DELINQUENT PEER RELATIONSHIPS AS A MEDIATOR OF THE
DIFFERENTIAL EFFECTS OF SOCIAL WITHDRAWAL AND BEHAVIORAL
INHIBITION ON DELINQUENCY

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ABSTRACT

DELINQUENT PEER RELATIONSHIPS AS A MEDIATOR OF THE DIFFERENTIAL EFFECTS OF SOCIAL WITHDRAWAL AND BEHAVIORAL INHIBITION ON DELINQUENCY

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Previous research has shown that the anxiety dispositions of behavioral inhibition and social withdrawal are differentially associated with delinquency in adolescence, such that behavioral inhibition decreases risk and social withdrawal increases risk for delinquency. However, it remains unclear why these highly similar dispositional characteristics would have opposite effects on risk for delinquency. The present study tested peer delinquency as a possible mediator of the differential effects of social withdrawal and behavioral inhibition on delinquency. The current study hypothesized that social withdrawal would be positively associated with peer and youth delinquency; that behavioral inhibition would be negatively associated with peer and youth delinquency; and that the effects of behavioral inhibition and social withdrawal on youth delinquency would be mediated by peer delinquency. The current study analyzed data from a longitudinal study of social development. Participants completed measures of behavioral inhibition and social withdrawal at age 12, peer delinquency at age 14, and
youth delinquency at age 16. Results from path analysis revealed that social withdrawal was significantly negatively associated with youth delinquency and peer delinquency. Additionally, peer delinquency was significantly positively associated with youth delinquency. Finally, peer delinquency significantly mediated the association between social withdrawal and youth delinquency, such that the negative association between social withdrawal and youth delinquency was accounted for by the negative association between social withdrawal and peer delinquency. All other hypothesized associations were non-significant. These results are inconsistent with findings from past research and suggest that further research is needed to understand how behavioral inhibition and social withdrawal are related to delinquency.
Dedicated to my family
ACKNOWLEDGEMENTS

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INTRODUCTION

Internalizing (i.e., anxiety and depression) and externalizing problems (i.e., conduct problems, delinquency) often co-occur. Internalizing disorders are those that occur within the individual (i.e., anxiety, depression, etc.), whereas externalizing disorders are characterized by a display of disruptive behavior, impulsivity, etc. (i.e., conduct disorder, attention deficit hyperactivity disorder). Although some research suggests that the presence of internalizing problems may be protective against the further development of externalizing problems, other research suggests that internalizing problems put an individual at increased risk for externalizing problems. One potential reason for this discrepancy in the research literature is the differential association between subcomponents of internalizing disorders, namely behavioral inhibition and social withdrawal, and delinquency. Kerr, Tremblay, Pagani, and Vitaro (1997) found that behavioral inhibition decreased and social withdrawal increased risk for delinquency, but they did not provide further information as to why these differential associations existed. One plausible explanation for these differences is that behavioral inhibition and social withdrawal are differentially related to peer delinquency, which in turn influences risk for the development of delinquency.

Social Withdrawal and Behavioral Inhibition

Internalizing problems are characterized by disordered mood or emotion (Kovacs & Devlin, 1998). The main focus of internalizing disorders is on anxiety (including
Generalized Anxiety, Separation Anxiety, Phobias, etc.) and depression, which are highly comorbid (Kovacs & Devlin, 1998; O’Neill, Podell, Benjamin, & Kendall, 2010). This comorbidity may be the result of overlap of symptoms and items used to assess these disorders, underlying negative affectivity, or a shared familial risk (Garber & Weersing, 2010). Individuals often experience internalizing problems as early as childhood and adolescence (Dadds et al., 1999).

Although abundant research on internalizing disorders in children exists, there is some ambiguity concerning further subcomponents of these conditions. In studying these disorders, researchers often measure different constructs of these disorders related to both anxiety and depressive disorders (Guberman & Manassis, 2011; O’Neill et al., 2010). Examples of these subcomponents are social withdrawal and behavioral inhibition. Although these constructs are similar in nature, the differences between them are great enough to warrant distinction. When studies have examined internalizing symptoms in children, they have often focused on disorders as a general construct without separating these components from one another (Hogue & Steinberg, 1995). In fact, some researchers have even considered social withdrawal to be a component of behavioral inhibition (Pérez-Edgar et al., 2011), while others have viewed inhibition as an antecedent to social withdrawal (Fox, Henderson, Marshall, Nichols, & Ghera, 2005). Despite similarities between social withdrawal and behavioral inhibition, the lumping together of these factors make it challenging to determine the differential roles that these variables may play in the development of other problems.

In an annual review by Rubin, Coplan, and Bowker (2009), the authors point out that social withdrawal has been operationalized in multiple ways, causing there to be
some ambiguity in understanding what this construct actually means. Because this concept has been defined differently by various researchers, it is challenging to know how relevant social withdrawal is and what role it plays in the development of abnormal thoughts, emotions, and behaviors of children. Some researchers have associated social withdrawal with certain temperamental dispositions (Fox et al. 2005; Rubin et al. 2009), while others have examined social withdrawal in a behavioral context related to a child’s rejection, isolation, or exclusion from a peer group (Gazelle & Ladd, 2003).

Despite these various definitions, social withdrawal can generally be thought of as a child’s isolation of himself/herself from their peer group (Harrist, Zaia, Bates, Dodge, & Pettit, 1997; Rubin & Asendorpf, 1993). Children who are socially withdrawn choose to isolate themselves from their peers, as opposed to having been rejected by their peers. However, as time progresses, these children may actually become rejected by their peers even when attempts are made to engage in social interactions (Wei & Chen, 2009). Social withdrawal represents a consistent display of solitary behavior in the presence of both familiar and unfamiliar peers. These behaviors may often be rooted in an individual’s feelings of anxiety, negative self-esteem, or perceived challenges in social relationships or social skills (Rubin et al., 2009).

Behaviorally inhibited individuals are sensitive to punishment, nonreward, and novelty and react warily in the presence of novel people, situations, or things. Behavioral inhibition is typically thought of as being biologically driven, and is thought to be motivated by uncertainty and fear (Gazelle & Rubin, 2010). It was derived from Gray’s (1982) work in which he distinguished an aversive neural motivation system from an appetitive neural motivation system. These two systems are the Behavioral Inhibition
System (BIS) and the Behavioral Activation System (BAS). This theory focuses on two dimensions of personality: anxiety (or proneness to anxiety), which is thought to be expressed and controlled by the BIS, and impulsivity, which is thought to be regulated by the BAS. An individual’s BIS, as discussed by Gray (1982), may limit behavior that could result in punishment or negative outcomes, and it is thought to contribute to feelings of anxiety, fear, and sadness (Carver & White, 1994).

Behavioral inhibition has also been characterized as a dimension of temperament or personality. Kagan (1997) believed that behavioral inhibition was expressed through a child’s wary behavior when faced with unfamiliar people, situations, and objects. Although inhibition is often examined through the use of observational techniques of young children (Gazelle & Rubin, 2010) questionnaires can be used to examine behavioral inhibition in older children and adolescence (Rubin et al., 2009).

**Comorbidity of Internalizing and Externalizing Disorders**

Besides internalizing disorders being comorbid with each other, they sometimes co-occur with externalizing disorders (Boylan, Vaillancourt, Boyle, & Szatmari, 2007; Chase & Eyberg, 2008; Loeber & Burke, 2011). Externalizing disorders refer to conditions with a central feature of dysregulated behavior (Kovacs & Devlin, 1998). These disorders often take the form of disruptive, aggressive, and delinquent behaviors. The externalizing behaviors of some children may be so severe as to warrant a specific clinical diagnosis. Diagnoses related to externalizing problems include Conduct Disorder, Oppositional Defiant Disorder, or Attention-Deficit/Hyperactivity Disorder (Burt, Krueger, McGue, & Iacono, 2003). However, even elevated levels of conduct problems
not warranting a formal diagnosis are predictive of occupational and social problems in adulthood (Caspi, Elder, & Bem, 1987).

Research on the co-occurrence of internalizing and externalizing disorders has presented mixed results. For younger children, anxiety may mitigate the severity of conduct disturbances, while these co-occurring problems may be a sign of future adult psychopathology (including criminality) for older children (Russo and Beidel, 1994). Some studies (Graham & Rutter, 1973; Marmorstein, 2007; Walker et al., 1991) have demonstrated a protective relationship between anxiety or depression and conduct problems. In these studies, the presence of internalizing disorders seemed to protect children from developing and displaying future conduct problems. However, other studies have shown the opposite relationship; children who displayed internalizing symptoms or who have been diagnosed with an internalizing disorder have been found to be at greater risk of displaying delinquent behavior than individuals without internalizing symptoms (Loeber, Stouthamer-Loeber, Van Kammen, & Farrington, 1991; Ollendick, Greene, Weist, & Oswald, 1990). This inconsistent pattern of associations between internalizing problems and externalizing problems suggest that mechanisms linking these outcomes are not entirely understood.

**Differential Effects of Social Withdrawal and Behavioral Inhibition**

The discrepancy across studies in associations between internalizing and externalizing problems has given rise to questions regarding why and how these seemingly opposing relationships exist. Kerr, Tremblay, Pagani, and Vitaro (1997) tested the possibility that subcomponents of internalizing problems, specifically behavioral inhibition and social withdrawal, have opposing influences on future risk for conduct
problems, possibly accounting for the highly variable association between internalizing and externalizing problems across different studies. Specifically, they hypothesized that behavioral inhibition reduces risk for future conduct problems, and social withdrawal increases risk for future conduct problems.

Kerr and colleagues defined behavioral inhibition as “a tendency to react fearfully to strange people, objects or situations or to the threat of punishment or nonreward” (p. 809). They defined social withdrawal as a “nonanxious preference for solitary activity or a failure to be rewarded by social interaction or others’ approval” (p. 810). Both of these constructs were measured using the Pupil Evaluation Inventory in which individuals were rated by their peers.

Using a sample of 778 boys from the Montreal Longitudinal Experimental Study, Kerr et al. (1997) used measures of inhibition, withdrawal, and disruptiveness at ages 10 to 12 to predict measures of self-reported depressive symptoms and delinquency at ages 13 to 15. The authors presented two hypotheses which are relevant to the present study: (1) behavioral inhibition would serve as a protective factor in the development of delinquency, whereas social withdrawal would be a risk factor; and (2) the pairing of social withdrawal and disruptiveness would lead to delinquency, whereas the pairing of inhibition and disruptiveness would not.

Results from this study did in fact support these hypotheses. Behavioral inhibition served as a protective factor against delinquency, such that disruptive boys who were inhibited were less likely to become delinquent than disruptive boys who were not inhibited. In contrast, social withdrawal served as a risk factor for delinquency, such that
disruptive boys who were socially withdrawn were at increased risk for delinquency as compared to disruptive boys who were not socially withdrawn.

Kerr and colleagues (1997) found that behavioral inhibition and social withdrawal have differential associations with conduct problems. However, it remains to be determined why these two highly associated dimensions of internalizing problems have highly discrepant effects on future risk for delinquency. Delinquent peer affiliation is one possible variable that might explain why behavioral inhibition and social withdrawal are differentially associated with delinquency.

**Peer Relationships**

Research has found that children tend to befriend individuals who are similar to them in terms of gender, grade level, and age (Kupersmidt, DeRosier, & Patterson, 1995; Matsueda & Anderson, 1998). Beyond these similarities, children also befriend peers who resemble them regarding deviant and prosocial behaviors (Mariano & Harton, 2005). Although these similarities may result in positive outcomes when prosocial friends befriend each other, the same cannot be said of deviant friendships. Numerous studies (Dishion, Spracklen, Andrews, & Patterson, 1996; Haynie, 2002; N. Piquero, Gover, MacDonald, & A. Piquero, 2009) have been conducted that reveal a significant positive association between an individual’s delinquent and aggressive behavior and peer delinquent behavior. Delinquent peer group affiliation has been found to be a predictor of an individual’s own future delinquent behavior (Ferguson, Swain-Campbell, & Horwood, 2002), suggesting that the association cannot be explained entirely by selection effects. In these friendships, deviant friends model delinquent behavior and expect others to behave similarly (Haynie, 2002). In addition, delinquent friends provide frequent reinforcement
for antisocial behavior, while prosocial behavior is frequently actively punished or ignored (Deater-Deckard, 2001).

It is possible that social withdrawal may increase the likelihood of affiliating with delinquent peers. As previously mentioned, when withdrawn children try to interact with their peers, these attempts are often met with exclusion, rejection, and peer neglect (Gazelle & Ladd, 2003; Rubin et al., 2009). Furthermore, withdrawn children are actively disliked by their classmates (Gazelle & Ladd, 2003; Ollendick et al., 1990). Research has found that social withdrawal is one of the strongest predictors of peer rejection during adolescence and middle school (Gazelle & Ladd, 2003; Rubin et al., 2009). As a result of the rejection they face from their prosocial peers, withdrawn children generally tend to befriend other rejected individuals (Deater-Deckard, 2001; Rubin et al., 2009) who are at increased risk for engaging in delinquent behaviors. Rejection by prosocial peers may increase the likelihood that socially withdrawn children affiliate with delinquent peers.

In contrast, behavioral inhibition may decrease the likelihood of affiliating with delinquent peers. Because behaviorally inhibited children are motivated by fear of punishment (Gazelle & Rubin, 2010) they may avoid spending time with peers who engage in delinquent behavior (carrying a high probability of punishment) and instead choose to interact with other inhibited children. Supporting this possibility, Coie, Terry, Zabrinks, and Lochman (1995) found that inhibited children were less likely than disinhibited children to associate with delinquent peers.

**The Present Study**

The present study extended the work of Kerr and colleagues (1997) by examining whether delinquent peer relationships might mediate the differential effects of social
withdrawal and behavioral inhibition on delinquency. Research reviewed above has shown that socially withdrawn children are rejected by prosocial peers and thus are likely to affiliate with delinquent peers (Gazelle & Ladd, 2003; Rubin et al. 2009). These findings suggest that delinquent peer relationships may explain why social withdrawal is associated with an increased risk for delinquency. Other research has shown that inhibited children are less likely to affiliate with delinquent peers (Coie et al., 1995). These findings suggest that reduced likelihood of affiliation with delinquent peers may explain why behavioral inhibition is inversely associated with delinquency. More specifically, behavioral inhibition may protect children from becoming delinquent by preventing affiliation with deviant peers.

The following hypotheses were evaluated in the present study:

1. Social withdrawal will be positively associated with delinquency.
2. Behavioral inhibition will be negatively associated with delinquency.
3. Social withdrawal will be positively associated with deviant peers.
4. Behavioral inhibition will be negatively associated with deviant peers.
5. Deviant peers will be positively associated with delinquency.
6. The positive association between social withdrawal and delinquency will be mediated by peer delinquency.
7. The negative association between behavioral inhibition and delinquency will be mediated by peer delinquency.

Hypotheses one through five can be seen in Figure 1.
Additionally, Kerr et al. (1997) used males with a history of disruptive behavior in their study. Therefore, the present study tested whether associations vary according to gender and to children’s history of conduct problems.

Currently, researchers only know that some children who have internalizing symptoms are more at risk of becoming delinquent, while others seem to be protected from these problems. By examining the processes explaining these differential associations, the proposed study could help improve understanding of how delinquency develops, and thus could aid in the identification of at-risk children. Furthermore, if the relationship between social withdrawal and delinquency is found to be mediated by friend’s delinquent behaviors, this finding would suggest that preventing affiliation with delinquent peers could be effective in preventing the development of delinquency among socially withdrawn children. Additionally, these findings could spur research examining...
whether affiliation with prosocial peers could mitigate the association between social withdrawal and delinquency.
METHODS

Participants

The present study utilized previously collected data from the Child Development Project, a longitudinal study of social development (CDP; Dodge, Bates, Pettit, 1990). The CDP recruited 585 children from Bloomington, IN, and Nashville and Knoxville, TN in 1987 and 1988. Families were randomly approached by the research staff during kindergarten preregistration in the spring when children were five years old. Families were asked if they would participate in a longitudinal study of child development. Approximately 75% of families who were approached agreed to participate. Furthermore, because not all families preregister, a proportion of participants were recruited on the first day of school or by letter or telephone. Three hundred and five participants were recruited in 1987, and 270 participants were recruited in 1988. Two hundred and four participants were from Nashville, 204 were from Knoxville, and 177 were from Bloomington. The sample is composed of 52% males, 81% European-Americans, 17% African-Americans, and 2% of other ethnicities (including Asian and Middle Eastern origins). Hollingshead (1979) socioeconomic status ranged from 8 to 66, with a mean of 39.5 (SD = 14.0), indicating that the sample includes families having a broad range of economic and social resources. Two hundred and nine children from the sample of 585 children were living in single-mother households at the time of initial data collection. None of the children were living in single-father households at the time of initial data.
collection. In addition, individuals received small payments (typically $20) for their participation at each data collection in the study. Parents and their children provided informed consent and assent, respectively, before participating in any research activities.

**Measures**

**Behavioral Inhibition:** Behavioral inhibition was measured using the Youth Characteristics Questionnaire (YCQ-Short Form; Bates, 1994; Appendix A). The YCQ is composed of 25 items and is a self-report questionnaire which was completed by children at age 12. Individuals rated themselves on items reflecting different temperament traits. The questionnaire is divided into four temperament domains: sociability/activity; resistance to control; negative emotionality/difficulty; and unadaptability. The unadaptability dimension of this questionnaire was used as a measure of behavioral inhibition, as it refers to the same underlying trait (Rothbart & Bates, 1998). Individuals responded on a 7-point scale indicating which response was most typical of them.

Questions on the unadaptability domain included “When in a new situation (e.g., start of the new school year, joining new club, etc.), how often are you uncomfortable?” and “When there is a sudden or unexpected change (e.g. a new person arrives, or there is a change in the family's plan), how often do you feel upset or uneasy about this change?”

One item was removed from the unadaptability dimension by the current researcher (“How much do you dislike surprises?”) due to this item’s low correlation with the other items on this dimension. Alpha coefficients for the revised unadaptability subscale was questionable at 0.63.

**Social Withdrawal:** The YCQ was also used as a measure of social withdrawal. Specifically, the reverse-scored sociability subscale was used as a measure of social
withdrawal. Examples of questions measuring social withdrawal include: “How much do you like to interact with people (reverse-scored)?” and “How much do you like to have people paying attention to you (reverse-scored)?” Alpha coefficients for the sociability subscale in a previous analysis of CDP data were .72 (Bates, 1994) which is acceptable.

**Externalizing Problems:** The Child Behavior Checklist (CBCL, Achenbach, 1991a; Appendix B) was used as a measure of child disruptiveness. It was completed by parents when children were 12 years old. The CBCL is suitable for children 4-18 years of age. It includes 118 items relating to child behavior problems scored on a three-point scale with a range of not true to often true. The externalizing scale of the CBCL is a composite of two subscales: aggressive behavior, and delinquent behavior. Examples of questions on the externalizing scale include: “argues a lot,” “doesn’t seem to feel guilty after misbehaving,” and “physically attacks people.” The CBCL has demonstrated strong concurrent and discriminant validity and is a highly regarded measure of child adjustment against which other measures of child adjustment are compared (Achenbach, 1991a). Individual item intraclass correlations of more than .90 were found of items for mothers who filled out the measure at 1-week intervals and for both parents completing the measure on their clinically-referred children. Test-retest reliability of mother’s ratings was .89 (Freeman, 1985). Internal consistency of the Externalizing and Total Problems scales are typically excellent, ranging from .92 to .96 and the reliability of the Internalizing scale is typically good to excellent ranging from .88 to .92 (Doll, 1998).

**Peer Delinquency:** Peer delinquency was measured using the Behavior of Friends (BFQ) questionnaire (Appendix C). This measure was created specifically for the CDP to assess the delinquent behavior of the individuals’ friend group and was
administered when participating youth were 14 years old. Individuals responded on a five-point scale (1 = never, 5 = very often). The purpose of this measure was to determine how often their friends engaged in a wide range of delinquent behaviors including getting into fights with other kids, stealing things, and suggesting that the individual do something that is against the law. Alpha coefficients for the BFQ are good and ranged from .87 to .88 in a previous analysis of CDP data (Goodnight et al., 2006). Furthermore, Pearson correlation between the age 14 and 16 BFQ scales was .54, suggesting stability in peer delinquency over time.

**Individual Delinquency:** The Youth Self-Report (YSR; Achenbach, 1991b; Appendix D) consists of 112 items and is composed of 8 subscales (withdrawn, somatic complaints, anxiety and depression, social problems, thought problems, attention problems, aggressive behavior, and delinquent behavior). It is appropriate for individuals between the ages of 6 and 18 and was completed by participants at age 16. The delinquency subscale was used to measure youth delinquency in the current study. It consists of 11 items relating to lying, cheating, stealing, theft, and swearing. Responses are on a 3-point scale (0=Not true of me, 1=Somewhat or sometimes true of me, 2= Very true or often true of me). The delinquency subscale has an alpha coefficient of .81 (Achenbach & Rescorola, 2001) which is good.
RESULTS

Preliminary Analyses

The means, standard deviations, and ranges of the variables of interest are presented in Table 1. In addition, bivariate correlations between the measures are presented in Table 2. Furthermore, in order to better understand if differences existed between females and males, independent samples t-tests were also conducted. The means and standard deviations, and results of the t-tests can be seen in Table 3. Results of the t-tests suggest that males and females did not differ on any of the variables.

Table 1.
Means, Standard Deviations, and Ranges for Study Variables.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean</th>
<th>Percent Missing</th>
<th>Standard Deviation</th>
<th>Min-Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Inhibition</td>
<td>3.06</td>
<td>13.20</td>
<td>0.99</td>
<td>1.00-6.20</td>
</tr>
<tr>
<td>Social Withdrawal</td>
<td>3.44</td>
<td>13.20</td>
<td>0.900</td>
<td>1.00-6.14</td>
</tr>
<tr>
<td>Peer Delinquency</td>
<td>1.96</td>
<td>15.00</td>
<td>0.49</td>
<td>1.19-4.31</td>
</tr>
<tr>
<td>Youth Delinquency</td>
<td>3.74</td>
<td>9.10</td>
<td>2.83</td>
<td>0-16</td>
</tr>
<tr>
<td>Externalizing</td>
<td>9.24</td>
<td>21.54</td>
<td>7.14</td>
<td>0-40</td>
</tr>
</tbody>
</table>

*Note.* YCQ = Youth Characteristics Questionnaire; BFQ = Behavior of Friends Questionnaire; YSR Delinquency = Youth Self-Report Delinquency Scale; CBCL Externalizing = Child Behavior Checklist Externalizing Scale.
Table 2.

Correlations Between Behavioral Inhibition, Social Withdrawal, Peer Delinquency, Youth Delinquency, and Externalizing Behaviors.

<table>
<thead>
<tr>
<th></th>
<th>Behavioral Inhibition</th>
<th>Social Withdrawal</th>
<th>Peer Delinquency</th>
<th>Youth Delinquency</th>
<th>Externalizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Inhibition</td>
<td>0.01</td>
<td>0.07</td>
<td>0.06</td>
<td>0.076</td>
<td></td>
</tr>
<tr>
<td>Social Withdrawal</td>
<td>0.12</td>
<td>-0.12</td>
<td>0.11*</td>
<td>-0.12*</td>
<td></td>
</tr>
<tr>
<td>Peer Delinquency</td>
<td>0.49**</td>
<td>-0.49**</td>
<td>0.22**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Youth Delinquency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.31**</td>
</tr>
</tbody>
</table>

Note. *p < .05; **p < .01.

Table 3.

Means and Standard Deviations of Variables by Gender, and Independent Samples T-Test Comparing Variables by Gender

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Independent Samples t-tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Means</td>
<td>Standard Deviation</td>
<td>Means</td>
</tr>
<tr>
<td>Behavioral Inhibition</td>
<td>3.07</td>
<td>1.03</td>
<td>3.04</td>
</tr>
<tr>
<td>Social Withdrawal</td>
<td>3.36</td>
<td>0.89</td>
<td>3.51</td>
</tr>
<tr>
<td>Peer Delinquency</td>
<td>2.00</td>
<td>0.48</td>
<td>1.93</td>
</tr>
<tr>
<td>Youth Delinquency</td>
<td>3.89</td>
<td>2.85</td>
<td>3.60</td>
</tr>
<tr>
<td>Externalizing</td>
<td>9.36</td>
<td>7.07</td>
<td>9.10</td>
</tr>
</tbody>
</table>
Primary Analyses

The primary hypotheses were tested using path analysis. The first hypothesis (i.e., that social withdrawal would be positively associated with delinquency) and the second hypothesis (i.e., that behavioral inhibition would be negatively associated with delinquency) were tested first.

Results revealed that social withdrawal at age 12 was significantly associated with age 16 youth delinquency ($\beta = -0.110, p = 0.03$). Behavioral inhibition at age 12 was not significantly associated with age 16 youth delinquency ($\beta = 0.063, p = 0.210$).

Figure 2. A visual depiction of associations between behavioral inhibition, social withdrawal and delinquency that were tested in hypotheses 1 and 2. Note. * = $p < .05$. ns = nonsignificant.

The third hypothesis (i.e., that social withdrawal would be positively associated with deviant peers), the fourth hypothesis (i.e., that behavioral inhibition would be
negatively associated with deviant peers), and the fifth hypothesis (i.e., that deviant peers would be positively associated with delinquency) were tested in the next model.

Results revealed that age 12 social withdrawal was not significantly associated with age 16 youth delinquency once delinquent peers were added to the model ($\beta = -0.040$, $p = 0.375$). Behavioral inhibition at age 12 was also not significantly associated with age 16 youth delinquency ($\beta = 0.032$, $p = 0.476$). However, peer delinquency at age 14 was significantly associated with age 16 youth delinquency ($\beta = 0.511$, $p < 0.001$). In addition, age 12 social withdrawal was significantly associated with age 14 peer delinquency ($\beta = -0.132$, $p = 0.010$). However, age 12 behavioral inhibition was not significantly associated with age 14 peer delinquency ($\beta = 0.081$, $p = 0.112$).

*Figure 3.* A visual depiction of associations between social withdrawal, behavioral inhibition, deviant peers, and youth delinquency that were tested in hypotheses 3, 4, and 5. Note. * = $p < .05$. ns = nonsignificant.

The final set of analyses tested hypotheses 6 (i.e., that the positive association between social withdrawal and delinquency would be mediated by peer delinquency) and
7 (i.e., that the negative association between behavioral inhibition and delinquency would be mediated by peer delinquency) using bootstrap mediation (Preacher & Hayes, 2008). Bootstrapping provides a less biased test of mediation as compared to alternative methods because it makes no assumption that data are normally distributed. Instead, bootstrapping treats the distribution of the obtained sample as a representation of the distribution of the population of interest by resampling the given sample with replacement in order to create \( k \) (usually at least 1000) different samples. In the current study \( k=5000 \) samples were created for the purposes of obtaining a sampling distribution of the indirect effect. A confidence interval (95%) was generated by sorting the indirect effects from smallest to largest. For mediation to be significant, zero is not contained within this confidence interval (Preacher & Hayes, 2008). These indirect paths can be seen in Figure 3 above.

Peer delinquency at age 14 significantly mediated the association between age 12 social withdrawal and age 16 youth delinquency (\( \beta = -0.068 \), 95% confidence interval = -0.122 to -0.013), such that the significant negative association between social withdrawal and youth delinquency was accounted for by the significant negative association between social withdrawal and peer delinquency and the positive association between peer delinquency and youth delinquency. The association between age 12 behavioral inhibition and age 16 youth delinquency was not mediated by age 14 peer delinquency (\( \beta = 0.042 \), 95% percentile = -0.023 to 0.106).

As a final step of the analyses, differences in hypothesized associations between males and females and between disruptive and nondisruptive children was tested using multiple group path models, where groups were based on child gender and on a mean cutoff on the age 12 CBCL externalizing scale. Individuals who were above the median
split on the externalizing scale were considered high in disruptive behavior. Individuals below the median split were considered low in disruptive behavior. In order to test whether paths varied for high versus low disruptive youths, model fit was evaluated before and after paths were constrained to be the same for individuals high or low in disruptive behavior. Significant improvements in model when allowing paths to differ for high and low disruptive youths would indicate that paths varied significantly between these groups. However, model fit was not significantly improved by allowing paths to be different for individuals high or low in disruptive behavior ($\Delta \chi^2(3) = 3.147, p = 0.370$), suggesting no significant differences in effects for high versus low disruptive youths.

Gender differences in pathways were also tested by examining changes in model fit before and after pathways were constrained to be equal for boys and girls. Model fit was not significantly improved by allowing paths to be different for boys and girls ($\Delta \chi^2(3) = 3.203, p = .361$), suggesting no significant differences in paths for between boys and girls.
DISCUSSION

The present study attempted to replicate and extend the findings of Kerr and colleagues (1997), who found that behavioral inhibition reduced risk for delinquency and social withdrawal increased risk for delinquency. The present study extended this work by examining peer delinquency as a mediator of the differential effects of social withdrawal and behavioral inhibition on delinquency. Multiple hypotheses were presented to explain these associations.

The first set of hypotheses posited that social withdrawal would be positively associated with delinquency and that behavioral inhibition would be negatively associated with delinquency. Although results revealed a significant association between social withdrawal and youth delinquency, it was not in the expected direction. In contrast to the positive association between social withdrawal and delinquency reported by Kerr and colleagues (1997), the current study found a significant negative association between these variables, suggesting that social withdrawal may have protected these children from becoming delinquent. This association did not vary according to gender or level of youth disruptiveness. In addition, the current study found a positive, although nonsignificant, association between behavioral inhibition and youth delinquency. In contrast, Kerr and colleagues (1997) found a significant negative association between behavioral inhibition and delinquency.
The second set of analyses examined the hypotheses that social withdrawal would be positively associated with peer delinquency, whereas behavioral inhibition would be negatively associated with peer delinquency. In addition, these analyses tested the hypothesis that deviant peers would be positively associated with youth delinquency. Although social withdrawal was significantly associated with peer delinquency, it was in the opposite direction hypothesized. Social withdrawal was found to be negatively associated with peer delinquency, such that withdrawn children were protected against engaging in relationships with deviant peers. This finding is inconsistent with previous research that suggests that withdrawn children have a tendency to socialize with rejected peers who are at an increased risk of becoming delinquent (Deater-Deckard, 2001; Rubin et al., 2009). The association between behavioral inhibition and peer delinquency was nonsignificant. However, as hypothesized, peer delinquency was positively associated with youth delinquency. This finding replicates previous research showing that affiliating with delinquent peers increases an individual’s likelihood of becoming delinquent (Haynie, 2002; Ferguson, Swain-Campbell, & Horwood, 2002).

The final set of hypotheses tested peer delinquency as a mediator of the differential effects of social withdrawal and behavioral inhibition on youth delinquency. It was hypothesized that the positive association between social withdrawal and delinquency would be mediated by peer delinquency, such that social withdrawal would be positively associated with peer delinquency and peer delinquency would be positively associated with youth delinquency. In addition, it was hypothesized that the negative association between inhibition and delinquency would be mediated by peer delinquency, such that behavioral inhibition would be negatively associated with peer delinquency and
peer delinquency would be positively associated with youth delinquency. Support for peer delinquency as a mediator of the association between social withdrawal and youth delinquency was found; interestingly, however, it was not in the direction hypothesized. Instead, social withdrawal was negatively associated with peer delinquency, and peer delinquency was positively associated with youth delinquency. This mediating effect suggested that the negative association between social withdrawal and youth delinquency was found because socially withdrawn children were less likely to associate with delinquent peers, which protected them from becoming delinquent. Finally, it should be noted that no significant differences were found between males and females on levels of behavioral inhibition and social withdrawal. This is consistent with previous research that suggests that males and females do not differ in the prevalence or frequency of social withdrawal or behavioral inhibition (Rubin et al., 2009).

As noted above, several inconsistencies were found between the current study and Kerr and colleagues (1997). There are several possible explanations for these inconsistencies. First, the measures used in the current study may not have been measuring the same exact constructs that had been previously measured by other researchers. This may be especially true regarding behavioral inhibition and social withdrawal. Previous research has suggested that social withdrawal may be a component of behavioral inhibition (Pérez-Edgar et al., 2011) or that inhibition may be an antecedent of social withdrawal (Fox et al., 2005). As such, it should be expected that a significant correlation would exist between these variables. However, such an association between behavioral inhibition and social withdrawal was not found, suggesting that these
constructs may not have been the exact same constructs as examined in previous research.

In addition, one important fact to keep in mind in regards to the measures of behavioral inhibition and social withdrawal used by Kerr and colleagues (1997) is that peers were rating individuals on these variables. In the present study, individuals rated themselves on these variables. With that being said, how an individual rates themselves may be different than how others see them. For example, Hymel, Bowker, and Woody (1993) examined variations in self and peer perceptions of unpopular children in the context of aggressive and withdrawn behaviors. Results indicated that some children had a tendency to overestimate their social competencies. Given this information, these overestimations may lead to discrepancies between self and peer reports of an individual’s disposition or behaviors.

Furthermore, it is especially likely that the measure of social withdrawal used in the study was not measuring the same construct that has been used in the past, especially in light of Kerr and colleagues’ (1997) findings. As Rubin, Coplan, and Bowker (2009) acknowledged, social withdrawal has been defined and measured in so many different ways that it is sometimes challenging to know exactly what this constructs really means. As a result, it’s difficult to compare one study to another regarding this construct because researchers may be using the same term to refer to highly discrepant constructs.

For example, Harrist and colleagues (1997) examined four subtypes of social withdrawal (unsociable, passive-anxious, active-isolates, and sad/depressed) and their relation to peer rejection and neglect. Relevant to this study was the finding that active isolates, considered to be withdrawn because they are shunned and prevented from
playing with peers, experienced a higher than expected level of peer rejection. In contrast, unsociable children, described as having adequate social skills yet showing a preference for object play to social play and appearing low in approach motivation, did not experience an increased risk for peer rejection. It may be the case that in the present study, the measure of social withdrawal used was more closely aligned with the concept of unsociable dimension of social withdrawal rather than the active-isolate dimension of social withdrawal given some of the questions found in the YCQ (e.g., how much do you like to interact with people?; how much do you like to have people paying attention to you?, etc.). If this is the case, it would not be expected that these children would associate with delinquent peers or demonstrate delinquent behavior themselves. In fact, because these children have adequate skills to associate with others, yet prefer solitary activity, they may be protected from affiliating with delinquent peers.

Thus, although previous research suggests that social withdrawal predicts peer rejection by prosocial peers in adolescence (Gazelle & Ladd, 2003) and that this rejection leads to an increased likelihood of delinquent peer affiliation (Deater-Deckard, 2001; Rubin et al., 2009), the findings of Harrist et. al. (1997) suggests that these associations may depend on the subtype of social withdrawal being measured. In the present study, the social withdrawal measure used may not have captured the dimension of social withdrawal that leads to rejection by prosocial peers.

**Strengths**

The current study has several notable strengths. One major strength of this study was the large sample size. Using such a large data set provided good statistical power to detect relations between variables. In addition, the sample was fairly representative given
that it was community-based. Individuals came from a wide range of socioeconomic backgrounds and were somewhat ethnically diverse.

Another strength of this study is the use of longitudinal data. By examining these variables in a developmental framework, it was possible to gain a better understanding of the temporal ordering of the risk factors under consideration. However, this study still did not allow for an inference of causality because it is not possible to conclude that all potential confounding influences on the associations between the predictors and outcomes were controlled.

**Limitations**

The current study also had several limitations. One limitation is that some attrition did occur throughout the course of the study. As such, data were not available from the full sample of the Child Development Project for all of the variables. While attrition was expected to occur, it occurred at an expected level given the length of the study. However, the generalizability of the findings could be reduced if individuals who dropped out of the study were systematically different from individuals who remained in the study (Miller & Hollist, 2007). Previous research using data from the Child Development Project suggests that individuals who discontinued participation in the study may have become disinterested in the study, lived too far away, or were unavailable at the time of collection. Additionally, individuals who remained in the study typically had a higher average socioeconomic status than those who dropped out (Goodnight et al., 2006).

Additionally, as alluded to above, this study may have contained less than optimal measurement of the variables of interest. First, because this study relied solely on self-
report measures, the associations between variables may have been inflated. This study may also have been stronger if the administration of the measurements occurred closer together. Although research suggests that social withdrawal and behavioral inhibition remain somewhat stable over time (Rubin, Coplan, and Bowker, 2009) this may only be for those children at the extremes of inhibition and withdrawal. Thus, it is possible that the effects of behavioral inhibition and social withdrawal may have been relatively short-lived for those individuals with less extreme levels of these traits.

In addition, the Youth Characteristics Questionnaire which was used as a measure of behavioral inhibition and social withdrawal is not extremely well-established or validated. Any shortcomings in the psychometric properties of the measures could have reduced or distorted the associations between variables in the study.

Future Directions

Given the limitations of the present study, this study lends itself to additional avenues of research. Future studies should include the use of multiple informants for each variable of interest. By doing this, any bias that may exist as a result of relying on only one informant could be reduced. In addition, future studies should include measures of youth and peer delinquency that capture recently emerging avenues for peer delinquency and aggression. For instance, cyberbullying, which involves sending harassing messages to others via technology (emails, social media, text messages, etc.) has become an increasingly prevalent form of peer aggression (Wade & Beran, 2011). While the fact that some forms of peer aggression and delinquency that are popular today were not included in the measures used in the study, it is not suspected that this would have affected the associations between anxiety dispositions and peer delinquency. This is
because the associations of inhibition and withdrawal with delinquency are not contingent on the types of delinquent behavior that occur, but rather based on individual’s disposition and likelihood of involvement with delinquent peer groups. However, more modern forms of peer aggression and delinquency could conceivably influence the effect of peer delinquency on youths’ own involvement in delinquent and aggressive behaviors. For example, cyberbullying may lend itself more easily to peer involvement as compared to more traditional forms of aggression and delinquency. Given this information, including more modern measures of peer and youth delinquency would be important to better understand the dynamics and mechanisms of delinquent peer influences.

Future studies should also take the lead from Harrist and colleagues (1997) and break down social withdrawal into its various dimensions. By looking at the major subtypes of social withdrawal, researchers may better understand the complexities of how social withdrawal relates to peer relationships and youth delinquency. Examining the subtypes of social withdrawal in the context of peer delinquency and individual delinquency may shed light on which withdrawn children are truly at risk for, or potentially protected from, becoming delinquent. It may be the case that socially withdrawn children who are unsociable are actually protected from associating with delinquent peers and becoming delinquent. On the other hand, socially withdrawn children who are active-isolates may actually be at increased risk of associating with delinquent peers (because of the rejection they face from their prosocial peers) and becoming delinquent. As such, a study that examined how these subtypes of social withdrawal are differentially associated with peer and youth delinquency would be useful in identifying at-risk children.
Conclusions

Although many of the hypothesized associations were non-significant or contrary to the hypothesized directions, this study sheds some light on the construct of social withdrawal. Given that the present findings regarding social withdrawal were contrary to previous research and given the recognition in the field of the ambiguity surrounding the construct of social withdrawal, future research is warranted. Specifically, additional research is necessary to understand how this construct, or certain subtypes of this construct, protect or place individuals at risk for certain negative outcomes.

This study also presented interesting findings regarding the mediating role of peer delinquency in the association between social withdrawal and youth delinquency. To the degree that the present study was measuring the unsociable dimension of social withdrawal, the current study suggests that some socially withdrawn children may be protected from becoming delinquent. Because these children tend to prefer solitary activity, they may be less likely to associate with delinquent peers, and thus less likely to become delinquent. In addition, these findings suggest that if an individual were to score low on a measure of unsociability, we may be able to identify children who are at risk for delinquency because these children may be more likely to associate with delinquent peers. Identifying the different subtypes of social withdrawal in children would be helpful for identifying those children who are at risk, or are protected, from becoming delinquent. By examining these different subtypes, we may be able to tailor our intervention strategies to fit the needs of an active-isolate child versus an unsociable child. For example, knowing that a child is an active-isolate would inform a clinician to work on reducing the child’s aggressive and immature behaviors, thus allowing the child to begin
to be accepted by prosocial peers. Finally, this study supports previous research suggesting that peer delinquency is a robust predictor of individual delinquency.
REFERENCES


Loeber, R. Peer Delinquency Scale, Pittsburgh Youth Study, Department of Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania, 1989.


APPENDIX A

YOUTH CHARACTERISTICS QUESTIONNAIRE

For the following set of questions please circle the number that is most typical of you. "About average" means how you think the typical person your age would be.

1. How much do you like to interact with people?

   1  2  3  4  5  6  7
   very little; much less than the average person
   about average
   much more than the average person
   very much;

2. When someone tells you not to do something you want to do, how often do you ignore him or her and keep doing it?

   1  2  3  4  5  6  7
   almost never           once in a while
   about half the time
   often
   almost every time

3. How often does your mood change in response to things that go on inside you?

   1  2  3  4  5  6  7
   very little; much less than the average person
   about average
   much more than the average person
   very often;

4. When there is a sudden or unexpected change (e.g. a new person arrives, or there is a change in the family's plan), how often do you feel upset or uneasy about this change?

   1  2  3  4  5  6  7
   never           once in a while
   about half the time
   often
   almost every time

5. How much do you like to perform for people (e.g., showing musical, sports, or other skills)?

   1  2  3  4  5  6  7
   very little; much less than the average person
   about average
   much more than the average person
   very much;

6. When someone has told you not to do something, how often do you start doing it when he or she is not watching?

   1  2  3  4  5  6  7
   almost never           once in a while
   about half the time
   often
   almost every time
7. How often are you in an upset, sad or angry mood?

1  2  3  4  5  6  7
Almost never  A few times a week  Several times a week  Once a day  Twice a day  3-4 times a day  More than 5 times a day

8. How much do you dislike surprises?

1  2  3  4  5  6  7
Much more than the average person  Sometimes like and sometimes dislike them  Like them much more than the average person

9. How much do you like to have people paying attention to you?

1  2  3  4  5  6  7
Much less than the average person  Much more than the average person  Very little

10. When someone has told you to do something, how often do you stop when that person is not watching?

1  2  3  4  5  6  7
Almost never  Once in a while  About half the time  Often  Almost every time

11. How frequently does your mood change in response to what happens around you?

1  2  3  4  5  6  7
Almost never  Once in a while  About half the time  Often  Very often; much more than the average person

12. When meeting a new person, how often are you uncomfortable?

1  2  3  4  5  6  7
Almost never  Once in a while  About half the time  Often  Almost every time

13. How often is your life fast-paced, with many events and activities in the same day?

1  2  3  4  5  6  7
Almost never  Once in a while  About half the time  Often  Almost every time

14. When someone tells you to do something that you don't want to do, how often do you act like you didn't hear him or her?

1  2  3  4  5  6  7
Almost never  Once in a while  About half the time  Often  Almost every time

15. When there is a problem, how much worrying do you tend to do?

1  2  3  4  5  6  7
Never work, even about big problems  Moderate amount of worry  A lot of worry, even about small problems
16. When in a new situation (e.g., start of new school year, joining new club, etc.), how often are you uncomfortable?

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<tr>
<td>Almost never</td>
<td>Once in a while</td>
<td>About half the time</td>
<td>Often</td>
<td>Almost every time</td>
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17. How much do you like to stay busy all of the time?

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<tr>
<td>Much less than the average person</td>
<td>MUCH more than the average person</td>
<td>Very little</td>
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18. How often do you frown or complain when told what or what not to do?

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<td>Almost never</td>
<td>Once in a while</td>
<td>About half the time</td>
<td>Often</td>
<td>Almost every time</td>
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19. How often do you cry?

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<tr>
<td>Almost never</td>
<td>A few times a month</td>
<td>Several times a month</td>
<td>Once a week</td>
<td>Twice a week</td>
<td>3-4 times a week</td>
<td>More than 5 times a week</td>
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20. When you go to a party or meeting where you don't know many people, how often do you feel like leaving right away?

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<tr>
<td>Never</td>
<td>Once in a while</td>
<td>About half the time</td>
<td>Often</td>
<td>Almost every time</td>
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21. How often do you feel like you are bursting with energy?

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<td>Almost never</td>
<td>A few times a month</td>
<td>Several times a month</td>
<td>Once a week</td>
<td>Twice a week</td>
<td>3-4 times a week</td>
<td>More than 5 times a week</td>
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22. How do you feel when someone (e.g. parent, teacher, older sibling) gives you directions or orders?

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<th>5</th>
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<th>7</th>
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<tbody>
<tr>
<td>No problem; never bothers me</td>
<td>Sometimes do and sometimes do not like it</td>
<td>Bothers me almost all the time</td>
<td></td>
<td></td>
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23. How often are you aware of and bothered by small discomforts or pain (e.g. cold, hungry, headache)?

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<td>Several times a month</td>
<td>Once a week</td>
<td>Twice a week</td>
<td>3-4 times a week</td>
<td>More than 5 times a week</td>
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24. When there is an unexpected change in your group's plans or a change in the members of your group, how often do you feel uncomfortable?

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<tbody>
<tr>
<td>Never</td>
<td>Once in a while</td>
<td>About half the time</td>
<td>Often</td>
<td>Almost every time</td>
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25. How much do you want to be in charge, have others follow your suggestions or examples?

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<tbody>
<tr>
<td></td>
<td>very little; much less than the average person</td>
<td>about average</td>
<td>much more than the average person</td>
<td>very much</td>
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Unadaptability (Behavioral Inhibition): 4, 8, 12, 16, 20, 24;
Sociability (Social Withdrawal): 1, 5, 9, 13, 17, 21, 25
APPENDIX B

CHILD BEHAVIOR CHECKLIST EXTERNALIZING BEHAVIOR SAMPLE ITEMS

0 = Not True
1 = Somewhat True
2 = Very True

3. Argues a lot
26. Doesn't seem to feel guilty after misbehaving
57. Physically attacks people
32. Sets fires
104. Unusually loud
105. Uses alcohol or drugs for nonmedical purposes
APPENDIX C

BEHAVIOR OF FRIENDS QUESTIONNAIRE

Now I’d like to ask you about the behavior of your friends, the people you do things with. Please use the following scale to tell me how often your friends do these things.
(1 = never; 2 = hardly ever; 3 = sometimes; 4 = often; 5 = very often)

How often do the kids in your group of friends:

_____1. Get into fights with other kids?
_____2. Steal things?
_____3. Smoke cigarettes?
_____4. Drink alcohol?
_____5. Smoke marijuana?
_____6. Use bad language?
_____7. Lie to their parents and teachers?
_____8. Get into trouble at school?
_____9. Suggest that you do something that is against the law?
_____10. Like to do things that make you scared or uncomfortable?
APPENDIX D

YOUTH SELF-REPORT DELINQUENCY SUBSCALE SAMPLE ITEMS

0 = Not True
1 = Somewhat True
2 = Very True

26. I don’t feel guilty after doing something I shouldn’t.

39. I hang around with kids who get in trouble.

63. I would rather be with older kids than with kids my own age.

67. I run away from home.

72. I set fires.

82. I steal from places other than home.

101. I cut classes or skip school.

105. I use drugs for nonmedical purposes (don’t include alcohol or tobacco).