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PRECURSORS TO ADOLESCENT DELINQUENCY AND RISK-TAKING BEHAVIOR

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PEER RELATIONS AND AGGRESSION:

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DEPARTMENT OF PSYCHOLOGY

BY

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Abstract

Adolescent problem behaviors are an important area of investigation because of the long-term implications of engaging in risky and delinquent behaviors. Past research has focused on overt aggression and peer rejection as an indicator of negative outcomes, without accounting for relational aggression. This research hopes to expand on our understanding of the pathways to adolescent problem behaviors by longitudinally assessing 377 high school students from a Northeastern town over the course of grades 10, 11, and 12. SEM analyses indicate that overt aggression continues to be a strong indicator for negative outcomes and relational aggression is an important indicator of both positive and negative outcomes above and beyond overt aggression via moderation by peer rejection. While the use of relational aggression paired with low levels of peer rejection indicated the highest risk of negative outcomes, higher levels of peer rejection conferred a small decrease on rates of the measured outcomes. Future studies combining ideas from research on both delinquency and popularity are needed to fully understand the impact of relational aggression on adolescent outcomes.

Peer Relations and Aggression:
Precursors to Adolescent Delinquency and Risk-Taking Behavior

Adolescent problem behaviors, such as delinquency, substance use, and other health risk behaviors, can be detrimental to adult functioning, as well as have the chance to involve further criminality that carries forward into adulthood (Barnes, Welte, Hoffman, & Dintcheff, 2005; Benda, 2002; Patterson, DeBaryshe, & Ramsey, 1989; Wanner, Vitaro, Carbonneau, & Tremblay, 2009). Past research has shown that there are a multitude of factors that can increase or decrease problem behaviors and reviews by both Barnes et al. (2005) and Petraitis, Flay, and Miller (1995) categorized these into essentially the same three groupings of variables: sociodemographic, individual, and social. While sociodemographic variables most certainly play a part in whether adolescents engage in problem behaviors, due to the sheer number of factors that can influence problem behaviors, this research will focus on only a few particularly well documented and more proximal social relations factors, specifically those that are related to the adolescent peer group. This focus on peer relations is due to the salience of the peer group during adolescence and decreasing parental monitoring as adolescents explore their newfound independence (Chen, Drabick, & Burgers, 2015).

The goal of this research is to better clarify the pathway, or pathways, that lead to delinquency and risk-taking behaviors in adolescents. To do that, this study tests competing models of the longitudinal associations between overt and relational aggression and later delinquent and risk-taking behaviors in adolescence. According to Moffitt (1993), there are two types of adolescents engaging in problem behaviors; those who are going through adolescence-limited delinquency and those who have life-course persistent delinquency. Adolescence-limited delinquents tend to temporarily engage in behaviors that they see as “adult”, such as substance

use and sexual activity, and while these behaviors are seen as problems to many outsiders, they are typically not of much long-term concern (Moffitt, 1993). The alternative is life-course persistent delinquency, which is much more of a cause for concern and potential intervention during adolescence because people who follow this course have much more difficulty in adulthood with breaking out of the problem behaviors that began in their youth, which tends to lead to criminality and poor quality of living (Moffitt, 1993). While this conceptualization helps us understand the surge in problem behaviors that we tend to see in adolescence, it does not provide a full picture of why some adolescents fall into one or the other group, and why some do not partake in these behaviors at all.

One of the most important and well documented precursors to joining a deviant peer group and engaging in delinquent and risk-taking behaviors is physically aggressive behavior (Benda, 2002; Prinstein & La Greca, 2004; Smith, Rose, & Schwartz-Mette, 2009; Snyder, Dishion, & Patterson, 1986). A large body of literature links physical aggression to later delinquency, substance use, and criminal outcomes (for a review, see Dodge, Coie, & Lynam, 2006). In fact, research shows that adolescents with traits such as aggression or impulse control issues tend to self-select other peers who have similar conduct problems (Chen et al., 2015; Snyder et al., 1986).

However, relational aggression is a somewhat newer concept and has not been the subject of as much study as physical aggression. Despite the paucity of research on relational aggression, there is some evidence that relational forms of aggression may serve as a precursor to later problems as well (Bowie, 2010). Furthermore, given that adolescent girls are far more likely to use relational aggression than physical aggression (Bowie, 2010; Crick, 1996), it is important to

address relational aggression as a predictor of problem behaviors in order to capture a potentially important developmental process that is largely understudied.

However, research also suggests that the link between aggression and later delinquency and risk-taking behaviors is not universal. Many children and adolescents display aggression, but do not experience later adjustment issues or other negative outcomes. For example, research with adolescents shows that aggression and other problem behaviors are associated with *both* high and low peer status (e.g., Cillessen & Mayeux, 2004), including peer rejection but also peer popularity (social visibility and power; Cillessen & Marks, 2011). Moffitt (1993) captured these two different pathways in her distinction between adolescence-limited and life-course persistent delinquents, as described above. Thus, it is important to test peer status as a mediating and moderating factor in the longitudinal association between aggression and problem behavior. In this study, we focus on peer rejection as that potential mediator and moderator and test the effects of both. The problem behavior outcome variables of interest for this study are deviant peer group affiliation, delinquency, and risk-taking behaviors, specifically alcohol use, drug use, and weapon carrying.

Overt and Relational Aggression

While the focus of the present research is on aggression in adolescence, the field has shown that aggression is relatively stable from childhood into adolescence for both males and females (Chen et al., 2015; Crick, 1996; Janes, Hasselbrock, Myers, & Penneman, 1979; Prinstein & La Greca, 2004). Much of the early research focused on males because the aggressive behavior of interest was more physical in nature. Research has shown that females tend to not be as physically aggressive as males, perhaps due to socialization (Smith et al., 2009). The same research also tended to focus on children, since the goal of much of that research was

on early intervention, which led to a gap in our understanding of the continued role that aggression plays in adolescence, especially for females. Since this gender difference could have implications for the types and rates of outcomes we are focusing on, gender will also be analyzed as a covariate in the analyses.

One thing to keep in mind when discussing aggression is the different types of aggression which are typically found to differ by gender or other traits. As noted previously, much of the research has focused specifically on physical aggression, which is typically not used by females. For this study, aggression will be divided into overt aggression and relational aggression. Overt aggression includes behaviors that are either physical in nature or threatening (Dodge et al. 2006). Overt aggression is typically not as accepted by peers and it is much more common in males, since it is very similar in conceptualization to physical aggression. In a review of the research at the time, Parker and Asher (1987) concluded that aggression, with a focus on overt aggression, was one of the best predictors of negative outcomes, specifically dropping out of school and criminality.

Relational aggression focuses on harming relationships and includes behaviors such as spreading rumors and excluding people from the peer group (Crick & Grotpeter, 1995). Relational aggression is commonly seen as the way that females aggress, but males also use relational aggression (Skara, Pokhrel, Weiner, Sun, Dent, & Sussman, 2008; Smith et al., 2009). The difference is that the adolescents who solely use relational aggression are significantly more likely to be female (Smith et al., 2009). Girls are more strongly socialized against aggression and might learn how to use more subtle forms of aggression, so they can maintain acceptance amongst their peers. In fact, Smith and colleagues (2009) found that relational aggression did not affect peer acceptance, as long as no overt aggression was present. However, other research has

found that relational aggression is a risk factor for negative outcomes, such as deviant social behaviors and drug use (Bowie, 2010; Skara et al., 2008). By including both overt and relational aggression, we hope to replicate the previously documented gender differences in aggressive behavior and help clarify if both are good predictors of negative outcomes.

Peer Rejection as Moderator and Mediator

Aggressiveness and/or disruptiveness is a particularly common correlate of peer rejection, with around half of all rejected children exhibiting aggressive or disruptive behaviors (Coie, 1990, Rubin, Bukowski, & Parker, 2006). While being an aggressive adolescent can be a way to attain higher social status, such as in the popular crowd, research previously covered shows that there seems to be those who can maintain social standing despite their aggression and others who are rejected for their aggressive behavior. Indeed, studies show that aggression paired with poor social skills typically means an adolescent will fall into the rejected sociometric category (Chen et al., 2015; Coie, Dodge, & Coppotelli,1982; Parker & Asher, 1987; Rose, Swensen, & Waller, 2004). While aggression often leads to rejection, many studies have shown also that both aggression and rejection independently contribute to a multitude of negative outcomes, continuing peer difficulties, increasing aggression, and delinquency, to name a few (Beirman & Wargo, 1995; Coie, Lochman, Terry, & Hyman, 1992; Miller-Johnson, Coie, Maumary-Gremaud, Lochman, & Terry, 1999; Prinstein & La Greca, 2004).

In fact, one study by Beirman and Wargo (1995) found that the combination of aggression and rejection predicted higher externalizing behaviors for boys at age 8 to 12 after a two-year period when compared to boys who were rejected, but not aggressive, or aggressive, but not rejected. In an age range closer to the current investigation, a 6-year longitudinal study on females that began in grades 4-6 and followed up at grades 10-12, aggression, which was

measured by asking which of their classmates, “start fights”, “interrupt”, and are “bossy”, predicted externalizing behaviors and increased health risk behaviors in adolescence and early adulthood only when the girl was also rejected by her peers (Prinstein & La Greca, 2004). In a sample of African-American boys and girls starting in grade 6 and ending in grade 10, aggression combined with rejection indicated increase in serious criminal offenses, whereas for girls, only peer rejection led to increases in minor offenses (Miller-Johnson et al., 1999).

These findings could lead one to make the claim that social preference acts as a moderator, changing the nature of the relationship between aggression and later outcomes. However, this body of research does not distinguish between overt and relational aggression. It is quite possible that once the gender differences in different types of aggression are teased apart, that the relationship between these variables will no longer be moderated by peer rejection. Additionally, there are many direct links between aggression and peer rejection, and peer rejection and negative outcomes. It is quite possible that peer rejection might instead mediate the longitudinal relationship between the different types of aggression and delinquent behaviors. For the remainder of this section, we will cover multiple lines of research that claim causal links between different forms of aggression and peer rejection, and between peer rejection and each of my outcome variables of interest: deviant peer group affiliation, delinquency, and risk-taking behaviors.

As noted previously, relational aggression has not been consistently predictive of increased peer rejection. However, overt aggression has been shown to directly increase peer rejection (Fite, Colder, Lochman, & Wells, 2007; Smith et al., 2009). Research also shows that peer rejection is one of the most important factors leading to negative outcomes for adolescents (Janes et al., 1979; Peake, Dishion, Stormshak, Moore, & Pfeifer, 2013; Parker & Asher, 1987;

Prinstein & La Greca, 2004; Rubin et al., 2006). Peer rejection is defined as being overtly disliked by peers. This is commonly conceptualized in sociometric research as receiving peer nominations for being *liked least* (Coie et al.,1982). This can include both the *controversial* sociometric category, which also receives nominations for being *liked most*, and the *rejected* sociometric category, which does not receive nominations for being *liked most* (Coie et al., 1982).

Successful peer relations are necessary, not only, for the development of social skills, but they provide opportunities for new experiences and knowledge attainment, as well as emotional support in times of stress (Chen et al., 2015; Parker & Asher, 1987; Rubin et al., 2006). During adolescence, peer influence is very powerful due to the increasing importance of close peer relations and decreasing parental influence (Chen et al., 2015). Those adolescents who have not been accepted by the majority of their peers might choose to associate with more deviant peers.

Once accepted into a deviant peer group, deviancy training begins. Adolescents begin to receive positive feedback for many of the deviant behaviors that their more normative peers punished them for (Dishion, Spracklen, Andrews, & Patterson, 1996; Fite et al., 2007). Additionally, deviant peers may punish social conformity, potentially ending attempts to improve behavior (Patterson et al., 1989; Snyder et al., 1986). The deviant peer group also provides the chance to participate in new types of problem behaviors that the adolescent may not have experienced otherwise. Research has found that people who had deviant peers in early adolescence were significantly more likely to have problems with delinquency, substance use, and gambling at ages 16 and 17 (Barnes et al., 2005; Vitaro, Brengden, Ladouceur, & Tremblay, 2001). This research shows that entrance into a deviant peer group predicts increases in or the addition of participation in novel types of delinquent behaviors. However, it is feasible that not

all adolescents who exhibit delinquency and risk-taking behaviors are part of the deviant peer group; therefore, deviant peer group affiliation is viewed as an outcome variable for the purposes of this study.

In addition to being a strong marker of entry into a deviant peer group, peer rejection has been studied for many decades as its own risk factor for problem behaviors and other negative life course outcomes. A 12-year longitudinal study on a sample of boys who had been referred to a child guidance clinic, found that teachers' ratings of *difficulty with peers* was the single best predictor of later problems with criminality (Janes et al., 1979). In an fMRI study, social exclusion led to increased risk-taking behavior, especially for those adolescents who had lower resistance to peer influence (Peake et al., 2013). This study found that social exclusion increased activity in areas of the brain associated with negative self-appraisals and mentalizing, likely dividing the adolescents' attention, causing them to be less attentive and more likely to make risky decisions. While merely being rejected can confer some immediate risks, being chronically rejected by peers is where long term affects can be found.

For most adolescents, the peer group that they spend the most time with is the one that they interact with at school. Naturally, when peer relations problems arise, school and any activities associated with it will become less desirable. The immediate outcomes of peer rejection are changes in social behaviors and decreased participation in school (Coie, 1990; Parker & Asher, 1987; Rubin et al, 1990; Rubin et al, 2006). As rejected peers experience chronic rejection, their academic performance also suffers and truancy rises (Coie, 1990; Rubin et al. 2006). Not only is school an aversive environment for rejected youths, but the lack of friends makes navigating the academic side of it even more daunting (Rubin et al., 2006). It is not difficult to see why rejected peers might feel like dropping out of school and turning to

delinquent behaviors is their safest and easiest option (Parker & Asher, 1987). Besides difficulties in school, the behavioral changes that rejected youths experience often lead to psychological adjustment issues. Rejected children have been shown to have more externalizing and internalizing problems than other sociometric groups (Coie, 1990; Kupersmidt & DeRosier, 2004; Rubin et al, 1990; Rubin et al. 2006).

Adolescent problem behavior can be thought of as any behavior that is not socially acceptable or age appropriate for adolescents; additionally, these behaviors are viewed as a cause for concern and require a response from their peers and/or elders (Jessor & Jessor, 1977, as cited by Donovan & Jessor, 1985). Delinquency is when these issues venture beyond just what is socially acceptable and become a question of legality. Research by Jessor and colleagues (1977; 1985) has found that adolescent problem behaviors load onto a single psychological factor thought to be unconventionality. While traits like problem drinking, precocious sex, and illicit drug use are positively associated with this factor, conventional behaviors and beliefs such as conservative religious and political values have been negatively associated with this factor, which is why the researchers chose to conceptualize their variable as unconventionality (Donovan & Jessor, 1985).

However, research on popular adolescents shows that some problem behaviors are more normative than others (Mayeux, Sandstrom, & Cillessen, 2008), which may lead one to think that the previously proposed single factor of unconventionality may be better conceptualized as two factors; one that is relatively normative and one that is more extreme. The more normative behaviors tend to be ones that adolescents deem to make them look more mature. These ‘‘adult’’ behaviors such as sexual activity and the use of alcohol, are simply tools to look “cool” to their peers. While these behaviors are seen as problems to most outsiders, they are actually normative

and even well-adjusted, according to Moffitt's theory (1993). Adolescents who only partake in these behaviors for reputational reasons are often adolescence-limited delinquents, which means that despite their problematic behavior, they will grow out of it and become well-adjusted adults (Moffitt, 1993).

It seems, then, that there are two different groups who normally partake in at least some of the problem behaviors that are the focus of this research: the rejected outcasts and the popular crowd. The stereotype of a delinquent youth with poor life course outcomes is an outcast who smokes, drinks, and otherwise parties while blowing off school, and has difficulty relating to peers of their own age. For many adolescents, these problem behaviors are likely to cease after society no longer gives them preference for participating in them, mainly once they graduate high school and move into the adult world. Due to this awareness of what is and is not accepted by society, these individuals are not at risk for the same outcomes as their more deviant peers who do engage in more extreme behaviors. Typically, these milder behaviors are seen as relatively normative and not cause for major concern unless the amount of engagement with these behaviors, such as underage drinking and sexual promiscuity begins to endanger the health of the adolescent. Due to this division of problem behaviors into two groups, more normative ones and more extreme ones, such as hard drug use and weapon carrying, we will be focusing on the population who has been rejected by their peers since they are the ones who theoretically tend to have more negative outcomes and life-course persistent delinquency.

Current Study

We want to test the relationship of overt aggression and relational aggression with deviant peer affiliation, delinquency, and health risk behaviors, specifically alcohol use, drug use, and weapon carrying both directly and indirectly through peer rejection. We will focus only

on the rejected peer group and not include the controversial peer group, which gets peer nominations for not being liked, similar to the rejected group, but also receives nominations for being most liked, because research shows that while the controversial peer group does exhibit risk behaviors during adolescence, controversial peers do not tend to carry the full span of deviant behaviors forward into adulthood in the way that the aggressive rejected adolescents tend to do (Mayeux et al., 2008; Moffitt, 1993). By focusing only on the rejected youth, any differences in how well the predictor variables work should indicate possible avenues for further research on points of intervention for these adolescents with more extreme and problematic behaviors. I hypothesize that both overt aggression and relational aggression will be positively associated with peer rejection and the outcome variables for both males and females. While I do not greatly expect overt aggression to be mediated or moderated by peer rejection due to its strength as a lone predictor for negative outcomes, I do expect relational aggression to work through or with peer rejection to predict negative outcomes. However, with the paucity of research and theory on how relational aggression works to predict any of the three outcomes of this study, deviant peer association, delinquency, and risk behaviors, I do not feel as if mediation or moderation is more likely for any of the three outcomes.

Method

Participants and Procedure

A total of 569 students from a mid-sized Northeastern city participated in the data collection in Grade 10 (52% girls), which was collected in the spring of 2002; 529 participated one year later, in Grade 11 (52% girls), and 481 participated the following year, in Grade 12 (55% girls). In total, 377 students (66% of the Grade 10 sample; 55% girls) participated in all three waves of data collection from 2002 to 2004.

All participants were recruited from the single public high school located in the city. The sample was diverse in terms of both ethnicity (75.6% White, 12.7% African American, 9.5% Latino, and 2.1% Asian) and socioeconomic status. To comply with the research policy of the local public school system, the following recruitment procedures were used. Letters describing the study were sent to the parents of all adolescents in the grade; parents who did not wish for their child to take part in the research returned a signed form stating such. Less than 1% of the potential sample was denied permission to participate by parents. Verbal assent was also obtained from the adolescents. Participants received a small candy bar for their time, and their names were entered into a raffle for one of ten $20 gift cards to a local electronics store.

Data collection took place in the late spring of each school year. All data collection took place during one 90-minute session that was held in the participants' English classes. English classes were selected for testing sessions because all students in the school were required to enroll in their grade-appropriate English class every year. All English classes participated in the study. The sessions were administered by one trained research assistant and were helped by one or two additional research assistants. In most cases, a member of the school faculty (usually the English teacher for that particular class) was also present. Sociometric assessment was administered first, followed by self-report questionnaires. Participants were reminded often that their responses to all questions were confidential, particularly that information they provided could not be released to their parents or school officials. Make-up sessions for students who were absent on the original day of testing were conducted approximately 2 weeks later and were administered by three members of the research team.

Aggression

To streamline sociometric assessment, a roster of all names of the students in the grade was used. The girls' names were printed on one side of the page, and the boys' names were printed on the other side. The names were alphabetized by first name and were printed next to a unique code number. Participants were provided with a booklet to record their nominations. Each page of the booklet contained one behavioral question, followed by enough space for 10 peer nominations. Participants were asked to read each question, think about the members of their grade who best fit that description, and then to find the names of those students on the roster and record the appropriate code numbers in the booklet. Each class was instructed that they could provide unlimited same- or cross-sex nominations for each question.

To assess overt aggression, participants were asked to nominate students in their grade, "who start fights, say mean things, or tease others." To assess relational aggression, participants nominated students in their grade, "who ignore others, spread rumors, and exclude other people in order to get their way." Both aggression variables are from the 10^{th} grade sample. Using the procedure of Coie and colleagues (1982), the number of nominations each grade member received for each item were totaled and then standardized to a z-score with a mean of 0 and an SD of 1 based on the average number of nominations received within the grade. For this variable, higher z-scores indicate higher levels of aggressive behavior.

Peer Rejection

Peer rejection was also assessed via sociometric measurement. Specifically, nominations for the item "like the least" was pulled from the 11^{th} grade sample. These scores were also standardized in the same way as the aggression scores; however, since this study focuses on peer

rejection alone and not peer preference, the procedure used by Coie and colleagues was not followed in full. A higher z-score for this variable indicates higher level of peer rejection.

Deviant Peer Affiliation

Deviant peer affiliation was also assessed via sociometric measurement. Participants were asked to nominate students in their grade, "who hang around with kids who get in trouble." This variable comes from the 12th grade sample and was standardized in the same way as aggression. A higher z-score for deviant peer affiliation indicates a stronger reputation for affiliating with other adolescents who are part of a deviant peer network.

Delinquency

The delinquent behaviors subscale of the Child Behavior Check List (CBCL) Youth Self-Report (YSR) was used to assess delinquency (Achenbach & Edelbrock, 1983, see Appendix A). Participants were asked how true eleven statements about themselves were (0 = not true to 2 = very true). Example statements are, "I don't feel guilty after doing something I shouldn't do," and, "I cut classes or skip school." All eleven items were summed together to get a composite delinquency score.

Health Risk Behaviors

Items assessing the frequency and severity of alcohol use, marijuana use, hard drug use, and weapon carrying were adapted from the Youth Risk Behavior Survey, a questionnaire developed by the CDC's National Center for Chronic Disease Prevention and Health Promotion (see Appendix B). The scale has seen continued use by the CDC since 1999, as well as by peer relations researchers in shortened and adapted forms (e.g., La Greca, Prinstein, & Fetter, 2001). Both the full and abbreviated forms have demonstrated good reliability and validity. Only items pertaining to the four target behaviors were included in the current analyses. These were

frequency and *severity* of alcohol use (four items), marijuana use (three items), hard drug use (seven items), and weapon carrying (two items). The scale scores were computed by taking the mean of the responses to the items in each scale. To measure frequency and severity of *alcohol use*, participants were asked how many days in their life they had had at least one drink of alcohol (0 = no days to 6 = 100 or more days), how old they were when they had their first drink of alcohol (0 = never had a drink to 6 = 8 years old or younger), how many days during the past month that they had consumed at least one drink (0 = no days to 6 = all 30 days), and how many days in the past month they had consumed five or more drinks within a couple of hours (0 = no days to 6 = 20 or more days). To assess frequency and severity of *marijuana use*, participants were asked similarly to *alcohol use* about how many times they had smoked marijuana, how old they were the first time they used it, and how many times in the past month they had used it. To assess frequency and severity of *hard drug use*, participants were asked separately how many times in their life they had used cocaine, inhalants, heroine, steroids, and methamphetamines (0 = no times to 5 = 40 or more times). Participants were also asked separately how many times during the past month they had used cocaine and inhalants (0 = times to 5 = 40 or more times). To measure *weapon carrying*, participants were asked how many days during the past month they had carried a weapon such as a gun, knife, or club (0 = no days to 4 = 6 or more days). Participants were also asked the same question about guns only. Participants were assured of the confidentiality of their answers throughout the data collection.

Results

Across genders, both types of aggression, peer rejection, and deviant peer association were all correlated with one another, as seen in Table 1. Also, all of the outcome variables were associated with one another. The one interesting variable is alcohol usage, which was

significantly positively correlated with every measured variable. For the purposes of the SEM model, the Youth Risk Behavior Survey items were counted as a single factor, but there were some small differences of interest between males and females that can be seen through the correlations between all measured variables in Table 2. While there are a few differences in the strength of correlations for some variables across gender, the most interesting differences are found with weapon carrying behavior. Females show no association with weapon carrying and any of the other variables, while males have significantly higher positive correlations between weapon carrying and all other youth risk behaviors; alcohol use, marijuana use, and hard drug use.

The relationship between the variables (seen in Table 1) was assessed via SEM using MPlus 8.2. The proposed SEM model can be seen in Figure 1. To assess the proposed model fit, all variables were included, with gender as a covariate. Missing data was handled with full-information maximum likelihood (FIML) estimation, which allowed all available observations to be utilized and avoided problems that can arise when only participants with complete data are used. The hypothesized model has marginally good fit, as it meets most of the model fit criteria reviewed by Schreiber, Stage, King, Nora, and Barlow (2006), but is outside of the proposed cutoff range for TLI. The CFI is 0.97; TLI is 0.93; RMSEA is 0.05; and SRMR is 0.05.

Direct Effects

Overt aggression significantly increased the risk of peer rejection and associating with deviant peers, controlling for gender (standardized coefficient = 0.18 and 0.46, respectively). Relational aggression also significantly increased risk of peer rejection (standardized coefficient = 0.51) but did not have any significant direct effects to any of the outcome variables. Peer rejection did not have any significant paths to any of the outcome variables.

Indirect Effects

I hypothesized that peer rejection might act as a mediator or a moderator between relational aggression and various negative outcome variables. The mediation analyses do not support this hypothesis. In fact, the lack of predictive utility of peer rejection on the outcome variables hinted at this. While overt aggression and relational aggression were both significantly associated with peer rejection, all three variables were only directly associated with one of the modeled outcome variables, deviant peer group association. I tested the significance of the indirect effects using bootstrapping procedures. Standardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. All of the indirect effects failed to reach significance and all of the confidence intervals contained 0, leading me to conclude that peer rejection does not act as a mediator in the proposed model. Despite mediation not occurring, peer rejection is still associated with enough variables in the model to continue to include it. However, the model with peer rejection omitted was not significantly different from the theoretically driven, proposed model, as shown when the two models are compared with a χ^2 difference test, χ^2 (3, N = 377) = 5.96, $p > .05$. Additionally, the fit indices suffered minimally from the exclusion of peer rejection from the model. This would suggest that the exclusion of peer rejection from the model would provide a more parsimonious explanation of the data, but first, moderation will be examined as well.

There were multiple significant interaction terms in the model. In line with my hypothesis of overt aggression not being moderated by peer rejection, peer rejection was not significantly moderated by peer rejection, however the relationship between overt aggression and scores on the CBCL delinquency scale (standardized coefficients = .30) approached significance, while the

other two variables were far from significant moderation. Simple slopes tests combined with the model estimates give a clearer view of how overt and relational aggression are related to the outcome variables. As seen in Figure 3, for low levels of overt aggression, there was no difference in scores on the CBCL delinquency scale, however, as peer rejection increased, higher overt aggression was associated with higher scores on the delinquency scale.

As hypothesized, relational aggression significantly moderated two of the three outcome variables, deviant peer association and delinquency (standardized coefficients = -.24 and -.25, respectively) with the moderation of the relationship between relational aggression and youth risk behaviors being marginally significant (standardized coefficient = -.21). All three followed a similar trend, at low levels of relational aggression, there was no notable difference between rates of the outcome variables, but as relational aggression increased, higher peer rejection was associated with lower rates of the outcome variables, while lower levels of peer rejection conferred the highest level of risk (Figures 4, 5, and 6). For youth risk behaviors, regardless of the level of peer rejection, there was an increase in risky behavior as relational aggression increased, but the other two outcome variables had a different relationship through peer rejection. For deviant peer association and CBCL delinquency, the highest ratings of peer rejection were associated with decreases in scores on the outcome variables as relational aggression increased.

A final model, as seen in Figure 7, was created from the significant paths of the original model with the moderated paths discussed added in to create the final model with great fit; CFI is 0.98; TLI is 0.97; RMSEA is 0.03; and SRMR is 0.06. A χ^2 difference test, χ^2 (6, N = 377) = 21.07, $p < .05$, shows that this model has significantly better fit than the initially proposed model, seen in Figure 2.

Discussion

Past research has reliably found connections between overt aggression, peer rejection, and negative life course outcomes (Benda, 2002; Prinstein & La Greca, 2004; Smith, Rose, & Schwartz-Mette, 2009; Snyder, Dishion, & Patterson, 1986). This research falls in line with these past findings. Higher levels of overt aggression were linked with increased peer rejection and associating with deviant peers in later years of high school. While the other outcomes of interest were not significantly impacted by overt aggression, deviant peer group association was correlated with them. This path to delinquent behavior through entrance into a deviant peer group has been well researched and seems to hold true here, though it was not tested longitudinally (Barnes et al., 2005; Dishion, et al. 1996; Fite et al., 2007; Patterson et al., 1989; Vitaro et al., 2001).

The other behavior of interest, relational aggression, was not associated with the other variables as directly as overt aggression, which has also been found in the literature (Bowie, 2010; Skara et al., 2008; Smith et al., 2009). Relational aggression was associated with increased peer rejection, but nothing else. Beyond that, peer rejection was not reliably linked with increases in any of the outcome variables. Another variable of interest is alcohol use, which may be too pervasive of a behavior in a high school sample to be of much utility. Alcohol use was significantly correlated with every variable measured and it was also pervasive in the sample; only 23 percent of the sample responded that they had never had alcohol by grade 12. With a presumed bias toward not admitting to having participated in underage drinking, that percentage of people might be even smaller. On the other end of the spectrum, weapon carrying proved to be the main variable that showed a notable difference between the genders. With only 21 percent admitting to having a carried a weapon, the gender difference could be due to chance, but it

could also point towards an already known difference between genders on proclivities toward overt violence (Smith et al., 2009).

Peer rejection did not act as a mediator of the relationship between overt or relational aggression and negative outcomes, but it did moderate a few of the relationships. Overt aggression has been well documented in the past as an indicator of negative outcomes (Benda, 2002; Prinstein & La Greca, 2004; Smith, Rose, & Schwartz-Mette, 2009; Snyder, Dishion, & Patterson, 1986). As has been found in the past (Beirman & Wargo, 1995; Coie, Lochman, Terry, & Hyman, 1992; Miller-Johnson, Coie, Maumary-Gremaud, Lochman, & Terry, 1999; Prinstein & La Greca, 2004), overt aggression combined with peer rejection did increase the risk of delinquency.

Of primary interest is peer rejection as a moderator of relational aggression. Since relational aggression is less often found to be linked with negative outcomes, the significant interaction between levels of relational aggression in grade 10 and peer rejection in grade 11, is a step towards better understanding the role of relational aggression in adolescent outcomes. All three measured outcomes were impacted by relational aggression, one directly, which was youth risk behaviors, and the other two were significantly moderated by peer rejection. Additionally, all of the risks were affected in a similar manner, as relational aggression increased, lower levels of peer rejection were at the highest risk of negative outcomes.

In particular, higher relational aggression and lower peer rejection led to the highest levels of risky behavior. This finding could be explained by research into popularity (Mayeux, Sandstrom, & Cillessen, 2008). Relational aggression is often a tool for increasing social standing. As noted earlier, adolescents often engage in risky behaviors to look ‘cool’ to their peers (Moffitt, 1995). The other two outcome variables followed slightly different paths. The

higher levels of relational aggression paired with the highest levels of peer rejection led to decreases in scores of delinquency and deviant peer association. This high rejection group includes adolescents from both the controversial and rejected sociometric categories (Coie et al., 1982). For the controversial group, the use of relational aggression is utilized to increase social standing, and as Moffitt (1993) pointed out, there are some behaviors that are acceptable to the peer group but associating with delinquent peers and engaging in more extreme delinquent behaviors might not be accepted. For the rejected group, adolescents who are rejected and engage in relational aggression might be more withdrawn and/or reactive, which leads them to not even engage with delinquent peers or have people with which to engage in delinquent behaviors. The middle level of peer rejection combined with higher relational aggression scored about the same as all of the groups in the lower relational aggression group and the lowest level of rejection scored the highest on measures of delinquency and deviant peer association. This group includes both the neglected and sociometrically popular, or well-liked, groups who do have peers with which to explore more delinquent behaviors and might be able to engage in some less socially acceptable behaviors without as much care for what the social group approves or disapproves of (Coie et al., 1982). The positive of this interpretation, if it is what is occurring, is that the sociometric groups who are at higher risk in the short term for deviant behaviors, is also the sociometric groups who typically are more well-adjusted in the long term, which lines up with Moffitt's (1993) adolescence limited delinquency (Parker & Asher, 1987).

The primary strengths of this study were its sample size and longitudinal design, however there were also multiple limitations. This study had limitations due to the data set being a preexisting data set collected in the 1990s and early 2000s with the variables discussed presently being collected between 2002 and 2004. While the variables included have likely not changed

much over this time span, the pervasion of the internet, and social media in particular, might have shifted or exacerbated the relationship between some of these variables in the intervening decade and a half. Being able to include this as a control variable or another moderator could be an important step for future research. Additionally, while this data included a multitude of variables, there are a few that had to be used for this research that may not have been the optimal way of framing a particular variable for the analyses presented.

Secondly, the range of time observed could be expanded in future studies to see how these predictor variables play out through early adulthood. As discussed earlier, some of these behaviors are merely an attempt to act older and look 'cool' to peers, while others are more indicative of more impactful adjustment issues. Over time these behaviors tend to taper off or become a more concerning pattern of behavior that should be the focus of potential intervention (Moffitt, 1993).

Another limitation of the current study is the reliance on self-report measures of substance use and weapon carrying. Despite emphasizing confidentiality during data collection, some students may not have felt comfortable reporting on their engagement in these activities and indeed, the completeness of the data suggests that students were more willing to answer the sociometric and psychometric scales than the scales on these risk behaviors.

A future direction for this research is to see if there are cultural differences in how different ethnicities handle peer rejection, as well as the frequencies of the various outcome variables. While this sample was reasonably representative, a study focused on comparing across subcultures could help further clarify levels of both overt and relational aggression and negative outcomes seen in high school students.

In conclusion, it seems that overt and relational aggression, as well as peer rejection, do have their own roles to play in negative life-course outcomes. Overt aggression has often been found to lead to persistent problems and ultimately criminal behavior, as was found here. Relational aggression has a bit more an interesting relationship to delinquency and risk behaviors through moderation by peer rejection. At high levels of peer rejection, those who utilized relational aggression were the most at risk of negative outcomes, but the for delinquency and deviant peer group association, higher relational aggression combined with low levels of peer rejection indicated that popularity and other social concerns might be a buffer against negative outcomes. More research needs to be done on how relational aggression plays out in adolescence, but it seems like a promising future research avenue for intersectional research in popularity and delinquency.

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Table 1.

Descriptive Statistics and Correlations for all measured variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
N	377	377	377	377	267	255	255	256	255
M	-.04	.04	.13	.13	4.31	.20	1.51	.04	.20
SD	.82	1.03	1.08	1.17	2.79	1.33	1.38	.21	.64
Minimum	-.39	-.40	-.55	-.36	.00	.00	.00	.00	.00
Maximum	8.93	12.11	10.59	14.68	18.33	5.75	5.33	1.71	4.00
% with Min	50.40%	63.13%	34.48%	59.42%	5.62%	23.53%	54.51%	92.97%	88.63%
% with Max	0.27%	0.27%	0.027%	0.27%	0.37%	0.39%	0.39%	0.39%	1.18%
1. Overt Aggression	1.00	.47**	.42**	.49**	.07	.13*	.12	.09	.12
2. Relational Aggression		1.00	.59**	.20**	-.02	.18**	.06	-.04	-.01
3. Peer Rejection			1.00	.21**	.05	.16**	.08	-.08	-.06
4. Deviant Peer Assoc.				1.00	.17**	.21**	.27**	.19**	.23**
5. CBCL Delinquency					1.00	.50**	.51**	.40**	.27**
6. Alcohol Use						1.00	.56**	.38**	.27**
7. Marijuana Use							1.00	.30**	.21**
8. Hard Drug Use								1.00	.39**
9. Weapon Carrying									1.00

Note. 1 and 2 collected in Grade 10. 3 collected in Grade 11. 4 through 9 collected in Grade 12. *$p < .05$; **$p < .01$.

Table 2.

Correlations by gender between measured variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Overt Aggression	-	**.56****	.55**	**.18****	.08	.18*	.14	-.05	.13
2. Relational Aggression	**.77****	-	**.70****	.28**	-.02	.28**	.10	-.05	-.02
3. Peer Rejection	.41**	**.53****	-	.26**	.05	.25**	.08	-.07	-.06
4. Deviant Peer Assoc.	**.52****	.37**	.24**	-	.17*	.19*	.22**	.06	-.01
5. CBCL Delinquency	.02	.10	.08	.11	-	.53**	**.63****	.32**	.15
6. Alcohol Use	.08	.09	.09	.21*	.48**	-	.61**	.35**	**-.03**
7. Marijuana Use	.07	.10	.10	.28**	**.39****	.53**	-	.43**	**-.01**
8. Hard Drug Use	.14	-.02	-.10	.19*	.44**	.40**	.26**	-	**-.03**
9. Weapon Carrying	.09	.12	-.05	.22*	.29**	**.38****	**.27****	**.44****	-

Note. Females above the diagonal. Males below the diagonal. 1 and 2 collected in Grade 10. 3 collected in Grade 11. 4 through 9 collected in Grade 12. Significant differences between genders bolded. *$p < .05$; **$p < .01$.

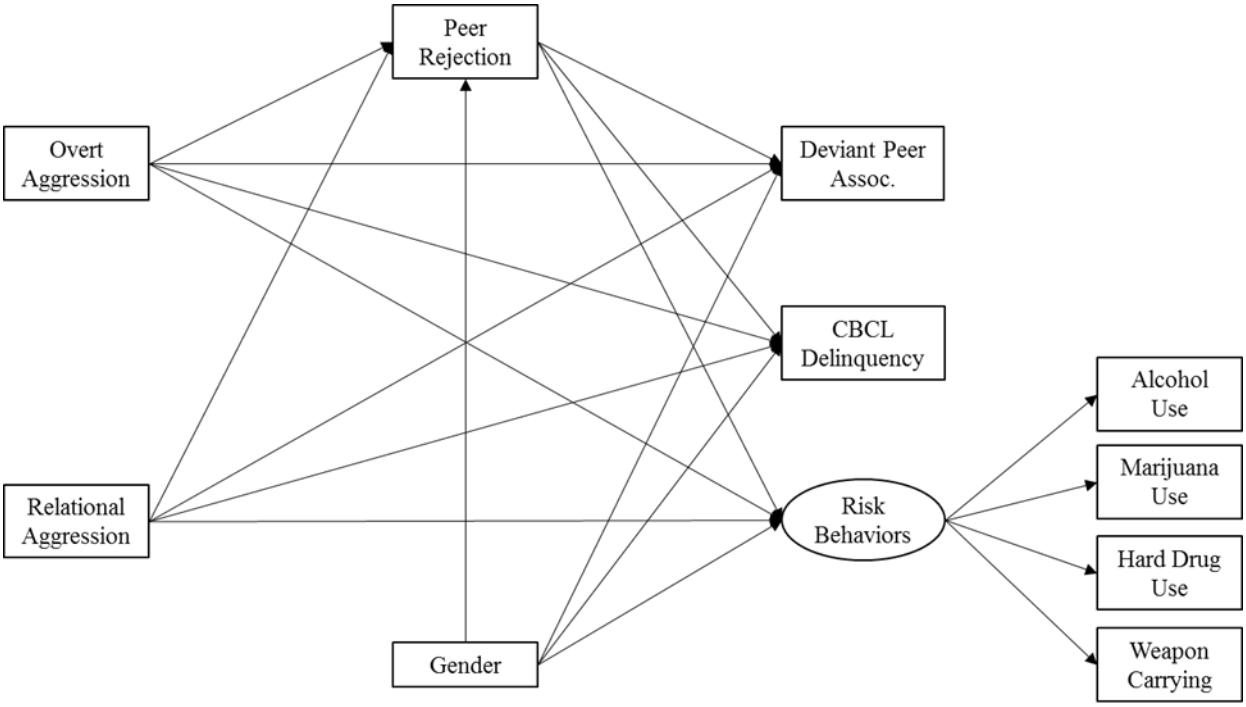

Figure 1. Diagram of proposed SEM model of peer rejection mediating all relationships with gender as a covariate.

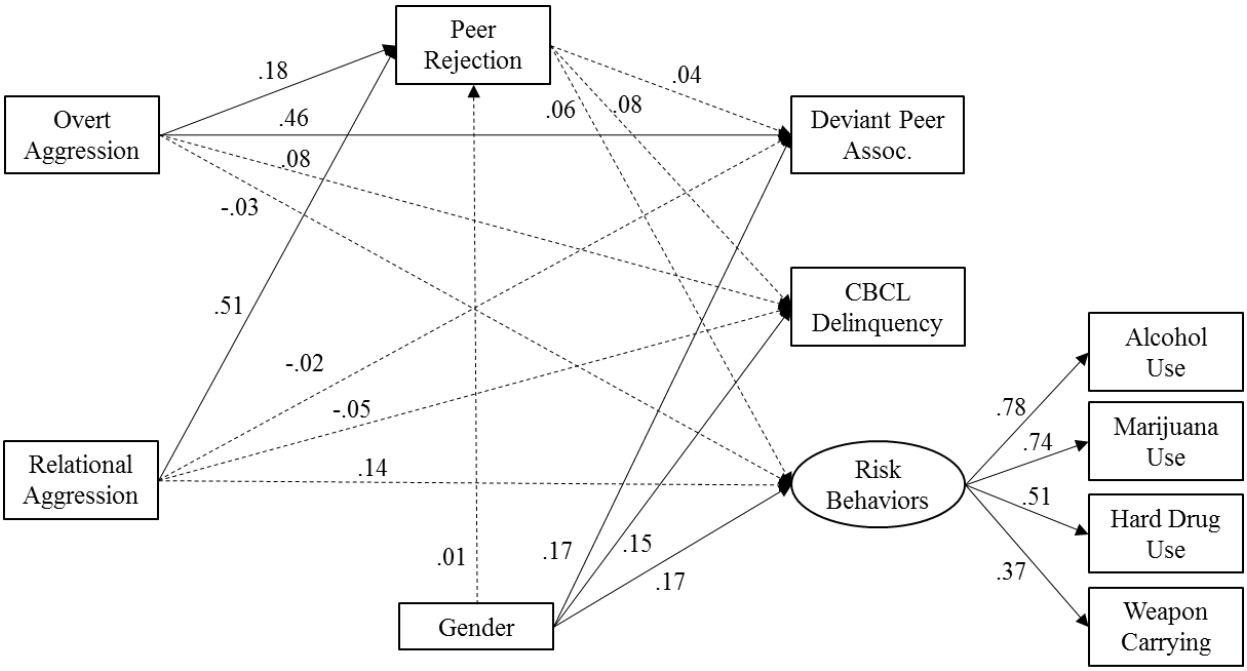

Figure 2. Estimation of proposed mediation model.

Note. Weights are standardized. Dotted lines are non-significant. Model fit is good, CFI is 0.97; TLI is 0.93; RMSEA is 0.05; and SRMR is 0.05.

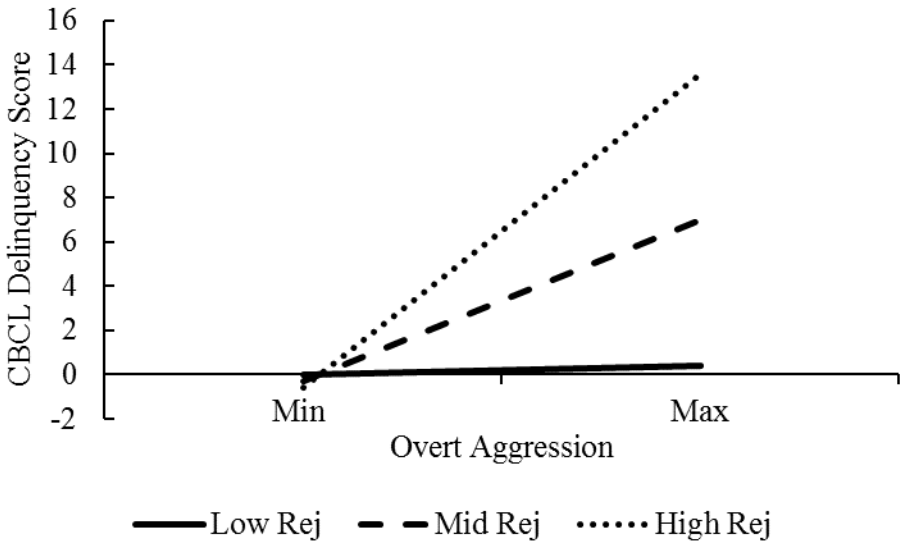

Figure 3. Moderation of the relationship between overt aggression and delinquency.

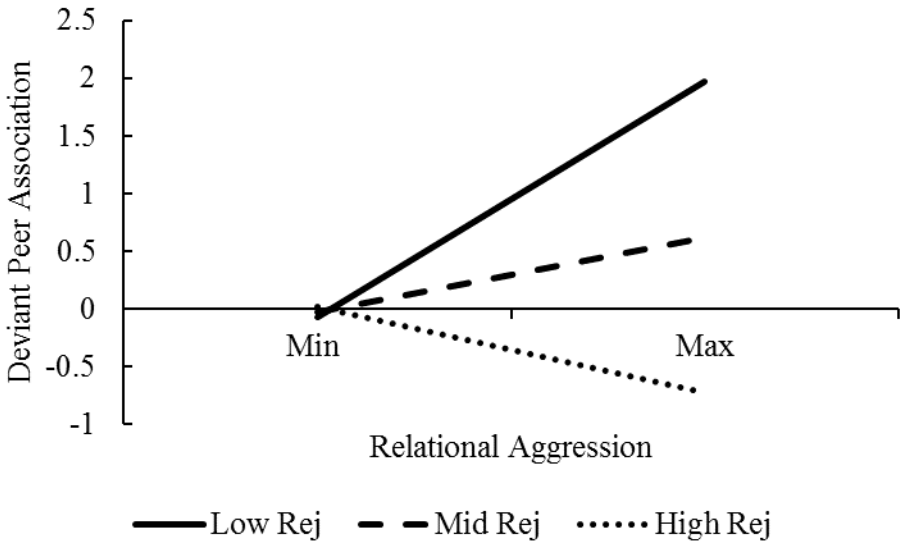

Figure 4. Moderation of the relationship between relational aggression and deviant peer group association.

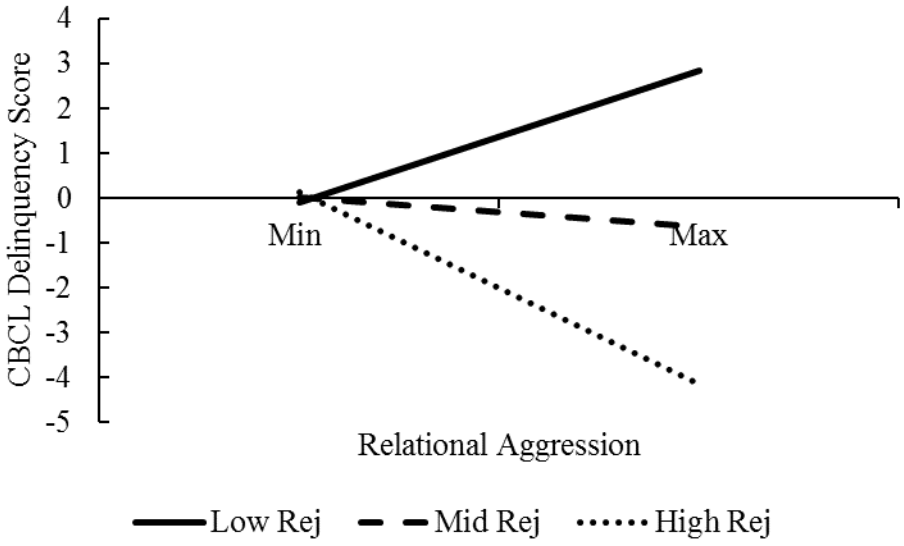

Figure 5. Moderation of the relationship between relational aggression and delinquency.

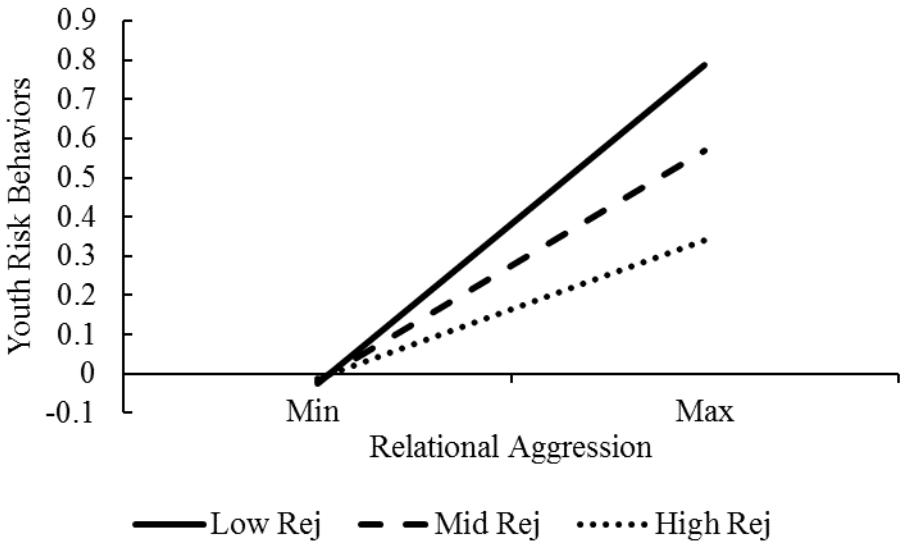

Figure 6. Moderation of the relationship between relational aggression and youth risk behaviors.

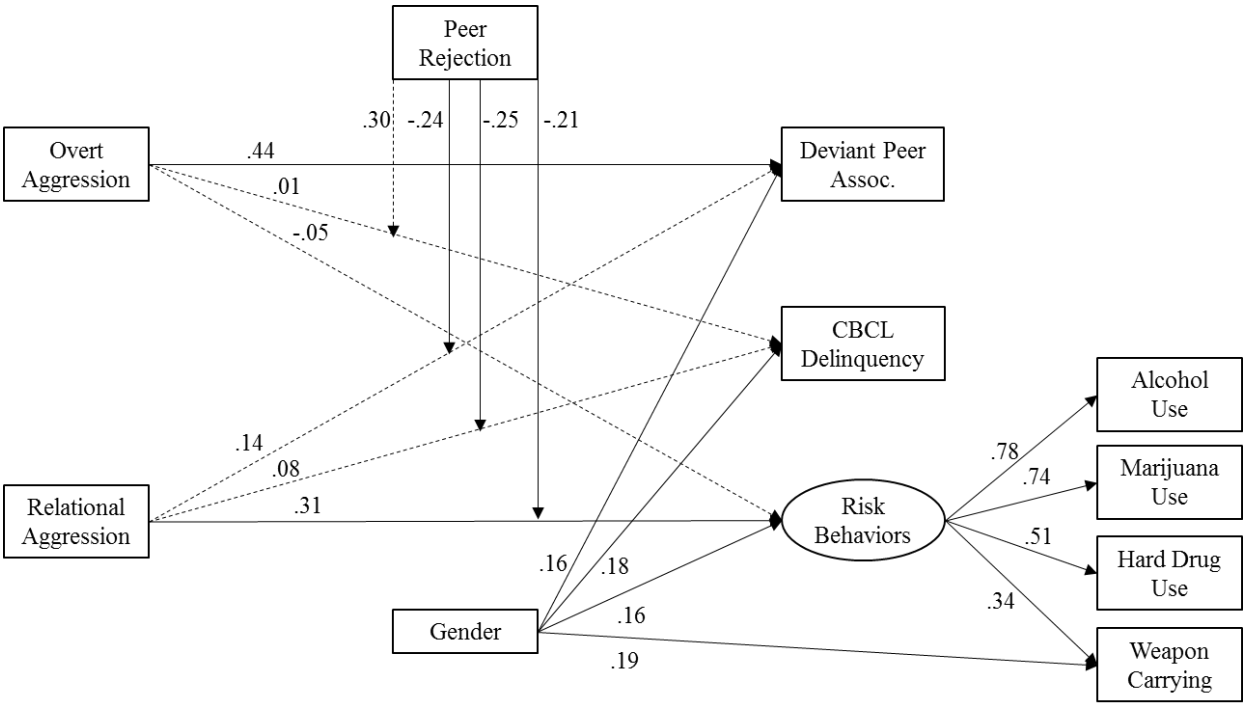

Figure 7. Estimation of final model.

Note. Weights are standardized. Dotted lines are non-significant. Model fit is good, CFI is 0.98; TLI is 0.97; RMSEA is 0.03; and SRMR is 0.06.

Appendix A

CBCL Delinquency Subscale Items

I don't feel guilty after doing something I shouldn't do.

I hang around with kids who get in trouble.

I lie or cheat.

I would rather be with older teens than with teens my own age.

I run away from home.

I set fires.

I steal at home.

I steal from places other than home.

I swear or use dirty language.

I cut classes or skip school.

I use alcohol or drugs for nonmedical purposes

Appendix B

CDC Youth Risk Behaviors Survey Items

Read the following questions and indicate your answer.

During the past 30 days, on how many days did you carry a weapon such as a gun, knife or club?

During the past 30 days, on how many days did you carry a gun?

During your life, on how many days have you had at least one drink of alcohol?

How old were you when you had your first drink of alcohol, other than a few sips?

During the past 30 days, on how many days did you have at least one drink of alcohol?

During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?

During your life, how many times have you used marijuana?

How old were you when you tried marijuana for the first time?

During the past 30 days, how many times did you use marijuana?

During your life, how many times have you used any form of cocaine, including powder, crack or freebase?

During the past 30 days, how many times did you use any form of cocaine, including powder, crack or freebase?

During your life, how many times have you sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?

During the past 30 days, how many times have you sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?

During your life, how many times have you used heroin?

During your life, how many times have you use methamphetamines (also called speed, crystal, crank, or ice)?

During your life, how many times have you taken steroid pills or shots without a doctor's prescription?