Delinquency as a Consequence of Parental Warmth and Self-Efficacy: Total Sample and Individual Male and Female Mediation Analyses

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Author Bio

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Abstract

Introduction: This study's purpose was to investigate the mediating effect of parental control self-efficacy on the parental warmth → child delinquency relationship in the mothers and fathers of early to mid-adolescent youth in a test of performance accomplishments as a prelude to parental self-efficacy.

Methods: Parental warmth and control self-efficacy estimates, representing parental support and control, respectively, were provided by the mothers and fathers of 3,934 (2,010 boys, 1,924 girls) youth from the Longitudinal Study of Australian Children (LSAC) and self-reported delinquency was obtained from the child.

Results: As predicted, parental control self-efficacy mediated the relationship between parental warmth and child delinquency, whereas parental warmth did not mediate the relationship between parental self-efficacy and child delinquency. When analyses were performed separately for boys and girls, the father warmth → father self-efficacy → child delinquency pathway achieved the most consistent results in boys and the mother warmth → mother self-efficacy → child delinquency pathway achieved the only significant effect in girls.

Conclusions: These results suggest that performance accomplishments, as characterized by a warm parent–child relationship, led to enhanced parental control self-efficacy, which, in turn, served to inhibit future delinquency in the child, thereby lending support to a social cognitive learning theory interpretation of the parental support–control interface.

Key Words: parental warmth; parental control self-efficacy; child delinquency; mediation

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Individual Male and Female Mediation Analyses

Parental control and support have been found to predict reduced levels of future delinquent behavior in the offspring of these parents (Hoeve et al., 2009). The mechanism of effect, however, is uncertain and a matter of conjecture for researchers, clinicians, and policy makers. It is possible that positive parenting directly affects the child by buffering them from negative peer and neighborhood influences or by teaching them basic social, coping, and problem-solving skills. A second possibility is that parenting exerts an indirect effect on the child by creating parental cognitions like parenting self-efficacy, that the child then models. Whereas the pathway running from positive parenting, to child self-efficacy, to child delinquency (Juang & Silbersisen, 1999; Olivari et al., 2018; Walters, 2018) is well-documented, there may be more to this relationship than meets the eye. This is because there is no meaningful theoretical rationale upon which to base the argument that positive parenting leads directly to child self-efficacy. The two most prominent sources of self-efficacy are modeling and performance accomplishments (Bandura, 1986). One or both may be capable of clarifying the *a* path (positive parenting to child self-efficacy) of the positive parenting → child self-efficacy → delinquency indirect effect.

Modeling (observational learning) and performance accomplishments (mastering a difficult task) are not only sources of self-efficacy, they are also variables potentially capable of explaining how parental support and control are connected. There are several different variable interfaces, three of which are mediation, moderation, and reciprocity. The missing variable or variables in the previously mentioned positive parenting → child self-efficacy → delinquency mediation sequence could be attributed to the child, the parent, or both. From the standpoint of

the child, it may be that positive parenting encourages the child to engage in more appropriate peer interactions or more effective problem solving, which then leads to increased competence and self-efficacy in the child. From the standpoint of the parent, it could be that positive parenting promotes a sense of parental self-efficacy which then serves as a model for the child to emulate in the development of their own self-efficacy. Before the full model can be evaluated, however, certain individual paths must be investigated. The purpose of the current investigation was to determine whether parental control self-efficacy mediates the relationship between the performance accomplishment of a parent forming a warm supportive relationship with their child and future child delinquency using a social cognitive learning framework.

Parental Self-Efficacy and Child Problem Behavior

Parental self-efficacy can be defined in general terms as a parent's degree of confidence in their ability to effectively support, control, and raise their offspring, although for the purposes of the current study the focus is on a parent's self-efficacy to control their child's behavior. Hence, the term parental control self-efficacy. According to Bandura (1986), self-efficacy is often an exercise in control. He goes on to state that there are four ways by which this control can be achieved: enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. Performance accomplishments, a form of enactive mastery experiences, promote self-efficacy by convincing the individual that they are capable of mastering a behavior by successfully performing a task. Modeling, a form of vicarious experiences, leads to self-efficacy by providing the individual with a prototype of successful performances to emulate. Hence, while performance accomplishments and modeling by the child may have little impact on a child's involvement in delinquency, performance accomplishments

and/or modeling by the parent may contribute to a child's future delinquent involvements by increasing parental self-efficacy.

Using data from Wave 1 of the National Longitudinal Study of Adolescent Health, Perrone et al. (2004) sought to evaluate low self-control in the child as a mediator of the parental self-efficacy–child delinquency relationship in a cross-sectional (single wave) analysis. All three variables—parental self-efficacy, low self-control, and delinquency—correlated significantly with one another. Based on the pattern of association obtained in this study, the authors concluded that low self-control partially mediated the relationship between parental self-efficacy and child delinquency. In a survey of 145 mothers and 53 fathers, Babskie et al. (2017) determined that adolescent involvement in various risk-taking behaviors (e.g., alcohol consumption, cyber activities, eating behaviors, problem peer associations) correlated inversely with parental self-efficacy to handle each specific behavior. Both these studies were limited, however, by the fact that the data were cross-sectional in nature. In addition, Perrone et al. (2004) employed procedures to test mediation that tend to produce erroneous and misleading results (Hayes, 2017; Preacher, 2014). Without benefit of proper methodology and good temporal order between variables it is impossible to know whether child behavioral problems are the cause or the effect of parental self-efficacy.

Whereas most of the research on parental self-efficacy and offspring deviance has relied on cross-sectional data (see Pereira & Barros, 2019), a few studies have employed a longitudinal design to investigate the relationship between parental self-efficacy and child behavior problems. With the aid of longitudinal data, Gärtner et al. (2018) ascertained that domain-specific parental self-efficacy predicted toddler inhibitory control six weeks later. Consistent with social cognitive learning theory, which holds that self-efficacy is most effective when it is domain-specific

(Bandura, 1986), domain-general self-efficacy failed to predict subsequent toddler inhibitory control. Prior to this, Weaver et al. (2008) uncovered a prospective correlation between parental self-efficacy, measured when the child was two years of age, and child conduct problems, measured at age four after child conduct problems at age two were controlled. This study also examined several mediational mechanisms and determined that the self-efficacy–conduct problem nexus was mediated by maternal depression at child age three. The use of prospective data with no overlap between waves helped establish temporal order between variables, whereas controlling for prior levels of maternal depression and child conduct problems in predicting subsequent maternal depression and child conduct problems, respectively, provided the variables with proper temporal direction (Cole & Maxwell, 2003). Still, it is uncertain how applicable these results are to adolescents, given that toddlers served as participants in both studies.

Parental Warmth and Child Problem Behavior

Parents who form warm, supportive relationships with their children tend to have children who exhibit few behavioral problems. Minor and serious delinquency, for instance, is elevated in children whose parents display limited warmth in their interactions with the child (Walker-Barnes & Mason, 2004; Fletcher et al., 2004; Pinquart, 2017). More recently, Yun and Cui (2020) documented a prospective relationship between low parental warmth and subsequent delinquency in adolescents living in the United States and South Korea. Although parental warmth exerted a stronger protective effect in American than in Korean youth, the effect was significant in both cultures. It has also been noted that the parental warmth–offspring delinquency relationship differs as a function of the gender of both the parent and child. Analyzing data from the Mobile (Alabama) Youth Survey, Jaggers et al. (2017) determined that adolescent females reported significantly lower levels of parental warmth than adolescent males,

and while lower levels of maternal warmth were associated with higher levels of delinquency in both adolescent males and females, the effect was significantly stronger for females.

Gender Moderation of the Self-Efficacy–Delinquency Relationship

According to the results of the previously mentioned Jaggers et al. (2017) study, the association between parental warmth and child delinquency varied by parent and child gender. Ruiz-Ortiz et al. (2017) likewise discovered that maternal coercion increased externalizing problems in girls but not boys, whereas maternal permissiveness increased externalizing problems in boys but not girls. Paternal warmth, on the other hand, protected girls but not boys from future externalizing problems. These and other studies (Fagan et al., 2011; Lowe & Dotterer, 2013) indicate that parent gender, child gender, or both interact with parental support in general and parental warmth in particular as each relates to child delinquent behavior. Unfortunately, each study was limited to cross-sectional data. Gender nonetheless moderated variable relationships in a study on harsh parenting and adolescent antisocial behavior performed by Burnette et al. (2012). In that study, early externalizing problems were found to be stronger predictors of subsequent antisocial behavior in girls than in boys, whereas peers were stronger predictors of future antisocial behavior in boys than in girls. There was no evidence that gender moderated the parental harshness–youth antisocial behavior relationship, however.

Present Study

The purpose of the current investigation was to assess how parental control and support interface by evaluating whether mother- and father-reported parental control self-efficacy (a facet of parental control) mediates the relationship between parental warmth (a facet of parental support) and child delinquency. This was evaluated using a social cognitive learning framework whereby parental warmth served as a performance accomplishment for increased parental control

self-efficacy. It was predicted that these two indirect effects, referred to from this point forward as the target pathways, would be significant. Comparison pathways were formed by reversing the order of the independent and mediating variables so that parental control efficacy became the independent variable and parental warmth the mediating variable. The target and comparison pathways were then contrasted. It was reasoned that the comparison pathways would not achieve significance because the performance accomplishment came after rather than before self-efficacy. In conducting this study, basic demographic measures and two variables known to be linked to the parental warmth–child delinquency nexus—peer delinquency (Miller, Loeber, & Hipwell, 2009) and parental knowledge (Yun, Cui, & Blair, 2016)—served as control variables.

Two hypotheses were tested in this study. The first hypothesis predicted that in the full sample of participants (boys and girls combined), mother and father parental control self-efficacy (control dimension) would mediate the relationships between mother and father warmth (support dimension) and child delinquency, but that mother and father warmth would not mediate the relationships between mother and father parental control self-efficacy and child delinquency. It was further reasoned that each target pathway (parental warmth → parental control self-efficacy → delinquency) would achieve a significantly stronger effect than its associated comparison pathway (parental control self-efficacy → parental warmth → delinquency). The second hypothesis held that when data on girls and boys were analyzed separately, the pathway running from father warmth to father self-efficacy to child delinquency would be significant and significantly stronger in boys than the pathway running from father self-efficacy to father warmth to child delinquency, and that the pathway running from mother warmth to mother self-efficacy to child delinquency would be significant and significantly stronger in girls than the pathway running from mother self-efficacy to mother warmth to child delinquency.

Method

Participants

Participants for this study were members of the Longitudinal Study of Australian Children (LSAC: Australian Institute of Family Studies, 2018), a large representative sample of Australian schoolchildren organized into two cohorts (B and K), both of which consist of seven waves of data with two years between waves. The B (baby) cohort runs from age 0-1 to age 12-13 and the K (kindergarten) cohort runs from age 4-5 to age 16-17. The sampling frames for the two cohorts came from the Australian Medicare enrollment database. Cohort K was selected for the current investigation because it covered the age range (early to mid-adolescence) and variables (parental warmth and self-efficacy) of prime interest in this study.

There were 4,048 participants in Cohort K at the start of the project. Most of these children participated in the LSAC-K at ages 12-13, 14-15, and 16-17, which consisted of Waves 5, 6, and 7, respectively. Children with complete data on at least five of the 15 variables under investigation ($n = 3,934$, 97.2% of the total; 2,010 boys and 1,924 girls) served as participants in this study. This was done in order to retain as much of the original sample's representativeness as possible. Youth who participated in the current investigation were 12.41 years of age (SD = 0.49) at the time of the Wave 5 interview. In addition, the vast majority of participants were non-indigenous persons (97.1%), with 2.7% aboriginal and 0.2% Torres Strait islander.

Measures

Parental Warmth. Cross-lagged independent and mediator variables (Waves 5 and 6) were employed in this study. One of these cross-lagged variables was parental warmth, which represented the support dimension of effective parenting. In this study, parental warmth was assessed separately for mothers and fathers. Parents rated each of the following six items ("hug

child;" "express happiness to child;" "warm encounters with child;" "enjoy doing things with

child;" "close when happy or upset;" "display physical affection") on a 5-point scale (1=

never/almost never, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *always/almost always*). Scores for

each individual item were then averaged to produce a mean score. The parental warmth scale

achieved excellent internal consistency in both mothers and fathers during the first two waves of

this study (α = .88–.91).

Parental Control Self-Efficacy. The other cross-lagged independent/mediator variable

was parental control self-efficacy, which represented the control dimension of effective

parenting. Parental control self-efficacy was assessed separately for mothers and fathers between

Waves 5 and 6 of the LSAC-K. An average score was computed from four items ("how often

does [child's name] behave in a manner different from the way you want him/her to?" [reverse

coded]; "how often do you think that [child's name] behavior is more than you can handle?"

[reverse coded]; "how often do you feel that you are good at getting [child's name] to do what

you want him/her to do?;" "how often do you feel that you are in control and on top of things

when you are caring for [child's name]") rated on the same 5-point scale as that used to rate

items on the parental warmth scale (1= *never/almost never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*,

5 = *always/almost always*). The internal consistency of this scale in the current sample of

participants was good (α = .76–.82).

Child Delinquency. Participant delinquency at Wave 7 when the child was 16 to 17

years of age served as the dependent variable in this study. Each child was presented with 17

different delinquent acts—got into a physical fight in public, skipped school, stole from a shop,

drew graffiti in a public place, carried a weapon, took a motor vehicle for a ride, stole money

from a person, ran away from home, purposely damaged property, damaged a parked car, ran

around with a group that damaged property, suspended or expelled from school, broke into a

house/flat/vehicle, stole something from a parked car, started a fire, used force or threat of force

to get money or things from someone, caught by police for something done wrong—and were

instructed to indicate how often they had engaged in this behavior over the past two years using a

six-point scale (0 = *not at all*, 1 = *once*, 2 = *twice*, 3 = *three times*, 4 = *four times*, 5 = *five or*

more times). A summed score which could range from 0 to 85 was then calculated. The two-year

stability of the delinquency scale was modest between Waves 5 and 6 of the LSAC-K ($r = .22$)

and high between Waves 6 and 7 ($r = .55$).

Control Variables. Five control variables were included in the present investigation,

three of which were demographic in nature: age (in years), gender (0 = *male*, 1 = *female*), and

indigenous status (0 = *non-indigenous*, 1 = *indigenous*). An 8-item peer delinquency scale

administered at Wave 5 ($\alpha = .81$) served as the fourth control variable. This variable was

assessed with eight items ("kids I know"…get into trouble, …get into trouble at school, …cheat

on tests, …get into fights, …smoke cigarettes, …drink alcohol, …have broken the law, …try

drugs) rated on a five-point scale (1 = *none of them*, 2 = *one or two of them*, 3 = *some of them*, 4

= *most of them*, 5 = *all of them*). The fifth and final control variable, parental knowledge,

consisted of four items ("Parents know my friends;" "Parents know how I spend my money;"

"Parents know what I do in my free time;" "Parents know where I am most afternoons")

administered at Wave 5 and rated on a three-point scale (1 = *parents don't know*, 2 = *parents*

know a little, 3 = *parents know a lot*) to generate a score that could range from 4 to 12 ($\alpha = .72$).

Precursor Measures. Prior levels of each predicted variable were controlled for the

purpose of establishing the causal direction of variables in this study (Cole & Maxwell, 2003).

Precursor measures for each cross-lagged mediator were already included in the study as

independent variables and one additional precursor measure was added to the design (Delinquency-5). Wave 5 delinquency was assessed with the same 17-item scale as was used to measure Wave 7 delinquency and was included in the present study as a predictor in the regression equation predicting Wave 7 delinquency. A lagged outcome measure means that what is being assessed in each case is a change in outcome from Wave 5 to Wave 6 (cross-lagged mediators) or from Wave 5 to Wave 7 (dependent variable).

Procedure

The LSAC is a nationally representative survey of Australian youth designed to identify the social, economic and cultural antecedents of youth development over the life course. Two large samples (Cohorts B & K) were constructed using two-stage cluster sampling. During the first stage of the cluster sampling procedure, postcodes were selected at random. Individual children were then randomly selected from each postcode. Sampling weights were created to account for a child's probability of selection and make adjustments for non-response. These weights were used to calculate correlations and conduct path analyses for the current investigation. The present study made use of the fifth, sixth, and seventh waves of Cohort K data, when participants were 12/13 (Wave 5), 14/15 (Wave 6), and 16/17 (Wave 7) years of age, respectively. Interviews were usually performed face-to-face and the research team often relied on computer-assisted self-interviewing technology, particularly when interviewing older children. Use of these data for research purposes was approved by the Institutional Review Board at Kutztown University.

Research Design

The current study employed a three-wave fixed-sample longitudinal panel design in which the independent and mediator variables were cross-lagged between Waves 5 and 6 of the

LSAC-K. The four independent variables (mother warmth, father warmth, mother control self-efficacy, and father control self-efficacy), five control variables (age, gender, indigenous, peer delinquency, and parental knowledge), and one precursor measure (child delinquency) were assessed at Wave 5 (age 12/13), the four mediator variables (mother control self-efficacy, father control self-efficacy, mother warmth, father warmth) were assessed at Wave 6 (age 14/15), and the dependent variable (child delinquency) was assessed at Wave 7. There were two target pathways (mother warmth → mother self-efficacy → child delinquency; father warmth → father self-efficacy → child delinquency) and two comparison pathways (mother self-efficacy → mother warmth → child delinquency; father self-efficacy → father warmth → child delinquency). It was predicted a priori that the target pathways would be significant, the comparison pathways would be non-significant, and the differences between the target and comparison pathways would be significant. Analyses were also performed on male and female youth separately.

Data Analytic Plan

All path analyses were performed with MPlus 8.3 (Muthén & Muthén, 1997-2017) using a maximum likelihood (ML) estimator. Indirect effects and path coefficients were tested against bias-corrected bootstrapped 95% confidence intervals (Preacher, 2015). Bias-corrected bootstrapped 95% confidence intervals (5,000 bootstrapped replications) were also used to test for differences between the target and comparison pathways (Preacher & Hayes, 2008). It should be noted that Confidence intervals that do not include zero are classified as significant. Analyses were carried out on the full sample and for boys and girls separately.

Sensitivity testing was performed on all significant indirect effects using Kenny's (2013) "failsafe ef" procedure: $(r_{my.x})$ x $(sd_{m.x})$ x $(sd_{y.x})$ / (sd_m) x (sd_y). The "failsafe ef" produces a

coefficient that indicates how strongly a confounding covariate would need to correlate with the mediating and dependent variables, controlling for the effects of the independent and mediating variables in the case of dependent variable, to completely eliminate the significant coefficient along the *b* path of the indirect effect.

A second sensitivity test was calculated, this time in an effort to rule out endogenous selection bias or a collider effect. This was accomplished by re-computing the analyses without precursor measures (i.e., earlier estimates of each outcome variable) in an effort to determine whether the *a* or *b* coefficients weakened once the precursor measures were removed from the model. This is based on the fact that conditioning on the precursor to an outcome variable can sometimes artificially inflate a path coefficient (Elwert & Winship, 2014).

A supplemental analysis was performed by treating delinquency scores as counts, although it should be noted that each delinquency item was truncated at five. It is for this reason that the negative binomial regression analysis used to evaluate these scores is referred to as a modified negative binomial regression analysis. This analysis was performed with a robust maximum likelihood (MLR) estimator and Monte Carlo integration. Because MLR does not allow for bootstrapping, 95% confidence intervals were constructed using Preacher and Selig's (2012) Monte Carlo Method for Assessing Mediation (MCMAM) algorithm.

Missing Data

Out of the 3,934 children who participated in this study, two-fifths (39.1%) had complete data on all 15 study variables. Another 6.1% of participants were missing data on one variable, 13.3% were missing data on two variables, 3.6% were missing data on three variables, 16.4% were missing data on four variables, 9.5% were missing data on five variables, and 12.2% were missing data on six to ten variables. Seven variables had more than 5% missing data: Father

Warmth-6 (42.6%), Father Self-Efficacy-6 (42.3%), Father Warmth-5 (38.1%), Father Self-Efficacy-5 (38.1%), Child Delinquency-7 (26.7%), Mother Warmth-6 (18.3%), and Mother Self-Efficacy-6 (18.3%). In the present study, missing data were handled with full information maximum likelihood (FIML). Research indicates that FIML is significantly less biased than listwise deletion and other traditional missing data procedures (Allison, 2002). In addition, FIML is reasonably robust to violations of its basic assumptions: i.e., multivariate normality and that data are missing at random (Collins, Schafer, & Kam, 2001).

Results

Preliminary Analyses

Descriptive statistics and correlations for all 15 study variables are listed in Table 1. The outcome measure (Delinquency-7) was highly skewed (skew = 6.54), with nearly half the values (46.6%) registering as zero. Even so, approximately two-thirds of all correlations and 10 out of 14 correlations involving Delinquency-7 were significant when measured against a Bonferroni-corrected alpha level. Multicollinearity analyses were performed on the predictor variables in all five regression equations. The results of this analysis revealed no evidence of multicollinearity between predictor variables: tolerance = .437–.998; variance inflation factor = 1.002–2.290.

Full Sample Analyses

Table 2 and Figure 1 provide a summary of the results of the five-regression equation maximum likelihood (ML) path analysis in the full sample. Consistent with the first hypothesis, the two target pathways (M Warmth-5 → M Self-Efficacy-6 → Delinquency-7; F Warmth-5 → F Self-Efficacy-6 → Delinquency-7) were significant and the two comparison pathways (M Self-Efficacy-5 → M Warmth-6 → Delinquency-7; F Self-Efficacy-5 → F Warmth-6 → Delinquency-7) were non-significant (see Table 3). Comparing pathways by means of the

Preacher-Hayes contrast test revealed that only the target and comparison pathways for mothers differed significantly from one another.

The "failsafe ef" coefficient for the mother target pathway (M Warmth-5 → M Self-Efficacy-6 → Delinquency-7) was -.18 and the "failsafe ef" coefficient for the father target pathway (F Warmth-5 → F Self-Efficacy-6 → Delinquency-7) was -.19. These results indicate that the *b* paths of both significant target pathways were modestly to moderately robust to the obfuscating effects of unobserved covariate confounders and omitted variable bias. When the precursors to each predicted variable were removed from the five regression equations, the coefficients rose rather than fell, an outcome inconsistent with the presence of endogenous selection bias or a collider effect.

Because of the highly skewed and zero-inflated nature of the Delinquency-7 outcome measure, a supplemental analysis was performed on delinquency counts truncated at 5 on each item. When a modified zero-inflated negative binomial analysis was conducted (Dispersion $Z =$ 19.47, $p < .001$; 46.6% zeros), the *a* ($Z = 5.28$, $p < .001$) and *b* ($Z = -2.02$, $p < .05$) paths and total indirect effect (MCMAM = -0.05556, -0.00106) of the mother target pathway and the *a* ($Z = 4.91$, $p < .001$) and *b* ($Z = -2.70$, $p < .01$) paths and total indirect effect (MCMAM = -0.07693, -0.00984) of the father target pathway were significant. The *b* path and total indirect effects for the mother and father comparison pathways, on the other hand, were non-significant.

Analyses Broken Down by Participant Gender

Because the gender x FSE-6 interaction was significant in predicting delinquency at Wave 7 ($p < .05$), the data were analyzed separately by gender. Path analytic results obtained when data were analyzed separately for boys and girls were largely consistent with the second hypothesis. In boys, both the mother and father target pathways (M Warmth-5 → M Self-

Efficacy-6 → Delinquency; F Warmth-5 → F Self-Efficacy-6 → Delinquency-7) were

significant, but only the difference between the father target and comparison pathways was

significant (Preacher-Hayes 95% BCBCI = -0.426, -0.012). The "failsafe ef" revealed that a

covariate confounder would need to correlate -.18 with FSE-6 and -.18 with Delinquency-7,

controlling for FWarm-5 and FSE-6 in the case of the latter, to completely eliminate the *b* path of

the significant father indirect effect in boys.

In girls, the mother target pathway (M Warmth-5 → M Self-Efficacy-6 → Delinquency)

was significant (95% BCBCI = -0.148, -0.007), but the other three indirect effects (mother

comparison, father target and comparison) were not. The difference between the mother target

(M Warmth-5 → M Self-Efficacy-6 → Delinquency) and comparison (M Self-Efficacy-5 → M

Warmth-6 → Delinquency) pathways was non-significant. Results from the "failsafe ef"

indicated that a covariate confounder would need to correlate -.15 with MSE-6 and -.15 with

Delinquency-7 to completely neutralize the *b* path of the significant mother indirect effect in

girls. There was no evidence of endogenous selection bias when boys and girls were analyzed

separately.

Discussion

The first hypothesis tested in this study held that when data on boys and girls were

analyzed together, the mother and father target pathways (Parental Warmth → Parental Self-

Efficacy → Delinquency) would be significant, the mother and father comparison pathways

(Parental Self-Efficacy → Parental Warmth → Delinquency) would be non-significant, and the

target and comparison pathways for both mothers and fathers would differ significantly from

each other. Results from a large-scale path analysis generally supported this hypothesis, even

when delinquency was treated as a count and subjected to zero-inflated negative binomial

analysis. Mother and father target pathways were significant, mother and father comparison pathways were non-significant, and the mother target pathway was significantly stronger than the mother comparison pathway. The one inconsistent finding was that the father target and comparison pathways did not differ significantly from each other. In each instance, the indirect effect of the target pathway was modestly to moderately robust to the effects of omitted variable bias and there were no signs of endogenous selection bias when precursor measures were removed from the five regression equations. Thus, while there was evidence of two significant indirect effects running from father and mother warmth (support dimension) to father and mother control self-efficacy (control dimension) to child delinquency, there was no evidence of a reverse indirect effect running from control to support to child delinquency.

The second hypothesis tested in this study predicted that a child's gender would moderate the indirect effect of parental warmth on child delinquency such that boys would be primarily influenced by paternal warmth and control self-efficacy and girls would be more sensitive to maternal warmth and control self-efficacy. When boys and girls were analyzed as a group, there was a significant gender x father self-efficacy-6 interaction, thereby justifying separate analyses for boys and girls. In boys, both the mother and father target pathways were significant, although only the father target and comparison pathways were significantly different from one another. In girls, the mother target pathway was significant, whereas the father target pathway was not, although in neither case was there a significant difference between the target and comparison pathways. As with the first hypothesis, results pertaining to the second research hypothesis were modestly to moderately robust to the obfuscating effects of unobserved covariate confounders and there was no evidence of endogenous selection bias or a collider effect.

Theoretical Implications

The goal of the current investigation was to assess potential mechanisms that might link a parenting factor, in this case, parental warmth, to offspring delinquency. There is a wellspring of data showing that parental support and control are capable of meaningfully and reliably predicting future child aggression and delinquency (Hoeve et al., 2009). Much less is known about the mechanisms responsible for this relationship. One could argue, for instance, that parenting factors like maternal and paternal warmth directly protect a child against future delinquency. In the current study, however, the direct effects of Wave 5 mother and father warmth on Wave 7 delinquency were so weak that they achieved a reverse sign (positive instead of negative) effect, the two *b* paths from Wave 6 mother and father warmth to Wave 7 delinquency were not significant, and the zero-order concurrent correlations between Wave 5 mother and father warmth and Wave 5 delinquency were non-significant when tested against a Bonferroni-corrected alpha. This suggests that the direct effect from parental warmth to child delinquency is weak or tenuous at best. It also explains why several studies have failed to identify a link between parental warmth and offspring aggression and problem behavior (e.g., Park & Jung, 2010; Simons et al., 2012). Alternately, parental warmth could have an indirect effect on future delinquency by stimulating one or more mediating mechanisms, at least some of which may be gender specific (maternal warmth and maternal self-efficacy in girls and paternal warmth and paternal self-efficacy in boys).

The purpose of the present set of analyses was to assess whether parental control self-efficacy mediates the parental warmth–child delinquency nexus. Although analyses based on a large sample of Australian children provided support for the proposed pathway and indicate one way in which parental support and control interface with one another, this study is only the first step in a multi-step process. That parental control self-efficacy, alone, is capable of directly

reducing future child delinquency seems improbable. It is more likely that a second mediator, something along the lines of child self-efficacy, serves as a link between parental self-efficacy and child delinquency in a serial multiple mediator design. After all, child self-efficacy has been found to mediate the relationship between parental support/control and child delinquency (Walters, 2018). As previously stated, self-efficacy is normally acquired through performance accomplishments or observational learning (Bandura, 1986). Extrapolating from the prior Walters (2018) investigation to the current study, the full effect could run from parental warmth to parental self-efficacy to child self-efficacy to child delinquency, with the *a* path (parental warmth → parental self-efficacy) representing self-efficacy acquired through performance accomplishments and the *d* path (parental self-efficacy → child self-efficacy) representing self-efficacy acquired through observational learning. Unfortunately, this pathway could not be tested with the LSAC-K sample because it requires four waves of data and the LSAC-K currently only has three adolescent waves.

Practical Implications

A practical implication of the current results is that parental self-efficacy may be an important factor in protecting children against delinquent behavior and preventing early delinquency from becoming more serious over time. This raises the question of how best to promote parental self-efficacy. For over a decade, researchers have claimed that training parents to more effectively discipline their children is one of the best ways of preventing delinquent behavior in children (Welsh & Farrington, 2007), a claim for which there is strong meta-analytic support (Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009; Piquero et al., 2016). Yet, it is also possible that parenting programs work, in part, by enhancing parental control self-efficacy. In the current study, parental warmth, a behavior that has nothing to do with parental discipline,

was selected to represent the performance accomplishment designed to enhance parental control self-efficacy. Hence, it was not parenting skills, per say, that led to decreased future delinquency in the current study, but rather, a warm and supportive parent–child relationship, followed by increase parental control self-efficacy. This speaks to several issues but is particularly germane to current efforts to expand parent training beyond its disciplinary skills origins by teaching parents how to form a warm and trusting bond with their child (Fabiano, 2016).

Self-efficacy, properly conceptualized, is domain-specific. Hence, self-efficacy refers to a person's stated belief in his or her ability to engage in a specific behavior (e.g., coping with the temptation to use drugs), complete a specific task (e.g., remaining focused on a therapeutic homework assignment), or avoid a specific outcome (e.g., falling into recidivism). There is a need, however, to identify what self-efficacy represents to both the parent and child. If we examine the item content of the parenting measure employed in the current study ("behavior of child different from what you want" [reverse coded];" "behavior of child more than you can handle" [reverse coded]; "good at getting what you want from child;" "in control and on top of things with regard to child") the emphasis is as much on the parent's ability to control themselves as it is on the parent's ability to control the behavior of their child (i.e., "more than you can handle;" "get what you want;" "on top of things"). This indicates that the behavioral domain being assessed by this scale relates in some way to self-regulation. Domain-specific self-efficacy, defined as a parent's belief in their ability to support and co-regulate their child's behavior during challenging times, was found by Gärtner et al., (2018) to correlate with the child's own level of inhibitory control and ability to self-regulate. This illustrates how a parent's belief in their ability to control their own behavior for the purpose of managing their child's behavior could serve as a model for how a child can learn how to control their own behavior.

This, in turn, could help complete the pattern (performance accomplishments → parental control self-efficacy → child self-efficacy → delinquency) started but not finished in the present study.

Limitations

The current study sought to fill a gap in the literature on the relationship between parental control self-efficacy and child delinquency. In so doing, it presents with several noteworthy strengths. One strength of this study is that the sample was of sufficient size to accommodate the analyses planned for both the full sample and two subsamples (boys and girls). Mediation analyses are sometimes compromised by low power (Preacher, 2015) but with sample sizes in the thousands, this was not a problem for the current study. Second, cluster sampling, a form of probability sampling, was used to construct the sample and sampling weights improved sample representativeness even more. Third, because data were organized into non-overlapping waves and prior levels of each outcome measure were controlled, there was temporal order and direction between variables (Cole & Maxwell, 2003). Fourth, unlike most survey studies in criminology and criminal justice, the variables were derived from multiple sources (i.e., the child and one or both parents) rather than from a single source (oftentimes the child or parent alone).

The aforementioned strengths notwithstanding, this study also suffers from several limitations. A principal limitation of this study is that only about 40% of the participants had complete data on all 15 study variables. Even so, 97.6% of all participants had complete data on all Wave 5 variables, thereby increasing the precision of FIML as a solution for missing data (Collins et al., 2001). The two-year gap between waves is a third limitation of this study. A two-year gap between waves provides increased opportunities for extraneous variables to affect the results of a study. This is particularly problematic when working with early to mid-adolescents, where developmental change is rapid. A fourth limitation of this study was that several

potentially important third variables, such as child disclosure (Yun et al., 2016) and low self-control (Lippold, Glatz, Fosco, & Feinberg, 2018), could not be controlled because they were not included in the original LSAC. It would be advisable to include such variables in future research on this topic either as independent, mediating, or control variables.

Conclusion

Results from the present investigation, when coupled with prior research, suggest that multiple pathways and mechanisms link parenting to childhood delinquency and that parental control and support can complement one another. The current study isolated one such pathway in which parental warmth promoted increased parental control self-efficacy, which, in turn, decreased levels of future child delinquency. When coupled with previously identified pathways, such as the ones that have been observed between parental warmth, child disclosure/parental knowledge, and child delinquency (Yun, 2016), between parental self-efficacy, maternal depression, and child conduct problems (Weaver et al., 2008), and between parental support, child self-efficacy, and child delinquency (Walters, 2018), the complexity of the relationship between parenting and delinquency becomes apparent. As previously stated, this complexity has important practical implications. Given the presence of multiple pathways between parental warmth and child delinquency, there are multiple mechanisms (e.g., performance accomplishments and modeling) and ways to prevent or inhibit future child delinquency (e.g., increasing parental knowledge by encouraging child disclosure to parents, decreasing maternal depression, amplifying child self-efficacy, or boosting parental self-efficacy). Thus, while multiple pathways muddy the theoretical waters, they offer a range of practical solutions that may be useful in preventing future child delinquency.

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Table 1

Descriptive Statistics and Correlations for the 15 Independent, Dependent, Mediating, and Control Variables

Variable	*n*	*M*	*SD*	Range	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	3934	12.41	0.49	12–13	.01	.03	.04	-.02	-.04	-.03	-.02	.00	-.02	-.02	-.00	.01	.01	.01
2. Gender	3934	0.49	-	0–1		.00	-.12†	.08†	.05	.06	.09†	.09†	.06†	.09†	.06†	.04	-.11†	-.12†
3. Indigenous	3934	0.03	-	0–1			.10†	-.06†	-.04	-.03	-.03	-.03	-.05	-.04	-.03	-.01	.12†	.05
4. Peer Delinquency	3841	10.04	3.08	8–40				-.29†	-.08†	-.10†	-.06	-.09†	-.18†	-.17†	-.18†	-.13†	.36†	.19†
5. Parental Knowledge	3807	11.14	1.34	4–12					.13†	.12†	.12†	.12†	.18†	.12†	.19†	.15†	-.24†	-.16†
6. M Warmth-5	3736	4.16	0.64	1.5–5						.29†	.69†	.26†	.36†	.22†	.30†	.19†	-.04	-.07†
7. F Warmth-5	2436	3.79	0.70	1–5							.28†	.71†	.21†	.39†	.14†	.33†	-.06	-.03
8. M Warmth-6	3215	4.03	0.70	1–5								.32†	.31†	.20†	.36†	.24†	-.03	-.09†
9. F Warmth-6	2259	3.61	0.74	1–5									.20†	.34†	.21†	.42†	-.03	-.07
10. M Self-Efficacy-5	3729	4.10	0.71	1–5										.41†	.58†	.35†	-.16†	-.18†
11. F Self-Efficacy-5	2434	4.18	0.63	1–5											.37†	.59†	-.14†	-.13†
12. M Self-Efficacy-6	3216	4.14	0.72	1–5												.44†	-.14†	-.22†
13. F Self-Efficacy-6	2268	4.17	0.66	1–5													-.10†	-.16†
14. Delinquency-5	3839	1.42	4.37	0–85														.24†
15. Delinquency-7	2882	2.09	5.80	0–82														

Note. Variable = variable name; Age = chronological age in years, Gender = male (0) vs. female (1), Indigenous = non-indigenous (0) vs. indigenous (1), Peer Delinquency = peer delinquency at Wave 5, Parental Knowledge = parental knowledge at Wave 5, M Warmth-5 = mother warmth at Wave 5, F Warmth-5 = father warmth at Wave 5, M Warmth-6 = mother warmth at Wave 6, F Warmth-6 = father warmth at Wave 6; M Self-Efficacy-5 = mother's parental control self-efficacy at Wave 5, F Self-Efficacy-5 = father's parental control self-efficacy at Wave 5; M Self-Efficacy-6 = mother's parental control self-efficacy at Wave 6, F Self-Efficacy-6 = father's parental control self-efficacy at Wave 6, Delinquency-5 = self-reported delinquency at Wave 5, Delinquency-7 = self-reported delinquency at Wave 7; *M* = mean, *SD* = standard deviation; Range = range of scores in current sample.

†*p* < .00048 (Bonferroni-corrected alpha: .05 / 105 correlations).

Table 2

Five-Equation Mediation Path Analysis of Full Sample (Boys and Girls Combined)

Variables	b (95% BCBCI)	β	Z	p
Outcome = M Self-Efficacy-6				
Age	0.015(-0.030, 0.059)	0.010	0.67	.500
Gender	0.022(-0.021, 0.067)	0.015	0.97	.330
Indigenous	-0.037(-0.190, 0.107)	-0.040	-0.50	.618
Peer Delinquency	-0.012(-0.023, -0.002)	-0.052	-2.24	.025
Parental Knowledge	0.042(0.023, 0.061)	0.079	4.29	<.001
M Warmth-5	0.107(0.068, 0.142)	0.096	5.23	<.001
M Self-Efficacy-5	0.535(0.494, 0.574)	0.524	25.74	<.001
Outcome = F Self-Efficacy-6				
Age	0.049(-0.001, 0.100)	0.037	1.94	.053
Gender	-0.026(-0.074, 0.023)	-0.019	-1.03	.304
Indigenous	-0.163(-0.459, 0.139)	-0.041	-1.07	.285
Peer Delinquency	-0.010(-0.020, 0.000)	-0.047	-1.84	.065
Parental Knowledge	0.047(0.023, 0.073)	0.099	3.73	<.001
F Warmth-5	0.102(0.058, 0.143)	0.111	4.76	<.001
F Self-Efficacy-5	0.526(0.473, 0.579)	0.512	19.43	<.001
Outcome = M Warmth-6				
Age	-0.007(-0.047, 0.033)	-0.005	-0.33	.743
Gender	0.091(0.050, 0.132)	0.064	4.35	<.001

Indigenous	-0.079(-0.228, 0.058)	-0.019	-1.08	.279
Peer Delinquency	0.004(-0.003, 0.012)	-0.019	1.17	.241
Parental Knowledge	0.011(-0.006, 0.028)	0.021	1.22	.223
M Self-Efficacy-5	0.067(0.035, 0.102)	0.068	3.99	<.001
M Warmth-5	0.712(0.669, 0.751)	0.655	33.47	<.001
Outcome = F Warmth-6				
Age	0.032(-0.020, 0.084)	0.021	1.20	.232
Gender	0.046(-0.006, 0.100)	0.030	1.70	.089
Indigenous	-0.296(-0.600, -0.068)	-0.065	-2.24	.025
Peer Delinquency	-0.007(-0.018, 0.003)	-0.028	-1.28	.202
Parental Knowledge	0.021(-0.006, 0.048)	0.038	1.51	.130
F Self-Efficacy-5	0.070(0.017, 0.126)	0.059	2.52	.012
F Warmth-5	0.713(0.662, 0.761)	0.675	28.66	<.001
Outcome = Delinquency-7				
Age	0.113(-0.337, 0.574)	0.009	0.49	.627
Gender	-1.046(-1.517, -0.617)	-0.087	-4.55	<.001
Indigenous	0.597(-1.045, 2.927)	0.017	0.60	.548
Peer Delinquency	0.150(0.038, 0.282)	0.079	2.39	.017
Parental Knowledge	-0.160(-0.410, 0.078)	-0.037	-1.28	.201
M Self-Efficacy-5	-0.493(-1.171, 0.177)	-0.059	-1.42	.157
M Warmth-5	0.154(-0.445, 0.722)	0.017	0.51	.611
F Self-Efficacy-5	0.262(-0.387, 1.069)	0.028	0.72	.474
F Warmth-5	0.755(0.101, 1.486)	0.091	2.16	.031

M Self-Efficacy-6	-0.793(-1.595, -0.200)	-0.097	-2.62	.009
M Warmth-6	-0.059(-0.601, 0.514)	-0.007	-0.21	.836
F Self-Efficacy-6	-1.132(-1.955, -0.506)	-0.126	-3.08	.002
F Warmth-6	-0.468(-1.087, 0.110)	-0.059	-1.52	.128
Delinquency-5	0.282(0.137, 0.461)	0.209	3.40	<.001
MSE-5 with FSE-5	0.208(0.178, 0.233)	0.449	17.04	<.001
MSE-5 with MWarm-5	0.172(0.152, 0.193)	0.367	17.12	<.001
MSE-5 with FWarm-5	0.116(0.093, 0.141)	0.224	9.41	<.001
FSE-5 with MWarm-5	0.101(0.082, 0.121)	0.238	10.27	<.001
FSE-5 with FWarm-5	0.191(0.167, 0.216)	0.408	15.10	<.001
MWarm-5 with Fwarm-5	0.154(0.130, 0.177)	0.325	10.27	<.001
MSE-6 with FSE-6	0.084(0.067, 0.100)	0.270	9.73	<.001
MSE-6 with MWarm-6	0.064(0.052, 0.078)	0.213	9.64	<.001
MSE-6 with FWarm-6	0.034(0.017, 0.052)	0.109	3.74	<.001
FSE-6 with MWarm-6	0.034(0.019, 0.050)	0.124	4.36	<.001
FSE-6 with FWarm-6	0.078(0.060, 0.096)	0.278	8.61	<.001
MWarm-6 with Fwarm-6	0.041(0.024, 0.058)	0.152	4.85	<.001

Note. Outcome = outcome measure; Age = chronological age in years; Gender = male (0) vs. female (1); Indigenous = non-indigenous (0) vs. indigenous (1); Peer Delinquency = peer delinquency at Wave 5; Parental Knowledge = parental knowledge at Wave 5; M Warmth-5/MWarm-5 = mother warmth at Wave 5; F Warmth-5/FWarm-5 = father warmth at Wave 5; M Warmth-6/MWarm-6 = mother warmth at Wave 6; F Warmth-6/FWarm-6 = father warmth at Wave 6; M Self-Efficacy-5/MSE-5 = mother's parental control self-efficacy at Wave 5; F Self-Efficacy-5/FSE-5 = father's parental control self-efficacy at Wave 5; M Self-Efficacy-6/MSE-6 = mother's parental control self-efficacy at Wave 6; F Self-Efficacy-6/FSE-6 = father's parental control self-efficacy at Wave 6; Delinquency-5 = self-reported delinquency at Wave 5, Delinquency-7 = self-reported delinquency at Wave 7; with = covariance; b (95% BCBCI) = unstandardized coefficient with 95% bias-corrected bootstrapped confidence interval (in parentheses); β = standardized coefficient; Z = Wald Z statistic, *p* = significance level of the Wald Z statistic; *N* = 3,934.

Table 3

Total, Direct, and Indirect Effects for Pathways Running from Parental Warmth to Delinquency

and from Parental Control Self-Efficacy to Delinquency in the Full Sample

Pathways	Estimate	BCBCI Lower	Upper
M Warmth-5 → Delinquency-7			
Total Effect	0.027	-0.437	0.494
Direct Effect	0.154	-0.445	0.722
Total Indirect Effect	-0.127	-0.500	0.284
Specific Indirect Effect			
MWarm-5 → MSE-6 → Delinquency-7	-0.085	-0.170	-0.026
MWarm-5 → MWarm-6 → Delinquency-7	-0.042	-0.427	0.368
F Warmth-5 → Delinquency-7			
Total Effect	0.306	-0.164	0.830
Direct Effect	0.755	0.101	1.486
Total Indirect Effect	-0.449	-0.919	-0.040
Specific Indirect Effect			
FWarm-5 → FSE-6 → Delinquency-7	-0.116	-0.227	-0.049
FWarm-5 → FWarm-6 → Delinquency-7	-0.333	-0.785	0.079
M Self-Efficacy-5 → Delinquency-7			
Total Effect	-0.921	-1.597	-0.283
Direct Effect	-0.493	-1.171	0.177
Total Indirect Effect	-0.428	-0.757	-0.177
Specific Indirect Effect			

MSE-5 → MWarm-6 → Delinquency-7	-0.004	-0.043	0.035
MSE-5 → MSE-6 → Delinquency-7	-0.424	-0.745	-0.109
F Self-Efficacy-5 → Delinquency-7			
Total Effect	-0.367	-0.918	0.201
Direct Effect	0.262	-0.387	1.069
Total Indirect Effect	-0.628	-1.084	-0.301
Specific Indirect Effect			
FSE-5 → FWarm-6 → Delinquency-7	-0.033	-0.108	0.002
FSE-5 → FSE-6 → Delinquency-7	-0.596	-1.047	-0.267
Preacher-Hayes Contrast Test			
MSE-6 mediator vs. MWarm-6 mediator	-0.081	-0.179	-0.004
FSE-6 mediator vs. FWarm-6 mediator	-0.083	-0.199	0.007

Note. ; M Warmth-5/MWarm-5 = mother warmth at Wave 5; F Warmth-5/FWarm-5 = father warmth at Wave 5; M Warmth-6/MWarm-6 = mother warmth at Wave 6; F Warmth-6/FWarm-6 = father warmth at Wave 6; M Self-Efficacy-5/MSE-5 = mother's parental control self-efficacy at Wave 5; F Self-Efficacy-5/FSE-5 = father's parental control self-efficacy at Wave 5; M Self-Efficacy-6/MSE-2 = mother's parental control self-efficacy at Wave 6; F Self-Efficacy-6/FSE-6 = father's parental control self-efficacy at Wave 6; Delinquency-7 = self-reported delinquency at Wave 7; BCBCI = bias-corrected bootstrapped 95% confidence interval (b = 5,000); Estimate = unstandardized point estimate; Lower = lower boundary of the 95% confidence interval; Upper = upper boundary of the 95% confidence interval; Preacher-Hayes Contrast Test = results from the Preacher and Hayes (2008) contrast test comparing target and comparison pathways; $N = 3,934$.

Figure Caption

Figure 1. Path analysis of the parental warmth → parental self-efficacy → child delinquency and

parental self-efficacy → parental warmth → child delinquency pathways for mothers and fathers

separately.

Note. SE = self-efficacy; Standardized beta coefficients are reported; Control variables are not shown; *N* = 3,934.

*p < .05; **p < .001.

Wave 5   **Wave 6**   **Wave 7**