Self-Efficacy in Parents and Children and its Relationship to Future Delinquent Behavior in Children

Glenn D. Walters
Kutztown University

Author Note

The author would like to express his gratitude to the Australian Government Department of Social Services (DSS), the Australian Institute of Family Studies (AIFS), and the Australian Bureau of Statistics (ABS) for providing access to the Growing Up in Australia: Longitudinal Study of Australian Children database. Address all correspondence concerning this paper to Glenn D. Walters, Department of Criminal Justice, Kutztown University, Kutztown, Pennsylvania 19530-0730; walters@kutztown.edu.

Author Bio

Glenn D. Walters, Ph.D., is a professor in the Department of Criminal Justice at Kutztown University where he teaches classes in corrections and research methods. His principal research interests include offender assessment, mediation analysis, and the development of an overarching psychological theory of crime.

Abstract

A moderated mediation analysis was performed on 3,600 (1,829 boys and 1,771 girls) adolescents from the Longitudinal Study of Australian Children (LSAC). Results from a path analysis revealed that child self-efficacy mediated the relationship between mother control self-efficacy and child delinquency in girls but not in boys and that it mediated the relationship between father control self-efficacy and child delinquency in both boys and girls, with the effect being stronger in girls. Alternately, the direct effect from parental control self-efficacy to child delinquency was stronger in boys than girls. These results suggest that while girls may be discouraged from engaging in delinquency by modeling the self-efficacy of their parents, boys may more likely be dissuaded from delinquency by parenting factors other than modeling.

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

Self-Efficacy in Parents and Children and its Relationship to Future Delinquent Behavior in Children

In their search for a mechanism capable of explaining the role of parenting in child delinquency, researchers have examined a number of variables, including child self-efficacy. Self-efficacy, a construct derived from Bandura's (1986) social cognitive theory of human behavior, can be defined as an individual's belief in their ability to successfully achieve or accomplish a specific behavioral outcome, goal, or task. Studies have shown that positive parenting can lead to child self-efficacy, which, in turn, can inhibit future child delinquency and risk-taking behavior (Juang & Silbersisen, 1999; Olivari, Cucci, Bonanomi, Tagliabue, & Confalonieri, 2018). Still, it is hard to imagine how positive parenting could lead to child self-efficacy without one or more intervening variables. Parent self-efficacy could be one such variable. Using the same sample as that employed in the current investigation, Walters (2019) discerned that the parenting behaviors of maternal and paternal warmth were followed by increased parental control self-efficacy, a psychological status variable. The purpose of the current investigation was to determine whether child self-efficacy can serve as a link between the psychological status variable of parental control self-efficacy and child delinquency.

Bandura (1982) theorizes that there are four pathways through which self-efficacy is learned—enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states—the first two of which—enactive mastery experiences or performance accomplishments and vicarious experiences or modeling—are the most common. Hence, there would appear to be a need for additional research on the development of self-efficacy beliefs in order to more fully understand the ameliorative effect of positive parenting on future delinquency by means of a rise in child self-efficacy. Consistent with Bandura's (1982)

theory, the performance accomplishment of achieving a good supportive relationship with one's child culminated in a greater sense of mastery over the authoritative aspects of parenting in the Walters (2019) study. This indicates that successful performance in a supportive parenting role corresponds with an increase in self-efficacy to perform tasks designed to enhance parental control and that a rise in parental control self-efficacy is then sometimes followed by a reduction in child delinquency. A review of the literature failed to identify any studies detailing the relationship between child and parent self-efficacy. The model tested in the current study held that parent self-efficacy would encourage child self-efficacy, presumably through observational learning channels, which would then encourage reduced involvement in delinquency.

Sex was found to moderate the results from Walters (2019), such that delinquency in girls correlated with mother warmth and self-efficacy but not father warmth and self-efficacy, while delinquency in boys correlated with both. Furthermore, the results of a meta-analysis by Hoeve et al. (2009) showed that parent and child sex moderated the effects of parenting on child delinquency. Finally, proponents of modeling assert that modeling is most effective when the observer shares certain characteristics in common with the model, a process known as model-observer similarity or salience (MOS: Bandura, 1994; Schunk, 1987). Although at least one study uncovered evidence of a gender-based MOS effect (Bussey & Bandura, 1984), most studies that have addressed this issue have failed to obtain additional learning or self-efficacy benefits from observing same-sex versus opposite-sex models (Gallupe, LaLonde, Nguyen, & Schulenberg, 2019; Hoogerheide, van Wermeskerken, van Nassau, & van Gog, 2018; Schunk, Hanson, & Cox, 1987). The results of another study revealed that maternal smoking correlated better with smoking in daughters than with smoking in sons, whereas paternal smoking correlated equally with smoking in daughters and sons (Kandel & Wu, 1995).

Thus, while it is a reasonable assumption that sex would moderate the various pathways in this study, just as it did in the Walters (2019) investigation, the exact nature of this moderating effect is difficult to gauge. It was anticipated that the modeling effect contained in the indirect effect for mother control self-efficacy would be strongest in girls and that the modeling effect encompassed by the indirect effect for father control self-efficacy would be strongest in boys. As a general rule, mothers as role models should have more salience for their daughters than for their sons, whereas fathers as role models should have more salience for their sons than for their daughters. Nevertheless, there are other factors, such as the strength of relationship between a child and parent, that can make one model more salient than another, even if the model and learner are not of the same sex (Ozer & Bandura, 1990).

Present Study

The purpose of this study was to evaluate a model in which child self-efficacy mediated the relationship between parental control self-efficacy and child delinquency through a modeling effect (parental control self-efficacy → child self-efficacy) conditioned on sex. To test this moderated mediation hypothesis, basic demographic measures and three parenting factors that may protect against delinquency (Hoeve et al., 2009)—psychological control (parental use of inductive discipline), supportive parenting (parental warmth), and indirect parenting (parental knowledge)—were controlled. Because the current study and the previous Walters (2019) investigation used the same sample and many of the same participants, the reader may wonder why the two studies were not merged into a single four-wave design starting at Wave 4 when participants were 10/11 years of age. The reason for this was three-fold. First, adding a wave two years before age 12/13 stretches the development time frame from early-to-middle adolescence to late childhood-to-middle adolescence, making the results less informative

developmentally. Second, adding another serial mediator to a design in which there are already two years between waves can result in a significant loss of precision, similar to the loss of fidelity that occurs with the addition of each new connection in an electrical circuit (Preacher, 2015). Third, several important variables were either not measured (i.e., parental knowledge, delinquency) or measured differently (i.e., child self-efficacy) at Wave 4 compared to later waves. The hypothesis tested in this study predicted that sex would moderate the parental control self-efficacy → child self-efficacy → child delinquency relationship such that the mother control self-efficacy pathway would be significantly stronger in girls than in boys and the father control self-efficacy pathway would be significant stronger in boys than in girls.

Method

Participants

Participants for the current 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). At the time the current study was being conducted, each cohort had been evaluated seven times. The B (baby) cohort began in infancy and ran every two years to age 12-13 and the K (kindergarten) cohort began as the child entered kindergarten and ran every two years to age 16-17. Sampling frames were created from the Australian Medicare enrollment database and participants were selected using a two-stage cluster probability sampling technique. The sample for the current investigation was restricted to Cohort K because it covered the age range (early to mid-adolescence) and variables (parental and child self-efficacy) of prime interest in this study.

The sample for this study was comprised of 3,600 LSAC-K members (1,829 boys, 1,771 girls) who, out of a total sample of 4,048 youth (88.9%), possessed complete data on at least

three of the five core variables for this study (i.e., sex, Wave 5 mother control self-efficacy, Wave 5 father control self-efficacy, Wave 6 child self-efficacy, Wave 7 child delinquency). Youth participants were 12.41 years of age (SD = 0.49) at the start of the study and were mostly non-indigenous (97.9%), with 2.0% classified as aboriginal and 0.2% classified as a Torres Strait islander. Although additional data on race were unavailable, over 75% of Australians are White. The vast majority of children (84%) were living in a two-parent home, with an average family income of $845 per week. Slightly more than half the fathers (54%) and nearly two-thirds of the mothers (63%) reported 12 or more years of education. Nearly a third of the children in the LSAC-K reported bullying another child at school in the past month (30.9%), 1.8% reported consuming more than a few sips of alcohol, and 1.7% acknowledged having tried marijuana.

Measures

Parental Control Self-Efficacy. The independent variable for this study was parental control self-efficacy, evaluated separately for mothers and fathers at Wave 5 of the LSAC-K. The scale consisted of four items presented to both mothers and fathers ("behavior of child different from what you wanted" [reverse coded]; "behavior of child more than what you could handle" [reverse coded]; "you are good at getting what you want from child;" "you are in control and on top of things with regard to child"). Each item was rated on a 5-point frequency scale (1= *never/almost never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *always/almost always*) and then averaged to produce a score that could range from 1 to 5. Internal consistency for scores on this measure was good in the current sample of participants (α = .78–.79). Because this scale was developed specifically for the LSAC, there are no validity data available.

Child Self-Efficacy. The mediator variable in this study was child self-efficacy to accomplish something of importance assessed at Wave 6 when the child was 14 to 15 years of

age. High scores on this measure reflect confidence in one's ability to succeed in life and items for this scale were taken from the General Self scale of Marsh's (1990) Self-Description Questionnaire II (SDQ-II). Each of the five items on the scale ("Overall, I have a lot to be proud of;" "Most things I do, I do well;" "Overall, most things I do turn out well;" "I can do things as well as most people;" "If I really try, I can do almost anything I want to") were rated on a five-point Likert-type scale (1 = *false*, 2 = *mostly false*, 3 = *sometimes false, sometimes true*, 4 = *mostly true*, 5 = *true*) and averaged to produce a score that could range from 1 to 5. The internal consistency of scores on the child self-efficacy scale was excellent (α = .89) and research supports the construct and concurrent validity of the SDQ-II based on factor analysis, multitrait-multimethod analysis, and convergent correlations with similar measures (Boyle, 1994).

Child Delinquency. Delinquency at Wave 7 when participants were 16 to 17 years of age served as the dependent variable in this study. The child delinquency scale consisted of 17 items—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—rated on a six-point frequency scale (0 = *not at all*, 1 = *once*, 2 = *twice*, 3 = *three times*, 4 = *four times*, 5 = *five or more times*). Items were assessed over the past year and ratings summed to create a total score that could range from 0 to 85. Two-year stability estimates suggest modest stability between Waves 5 and 6 (r = .22) and high stability between Waves 6 and 7 (r = .55). The items on the scale are very similar to

the Self-Report of Offending (SRO), which has been found to possess good construct, concurrent, and predictive validity (Huizinga, Esbensen, & Weiher, 1991).

Control Variables. Six control variables were included in this study. Three of the control variables were demographic in nature—age (in years), gender (1 = *male*, 0 = *female*), and non-indigenous (1 = *non-indigenous*, 0 = *indigenous*)—and the other three were parenting measures—parental knowledge, parental warmth, and parental inductive. The parental knowledge scale was completed by the child and the parental warmth and inductive scales were completed by the child's parents. The mother warmth and inductive scales were included in the mother self-efficacy analysis and the father warmth and inductive scales were included in the father self-efficacy analysis. All three parenting control variables were assessed at Wave 5 of the LSAC-K.

Parental knowledge was assessed with 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"). Each item was rated on a three-point scale (1 = *parents don't know*, 2 = *parents know a little*, 3 = *parents know a lot*) and the results summed to form a total score that could range from 4 to 12 ($\alpha = .72$). There are no validity data on the parental knowledge, warmth, or induction scales, as they were developed specifically for the LSAC.

Parental warmth was assessed with a six-item scale ("hug child;" "express happiness to child;" enjoy doing things with child;" "warm encounters with child;" "close to child when happy or upset;" "display physical affection"). Each item on the parental warmth measure was rated on a five-point scale (1 = never/almost never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always/almost always) and item scores averaged to create a total score that could range from 1 to 5 ($\alpha = .90$).

Parental use of inductive methods in disciplining the child was the third parental control variable included in this study. The parental inductive scale was composed of five items ("reasons with child when misbehaves;" "gives reasons for rules;" " explains correction;" "explains consequences of behavior;" "emphasizes reasons for rules") scored using a five-point frequency scale (1 = never/almost never, 2 = rarely 3 = sometimes, 4 = often, 5 = always/almost always). Averaging the item scores produced a total score that could range from 1 to 5 ($\alpha = .92$).

Precursor Measures. Cole and Maxwell (2003) recommend controlling for prior levels of each predicted variable when conducting a mediation analysis. There were two predicted variables, the mediator (child self-efficacy at Wave 6) and the dependent variable (child delinquency at Wave 7). Consequently, Wave 5 child self-efficacy and Wave 5 delinquency were added to the two regression equations, one of which predicted child self-efficacy at Wave 6 and the other of which predicted delinquency at Wave 7. In Process, the statistical procedure used to conduct the moderated mediation analyses in this study, all covariates are assigned to all equations and so Wave 5 child self-efficacy and Wave 5 delinquency served as covariates in both regression equations.

Procedure

The LSAC employs a nationally representative sample of children in an effort to study the social, economic and cultural antecedents of youth development over the life course. Two-stage cluster sampling was used to construct two large samples of participants (Cohorts B & K). Postcodes were randomly selected during the first stage of the procedure and individual children were randomly selected from each postcode during the second stage of the procedure. Sampling weights were calculated based on a child's probability of being selected for the study and as a way of adjusting for non-response. The weights were not used to calculate means and standard

deviations but were instead, used to compute correlations and the regression analyses. Use was made of the fifth, sixth, and seventh waves of the LSAC-K when participants were 12/13 (Wave 5), 14/15 (Wave 6), and 16/17 (Wave 7) years of age. Face-to-face interviews were usually performed with the aid of computer-assisted self-interviewing technology. This study was approved by the Institutional Review Board at Kutztown University.

Research Design

A three-wave fixed-sample longitudinal panel design was employed in the current study. Although all study variables were assessed in all three waves, the independent variables (mother and father control self-efficacy) were taken from Wave 5, the mediator (child self-efficacy) was taken at Wave 6, and the dependent variable (child delinquency) was taken at Wave 7. The six control variables (age, sex, indigenousness, parental warmth, parental knowledge, and parental inductive) and two precursor measures (prior child self-efficacy and prior delinquency) were all taken at Wave 5. Besides serving as a control variable, sex was treated as a moderator variable and its effect on both the mediator and dependent variables was tested by calculating its interaction with each of the two independent variables. Two pathways were tested in this study: one of which ran from mother control self-efficacy at Wave 5 to child self-efficacy at Wave 6 to child delinquency at Wave 7 and the other of which ran from father control self-efficacy at Wave 5 to child self-efficacy at Wave 6 to child delinquency at Wave 7.

Data Analytic Plan

Path analyses were performed with Hayes' (2018) Process macro for SPSS (Model 8) where indirect effects, path coefficients, and moderation are all tested using a least squares regression approach and percentile bootstrapped 95% confidence intervals (5,000 bootstrapped replications). Bootstrapping was particularly important because the dependent variable was

positively skewed (Delinquency-7). A significant confidence interval is one that excludes zero. Two sensitivity tests were calculated. Kenny's (2013) "failsafe ef" procedure—$(r_{my.x})$ x $(sd_{m.x})$ x $(sd_{y.x})$ / (sd_m) x (sd_y)—was used to test for omitted variable bias. The coefficient produced by this procedure denotes how well a confounding covariate would need to correlate with the mediating and dependent variables, controlling for the independent and mediating variables in the case of the latter, to eliminate the *b* path coefficient of a significant indirect effect. A second sensitivity test, this one designed to rule out endogenous selection bias or a collider effect, was conducted by running the analyses without precursor measures given that conditioning on a precursor can sometimes inflate path coefficients (Elwert & Winship, 2014). Finally, a reverse or backwards model analysis was performed by switching the independent and mediator variables such that child self-efficacy became the independent variable and parental control self-efficacy the mediator variable. This was done in order to assess the importance of variable order and further rule out third variable explanations of the results.

Missing Data

Of the 3,600 children who participated in this study, nearly half (*n* = 1638, 46.3%) had complete data on all 14 variables. Another 9.6% of participants were missing data on one variable, 4.9% were missing data on two variables, 25.5% were missing data on three variables, 11.4% were missing data on four variables, and 2.5% were missing data on five to nine variables. In addition, there were five variables that had more than 5% missing data: Child Self-Efficacy-6 (9.4%), Delinqency-7 (21.5%), Father Warmth (35.1%), Father Self-Efficacy-5 (35.1%), and Father Inductive (35.6%). Missing data were handled with expectation maximization (EM), a procedure that has been found to be significantly less biased than traditional missing value procedures such as listwise deletion and simple imputation (Allison, 2002).

Results

Preliminary Analyses

Table 1 lists descriptive statistics and correlations for all 14 variables. A little more than half the correlations in Table 1 were significant when evaluated against a Bonferroni-corrected alpha level ($p < .00055$). Child delinquency at Waves 5 and 7 were the only variables with significant skew (6.1–6.8). Collinearity diagnostics were run in an effort to determine whether there was evidence of multicollinearity between predictor variables. The resulting analysis failed to show signs of multicollinearity: tolerance = .681–.999; variance inflation factor = 1.001–1.468.

Main Analyses

Table 2 summarizes the results of a two-regression equation path analysis using mother control self-efficacy as the independent variable. As shown, the independent variable (mother control self-efficacy: MSE), moderator variable (sex), and the MSE x sex interaction all predicted Wave 6 child self-efficacy, controlling for age, non-indigenous, parental knowledge, warmth, and induction, along with Wave 5 child self-efficacy and delinquency. MSE, sex, and their interaction also predicted delinquency at Wave 7. The effect of the MSE x sex interaction on Wave 6 child self-efficacy is depicted in the upper panel of Figure 1 and its effect on Wave 7 child delinquency is portrayed in the lower panel of Figure 1. The upper panel denotes that self-efficacy in girls but not boys correlated with the mother's level of control self-efficacy, and the lower panel connotes that maternal self-efficacy predicted lower levels of delinquency in both boys and girls, although the effect was stronger in boys. On the other hand, the indirect effect of mother control self-efficacy on delinquency via child self-efficacy was significant in girls (95%

PBCI = -0.1998, -0.0663) but not boys (95% PBCI = -0.0663, 0.0229), and significantly stronger in girls than boys (Index of Moderated Mediation 95% PBCI = 0.0431, 0.1818).

The results varied slightly when father control self-efficacy (FSE) replaced mother control self-efficacy as the independent variable in the regression analysis. As outlined in Table 3, sex, father control self-efficacy (FSE), and the FSE x sex interaction both predicted child self-efficacy in the equation where child self-efficacy served as the outcome measure and FSE and sex both predicted delinquency in the equation where child delinquency served as the outcome measure. In the second equation, the FSE x sex interaction achieved significance in the OLS regression but not when 95% percentile bootstrapped confidence intervals were examined. Graphs of the two interactions (not shown) were similar but less extreme than those depicted in Figure 1 and revealed that the effect of father self-efficacy on child self-efficacy was stronger in girls than in boys and its effect on child delinquency was stronger in boys than in girls. Even though the indirect effects for girls (95% PCBI = -0.2690, -0.0878) and boys (95% PCBI = -.1314, -0.0117) were both significant, the effect in girls was significantly stronger than that obtained with boys (Index of Moderated Mediation 95% PBCI = 0.0288, 0.1960).

Sensitivity Testing

The “failsafe ef” coefficient for the indirect effect of mother control self-efficacy on child delinquency via child self-efficacy was -.20 in girls and the “failsafe ef” coefficient for the indirect effect of father control self-efficacy on child delinquency via child self-efficacy was -.19 in girls and -.13 in boys. What this means is that an unobserved confounding covariate would need to correlate -.20 with child self-efficacy and -.20 with child delinquency, controlling for mother self-efficacy and child self-efficacy in the case of child delinquency, to completely eliminate the *b* path of the significant mother control self-efficacy indirect effect. Likewise, a

confounding covariate would need to correlate -.19 in girls and -.13 in boys with both child self-efficacy and child delinquency, controlling for father self-efficacy and child self-efficacy in the case of child delinquency, to bring the *b* path coefficient of the significant father control self-efficacy indirect effects down to zero.

Whereas the "failsafe ef" is used to assess for omitted variable bias, removing all precursor measures from the regression equations and recalculating the analysis is designed to test for endogenous selection bias or what is more commonly referred to as a collider effect. A collider effect can occur because conditioning on the precursor to an outcome has the capacity to artificially inflate one or more path coefficients (Elwert & Winship, 2014). When Child Self-Efficacy-5 and Delinquency-5 were removed from the two regression equations, there were modest to moderate improvements in the path coefficients, outcomes inconsistent with the presence of a collider effect.

Reverse Modeling

A reverse or backwards mediation analysis was performed in an effort to rule out a third variable explanation for the relationship between the independent (parental self-efficacy) and mediator (child self-efficacy) variables. To rule out a third variable explanation of the *a* path association, a reverse analysis was performed in which child self-efficacy at Wave 5 became the independent variable and parental self-efficacy at Wave 6 became the mediator variable. When the switch was made between mother control self-efficacy and child self-efficacy, the indirect effect was non-significant in both boys (95% PBCI = -0.0139, 0.0046) and girls (95% PBCI = -0.0121, 0.0073). A similar outcome was obtained when father control self-efficacy and child self-efficacy were switched. Again, there was no effect for boys (95% PBCI = -0.0091, 0.0141) or for girls (95% PBCI = -0.0230, 0.0028).

Discussion

The first part of the hypothesis tested in this study held that sex would moderate the relationship between parental control self-efficacy and child self-efficacy. This part of the hypothesis received support in that mother control self-efficacy and father control self-efficacy both interacted with sex in association with child self-efficacy, despite the use of a constricted sample (i.e., most participants displayed high self-efficacy and low delinquency). The second part of the hypothesis, which held that girls would be more apt to model the behavior of their mothers and boys the behavior of their fathers, received only partial support. Thus, while the modeling effect for mother self-efficacy, consistent with predictions, was confined to girls, the modeling effect for father self-efficacy was significant for both boys and girls and contrary to predictions, stronger for girls than for boys. These results are similar to those obtained by Kandel and Wu (1995) whereby maternal modeling of cigarette smoking was stronger for daughters than for sons, just as the modeling effect of mother self-efficacy was present for girls but not for boys in the current study. The two studies diverge, however, in their estimation of the father modeling effect. Rather than sons and daughters being equally affected by their fathers' modeling of smoking behavior, as they were in the Kandel and Wu (1995) study, girls were more likely to model father self-efficacy than boys in the current investigation. This suggests that parent control self-efficacy, regardless of whether it was modeled by the mother or father, was more salient for girls than it was for boys.

The results of this study indicate that early adolescent boys and girls both respond to parental control self-efficacy, but in different ways. Child self-efficacy, which predicted lower levels of future delinquency in both boys and girls, aligned more closely with parental self-efficacy in girls. Thus, while boys displayed higher levels of self-efficacy than girls, the self-

efficacy of girls was significantly more responsive to prior levels of mother and father control self-efficacy. The direct effect of parental control self-efficacy on child delinquency, by contrast, was stronger in boys than in girls. Thus, while girls were more likely to model the self-efficacy of their parents, boys were perhaps more likely to benefit from other consequences of parental control self-efficacy, such as fear/respect and opportunity. Parents with strong control self-efficacy beliefs are confident in their ability to manage their child's behavior. Parental confidence could, in turn, promote fear and/or respect in a misbehaving child or reduce the child's opportunities for future misbehavior through increased parental surveillance. The role of fear as a hedge against crime and antisocial behavior has been largely overlooked in criminology, but it may help reduce risk for certain forms of crime (Pickett, Roche, & Pogarsky, 2018). In addition, active parental surveillance has been found to covary negatively with offspring offending above and beyond passive parental knowledge (Lahey, Van Hulle, D'Onofrio, Rodgers, & Waldman, 2008).

The practical implications of the current results build on the possibility that we may be able to reduce crime by addressing the self-efficacy needs of parents and children. Revisiting Bandura's (1994) four sources of self-efficacy, we can see, based on the current results, how performance accomplishments and modeling can be used to enhance self-efficacy. Training parents to be effective disciplinarians has been shown to reduce delinquency in affected offspring (Piquero et al., 2016). Because parenting programs are often run in groups, they provide parents with the opportunity to model effective parenting practices and thus further improve their control self-efficacy. Child self-efficacy can also be enhanced, not only by modeling the control self-efficacy they observe in their parents, but also with performance accomplishments of their own, from learning prosocial skills designed to increase positive peer

associations and resistance skills designed to decrease negative peer associations. The other two sources of self-efficacy cited by Bandura are verbal persuasion and physiological and affective states. Verbal persuasion and physiological and affective states could also increase self-efficacy beliefs—verbal persuasion, by providing the child with practical and realistic feedback, and physiological and affective arousal, by inducing a positive mood state.

There are several study limitations that should be mentioned. First, the large sample may have created statistically significant effects of questionable practical utility. It should be noted, however, that mediation analysis in general, and moderation mediation in particular, normally produce small effects (Kenny & Judd, 2014), and thus require larger samples. What is more, sensitivity testing revealed that the results were modestly to moderately robust to the effects of unmeasured covariate confounders and reverse modeling showed that switching the independent and mediator variables produced nonsignificant pathways in a sample that had previously produced significant pathways running from parent to child self-efficacy. Second, although the internal consistency reliability of most of the variables in this study ran from adequate to excellent, most of the measures were developed specifically for the LSAC and have not been formally validated. Third, the parental self-efficacy measure used in this study was specific to parental control, whereas the child self-efficacy scale assessed self-efficacy for success more generally. There are any number of ways this could have affected the results, but the most likely outcome was that it reduced the size of the parent–child self-efficacy correlation.

In the past, criminological theory and research have focused almost exclusively on the negative or risk side of the risk/prevention equation. The current study, however, indicates that positive or promotive factors may also play a role in early delinquency, albeit on the positive or preventive side. The current study, in conjunction with the previous Walters (2019)

investigation, demonstrate that success in one realm of parenting can lead to success in another realm and that this success can protect a child from future criminal involvement, in part, by increasing the child's sense of mastery and general self-efficacy. Additional research is nonetheless required to achieve a thorough, complete, and informed understanding of how the positive lessons provided by parents and others, including siblings, peers, and teachers, can be brought to bear on the ubiquitous problem of juvenile delinquency.

References

Allison, P. D. (2002). *Missing data*. Thousand Oaks, CA: Sage.

Australian Institute of Family Studies. (2018). *Longitudinal Study of Australian Children Data User Guide – December 2018*. Melbourne: Australian Institute of Family Studies.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37,* 122–147.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71–81). New York: Academic Press.

Boyle, G. J. (1994). Self-Description Questionnaire II. In D. J. Keyser & R. C. Sweetland, *Test Critiques* (Vol. X, pp. 632–643). Kansas City, MO: Test Corporation of America.

Bussey, K., & Bandura, A. (1984). Influence of gender constancy and social power on sex-linked modeling. *Journal of Personality and Social Psychology, 47*, 1292–1302.

Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*, 558–577.

Elwert, F., & Winship, C. (2014). Endogenous selection bias: The problem of conditioning on a collider variable. *Annual Review of Sociology, 40*, 31–53.

Gallupe, O., LaLonde, P., Nguyen, H., & Schulenberg, J. (2019). A randomized trial testing deviant modeling, peer gender, and theft: Replication and extension. *Journal of Experimental Criminology, 15*, 421–439.

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). New York: Guilford.

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

Hooerheide, V., van Wermeskerken, M., van Nassau, H., & van Gog, T. (2018). Model-observer similarity and task-appropriateness in learning from video modeling examples: Do model and student gender affect test performance, self-efficacy, and perceived competence? *Computers in Human Behavior, 89*, 457–464.

Huizinga, D., Esbensen, F.-A., & Weiher, A. W. (1991). Are there multiple paths to delinquency? *Journal of Criminal Law and Criminology, 82*, 83–117.

Juang, L. P., & Silbereisen, R. K. (1999). Supportive parenting and adolescent adjustment across time in former East and West Germany. *Journal of Adolescence, 22*, 719–736.

Kandel, D. B., & Wu, P. (1995). The contributions of mothers and fathers to the intergenerational transmission of cigarette smoking in adolescence. *Journal of Research on Adolescence, 5*, 225–252.

Kenny, D. A. (2013). *Mediation: Sensitivity analysis* [webinar]. Retrieved from http://davidakenny.net/webinars/Mediation/Sensitivity/Sensitivity.html.

Lahey, B. B., Van Hulle, C. A., D'Onofrio, B. M., Rodgers, J. L., & Waldman, I. D. (2008). Is parental knowledge of their adolescent offspring's whereabouts and peer associations spuriously associated with offspring delinquency? *Journal of Abnormal Child Psychology, 36*, 807–823.

Marsh, H.W. (1990). *Self-Description Questionnaire-II: Manual and research monograph*. San Antonio, TX: Psychological Corp.

Olivari, M. G., Cucci, G., Bonanomi, A., Tagliabue, S., & Confalonieri, E. (2018). Retrospective paternal and maternal parenting styles, regulatory self-efficacy and adolescent risk taking. *Marriage and Family Review, 54*, 282–295.

Ozer, E. M., & Bandura, A. (1990). Mechanisms governing empowerment effects: A self-efficacy analysis. *Journal of Personality and Social Psychology, 58*, 472–486.

Pickett, J. T., Roche, S. P., & Pogarsky, G. (2018). Toward a bifurcated theory of emotional deterrence. *Criminology, 56*, 27–58.

Piquero, A. R., Jennings, W. G., Diamond, B, Farrington, D. P., Tremblay, R. E., Welsh, B. C., & Reingle Gonzalez, J. M. (2016). A meta-analysis update on the effects of early family/parent training programs on antisocial behavior and delinquency. *Journal of Experimental Criminology, 12*, 229–248.

Preacher, K. J. (2015). Advances in mediation analysis: A survey and synthesis of new developments. *Annual Review of Psychology, 66*, 825–852.

Schunk, D. H. (1987). Peer models and children's behavioral change. *Review of Educational Research, 57*, 149–174.

Schunk, D. H., Hanson, A. R., & Cox, P. D. (1987). Peer-model attributes and children's achievement behaviors. *Journal of Educational Psychology, 79*, 54–61.

Walters, G. D. (2019). *Delinquency as a consequence of parental warmth and self-efficacy: Total sample and individual male and female mediation analyses*. Manuscript submitted for review.

Table 1

Descriptive Statistics and Correlations for the 14 Independent, Dependent, Mediating, Moderating, and Control Variables

Variable	*n*	*M*	*SD*	Range	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	3600	12.41	0.49	12–13	-.00	-.02	-.02	-.03	-.03	-.01	.02	-.02	-.02	-.02	-.00	.02	.02
2. Sex	3600	0.51	-	0–1		.01	-.07†	-.03	-.05	.06†	.10†	-.05	-.08†	.01	.09†	.12†	.12†
3. Non-Indigenous	3600	0.98	-	0–1			.07†	.02	.02	-.01	.03	.03	.02	.05	.02	-.13†	-.07†
4. Parental Knowledge	3509	11.16	1.30	4–12				.13†	.14†	-.00	-.00	.17†	.14†	.23†	.17†	-.22†	-.16†
5. M Warmth	3458	4.16	0.63	1.5–5					.32†	.36†	.08†	.37†	.23†	.10†	.09†	-.02	-.06
6. F Warmth	2413	3.79	0.70	1–5						.11†	.42†	.22†	.40†	.09†	.11†	-.04	-.04
7. M Inductive	3461	3.99	0.79	1–5							.20†	-.06†	-.06	-.01	-.02	.05	.04
8. F Inductive	2395	3.78	0.77	1–5								-.03	.05	-.01	-.01	.04	.02
9. M Self-Efficacy-5	3452	4.12	0.70	1–5									.42†	.16†	.14†	-.12†	-.18†
10. F Self-Efficacy-5	2412	4.18	0.63	1–5										.14†	.16†	-.12†	-.14†
11. C Self-Efficacy-5	3539	4.09	0.69	1–5											.48†	-.12†	-.10†
12. C Self-Efficacy-6	3274	3.97	0.73	1–5												-.07†	-.15†

13. Delinquency-5	3537	1.34	4.20	0–85	.28†
14. Delinquency-7	2877	2.09	5.81	0–82	

Note. Variable = variable name, Age = chronological age in years, Sex = male (1) vs. female (0), Non-Indigenous = non-indigenous (1) vs. indigenous (0), Parental Knowledge = parental knowledge at Wave 5, M Warmth = mother warmth at Wave 5, F Warmth = father warmth at Wave 5, M Inductive = mother use of inductive discipline at Wave 5, F Inductive = father use of inductive discipline at Wave 5, M Self-Efficacy-5 = mother control self-efficacy at Wave 5, F Self-Efficacy-5 = father control self-efficacy at Wave 5, C Self-Efficacy-5 = child self-efficacy at Wave 5, C Self-Efficacy-6 = child self-efficacy at Wave 6, Delinquency-5 = self-reported child delinquency at Wave 5, Delinquency-7 = self-reported child delinquency at Wave 7, *M* = mean, *SD* = standard deviation, Range = range of scores in current sample. †$p < .00055$ (Bonferroni-corrected alpha: .05 / 91 correlations).

Table 2

Mediation Path Analysis with Mother Control Self-Efficacy as the Independent Variable

Variables	**b**	**SE**	**t**	***p***	**95% PBCI**
Outcome = C Self-Efficacy-6					
Constant	4.727	1.504	3.14	.002	
Age	0.094	0.104	0.91	.363	[-0.1089, 0.3002]
Sex	2.779	0.623	4.46	<.001	[1.6072, 4.0658]
Non-Indigenous	-0.029	0.355	-0.08	.935	[-0.6371, 0.5943]
Parental Knowledge	0.165	0.039	4.20	<.001	[0.0821, 0.2457]
M Warmth	0.159	0.097	1.64	.102	[-0.0434, 0.3569]
M Inductive	-0.033	0.014	-2.28	.022	[-0.0608, -0.0043)
M Self-Efficacy-5	0.624	0.116	5.36	<.001	(0.4203, 0.4880)
MSE-5 x Sex	-0.524	0.149	-3.51	<.001	(-0.8223, -0.2449)
C Self-Efficacy-5	0.454	0.016	29.28	<.001	(0.4203, 0.4880)
Delinquency-5	-0.026	0.013	-2.07	.039	(-0.0560, 0.0030)
Outcome = Delinquency-7					
Constant	9.605	2.427	3.96	<.001	
Age	0.075	0.167	0.45	.653	[-0.2519, 0.4100]
Sex	4.360	1.006	4.33	<.001	[1.2280, 7.8181]
Non-Indigenous	-0.920	0.572	-1.61	.108	[-2.3219, 0.3863]
Parental Knowledge	-0.191	0.064	-2.99	.003	[-0.3412, -0,.0350]
M Warmth	-0.083	0.157	-0.53	.599	[-0.4085, 0.2469]

M Inductive	0.007	0.023	0.28	.776	[-0.0300, 0.0423]
M Self-Efficacy-5	-0.599	0.188	-3.18	.002	[-0.9078, -0.2942]
MSE-5 x Sex	-0.820	0.240	-3.41	<.001	[-1.6217, -0.1018]
C Self-Efficacy-6	-0.200	0.027	-7.46	<.001	[-0.2798, -0.1329]
C Self-Efficacy-5	0.020	0.028	0.72	.474	[-0.0498, 0.0885]
Delinquency-5	0.253	0.021	12.30	<.001	[0.1408, 0.3799]

Note. Outcome = outcome measure, Age = chronological age in years, Sex = male (1) vs. female (0), Non-indigenous = non-indigenous (1) vs. indigenous (0), Parental Knowledge = parental knowledge at Wave 5, M Warmth = mother warmth at Wave 5, M Inductive = mother use of inductive discipline at Wave 5, M Self-Efficacy-5/MSE-5 = mother control self-efficacy at Wave 5, C Self-Efficacy-5 = child self-efficacy at Wave 5, C Self-Efficacy-6 = child self-efficacy at Wave 6, Delinquency-5 = self-reported child delinquency at Wave 5, Delinquency-7 = self-reported child delinquency at Wave 7, MSE-5 x Sex = interation between mother control self-efficacy at Wave 5 and sex, b= unstandardized coefficient, SE = standard error, t = asymptotic t-test statistic, *p* = significance level of the asymptotic t-test statistic, 95% PBCI = percentile bootstrapped 95% confidence interval, *N* = 3,600.

Table 3

Mediation Path Analysis with Father Control Self-Efficacy as the Independent Variable

Variables	**b**	**SE**	**t**	***p***	**95% PBCI**
Outcome = C Self-Efficacy-6					
Constant	3.118	1.532	2.04	.042	
Age	0.124	0.103	1.20	.230	[-0.0831, 0.3306]
Sex	2.832	0.792	3.58	<.001	[1.2794, 4.4967]
Non-Indigenous	-0.025	0.353	-0.07	.943	[-0.6682, 0.6163]
Parental Knowledge	0.151	0.039	3.83	<.001	[0.0635, 0.2327]
F Warmth	0.345	0.104	3.33	<.001	[0.1320, 0.5758]
F Inductive	-0.041	0.014	-2.82	.005	[-0.0694, -0.0113]
F Self-Efficacy-5	0.846	0.148	5.72	<.001	[0.5292, 1.1814]
FSE-5 x Sex	-0.522	0.188	-2.76	.006	[-0.9126, -0.1558]
C Self-Efficacy-5	0.449	0.015	29.08	<.001	[0.4151, 0.4838]
Delinquency-5	-0.020	0.013	-1.57	.116	[-0.0522, 0.0098]
Outcome = Delinquency-7					
Constant	9.118	2.489	3.66	<.001	
Age	0.064	0.168	0.38	.704	[-0.2664, 0.3879]
Sex	4.176	1.289	3.24	.001	[0.5751, 8.0783]
Non-Indigenous	-0.898	0.574	-1.56	.118	[-2.2491, 0.3457]
Parental Knowledge	-0.219	0.064	-3.42	<.001	[-0.3733, -0.0648]
F Warmth	0.254	0.169	1.50	.133	[-0.498, 0.5707]

F Inductive	0.028	0.024	1.21	.227	[-0.0096, 0.0671]
F Self-Efficacy-5	-0.770	0.241	-3.19	.001	[-1.1305, -0.4357]
FSE-5 x Sex	-0.770	0.306	-2.51	.012	[-1.6629, 0.0429]
C Self-Efficacy-6	-0.198	0.027	-7.31	<.001	[-0.2755, -0.1302]
C Self-Efficacy-5	0.015	0.028	0.54	.594	[-0.0577, 0.0845]
Delinquency-5	0.250	0.021	12.05	<.001	[0.1457, 0.3723]

Note. Outcome = outcome measure, Age = chronological age in years, Sex = male (1) vs. female (2), Indigenous = non-indigenous (1) vs. indigenous (2), Parental Knowledge = parental knowledge at Wave 5, M Warmth = mother warmth at Wave 5, M Inductive = mother use of inductive discipline at Wave 5, F Self-Efficacy-5/FSE-5 = father control self-efficacy at Wave 5, C Self-Efficacy-5 = child self-efficacy at Wave 5, C Self-Efficacy-6 = child self-efficacy at Wave 6, Delinquency-5 = self-reported child delinquency at Wave 5, Delinquency-7 = self-reported child delinquency at Wave 7, FSE-5 x Sex = interation between father self-efficacy at Wave 5 and sex, b= unstandardized coefficient, SE = standard error, t = asymptotic t-test statistic, p = significance level of the asymptotic t-test statistic, 95% PBCI = percentile bootstrapped 95% confidence interval, N = 3,600.

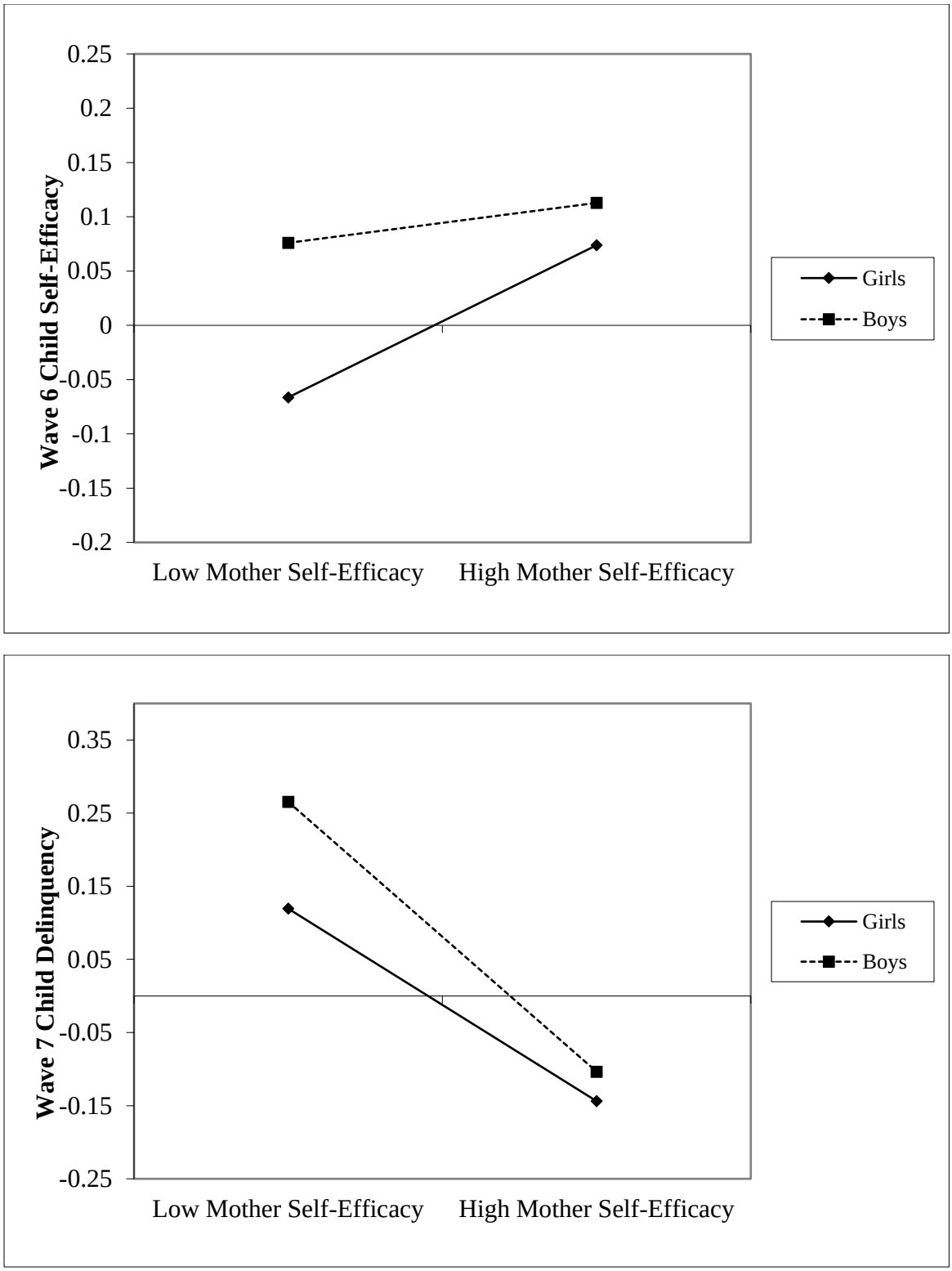

Figure 1. *Effect of interactions between child sex and mother control self-efficacy on child self-efficacy (upper panel) and child delinquency (lower panel)*