. Interviewers was trained on procedures of data collection, panel survey, structure of questionnaire, interview techniques and ethical issues. Written informed consent was obtained from all participants and their parents, but the survey was not reviewed by any ethics board at the time. Participants were informed that confidentiality would be kept at all stages of the study. The interviews lasted on average 50 min. Children and adolescents filled out the survey and provided a broad range of information on their lives, including their delinquent behaviors and parent–child relationship. They were compensated with a gift for participation. For parents, a telephone survey was conducted to gain only additional information relevant to socio-economic background such as family structure, parental education, parental employment, income, etc.

The childhood cohort study (ages 9–12) began in 2004 with a baseline sample of 2884 children. Follow-up face-to-face interviews were conducted every year for 5 years from 2004 to 2008. The first four surveys were used in this study (ages 9–12). Response rates in the four waves were high: 2707 children participated in wave 2 (95.2%), 2672 in wave 3 (94.0%), and 2511 in wave 4 (88.3%). The study's analytic sample was limited to children and their parents in which there were valid responses to the main variables from these interviews. Among 2884 eligible cases, 2357 children and their parents provided all requested data in all 4 years. Seventy-four cases were excluded due to incomplete information on one or more variables, so the final sample consisted of 2283 children. About 52% of the children in the final sample were boys and most children (96%) lived with both parents. About 7% of the mothers did not have a high school education, 62% had a high school diploma, and 31% had education beyond high school.

The adolescence cohort study (ages 13–16) began in 2003 with a baseline sample of 3449 adolescents. Follow-up face-to-face surveys were conducted for 6 years (from 2003 to 2008). The first four surveys were used in this study (ages 13–16). Response rates were laudable across the four waves; 3188 youth participated in wave 2 (92.4%), 3125 in wave 3 (90.6%), and 3121 in wave 4 (86.0%). A total of 2829 adolescents and their parents provided all requested data in all 4 years. One hundred and seven cases were excluded due to incomplete information on one or more variables, so the final sample consisted of 2722 adolescents. About half of the adolescents in the final sample were boys, and almost all children in the final sample lived with both parents (94%). About 17% of mothers did not have a high school education, 59% had a high school diploma, and 23% had education beyond high school.

For both childhood and adolescence samples, baseline characteristics of the final sample and the excluded cases were compared to determine the influence of dropped cases on the findings. The dropped cases were less likely to have mothers who have a high-school diploma, and more likely to have mothers who have education beyond high school. There were no significant differences in all other variables, including child gender and family structure. Based on this comparison, the final sample appears to differ from the dropped cases in only one limited respects (that is, mother's education), and the variable are controlled for in analyses.

Measures

Delinquent behaviors

Delinquent behavior was measured using a self-report Delinquent Behavior Checklist, which was generated by National Youth Policy Institute of South Korea to assess a wide range of juvenile delinquency. Children and adolescents were asked to report if they were ever involved in delinquent behavior during the previous year. For the childhood sample, items included relatively minor deviance such as jaywalking, acting out against a teacher, cheating on a school test, and spending money to buy school supplies for another purpose, to more serious deviance such as being truant, running away from home, leaving other students out in the cold, ridiculing other students, intimidating other students, drinking alcohol, smoking cigarettes, hitting other people, taking money or something from other people, and stealing money or something from other people.

The types of delinquent behaviors may change as a child moves from childhood to adolescence. Given that more serious forms of delinquency tend to emerge in adolescence, the National Youth Policy Institute of Korea formulated a somewhat different behavior set to measure delinquency in adolescence; Items excluded some minor acts such as jaywalking, and included several more serious acts such as engaging in sexual assault. For adolescents, items used to assess delinquency were: being truant, running away from home, leaving other students out in the cold, ridiculing other students, intimidating other students, drinking alcohol, smoking cigarettes, hitting other students or other people, fighting in groups, taking some money or something from other people, stealing some money or something from other people, dating for compensation, engaging in sexual relationships, and engaging in sexual assault or sexual harassment. This study included the item "engaging in sexual relationships" as one of the delinquent behaviors, because it is considered a serious misdeed during adolescence in South Korea, even though this is not risky (Yoon 2008; Lee and Lee 2011).

Children and adolescents were asked to rate their delinquent acts during the previous year by answering yes (1) or no (0) to each specific question. All responses were summed, so that a higher score indicates more delinquency. The rates of delinquency had positively skewed distributions, and thus, the data was log-transformed to normalize the skewed distribution.

Parental monitoring

Parental monitoring was measured by children's perceptions of the amount of parental knowledge gained about their whereabouts, activities, and friendships. Children and adolescents were asked to rate the extent to which parents were knowledgeable about their whereabouts, activities, and friendships during previous year. Four specific items were used to assess parental monitoring: (a) "When I am away from home, my parents know where I am." (b) "In my free time away from home, my parents know who I am with." (c) "When I am away from home, my parents know what I am

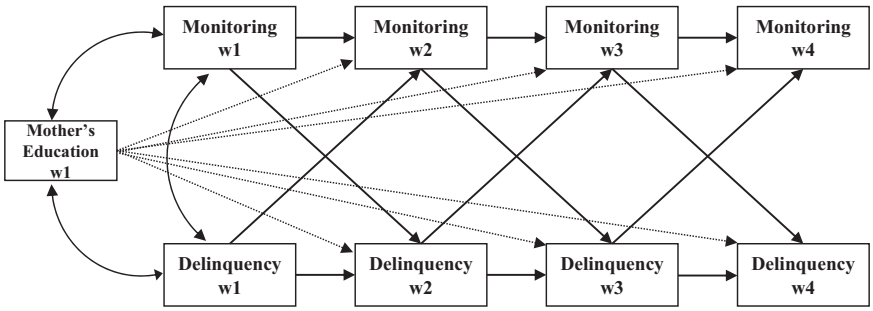

Fig. 1 The theorized cross-lagged path model

doing." and (d) "When I am away from home, my parents know when I will be back." Each response was scored on a 5-point scale (1: strongly disagree, 5: strongly agree) and all responses were summed, so that a higher score indicated more parental monitoring. For both childhood (mean $\alpha = 0.84$) and adolescence samples (mean $\alpha = 0.87$), the mean alpha for the parental monitoring scale was high in all 4 years. The distribution of parental monitoring was slightly skewed, and thus the data were log-transformed to follow the normal distribution.

Controls

This study controlled for mother's education, because previous studies showed this factor was associated with parental monitoring and delinquency (Gault-Sherman 2012; Petti and Arsiwalla 2008). The mother's education at baseline was analyzed as a continuous variable on an 8-point scale (1: uneducated, 8: more than a Master's degree).

Data Analyses

Descriptive statistics of the childhood and adolescence samples was first conducted using Stata 13.0. Means and standard deviations for each variables were examined at each time points, with comparison of boys and girls. All differences were determined by an *F*-test.

Next, cross-lagged path models were formulated for the two age samples to test whether the bidirectional relationship between parental monitoring and delinquency was different for boys and girls, and to compare potential gender differences in childhood and adolescence. Cross-lagged path models are widely used to assess causal relationships between two variables with multiple sets of data. Figure 1 shows the theorized cross-lagged path model in this study. The initial correlation between parental monitoring and child delinquency at baseline was estimated. The auto-regressive paths between the same variable and cross-lagged paths between the two different variables were formulated across the four sets of data. The residual correlations between each time point were added as model fit was significantly improved. The model also controlled for the effect of the mother's education at baseline on both parental monitoring and delinquent behavior across waves.

Repeated cross-lagged analysis relies on an assumption of invariance which requires that the causal structure of each variable does not change over time. The equality of causal process was tested by constraining the two sets of auto-regressive regression coefficients and both sets of cross-lagged coefficients to be equal across waves and then comparing the constrained and unconstrained models. The test of equality was performed separately for boys and girls in childhood, and for boys and girls in adolescence. For all four models, constraining the autoregressive paths of parental monitoring to be equal across waves resulted in a significant difference in chi-square statistics. However, constraining the autoregressive paths of delinquency and constraining the two sets of cross-lag paths, to be the same across waves did not result in a significant change in the model fit. Accordingly, in the final models of the four groups, stabilities of parental monitoring were free to vary across waves, but stabilities of delinquency and the two sets of cross-lag paths were constrained to be equal across the four waves. As shown in Table 1, the final models showed an acceptable fit to the data.

Finally, multiple-group analyses were conducted to assess whether there were gender differences in the bidirectional parent–child relationship within the final models. The multiple-group analyses were performed separately for childhood and adolescence samples. The cross-lagged path analyses were conducted within a structural equation modeling (SEM) framework, using maximum likelihood estimation in AMOS (ver. 18.0). To evaluate the model fit, the chi-square test was used, which indicates good fit if it is small and insignificant. Other model fit indices were also employed: (a) the root mean square error of approximation (RMSEA), which indicates a good fit if it is less than 0.08;

Table 1 Goodness of fit indices for the cross-lagged path models

Model		χ^2	*df*	CFI	TLI	RMSEA
Boys in childhood	Unconstrained model	38.09	7	.98	.91	.03
	Final constrained model	43.02***	13	.98	.93	.03
Girls in childhood	Unconstrained model	67.11	7	.96	.90	.08
	Final constrained model	76.53***	13	.96	.92	.05
Boys in childhood	Unconstrained model	73.06	7	.97	.90	.07
	Final constrained model	80.95***	13	.97	.91	.06
Girls in childhood	Unconstrained model	91.81	7	.97	.92	.08
	Final constrained model	102.96***	13	.97	.92	.06

***$p < .001$

(b) the comparative fit index (CFI) and the Tucker-Lewis index (TLI), which indicate good fits if they exceed 0.90.

Results

Data were analyzed for 1204 boys and 1079 girls in childhood (ages 9–12), and for 1359 boys and 1363 girls in adolescence (ages 13–16). Tables 2 and 3 compare the characteristics of all boys and girls used in the analyses of the two samples. For the childhood sample (ages 9–12), the results showed significant differences between boys and girls in their perceived parental monitoring and in self-reported delinquent behaviors in all 4 years (Table 2). Girls reported significantly higher levels of parental monitoring than boys in all 4 years. Boys reported significantly higher levels of delinquency from ages 9 to 11, but not at age 12. This is related to a sharp increase of delinquency in girls at this time, when they were transitioning into early adolescence (age 12). There was no gender difference in mother's education at baseline.

For the adolescence sample (ages 13–16), the results also showed significant differences between boys and girls in their perceived parental monitoring and in self-reported delinquent behaviors in all 4 years (Table 3). Girls reported higher levels of parental monitoring than boys in all 4 years. Boys reported significantly higher levels of delinquency at ages 15 and 16, but there was no gender difference in delinquency at ages 13 and 14. At this time, the delinquency of girls was similar to that of the boys at ages 13 and 14. Again, no differences between boys and girls were found in mother's education.

Multiple-group analyses showed that the unconstrained model had better fit for both childhood ($\chi^2_{diff} = 17.22$ [137.65–120.43], df = 9 [38–29], $p < .05$) and adolescence models ($\chi^2_{diff} = 22.14$ [215.19–193.04], df = 9 [38–29], $p < .01$). These results indicated that the path coefficients significantly differ for boys and girls in both childhood and adolescence models. Thus, all results and interpretations for path models were obtained based on the unconstrained model. Figures 2 and 3 show the results of cross-lagged path models for boys and girls in the childhood and adolescence. These results show the cross-lagged effects of parental monitoring and delinquency of boys and girls, with

Table 2 Childhood sample—descriptive statistics for the variables by gender

Variables	Boys		Girls		
	M	SD	*M*	SD	*F* test
Parent monitoring (age 9)	2.51	.35	2.62	.29	64.57***
Parent monitoring (age 10)	2.55	.33	2.66	.28	70.00***
Parent monitoring (age 11)	2.58	.30	2.68	.24	65.97***
Parent monitoring (age 12)	2.57	.28	2.64	.28	27.26***
Child delinquency (age 9)	.82	.55	.66	.50	50.08***
Child delinquency (age 10)	.77	.55	.65	.48	31.47***
Child delinquency (age 11)	.74	.53	.69	.49	5.13*
Child delinquency (age 12)	.78	.52	.78	.51	0.00
Mother education (age 9)	4.47	1.01	4.45	.97	0.32

Parental monitoring and delinquent behavior were log transformed

*$p < .05$, ***$p < .001$

Table 3 Adolescence sample—descriptive statistics for the variables by gender

Variables	Boys		Girls		
	M	SD	*M*	SD	*F* test
Parent monitoring (age 13)	2.48	.30	2.55	.28	38.63***
Parent monitoring (age 14)	2.53	.28	2.61	.26	53.53***
Parent monitoring (age 15)	2.52	.28	2.61	.25	82.09***
Parent monitoring (age 16)	2.55	.27	2.62	.24	58.50***
Child delinquency (age 13)	.51	.60	.53	.60	0.55
Child delinquency (age 14)	.36	.54	.35	.51	0.12
Child delinquency (age 15)	.42	.53	.35	.48	13.27***
Child delinquency (age 16)	.49	.54	.37	.46	39.23***
Mother education (age 13)	4.22	1.08	4.18	1.05	1.11

Parental monitoring and delinquent behavior were log transformed

***$p < .001$

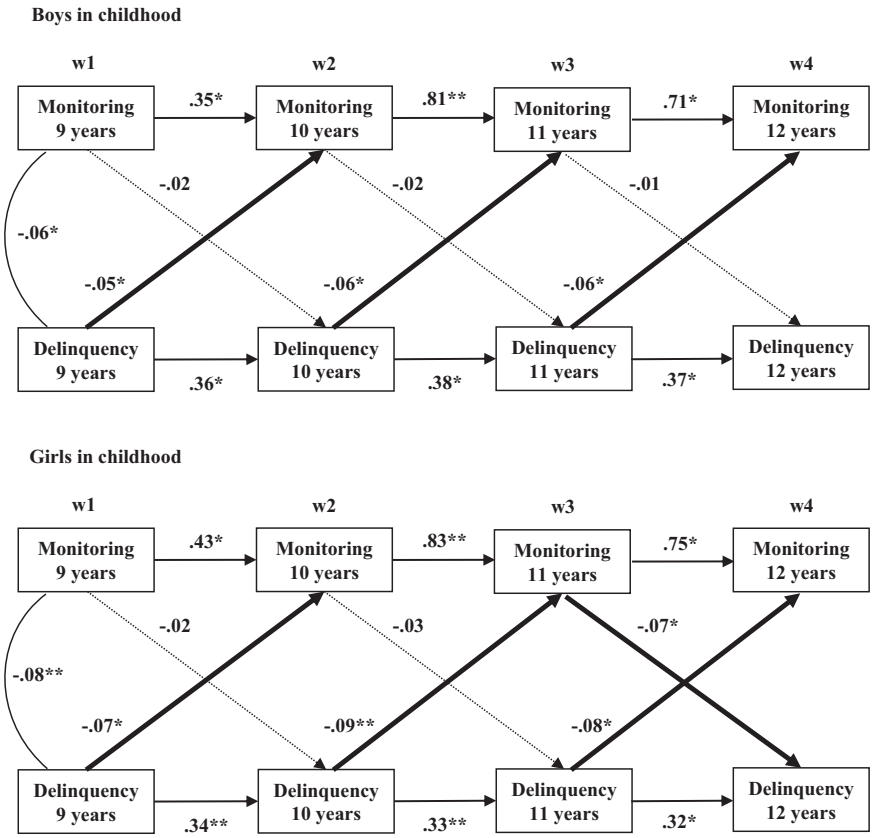

Fig. 2 Cross-lagged path model for parental monitoring and delinquency in childhood boys and girls (ages 9–12 years). β values are indicated on the arrows, and bold arrows indicate statistical significance (*$p <$ 0.05, **$p < 0.01$)

control for the stability of the constructs and the effect of the mother's education at baseline. These models focus on the bidirectional relationship of parental monitoring and delinquency, and thus do not show the path coefficients between the mother's education and the main variables. Paths with standardized coefficients that were statistically significant ($p < 0.05$) are presented as bold lines.

Figure 2 shows the results of cross-lagged path model for childhood boys and girls (ages 9–12). For boys in childhood, delinquency ($\beta = 0.36 \sim 0.38$) had high stability between measurement points. The stability of parental monitoring increased from 9 to 11 years, but slightly declined from 11 to 12 years ($\beta = 0.35 \sim 0.81$). As regards the cross-lagged effects, a boy's delinquency negatively influenced parental monitoring in all 4 years, with control for the stability of the constructs and the effect of the mother's education. More specifically, greater delinquency by boys at ages 9 ($\beta = -0.05$, $p < 0.05$), 10 ($\beta = -0.06$, $p < 0.05$), and 11 ($\beta = -0.06$, $p < 0.05$) significantly predicted reduced parental monitoring 1 year later. However, parental monitoring had no effect on the delinquency of boys in any of the 4 years. Regarding the control variable, higher level of mother's education at baseline was associated with greater parental monitoring at ages 10 ($\beta = 0.06$, $p < 0.05$). For girls in childhood, delinquency ($\beta = 0.32 \sim 0.34$) was highly stable across 4 years. The stability of parental monitoring increased from 9 to 11 years, but slightly declined from 11 to 12 years ($\beta = 0.43 \sim 0.83$). Analysis of cross-lagged effects indicates that a girl's delinquency had a negative influence on parental monitoring in all 4 years, with control for the stability of the constructs and the effect of the mother's education. The higher levels of delinquency of girls at ages 9 ($\beta = -0.07$, $p < 0.05$), 10 ($\beta = -0.09$, $p < 0.01$), and 11 ($\beta = -0.08$, $p < 0.05$) predicted reductions in parental monitoring 1 year later. Parental monitoring also negatively affects delinquency in girls, but this influence was only significant from ages 11 to 12, in that reduced parental monitoring at age 11 predicted increased of delinquency at age 12 ($\beta = -0.07$, $p < 0.05$). For the control variable, higher level of mother's education at baseline was related to greater parental monitoring at ages 10 ($\beta = 0.13$, $p < 0.01$) and 11($\beta = 0.11$, $p < 0.05$).

Figure 3 shows the results of cross-lagged path model for adolescent boys and girls (ages 13–16). For boys in adolescence, delinquency showed high stability between measurement points ($\beta = 0.49 \sim 0.52$). The stability of parental monitoring showed moderate increment over time ($\beta = 0.37 \sim 0.83$). With regards to the cross-lagged effects, significant effects were not found between parental monitoring and delinquency of boys at any age, from 13 to 16. Regarding the control variable, higher level of mother's

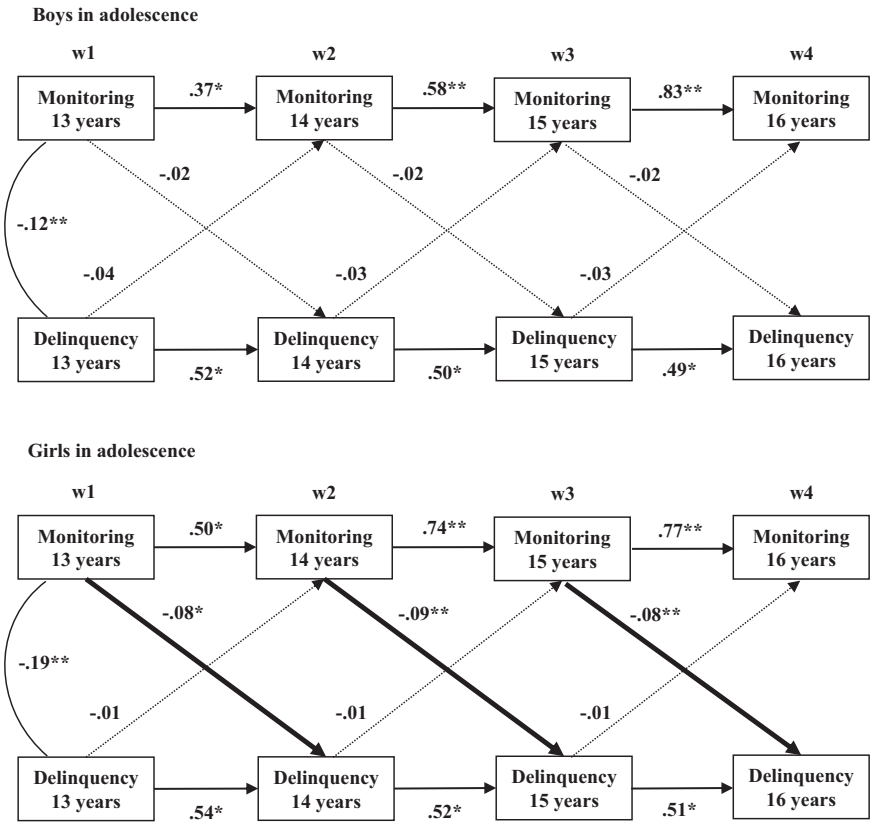

Fig. 3 Cross-lagged path model for parental monitoring and delinquency in adolescence boys and girls (ages 13–16 years). β values are indicated on the arrows, and bold arrows indicate statistical significance (*$p <$ 0.05, **$p < 0.01$)

education at baseline was associated with greater parental monitoring at ages 14 ($\beta = 0.05$, $p < 0.05$) and 16 ($\beta = 0.07$, $p < 0.05$). For girls in adolescence, delinquency was highly stable during adolescence ($\beta = 0.51 \sim 0.54$) across 4 years. The stability of parental monitoring showed moderate increment over time ($\beta = 0.50 \sim 0.77$). As regards the cross-lagged effects, parental monitoring has a significant influence on the delinquency of girls in all 4 years, with control for the effects of stability and the mother's education. These results show that higher levels of parental monitoring at age 13 ($\beta = -0.08$, $p < 0.05$), 14 ($\beta = -0.09$, $p < 0.01$), and 15 ($\beta = -0.08$, $p < 0.01$) predicted reduced delinquency of girls 1 year later. However, the delinquency of girls did not affect parental monitoring during adolescence. For the control variable, higher level of mother's education at baseline was related to greater parental monitoring at ages 14 ($\beta = 0.10$, $p < 0.01$).

Discussion

The present study investigated the bidirectional relationships between perceived parental monitoring and self-reported delinquent behaviors in boys and girls during childhood and adolescence. The main results are summarized as follows: (1) the mean-levels of parental monitoring and delinquency differ for boys and girls. Overall, girls were more monitored by parents than boys, while boys were more delinquent than girls. (2) The bidirectional effects between parental monitoring and delinquency differed for boys and girls. For girls, delinquency had a stronger effect during childhood, but parental monitoring had a stronger effect in the childhood–adolescence transition and adolescence. For boys, delinquency similarly had a stronger effect primarily in childhood. Parental monitoring, however, did not affect delinquency of boys at any age. These findings illustrate that the bidirectional relationships between monitoring and delinquency are more evident in girls than in boys. This study highlights the importance of considering gender when examining bidirectional parent–child relationships in future studies, and when designing and developing intervention programs to support families with delinquent children and adolescents.

The findings of this study show significant gender differences in the mean levels of parental monitoring and delinquency from childhood to adolescence. Girls consistently received more parental monitoring than boys from childhood to adolescence, in agreement with prior studies (Bowman et al. 2007; Fagan et al. 2011; Svensson 2003). This supports the presence of gender-stereotypical socialization, which assumes that girls are more closely monitored by parents because their delinquency may elicit harsher

responses from others (Fagan et al. 2011; Pomerantz and Ruble 1998). Boys are more delinquent than girls, particularly in childhood (ages 9–11) and middle adolescence (ages 15 and 16). Notably, boys and girls did not differ in delinquency during early adolescence (ages 12–14), which is somewhat inconsistent with conventional theory and prior empirical studies suggesting that boys are more delinquent than girls at all ages (Hirschi 1969; Gottfredson and Hischi 1990). The results of the present study seem to reflect the recent trend of increase in girls' delinquency during early adolescence. Some previous studies focusing on early adolescence also showed no gender differences in delinquency during early adolescence (Haynie 2003; Moffitt et al. 2001). Moffitt et al. (2001) found that boys and girls are most similar in delinquency at around age 14, the age corresponding to the most visible aspect of puberty in girls.

The findings from this study revealed that the bidirectional effects between parental monitoring and delinquency from childhood to adolescence differed for boys and girls. For girls, the influence of prior delinquency on parental monitoring was stronger during childhood (ages 9–12), but the influence of parental monitoring on subsequent delinquency was stronger during adolescence (ages 13–16). A significant shift in the parent–child relationship was found during the transitional period from childhood to adolescence (ages 11 to 12). These findings for girls provide strong evidence for the theorized bidirectional relationship between delinquency and parental monitoring. These findings also provide support for developmental theory that the parent–child relationship change as the child moves from childhood to adolescence. In particular, parental monitoring can be more important for controlling the delinquency of girls during adolescence, consistent with prior theoretical and empirical studies (Haynie 2003; Pomerantz and Ruble 1998).

This study found that delinquency of girls has a consistent influence on parental monitoring in childhood, in that more delinquency was related to less parental monitoring. As developmental theories suggested, delinquent girls could make parental monitoring difficult, since they tend to become more delinquent to undermine parental attempts to control their behavior (Laired et al. 2003; Patterson 1982). Parents, thus, may become less engaged with their girls to prevent further delinquent acts and subsequent negative interactions with their girls. In addition, delinquent children might make parental monitoring more difficult, since they are inclined to deceive or not to disclose information regarding their whereabouts and activities to their parents as they become more involved in delinquent behavior (Kerr and Stattin 2000).

Interestingly, the transition from childhood to adolescence appeared to signal a shift in the bidirectional links for girls. In particular, parental monitoring did not influence the delinquency of girls at ages 9–11, but it began to affect the delinquency during the transition (ages 11–12). Generally, as children enter early adolescence, they spend more time away from direct adult supervision, and are exposed to multiple challenges in broader social domains (e.g., entering into middle school, joining new peer networks). They also begin to experience neurobehavioral changes due to puberty. Previous research suggested that girls are more vulnerable to the stresses resulting from puberty and changes in school, because they have a more negative view of puberty and are more susceptible to interpersonal relationships with others (Haynie 2003; Petersen et al. 1991). The stress brought on by changing schools and peer networks, as well as puberty, may cause girls to rely more strongly on their parents. When parental monitoring for delinquent girls is weak during this challenging period, the girls may have more opportunities to become involved with delinquent peers and engage in delinquent behaviors.

During adolescence, the influence of parental monitoring on girls' behavior becomes stronger, but the influence of delinquent behaviors on parental monitoring become weaker. The findings of this study are consistent with previous studies suggesting that parental monitoring can be more effective in controlling delinquency in girls than boys (Fagan et al. 2011; Haynie 2003; Pomerantz and Ruble 1998). There may be several explanations for this finding. First, as girls mature physically during adolescence, parents may develop greater concerns for girls than boys, because they view girls as more vulnerable (Haynie 2003; Pomerantz and Ruble 1998). In addition, harsh social responses to poor behavior are generally stronger for adolescent girls than adolescent boys, even if they engage in equal levels of delinquency (Fagan et al. 2011; Heimer 1996). Given the greater stigma attached to delinquency in girls, parents may more closely monitor and place additional restrictions on them to protect them from delinquent behaviors and deviant peers. The greater controls imposed on girls may contribute to their lower rates of delinquency. Second, the findings for girls may be related to girls' perceptions of the quality of their attachments to their parents. Prior studies suggested that the effectiveness of parental monitoring in controlling delinquency depends on the quality of the parent-child attachment (Fagan et al. 2011; Leadbeater et al. 1999). The stronger attachment of girls to their parents may mean that girls are more likely to interpret their parents' monitoring as a trustworthy and helpful resource to protect them from delinquency, and this in turn may increase the effectiveness of parental monitoring in controlling delinquency of girls.

For boys, there is a unidirectional relationship between parental monitoring and delinquency, in that a boy's delinquency was related to less parental monitoring. Delinquency had a similar effect on parental monitoring in boys and girls; the influence of delinquency of boys on

parental monitoring was stronger during childhood (ages 9–12), but it becomes weaker during adolescence (ages 13–16). However, parental monitoring had a different effect on delinquency of boys and girls; parental monitoring did not affect delinquency of boys throughout development. The findings for boys provide support for theoretical perspectives assuming that parental monitoring may be less effective in controlling delinquency of boys. Many empirical studies, mostly focusing on boys, also found a unidirectional influence of delinquency of boys on parental monitoring (Burke et al. 2008; Fite et al. 2006; Vuchnich et al. 1992). For example, Burke et al. (2008) found that conduct disorders of boys (ages 7–12) predicted less parental supervision at age 17, but were not predicted by prior parental supervision. Fite et al. (2006) found that delinquent behavior of boys (ages 9–13) predicted reduced parental monitoring, but that parental monitoring did not affect delinquency at any age.

There are several possible explanations for this finding. First, it may be because parents monitor boys less than girls, and therefore simply know less about boys' behaviors. In fact, several studies suggested that parents may be less likely to solicit information about the activities and behaviors of boys than girls (Racz and McMahon 2011; Stattin and Kerr 2000). The reduced parental monitoring and greater parental ignorance of boys' behaviors may mean that their monitoring efforts are less effective. Even though parents recognize delinquency in their boys, they may not try to control or deter delinquent behaviors—assuming it is not serious—because they view it as normative for boys (Pomerantz and Ruble 1998). This broader gender role socialization may allow boys to have more opportunities to exercise their autonomy and competence without parental monitoring. Second, a boy's perception of the quality of attachment to his parents may influence the effect of parental monitoring in controlling delinquency. Boys tend to perceive themselves less attached to their parents than girls, and may be more likely to view parental monitoring as invasive, not as a valuable resource that provides protection (Leadbeater et al. 1999). Such perception may decrease the effect of parental monitoring on delinquency in boys. This is supported by the view that the effectiveness of parental monitoring in controlling delinquency depends on the parent–child attachment (Fagan et al. 2011). Finally, adolescent boys are often more influenced by their peers than their parents. Prior research showed that the parent–child relationship was a major predictor of a girl's delinquency, but the child–peer relationship was a major predictor of a boy's delinquency (Liu and Kaplan 1999; Svensson 2003). If boys are satisfied with their peer relationships, they may be less influenced by parents, even though they receive less parental monitoring.

This research is unique in several ways. First, the sample size is very large and most children lived with both parents. Second, longitudinal research focusing on two developmental periods—childhood and adolescence—is scarce. Third, this study directly compares the bidirectional relationships between parental monitoring and delinquency in boys and girls during childhood and adolescence. The findings from this study provide important new information about the nature of parent–child relationship, and may be useful for developing intervention strategies that seek to support families with delinquent children and adolescents.

However, the results should be interpreted with caution because of several limitations. First, this study assessed parental monitoring and delinquency using self-reporting by children and adolescents, and this might have led to single-reporter bias. Unfortunately, data used in current study did not provide parents' report of monitoring and delinquent behavior. However, previous researchers have suggested that child's self-report in these periods can be more important, because "the behavior of children and adolescents may be more influenced by their own perceptions of how much their parents know than by their parents' perceptions or by objective level of monitoring" (Laired et al. 2003, p. 5). Thus, even though parents' report was not included, this study based on youth's self-report is believed to provide valid and insightful findings about relationships between monitoring and delinquency. Still, in order to avoid any possible rater bias, future research should seek to examine data provided by multiple informants.

Second, parental monitoring in this study was measured by asking children and adolescents the extent to which parents were knowledgeable about their activities. This approach has been common in the relevant studies of parental monitoring (Bailey et al. 2009; Fite et al. 2006). However, some recent reports argued that parental monitoring and parental knowledge are different constructs that may be distinctively related to delinquent behavior and such measure represents rather parental knowledge than monitoring (Stattin and Kerr 2000; Wertz et al. 2016). Thus, future studies are encouraged to use separate measures of parental monitoring and parental knowledge and examine their unique associations with delinquent behaviors.

Finally, this study did not distinguish between serious and minor delinquent acts, which might have influenced the findings. Previous criminology studies showed that parental monitoring has a stronger link to serious than minor delinquency (Hoeve et al. 2009). The sample used in the present study was drawn from a general population-based study, and it is likely that most of the delinquent acts were minor. Future studies should try to distinguish between serious and minor delinquent acts in analysis of the relationship between parental monitoring and delinquency.

Compliance with Ethical Standards

Conflict of Interest The author declares that she has no competing interest.

References

Bailey, J. A., Hill, K. G., Oesterle, S., & Hawkins, J. D. (2009). Parenting practices and problem behavior across three generations: Monitoring, harsh discipline, and drug use in the intergenerational transmission of externalizing behavior. *Developmental Psychology*, *45*, 1214–1226.

Barnes, G. M., Hoffman, J. H., Welte, J. W., Farrell, M. P., & Dintcheff, B. A. (2006). Effects of parental monitoring and peer deviance on substance use and delinquency. *Journal of Marriage and Family*, *68*, 1084–1104.

Belsky, J. (1984). The determinants of parenting: A process model. *Child Development*, *55*, 83–96.

Bowman, M. A., Prelow, H. M., & Weaver, S. R. (2007). Parenting behaviors, association with deviant peers, and delinquency in African American adolescents: A mediated-moderation model. *Journal of Youth Adolescence*, *36*, 517–527.

Burke, J. D., Pardini, D. A., & Loeber, R. (2008). Reciprocal relationships between parenting behavior and disruptive psychopathology from childhood through adolescence. *Journal of Research in Crime and Delinquency*, *36*, 679–692.

Chesney-Lind, M., & Shelden, R. G. (2014). *Girls, delinquency, and juvenile justice* (4th ed). West Sussex, UK: John Wiley & Sons.

Cho, S. (2017). Self-control and risky lifestyles in context: Cross-level integration between opportunity and collective efficacy in the study of peer victimization among South Korean youth. *Journal of Child and Family Studies*, *26*, 67–79.

Dishion, T. J., & McMahon, R. J. (1998). Parental monitoring and the prevention of child and adolescent problem behavior: A conceptual and empirical formulation. *Clinical Child and Family Psychology Review*, *1*, 61–75.

Endendijk, J. J., Groeneveld, M. G., van der Pol, L. D., van Berkel, S. R., Hallers-Haalboom, E. T., Bakermans-Kranenburg, M. J., & Mesman, J. (2016). Gender differences in child aggression: Relations with gender-differentiated parenting and parents' gender-role stereotypes. *Child Development*, *88*, 299–316.

Fagan, A. A., Lee Van Horn, M., Antaramian, S., & Hawkins, J. D. (2011). How do families matter? Age and gender differences in family influences on delinquency and drug use. *Youth Violence and Juvenile Justice*, *9*, 150–170.

Farrell, A. D., Kung, E. M., White, K. S., & Valois, R. F. (2000). The structure of self-reported aggression, drug use, and delinquent behaviors during early adolescence. *Journal of Clinical Child Psychology*, *29*, 282–292.

Fite, P. J., Colder, C. R., Lochman, J. E., & Wells, K. C. (2006). The mutual influence of parenting and boys' externalizing behavior problems. *Applied Developmental Psychology*, *27*, 151–164.

Gault-Sherman, M. (2012). It's two-way stress: The bidirectional relationship between parenting and delinquency. *Journal of Youth Adolescence*, *41*, 121–145.

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

Griffin, K. W., Botvin, G. J., Scheier, L. M., Diaz, T., & Miller, N. L. (2000). Parenting practice as predictor of substance use, delinquency, and aggression among urban minority youth: Moderating effects of family structure and gender. *Psychology of Addictive Behaviors*, *14*, 174–184.

Haynie, D. L. (2003). Contexts of risk? Explaining the link between girls' pubertal development and their delinquency involvement. *Social Forces*, *82*, 355–397.

Heimer, K. (1996). Gender, interaction, and delinquency: Testing a theory of differential social control. *Social Psychology Quarterly*, *59*, 39–61.

Hirschi, T. (1969). *Causes of delinquency*. New Brunswick: Transaction Publishers.

Hoeve, M., Duba, J. S., Eichelsheim, V. I., Van der Laan, P. H., Smeenk, W., & Gerris, R. M. (2009). The relationship between parenting and delinquency: A meta-analysis. *Journal of Abnormal Child Psychology*, *37*, 749–775.

Kandel, D. B., & Wu, P. (1995). Disentangling mother–child effects in the development of antisocial behavior. In J. McCord (Ed.), *Coercion and punishment in long-term perspectives* (pp. 106–123). New York, NY: Cambridge University Press.

Kerr, M., & Stattin, H. (2000). What parents know, how they know it, and several forms of adolescent adjustment: Further support for a reinterpretation of monitoring. *Developmental Psychology*, *36*, 366–380.

Kerr, M, Stattin, H. (2003). Parenting of adolescents: Action or reaction?. In: A. C. Crouter, & A. Booth (eds.) Children's influence on family dynamics: The neglected side of family relationships. (pp. 121–151). Mahwah, NJ: Erlbaum.

Kim, D., & Kim, H. (2009). Body-image dissatisfaction as a predictor of suicidal ideation among Korean boys and girls in different stages of adolescence: A two-year longitudinal study. *Journal of Adolescent Health*, *45*, 47–54.

Kim, J. S. (2007). Trends and Characteristics of Juvenile Crime 1966-2005. *Korean Journal of Criminology*, *19*, 55–86.

Lee, C. H. et al. (2016). *Crime phenomenon and Criminal justice policy in Korea (2015)*. Seoul, Korea: Korean Institute of Criminology.

Laired, R. D., Petti, G. S., Bates, J. E., & Dodge, K. A. (2003). Parent's monitoring-relevant knowledge and adolescents' delinquent behavior: Evidence of correlated developmental changes and reciprocal influences. *Child Development*, *74*, 752–768.

Leadbeater, B. J., Kuperminc, G. P., Blatt, S. J., & Hertzog, C. (1999). A multivariate model of gender differences in adolescents' internalizing and externalizing problems. *Developmental Psychology*, *35*, 1268–1282.

Lee, J., & Randolph, K. A. (2015). Effect of parental monitoring on aggressive behavior among youth in the United States and South Korea: A cross-national study. *Children and Youth Services Review*, *55*, 1–9.

Lee, K., Kim, K., & Lim, H. (2007). *Korean Youth Pane Survey (KYPS) V: A brief report 07-R01*. Washington, DC: National Youth Policy Institute, 2007.

Lee, K., & Lee, J. (2011). Self-esteem and delinquency in South Korean adolescents: Latent growth modeling. *School Psychology International*, *33*, 54–68.

Liu, X., & Kaplan, H. B. (1999). Explaining the gender difference in adolescent delinquent behavior: A longitudinal test of mediating mechanisms. *Criminology*, *37*, 195–215.

Martens, P. L. (1997). Parental monitoring and deviant behavior among juveniles. *Studies on Crime and Crime Prevention*, *6*, 224–244.

Miller, S., Loeber, R., & Hipwell, A. (2009). Peer deviance, parenting and disruptive behavior among young girls. *Journal of Abnormal Child Psychology*, *37*, 139–152.

Moffitt, T. E., Caspi, A., Rutter, M., & Silva, P. A. (2001). *Sex differences in antisocial behavior: Conduct disorder, delinquency, and violence in the Dunedin longitudinal study*. Cambridge, UK: Cambridge University Press.

Pardini, D. A., Fite, P. J., & Burke, J. D. (2008). Bidirectional associations between parenting practices and conduct problems in

boys from childhood to adolescence: The moderating effect of age and African-American ethnicity. *Journal of Abnormal Child Psychology*, *36*, 647–662.

Patterson, G. R. (1982). *Coercive family process*. Eugene, OR: Castalia.

Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *A social learning approach*. Eugene, OR: Castalia.

Petersen, A. C., Sarigiani, P. A., & Kennedy, R. E. (1991). Adolescent depression: Why more girls? *Journal of Youth and Adolescence*, *20*, 247–271.

Petti, G. S., & Arsiwalla, D. D. (2008). Commentary on special section on "bidirectional parent–child relationships": The continuing evolution of dynamic, transactional models of parenting and youth behavior problems. *Journal of Abnormal Child Psychology*, *36*, 711–718.

Pomerantz, E. M., & Ruble, D. N. (1998). The role of maternal control in the development of sex differences in child self-evaluative factors. *Child Development*, *69*, 458–478.

Racz, S. J., & McMahon, R. J. (2011). The relationship between parental knowledge and monitoring and child and adolescent conduct problems: A 10-year update. *Clinical Child and Family Psychology Review*, *14*, 377–398.

Rebellon, C. J., Manasse, M. E., Agnew, R., Van Gundy, K. T., & Cohn, E. S. (2016). The relationship between gender and delinquency: Assessing the mediating role of anticipated guilt. *Justice of Criminal Justice*, *44*, 77–88.

Sampson, R. J., & Laub, J. H. (1993). *Crime in the making: Pathways and turning points through life*. Cambridge, MA: Harvard University Press.

Scarr, S., & McCartney, K. (1983). How people make their own environments: A theory of genotype-environment effects. *Child Development*, *54*, 424–435.

Shaw, D. S., & Bell, R. Q. (1993). Developmental theories of parental contributors to antisocial behavior. *Journal of Abnormal Child Psychology*, *21*, 493–518.

Snyder, H. (2008). *Juvenile arrests 2006*. Washington, DC: US Department of Justice, Office of Juvenile Justice and Delinquency Prevention.

Snyder, H. (2011). Arrest in the United States, 1980-2009. US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics.

Stattin, H., & Kerr, M. (2000). Parental monitoring: A reinterpretation. *Child Development*, *71*, 1072–1085.

Svensson, R. (2003). Gender differences in adolescent drug use: The impact of parental monitoring and peer deviance. *Youth & Society*, *34*, 300–329.

Vuchnich, S., Bank, L., & Patterson, G. R. (1992). Parenting, peers, and the stability of antisocial behavior in preadolescent boys. *Developmental Psychology*, *28*, 510–521.

Wertz, J., Mottingham, K., Agnew-Blais, J., Matthews, T., Pariante, C. M., Moffitt, T. E., & Arseneault, L. (2016). Parental monitoring and knowledge: Testing bidirectional associations with youths' antisocial behavior. *Development and Psychopathology*, *28*, 623–638.

Willoughby, T., & Hamza, C. (2011). A longitudinal examination of the bidirectional associations among perceived parenting behaviors, adolescent disclosure and problem behavior across the high school years. *Journal of Adolescence*, *40*, 463–478.

Yoo, J. A. (2017). Developmental changes in the bidirectional relationships between parental monitoring and child delinquency. *Children and Youth Services Review*, *73*, 360–367.

Yoon, O. K. (2008). A study on the cause of juvenile delinquency: Comparing relative effects of the individual, family, school, community contexts. *Korean Correction Review*, *38*, 107–138.

Yun, H., Cui, M., & Blair, B. L. (2016). The mediating roles of adolescent disclosure and parental knowledge in the association between parental warmth and delinquency among Korean adolescents. *Journal of Child and Family Studies*, *25*, 2395–2404.