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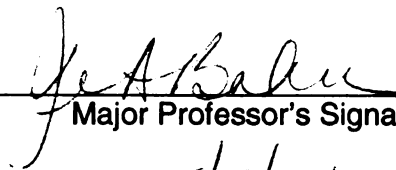
CONDUCT DISORDER AND JUVENILE DELINQUENCY IN
FEMALES: A META-ANALYTIC REVIEW

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**CONDUCT DISORDER AND JUVENILE DELINQUENCY
IN FEMALES: A META-ANALYTIC REVIEW**

By

Dara Kearns-Psarouthakis

A DISSERTATION

**Submitted to
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ABSTRACT

CONDUCT DISORDER AND JUVENILE DELINQUENCY IN FEMALES: A META-ANALYTIC REVIEW

By

Dara Kearns-Psarouthakis

Past research on juvenile antisocial behavior operated on the assumption that female antisocial behavior is a milder, less pervasive form of male antisocial behavior. Hence, research studies have tended to concentrated exclusively on males or utilize aggregated samples. Contemporary research has begun to examine gender differences, however, these efforts are limited and are scattered across disciplines making assumptions regarding female antisocial behavior difficult. In this meta-analytic review of developmental and outcome risk for female antisocial behavior, Conduct Disorder and Juvenile Delinquent samples were examined regarding within and between gender differences. This research challenges some of the fundamental assumptions regarding female antisocial behavior. When compared to normal females and similarly antisocial males, a specific developmental risk profile does exist for both Conduct Disorder and Juvenile Delinquent females, and these females are at greater risk for poor prognosis. Indeed, there is a gender paradox regarding antisocial behavior. A selective female affliction for Conduct Disorder and Juvenile Delinquency appears to exist in which these antisocial females experience greater specific developmental risk, greater levels of distress and behavioral severity, and poorer prognosis than do antisocial males.

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This research project is dedicated with love to my husband, Peter, my children, Gray and Taylor, and my dearly loved Mom. Thank you for all your love and unfailing support throughout the many years and phases of this project. It is also dedicated to my Dad, who missed its ending, although I know he is reading it in the next place.

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INTRODUCTION

Based upon the definition provided by the Diagnostic Statistical Manual, Fourth Edition (DSM-IV), Conduct Disorder (CD) is a repetitive, persistent pattern of behavior in which the basic rights of others or age-appropriate societal norms or rules are violated. Children or adolescents with this disorder often initiate aggressive behavior or react aggressively to others, deliberately destroy others property and commonly exhibit deceitfulness or theft. Conduct Disorder is often associated with an early onset of sexual behavior, drinking, smoking, use of illegal substances and reckless and risk-taking acts. These behaviors may lead to problems in school, home or the community (e.g. school suspension or expulsion, legal difficulties, sexually transmitted disease and physical injury). Longitudinal research on children with CD indicates the persistence of antisocial behavior in adulthood (Robins & Price, 1991; Zoccolillo, Pickles, Quinton, & Rutter, 1992). The prognosis for adolescent females with this disorder is particularly poor and often associated with early and violent death, arrest, substance abuse/dependence, pregnancy, and poor school outcome (Zoccolillo, Tremblay, & Vitaro, 1996; Fergusson & Woodward, 2000).

Conduct Disorder has been identified as the second most common psychiatric disorder found in females (Cohen, Cohen & Brooks, 1993; Zoccolillo, 1993; Zoccolillo & Rogers, 1991). As adolescent CD females have such poor outcome histories, correct identification and intervention is imperative at early ages to aid prevention and treatment services. However, the diagnosis of CD in females is a complex issue. Female antisocial behavior tends to be viewed within the framework of male antisocial behavior, that the

etiology, developmental pathways, and correlates are similar. Due to this assumption, there has been relatively little research conducted on conduct disorder in females (Zoccolillo, 1993). Most research on antisocial behavior and CD tends to focus exclusively on males or aggregated samples. Relevant research in the psychological domain has tended to concentrate on males mainly due to the assumption that CD in females is rare. This belief has led researchers to either focus exclusively on males or treat all children with CD similarly without examining gender differences (Zoccolillo, 1993). Criminology researchers have also tended to limit the focus of their research to male subjects based on the assumption that female CD and delinquency are a mild, rarer form of male antisocial behavior (Hoyt & Scherer, 1998). As males typically have higher arrest rates and commit more serious and violent types of crimes, attention toward female conduct problems has been limited in the past. However, data based upon arrest rates since the early 1980's indicate that female arrest rates for delinquent and violent offenses are rising at an alarming rate (Hoyt & Scherer, 1998). Clearly, conduct problems and antisocial behavior among females is a serious social problem requiring urgent address.

As much of current research is limited and remains scattered across disciplines, it is difficult to make assumptions about female conduct disorder. The purpose of this research is to cumulate information across studies and disciplines in an attempt to examine the pattern of conduct problems in females. As different disciplines define antisocial behavior utilizing differing terminology, the words conduct problems, antisocial behavior and delinquency will be used interchangeably. This study extended current research by attempting to draw conclusions based upon a variety of literatures examining different aspects of conduct problems in females.

I. REVIEW OF THE LITERATURE

The review of the literature will focus on providing background information in relevant areas of research pertaining to the questions being addressed in this research project. First, limitations regarding the underrepresentation of females with Conduct Disorder and basic assumptions will be discussed. Second, a discussion on prevalence rates of Conduct Disorder in females will be presented. Finally, a discussion of current research conclusions relating to the pattern of conduct problems in females will be presented.

Research Limitations

The *Diagnostic and Statistical Manual of Mental Disorders* is widely used to classify mental disorders in most research studies and mental health facilities. Recent revisions in the *Diagnostic and Statistical Manual of Mental Disorders*, (4th ed.) (DSM-IV; APA, 1994) on the criteria for Conduct Disorder may have unintentionally prevented clinicians from correctly identifying female populations with Conduct Disorder. Diagnostic criteria may be inappropriate for use with females. Although the DSM-III recognized that antisocial behavior symptoms could be differentially expressed in men and women (Williams & Spitzer, 1982), these differences were excluded in the revision to the DSM-III-R. Validity studies of revised criteria comparing the DSM-III to the DSM-III-R (Lahey, Loeber, Stouthamer-Loeber, Christ, Green, Russo, Frick, & Duncan, 1990), the DSM-III-R (Spitzer, Davies, & Barkley, 1990), and the DSM-IV (Lahey, Applegate, Barkley, Garfinkel, McBurnett, Kerdyck, Greenhill, Hynd, Frick, Newcorn,

Biederman, Ollendick, Hart, Perez, Waldman, & Shaffer, 1994) either did not examine females or were comprised primarily of male subjects. Since significant female populations were not included, the validity of usage of these criteria to identify this disorder in females is compromised. Therefore, research utilizing DSM diagnostic criteria may be biased and result in an underrepresentation of females diagnosed with CD (Zoccolillo et al., 1996). Revisions from the DSM-III to the DSM-III-R excluded criteria more related to less overt behaviors. Criteria for childhood Antisocial Personality Disorder and Conduct Disorder became similar and symptoms of early substance abuse, school suspension, school underachievement relative to ability, promiscuity, and delinquency (for Antisocial Personality Disorder) and disobedience, early substance abuse and blaming others (for Conduct Disorder) were excluded while cruelty to animals or people or sexual coercion were included for Antisocial Personality Disorder (Zoccolillo et al, 1996). Current diagnostic criteria in the DSM-IV (American Psychological Association, 1994) define Conduct Disorder as:

a repetitive and persistent pattern of behavior in which either the basic rights of others or major age-appropriate societal norms or rules are violated, as manifested by the presence of three (or more) of the following criteria in the past 12 months, with at least one criterion present in the past 6 months: aggression to people and animals, destruction of property, deceitfulness or theft, and serious violations of rules (pp. 90-91).

As the criteria for Conduct Disorder in the revision from the DSM-III to the DSM-III-R were not validated on significant female populations and symptomology common in females were discontinued in the DSM-IV, it may be the case that the current

criteria are not sensitive to the identification of Conduct Disorder in females (Zoccolillo, 1993). Zoccolillo et al., (1996) suggests that the consequences of missing a significant **population** of children with CD (e.g. females) will result in a consistent underestimate of **the** prevalence rates and continuities between childhood and adult antisocial behavior, as **well** as the need for treatment and prevention services. Of additional concern, the validity **studies** of the DSM-III-R did not include well-represented samples of preschool and **adolescent** populations (Spitzer et al., 1990) and may contribute to the confusion or lack of **sensitivity** regarding early and adolescent-onset diagnoses in females.

The issue of underrepresentation in Conduct Disorder diagnosis is further **complicated** by the possibility that females with conduct problems may not be found in the **psychiatric** or criminal justice systems. It appears that women with Antisocial **Personality** Disorder (an adult outcome of childhood Conduct Disorder) rarely seek **treatment**. In addition, lifetime prevalence rates for felony convictions, in adult women **with** antisocial personality disorder, are only around 17% (Zoccolillo, 1993). Females **appear** to be arrested less often and for less serious offenses than do males. Females are **more** likely to be incarcerated for sexual misdemeanors, such as promiscuity and **prostitution**. Females with Conduct Disorder or Antisocial Personality Disorder often **have** high rates of arrest, but fewer felony convictions and incarcerations (Chesney-Lind & **Shelden**, 1992; Zoccolillo, 1993).

Much of the early research on antisocial behavior has stemmed from the criminal **justice** system. A troubling theme to emerge from this literature is that the juvenile justice **system** is imperfect in its treatment of female delinquents and inherent biases are **prevalent** (Hoyt & Scherer, 1998). Some researchers (Chesney-Lind & Shelden, 1992)

have suggested that the ways in which agencies and courts deal with females with conduct problems should be examined, as gender-bias is prevalent. Historically, female delinquency has been conceptualized as inappropriate sexual expression. Female delinquents needed the protection of the courts to look after their well-being; therefore girls were arrested mainly for status offenses and for being 'incorrigible' (Hoyt & Scherer, 1998). It is difficult to fully understand the treatment of an adolescent female by the juvenile justice system. Official data reveals that gender differences exist and females are treated differently (Hoyt & Scherer, 1998). What is unclear, however, is whether this differential treatment is warranted. In adolescence, girls tend to be arrested less, are arrested for more minor offenses, and are less likely to be adjudicated than boys (Hoyt & Scherer, 1998). When adolescent girls are arrested, they tend to be arrested for committing status offenses. Status offenses are those that are illegal if committed by a juvenile but would not be if committed by an adult. Self-report delinquency data consistently reveals that girls do not commit more status offenses than males (Chesney-Lind & Shelden, 1992). However, females are significantly more likely to be arrested for status offenses than are males. This suggests that statutes are applied in a discretionary fashion that allows parents and authorities to hold girls legally responsible for moral behaviors that they would not consider worthy of arrest if perpetrated by male adolescents (Hoyt & Shelden, 1998; Rosenbaum & Chesney-Lind, 1994). Female delinquents are not committing status offences at a higher rate than male delinquents; they are just arrested and referred for incarceration or treatment for minor delinquency more often than male delinquents. This negative bias affects female delinquency by

perpetuating a double standard and negative gender bias with regard to female delinquency (Chesney-Lind & Shelden, 1992; Hoyt & Scherer, 1998).

Of additional concern is the bootstrapping (the re-arrest and detention) of adolescent females on court violations rather than actual delinquency, leading again to high numbers of girls being adjudicated and incarcerated for non-delinquent offenses (Hoyt & Scherer, 1998). Other researchers suggest that once other variables are controlled, female adolescents actually receive more lenient treatment for minor offenses and no differences exist in the adjudication and incarceration of serious person-to-person crimes committed by either sex (Hoyt & Scherer, 1998). Review and research articles in either the psychological or criminological domains operate on the assumption (whether accurate or not) that female antisocial behavior is rarer than males and is manifested in a less serious manner. However, only the judicial system assumes that females need to be protected from themselves, and therefore extends differential correctional treatment to females in an arena where gender differences in offending do not exist. The greatest differences in rates of offending between male and female adolescents (the gender gap), by self-report and official statistics, are for serious and violent index crimes (Hoyt & Scherer, 1998). Although males violently offend more than females, female violent crime has risen over the last decade at an alarming rate (Loeber & Farrington, 2000). Females are committing more violent crime. Arrest rates, aggravated assault, and property crimes have staggering growth rates as compared to male adolescents (Hoyt & Scherer, 1998). For example, female violent crime arrest from 1989 to 1993 rose 125% while male violent crime arrest rose only 63% (Hoyt & Scherer, 1998). As in the psychological domain, treatment programming by the justice system may not provide appropriate or

effective interventions to accurately meet the mental health needs of antisocial adolescent females.

These issues suggest that the population of females with conduct problems and antisocial behavior may be seriously underrepresented and underdiagnosed. Criteria utilized to measure Conduct Disorder by the DSM-III-R and the DSM-IV may be imperfect in that they may miss the underlying features of the disorder. Indeed, researchers in this field have never come to perfect agreement on the essence of Conduct Disorder (Zoccolillo, 1993). Sex differences in Conduct Disorder appear to persist, regardless of the tendency to treat the two sexes similarly with regard to the behavioral manifestations of this disorder. Of interest in this report, are not the differences between the sexes, but rather an attempt to more fully understand issues relating to conduct problems in the female gender alone.

Several methodological issues may be responsible for the conflicting results in the empirical literature. Different referral patterns and small sizes of clinical samples may result in inaccurate prevalence rates and difficulty in comparing samples across studies and to the general population not accessing clinical services (Joffe, Offord, & Boyle, 1988). Cross-sectional designs appear to limit knowledge of the origins and developmental progression of a disorder (Joffe, et al., 1988) and epidemiological studies are limited because historical data limits the knowledge of active symptomology (Marmorstein & Iacono, 2001). Research on female delinquency has also been hampered by methodological constraints. As in the psychological literature, empirical research operates either on the assumption that females engage in unique pathways to delinquency or have the same causal links as males (Hoyt & Sherer, 1998). Researchers disagree

whether cross-gender or within sex comparisons are useful and research is further limited by typical biases in sampling, inadequate sample descriptions and measurement, and design restrictions (Hoyt & Sherer, 1998, p. 86).

Prevalence Rates

Most epidemiological studies of Conduct Disorder in children conclude that this disorder comprises the majority of emotional disturbances in children and adolescents. Indeed, Conduct Disorder appears to be the second most common psychiatric disorder found in females (Cohen et al., 1993; Zoccolillo & Rogers, 1991). There is some discrepancy, however, as to the rate of prevalence in females. Epidemiological studies from past decades indicate prevalence ranges from 0.8% to 8 % in females (Graham & Rutter, 1973; Kashani, Beck, Hooper, Fallahi, Corcoran, McAllister, Rosenberg, & Reid, 1987; McGee, Feehan, Williams, Partridge, Silva, & Kelly, 1990; Esser, Schmidt, & Woerner, 1990; Anderson, Williams, McGee, & Silva, 1990). Given the concern that the DSM-III-R criteria may not be appropriate to accurately diagnose CD in females, this wide range in reported prevalence may be the result of researchers utilizing the DSM-III-R criteria to establish prevalence. Estimates of CD in females based upon clinical or criminological samples may also underestimate the true rate of CD, as adolescent females and women are arrested and referred for services at much lower rates than males (Robins, et al., 1991; Zoccolillo, 1993)

Discrepancies also exist with regard to the prevalence of sex differences and age of onset. Not all studies indicate a male dominance with regard to prevalence. Esser et al., (1990) in a longitudinal study, demonstrated similar prevalence rates 8% - 7% (males vs. females, respectively) in adolescence. Sex differences in prevalence rates of conduct

disorder appear marked in preadolescence, with males more commonly diagnosed, but tend to diminish by adolescence (Offord, 1985; Zoccolillo, 1993). Children with conduct disorder are primarily boys, whereas early and late adolescence diagnoses are typically attached to females. Prevalence rates of CD in adolescence do not appear to differ by sex, especially when both aggressive and non-aggressive CD symptoms are measured (Kashani et al., 1987; McGee, et al., 1990; Zoccolillo, 1993). Hypotheses drawn from some epidemiological studies (Kashani et al., 1990; Anderson et al., 1990; McGee, Feehan, Williams, & Anderson, 1992) seem to indicate that conduct disorder may have a later onset in girls than boys. Others, (Robins et al., 1991; Zoccolillo & Rogers, 1991) indicate that girls with CD experience symptomology early on, around the ages of eight or nine. However, studies reporting an adolescent onset in females (Kashani et al., 1987; Anderson et al., 1990; McGee et al., 1992) measured Conduct Disorder by including non-aggressive behaviors (truancy, running away, lying, substance abuse, stealing), which typically emerge around the beginning of adolescence. Therefore, it is possible that sampling measures neglected to identify girls in preadolescence because the majority of the symptoms for nonaggressive Conduct Disorder do not emerge until early adolescence (Zoccolillo, 1993). Inferences regarding sex differences and prevalence rates cannot be conclusively drawn, due to the number of discrepant studies in this area. However, Conduct Disorder in females remains a clinically significant psychiatric diagnosis. Clinicians referring males and females for mental health treatment are in serious error by assuming that females do not suffer from this disorder and do great disservice to girls by not adequately providing treatment.

Further complicating the issue of prevalence are variables that may have independent or additive effects. In addition to age and gender, variables such as socio-economic status and familial variables appear to impact Conduct Disorder. Low socio-economic status is commonly associated with increases in the rates of Conduct Disorder, as well as its stability. Children with psychiatric disorders are more likely to live in poorer areas, have parents with dysfunctional marriages, parents with psychiatric disturbances, and a large number of siblings (Offord, 1985). One potential risk factor for Conduct Disorder is a parental diagnosis of Antisocial Personality Disorder. In addition, maternal psychiatric diagnosis and ineffective discipline practices appear to have negative impact. Munson, McMahon, & Spieker (2001) suggest that females with adolescent mothers appear at greater risk for conduct and behavior problems than are boys. Researchers are currently examining this literature in an attempt to determine whether conduct problems in children are the result of harsh punishment or if these children are less responsive to punishment, leading parents to employ increasingly harsher punishments (Patterson, 1982).

Developmental Pathway of Female CD and Delinquency

Age of onset

Empirical research on the etiology and developmental pathway of female delinquency remains clouded. It is unclear whether prevalence rates of conduct problems differ by gender in the preschool years (Nixon, 2002). Some research suggests that aggressive behavior in childhood directly increases the likelihood of delinquent behavior in adolescence (Brook, Whiteman, Finch & Cohen, 1996). Physical aggression in girls

appears to be stable over time and does not evidence an increase in later onset. Although less consistently predictive in girls, high levels of stable aggressive childhood behaviors tend to be predictive of violent and non-violent offending in adolescent females (Briody, Nagin, Tremblay, Bates, Brame, Dodge, Fergusson, Horwood, Loeber, Laird, Lynam, Moffitt, Pettit, & Vitaro, 2003). However, these results varied depending on the sample and outcome variables (Briody et al., 2003). Briody et al., (2003) suggest that the lack of predictive power of childhood aggression for female juvenile delinquency is affected by small sample sizes and that girls are less likely to engage in delinquent acts measured in the study outcome. In both genders, small percentages of children exhibit chronic, stable aggressive-behavior (Briody, 2003). Despite the fact that childhood aggression follows a similar course across both genders, chronic childhood aggression is strongly predictive of delinquency only in males even when chronically aggressive girls evidenced higher rates of aggression than most males (Briody, 2003).

Childhood delinquency is common, and although male childhood referral rates are higher than females this gender gap is decreasing as female court referrals have been increasing at a higher rate compared to males (Loeber & Farrington, 2000). Research suggests that early-onset offending is related to later more serious offending for both genders, as compared to later-onset offending (Piquero & Chung, 2001). Small percentages of adolescents, of both genders, are responsible for the majority of total offences committed (Piquero & Chung, 2001). While most girls have very small levels of disruptive behaviors in childhood, females who exhibit higher levels of childhood disruptive behaviors tend to report more CD symptoms and receive a CD diagnosis in adolescence (Côté, Zoccolillo, Tremblay, Nagin, & Vitaro, 2001).

Moffitt (1993) suggests neuropsychological functioning present in infancy, such as temperament, behavior, and intelligence, are responsible for persistent antisocial behavior. Moffitt (1993) theorizes two distinct categories of antisocial behavior. Adolescent-limited behavior, antisocial behavior transient to adolescence, and life-course-persistent behavior in which antisocial behavior manifests early and is stable into adulthood. Life-course-persistent individuals possess different neuropsychological functioning responsible for continuity of antisocial behavior (Moffitt, 1993). Evidence of whether there is a life-course-persistent category among females is unclear. While life-course-persistent criminals are more likely to be male, Kjelsberg (1999) study seems to indicate that within a clinical sample adolescent-limited criminal behavior is more likely to be perpetrated by females. Indeed, Moffitt & Caspi (2001) suggest that the majority of female antisocial behaviors are normative and limited to adolescence. Life-course persistent female offenders do exist, although they are rare (Moffitt & Caspi, 2001). Adolescent-limited and life-course-persistent criminal behavior in females is remarkably similar, with a few exceptions. Antisocial behaviors correlated with life-course-persistent criminal behavior in females were IV drug use and sexual offenses (Kjelsberg, 1999). In addition, discharge from clinical facilities to foster home, residential facilities, or mental hospitals, rather than the family home was also significantly correlated with life-course-persistent criminal behavior. Female polysubstance use appears to be the strongest predictor of life-course-persistent criminal behavior into adulthood (Kjelsberg, 1999).

Risk Factors

Temperament

Although there are clear distinctions between the two categories of female antisocial behavior, what is unclear, however, are the roles these distinctions play in the etiology of developmental pathways to female delinquency. In addition, the role neuropsychological functioning plays in the course of antisocial behavior has been called into question as empirical evidence (Aguilar, Sroufe, Egeland, & Carlson, 2000) suggests that psychosocial history may have a larger on the course of these two different types of offending. Evidence suggests that early-onset persistent-offending is characterized by an avoidant attachment style (Aguilar, et al., 2000; Munson et al., 2001), and disadvantaged environments, with considerable family stress and maltreatment (Aguilar, et al., 2000). As the data (Aguilar, et al., 2000) were presented aggregated across gender, it is unclear if psychosocial history is impacted by gender.

Familial and Peer Disadvantage

Female conduct problems in early adolescence and later antisocial behavior have been linked to economic, familial, and individual (peer) disadvantage (Fergusson & Woodward, 2000; Storvoll & Wichstrøm, 2002). What is difficult to understand however is whether these risk factors mediate the link between CD and poor outcome, or whether CD causes risk of adverse outcome. Davies & Windle (1997) indicate that a chaotic home life, demonstrated by marital discord, low levels of family emotional bonding and support, and parenting styles of inadequate/harsh discipline and stress, is the strongest predictor of conduct problems in adolescent females. Research has suggested that early adolescent CD females are more likely to participate in risky behaviors (such as, deviant

peers, promiscuous sexuality, and school problems) in later adolescence (Fergusson & Woodward, 2000). This suggests a trajectory in which early CD is associated with engaging in risky behavior, which then tends to increase the potential future risk of psychosocial problems (Fergusson & Woodward, 2000).

Developmentally, CD is “trait like” antisocial behavior, whereas antisocial behavior not associated with CD tends to be normative and transient (Zoccolillo, 1993). Delinquency and aggression, in the absence of CD are influenced by race, environment, SES, and are not predictive of adult Antisocial Personality Disorder (Zoccolillo, 1993). Theories in the criminology literature on the causes of delinquency have also tended to concentrate on male populations, based on the assumption that violence and crime is more male oriented. A gender gap exists between the rates of male and female delinquency, with males offending at higher rates. Self-report studies appear to indicate that although males engage in more violent delinquency, females are significantly committing violent delinquent acts (Heimer & De Coster, 1999). Therefore, it is increasingly important to explain why males and females offend at different rates and engage in differing antisocial behaviors.

The relationship between gender and antisocial behavior appears quite complex. Review of relevant theory (Heimer & De Coster, 1999) indicates three main theoretical viewpoints. Power-control theory suggests social class, parenting, risk needs, and gender gap associations explain nonviolent delinquency, such as status offenses, petty theft, and drug offenses. Feminist theory suggests that an explanation of the relationship between gender and delinquency lies in each sex’s differentiated experience within a patriarchal society. Differential association theory suggests that interactions with others and social

structural context mold the learning of violent definitions, thereby increasing the odds of behaving violently. Structural and cultural factors contribute to the gender gap in different ways. Structural factors include socioeconomic status, race, female-headed household, and public assistance, and prior violent delinquency. Cultural factors include aggressive peer associations, coercive parental discipline, parental supervision, emotional bonds to family, violent definitions and gender definitions (Heimer & De Coster, 1999).

Heimer & De Coster (1999) have identified links between these structural and cultural factors and pathways contributing to violent delinquency, which are gender-differentiated. The researchers suggest that the gender gap in violent offending may be explained by structural and cultural factors involved in the differential associations among males and females. For both genders, accepting and endorsing violent definitions is the best predictor of future violent behavior. A prior history of violent delinquency impacts both genders similarly by increasing the likelihood of future violent offending by promoting violent definitions. In addition, structural disadvantage impacts violent delinquency, for both genders, by providing opportunity to learn violent definitions (Heimer & De Coster, 1999). Flannery, Singer, & Wester (2001) indicate that adolescents engaging in violent behavior are more likely to have witnessed violent activity in their environments. Violent adolescent females are also more likely to manifest trauma symptoms of anger, anxiety, depression and posttraumatic stress than other females or violent males (Flannery et al., 2001).

As noted above, greater acceptance of violent definitions extends the likelihood of violent offending, for both genders. Females who accept and maintain violent definitions are more likely to behave violently, while females who accept traditional gender

definitions are less likely to behave violently (Heimer & De Coster, 1999). Hence, cultural definitions appear to significantly explain female violent delinquency. However, what is especially interesting in the researchers theoretical explanation of the gender gap in violent delinquency are how structural and cultural forces that impact the endorsement of these definitions differently between the sexes. Although greater social controls are imposed on disadvantaged females, by learning more traditional gender definitions, disadvantaged females are more likely to behave violently than other females because they experience greater exposure to violent definitions.

Coercive parental discipline and association with aggressive peers, along with prior history of violence, appear to strongly influence violent delinquency among males while not impacting female delinquency at all (Heimer & De Coster, 1999). Violent female delinquency appears to be suppressed by the more subtle mechanism of familial bonds. Females with strong emotional bonds to their families are less likely to behave violently because they are less likely to learn violent definitions. Subtle controls, rather than direct parental controls such as coercive discipline and supervision appear to explain the greatest variation in female violent delinquency. Strong emotional familial bonds and acceptance of traditional gender definitions tend to limit knowledge of violent definitions, which has the greatest impact on the reduction of violent delinquency in females (Heimer & De Coster, 1999).

Disadvantaged social status increases violent delinquency in both genders, although disadvantaged females have a greater chance at violent offending than other females, while still not offending at the same rate as disadvantaged males. However, extremely disadvantaged females, although exposed to more violent definitions, are also

more likely to internalize traditional female roles and definitions. Subtle controls and emotional bonds appear to have no impact on male violent delinquency. Direct parental controls, prior violent histories, and aggressive friends have the greatest impact. Although the acquisition of violent definitions is the strongest predictor of violent offending across genders, the pathways leading to violent delinquency differ according to the structural and cultural links in the differential associations of males and females (Heimer & De Coster, 1999). Direct parental supervision directly reduces violent delinquency in boys (not in girls) while the use of coercive discipline increases the likelihood of learning violent definitions in boys. In addition, association with aggressive peers and a prior violent history increases the likelihood of acquiring violent definitions. Traditional gender definitions and emotional bonds have an unimportant influence on male violent delinquency. Direct parental controls and associations with aggressive peers have an unimportant impact on female violent delinquency.

In females, Black race and low SES directly influences the acquisition of violent definitions. Girls in female-headed households tend to be less likely to internalize and accept traditional gender definitions. Disadvantaged boys and girls are more likely to engage in violent delinquency because disadvantaged structural factors tend to influence learning of violent definitions. However, disadvantaged structural factors also tend to influence the internalization of traditional gender definitions (Heimer & De Coster, 1999). It is this link between structural and cultural factors that the pathway to violent offending differs in males and females and contributes significantly to the explanation of the gender gap in violent offending. The acquisition and internalization of traditional gender roles, coupled with a strong emotional familial bond, reduces violent delinquency

in females, but not in males. Therefore, males are more likely to engage in violent delinquency. Females are engaging in a significant amount of violent delinquency; however girls who do not are strongly bonded to their family and accept societal roles of female behavior. Girls who do violently offend tend to be of lower SES, Black, with mother-headed household rejecting the patriarchal definition appropriate behavior for females (Heimer & De Coster, 1998).

Developmental Course of Female Conduct Problems

Sexual Abuse

The short and long-term impact of sexual abuse on the mental health of children and adolescents is well established in the research literature. Female victims of sexual abuse appear to manifest distinct patterns of behaviors. Victims of sexual abuse tend to display higher levels of internalizing and externalizing problems. Sexually abused females are thirty times more likely to develop conduct problems than those who have not been abused (Bagley, Bolitho, & Bertrand, 1995). Acting-out behaviors are often viewed as “post-traumatic adaptive responses to primary and often secondary trauma, a survival and coping strategy to sustain significant relationships” (Bowers, 1990, p. 401). Behavioral manifestations of sexual abuse typically consist of non-relational forms of aggression, theft, lying, running away, and prostitution (Chesney-Lind & Shelden, 1992). As sexually abused females are significantly more likely to develop conduct problems, an examination of background and familial patterns is imperative. Sexually abused males have twice the risk of suicidal behaviors than that of abused females (Bagley, Bolitho, &

Bertrand, 1995). Sexually abused females evidence significantly higher levels of internalizing and conduct problems (Bagley et al., 1995).

Comorbidity

Comorbidity is the extent to which other coexisting symptoms or disorders make independent contributions to manifestation and outcome of a specific disorder. Children with comorbid disorders within a dimension (e.g. internalizing or externalizing) tend to function worse and have a more problematic outcome than those with a pure or single disorder (Ollendick, Seligman, & Butcher, 1999). Children or adolescents diagnosed as comorbid across dimensions of behavior seem to have a mixed outcome. Empirical data are mixed whether outcomes are worse or if the comorbid conditions tend to have a moderating effect (Ollendick et al., 1999). The presence of hyperactivity coexisting with conduct problems appears to predict the presence of antisocial behavior in adolescence (Offord & Bennett, 1994).

Anxiety

Conduct disorders appear to coexist with anxiety disorders. Among incarcerated adolescents, females tend to evidence more somatoform and other anxiety disorders (Domalanta et al., 2003). Anxiety has been indicated as having a moderating effect on the severity of conduct problems, although it has been associated with an increase in internalizing disorders in females (Russo & Beidel, 1994). However, for older adolescents, anxiety has been associated with an increased involvement in conflicts with authority (Loeber, Russo, Stouthamer-Loeber, & Lahey, 1993). In a study of CD incarcerated adolescents, Ollendick et al., (1999) did not find anxiety disorders to moderate the behavioral effects (for example: frequency and severity of delinquency) of

Conduct Disorder for either gender. In addition, neither males nor females (with or without comorbid anxiety disorder) differed with regard to the frequency, severity or number of offenses (Ollendick et al., 1999). It is unclear, however, whether the anxiety symptoms were present when the delinquent behavior occurred. Research on the effects of comorbid conditions on the conduct problems in girls is inconclusive.

Depression

Major depressive disorders appear to be prevalent in juvenile delinquent populations (Alessi, McManus, Grapentine, & Brickman, 1984; Domalanta, Risser, Roberts, & Risser, 2003). Incarcerated females tend to have a higher prevalence of major depressive disorders than males (Chiles, Miller, & Cox, 1980; Kashani, Manning, McKew, Cytryn, Simonds, & Wooderson, 1980; Ulzen & Hamilton, 1998). However, Domalanta et al., (2003) found similar prevalence rates in males (9.6%) and females (10.2%). CD females with comorbid Major Depressive Disorder seem to have a particularly poor outcome. These females have more negative emotionality, more disruptive behavior, poor school success, than females with either disorder alone (Marmorstein & Iancono, 2001) Of serious concern, is the finding that a diagnosis of CD/MDD results in greatly increased levels of substance abuse (Marmorstein & Iancono, 2001). What is unclear, however, is the role depression plays in antisocial behavior. Do depressive symptomology exacerbate antisocial behavior in delinquent youth or is there an etiological relationship between depressive symptomology and conduct problems? Some research tends to suggest that conduct problems develop as a manifestation of a MDD or dysthymic disorder (Kovacs, Paulauskas, Gatsonis, & Richards, 1988). Once CD is evident, however, it seems to follow CD developmental course and persists after

depression or dysthymia diminish. In addition, conduct problems tend to be associated with late-onset depression and are cumulative in that if CD symptomology are ever present depressed individuals are more likely to consistently evidence disruptive behavior problems (Kovacs et al., 1988). Research on the association between MDD and CD in female adolescents in the empirical literature is rare, however, and it remains unclear what course these disorders follow.

Suicide

The prevalence of suicide and suicide ideation in females tends to be higher than males, and evidences a dramatic increase in later adolescence (ages 14-16) (Joffe, Offord, & Boyle, 1988; Andrews & Lewinsohn, 1992). Relative estimates of suicidal behavior in adolescent females in nonclinical samples suggest significant relation to psychiatric disorders, especially Conduct and Emotional Disorders (Joffe et. al., 1988; Andrews & Lewinsohn, 1992). Suicide attempts most often occur in association with a psychiatric disorder (Andrews & Lewinsohn, 1992). Although it has been suggested that suicidal behavior tends to be associated with depressive disorders, Andrews & Lewinsohn (1992) indicate that more males with suicidal behavior than females have a depressive diagnosis. No gender differences in prevalence rates disruptive behavior disorders were found among suicide attempters (Andrews & Lewinsohn, 1992). Conduct Disorder has been found to be similarly prevalent to depression in female suicide attempters (Trautman, Rotheram-Borus, Dopkins, & Lewin, 1991; Andrews & Lewinsohn, 1992). However, research on the relationship between CD and suicide in female adolescents is inconclusive. Conduct Disorder has been found to be predictive of suicide attempts in females, however, after adjustment for other factors the predictive influence of CD on

suicide was not significant (Kelly, Lynch, Donovan, & Clark, 2001). In addition, epidemiologic studies (Gould, King, Greenwald, Fisher, Schwab-Stone, Kramer, Flisher, Goodman, Canino, & Shafer, 1998) did not find suicide ideation and attempt to be related to disruptive behavior disorders for either gender.

Exploration of empirical research on antisocial behavior and suicide risk is imperative as many adolescents referred to clinical and juvenile justice systems have an elevated risk for suicidal behavior and completion (Alessi, McManus, Brickman, & Grapentine, 1984; Cairns, Peterson, & Neckerman, 1988; Hendren & Blumenthal, 1989; Memory, 1989). Cairns et al., (1988) propose several interesting theories on the significant relationship between severe aggression and suicide. They suggest that both suicidal behavior and violent behavior are expressions of poor impulse control. A cycle is created where the adolescent acts out inappropriately, is reacted to negatively, and then feels higher levels of stress and depression. Female adolescents will be especially vulnerable; as aggressive females tend to be less tolerated and are more likely to be alienated by peers than are boys (Cairns et al., 1988). Poor impulse control may also be at fault, as these researchers (Cairns et al., 1988) suggest the possibility that CD/JD adolescents have similar depressive prevalence to those without antisocial behavior, but tend to act out and become more self-destructive than other adolescents when feeling depressed. Indeed, Rohde, Seeley, & Mace (1997) indicate impulsivity and instability is significantly related to suicidal behavior in adolescent delinquent females. Finally, Cairns et al., (1988) suggest that the strong association between suicide and aggressive behavior may be that the aggression is a manifestation of a depressive disorder itself.

In addition to psychiatric disorder, common risk factors for adolescent suicide include history of suicidal ideation, recent loss or negative life event, exposure to suicide either direct or indirect, and substance abuse (Hendren & Blumenthal, 1989). Juvenile delinquent adolescents who have been physically or sexually abused are also more likely to present with suicidal ideation (Battle, Battle & Tolley, 1993; Evans, Albers, Macari, & Mason, 1996). Joffe et al., 1988 also found a strong association between familial dysfunction, rather than economic disadvantage, and suicidal behavior. Parental arrest and family functioning appear to strongly predict suicidal behavior. Although the above data were not separated by sex and disorder, these associations are disturbing in light of the fact that many females with antisocial behavior and conduct problems have a patterned background of familial dysfunction, parental antisocial behavior, substance use, as well as physical and/or sexual abuse. These associations only increase the necessity for accurate referral, diagnosis, prevention and treatment, as CD and JD females are especially vulnerable to risk factors correlating with suicidal behavior.

Substance Use/Abuse

There appears to be a high prevalence rate of CD comorbid with substance use and abuse among adolescents of both genders. It is difficult to separate the two conditions with regard to outcome and behavioral manifestation (Burkstein, Glancy & Kaminer, 1992). Researchers question whether substance abuse is part of the course and symptomology of CD or is occurring due to a CD/SUD comorbid condition. Among incarcerated adolescents, White and Hispanic females tend to abuse drugs and alcohol more than African-American females (Domalanta, 2003). Among females with a

Substance Use Disorder (SUD) are more likely to be dually diagnosed with CD and affective disorders (Bukstein, Glancy & Kaminer, 1992).

Conduct Disorder symptomology appear to predate the onset of first substance use (Crowley, Macdonald, Whitmore, & Mikulich, 1998). Research indicates an association between early disruptive behavior and later alcohol and substance use for both genders (Windle, 1990; Brook, Whiteman, Finch, & Cohen, 1996). King, Ghaziuddin, McGovern, Brand, Hill & Naylor (1996) indicate that CD and alcohol/SUD are more strongly associated in females than in males. To contrast, however, although substance use/abuse was found to be correlated with delinquency in both male and female adolescents only among males were the correlations among alcohol, drug use and CD, as well as sexual activity, alcohol, drug use and CD more significant (Martin, Milich, Martin, Hartung, & Haigler, 1997). Other research (Grilo, Becker, Fehon, Walker, Edell, & McGlashan, 1998) indicates similar prevalence rates of males and females with regard to CD and alcohol use disorders.

Outcomes

As noted above, childhood aggressive behavior tends to be associated with antisocial behavior later in life. Girls with high levels of conduct problems in early adolescence, also have a poor outcome history. These female experience poor school success, are more likely to engage in substance use, and are at increased risk for multiple sexual partners and teenage pregnancy, and sexual assault (Fergusson & Woodward, 2000). Continued antisocial behavior into adulthood is also indicated (Fergusson & Woodward, 2000). Therefore, conduct problems in childhood appear to predict an

increase in the rates of psychiatric disorder overall and the stability of antisocial behaviors across the lifespan (Offord & Bennett, 1994).

Conduct Disorder appears to predict antisocial behavior in adulthood, alcohol abuse and dependence. Conduct problems appear to predict strongly in women for internalizing disorders. Robins & Price (1991) in a multi-age survey of adult disorders predicted by childhood conduct problems again found conduct problems to be more common in males than females. Even so, the researchers demonstrated that despite the elevated prevalence rate of conduct problems in males, conduct problems in childhood were similarly predictive of adult disorders in both sexes. The presence of one or more conduct problem in childhood predicted the subsequent development antisocial personality disorder, substance abuse, anxiety disorders, schizophrenia, major depressive episodes, and somatization disorders in adulthood (Robins & Price, 1991). Respondents who reported more childhood conduct problems also experienced a greater numbers of disorders in adulthood. Childhood conduct problems appear to have a huge direct effect on the development of externalizing disorders (antisocial personality disorder, drug and alcohol abuse), however childhood conduct problems also directly effect the development of non-externalizing disorders (anxiety disorder, depression, and schizophrenia) and elevate the risk for substance abuse even without the development of antisocial personality disorder (Robins & Price, 1991).

Even though base rates for childhood conduct problems in males are higher, the presence of one or more childhood conduct problem is predictive of adult disorders in both sexes (Robins & Price, 1991). In addition, this research suggests that childhood conduct problems in females may be *more* predictive of adult Antisocial Personality

Disorder in females than in males. This is disturbing as the minimum number of childhood symptoms required for a diagnosis of Antisocial Personality Disorder is three (DSM-IV, APA, 1994). Research on conduct problems in females remains unresolved. Utilization of inappropriate criteria, particularly in preadolescence, has made conclusions regarding the development and manifestation of conduct disorder in females difficult. As much of the current research employed the use of DSM-III and DSM-III-R criteria, questions arise regarding the usefulness of evidence based on these measures. In addition, the DSM-IV criteria may contribute to an under-diagnosis of female Conduct Disorder, as well as the assumption that this disorder is relatively rare in females (Robins & Price, 1991; Zoccolillo et al., 1996).

Upon examination, it is apparent that the research literature offers tentative assumptions regarding females with conduct problems. Conduct Disorder in females appears to be a significant psychiatric disorder. Females who have been sexually abused, have dysfunctional families or parents with psychiatric disorders, and are of low socioeconomic status are at higher risk for conduct disorder. Although the research literature is limited regarding specific conclusions, significant areas of interest to this study have been identified. It is imperative to be able to describe the clinical profile of females with conduct problems, as this is currently unclear. This research study attempts to broaden the current research base by drawing together past research literature in an attempt to investigate the clinical profile of conduct problems in females using a quantitative meta-analytic procedure in an effort to identify and attempt to draw definitive conclusions.

The major intent of this research is to summarize previous research studies to determine if a predictive relationship exists between individual and psychosocial

correlates and Conduct Disorder and Juvenile Delinquency in females. Two major questions are addressed:

1. Is there a specific clinical profile of Conduct Disorder and Juvenile Delinquency within the female gender? Does a specific risk trajectory exist in the development of conduct problems, and if so, are there specific identifiable outcomes. In this regard, individual correlates of race, temperament, and cognitive functioning, and psychosocial correlates of familial distress and disadvantage, physical and sexual abuse, and deviant peer associations are examined. In addition, adolescent outcomes, such as academic difficulty or teenage pregnancy, were examined to determine if a relationship exists between antisocial behavior and poor prognosis.
2. Does the clinical profile of Conduct Disorder and Juvenile Delinquency differ with regard to gender? Are the trajectories of risk and outcome similar for both females and males, or do specific sex differences exist? As male dominated prevalence rates in community studies have led researchers to the assumption that Conduct Disorder and antisocial behavior is relatively rare in females, the behavioral manifestations of conduct problems between genders was examined.

III. METHODOLOGY

Study Selection

Research articles examining quantitative outcome variables comparing antisocial conduct problem females with 'normal' females (those not exhibiting antisocial or conduct problem behavior) or antisocial males were identified regarding risk and outcome trajectory individual and psychosocial correlates. Individual correlates included race, temperament, early-onset antisocial behavior, conduct disorder symptoms and/or delinquent offense commission, and cognitive functioning. Psychosocial correlates included family characteristics (inconsistent/harsh discipline, antisocial/mentally ill/substance-abusing parents, parental discord, marital violence, inappropriate parenting, physical/sexual abuse and/or neglect), low socio-economic status, and deviant peer affiliation. Research articles examining adolescent outcome of Conduct Disorder and Juvenile Delinquency and comorbid diagnosis of Conduct Disorder, with regard to between and within gender differences, were identified. Meta-analysis was used to explore the relative predictive strength of the association between individual and psychosocial correlates and the development of Conduct Disorder and Juvenile Delinquency within gender, as well a crossing gender boundaries.

Two procedures were used to locate relevant studies. Literature search procedures with a computer-generated search computerized data bases (*PsychINFO*, *PsychLIT*, *ERIC*, *Social Sciences Citation Index*, *Social Sciences Abstracts*, *Sociological Abstracts*, *Criminal Justice Abstracts*, *Criminal Justice Periodical Index*, *National Criminal Justice*

Research Service, Child Abuse, Child Welfare, and Adoption, Data Archive on Adolescent Pregnancy and Pregnancy Prevention (DAAPPP), Family Studies, and Cambridge Science Abstracts) were conducted. In order to locate additional studies, the reference sections from each identified study and relevant review articles were examined. The computer searches utilized the following keywords with appropriate separators (and, or): *conduct disorder, juvenile delinquency, girl, female, vs. male, gender, female juvenile delinquency, DSM-III, DSM-III-R, DSM-IV, sexual abuse, physical abuse, anxiety, depression, ADHD, substance abuse, suicide, eating disorders, age of onset, arrest, treatment, self-report.*

Studies eligible for review consisted of Conduct Disorder or Juvenile Delinquency research targeting females and gender differences. To be included in this review, each study had to meet the following criteria: (a) adhere to the following definition of conduct disorder or involve adjudicated juvenile delinquents in the subject sample; (b) include female subjects in the sample; (c) involve a control condition of some sort (e.g. “normal” female or male populations); (d) include sufficient information necessary to compute statistics used in the meta-analysis; (e) report data for each gender separately in analyses with mixed gender samples; (f) examine a primarily juvenile sample (defined as under 18 years of age); (g) be published between years 1980-2003. Only published articles were included in this meta-analysis.

Current diagnostic criteria in the DSM-IV (American Psychological Association, 1994) defines Conduct Disorder as:

a repetitive and persistent pattern of behavior in which either the basic rights of others or major age-appropriate societal norms or rules are violated, as manifested

by the presence of three (or more) of the following criteria in the past 12 months, with at least one criterion present in the past 6 months: aggression to people and animals, destruction of property, deceitfulness or theft, and serious violations of rules (pp. 90-91).

The inclusion criteria study definition of Conduct Disorder (CD), defined by a standardized psychological assessment or psychiatric diagnosis, included two or more symptoms occurring before the age of 15, modified from the childhood symptoms of the DSM-III (American Psychological Association, 1980) and DSM-IV (American Psychological Association, 1994). These symptoms include: *chronic violations of rules at school; chronic lying; often bullies, threatens, or intimidates others; two or more physical fights; used a weapon that can cause serious physical harm; physically cruel to people or animals; stolen while confronting victim; deliberate fire setting, deliberate destruction of property; broken into someone's home, building, car; nontrivial theft without victim confrontation; running away from home overnight; stays out late despite parental prohibitions; chronic violations of rules at home; suspended or expelled from school; delinquency; promiscuity (three or more sexual partners or sex for money or drugs); truancy (at least 5 days in a school year)*. This definition was chosen in light of the potential insensitivity of criteria from the DSM-III-R (American Psychological Association, 1987) and DSM-IV (American Psychological Association, 1994). In addition, as published articles from 1980-2003 were examined, it is necessary to include symptoms of CD reported by the DSM-III (American Psychological Association, 1980).

Research examining Conduct Disorder symptoms and their related association, not specifically assigned a psychiatric diagnosis based upon the DSM-III, DSM-III-R, or

DSM-IV criteria, but assessed by a standardized psychological measure and providing appropriate description of defined conduct problem behavior were included in this analysis. These behaviors were described as 'conduct problem', 'antisocial', or 'externalizing' in the literature. However, studies examining antisocial conduct problem behaviors needed to adhere to the above definition of Conduct Disorder to be included in the analysis. Study inclusion required two or more Conduct Disorder symptoms in the antisocial conduct problem definition. Research studies assessing 'externalizing' or 'disruptive' behaviors without providing definitional description, or aggregated quantitative data across all externalizing disorders were excluded. As such, research combining hyperactivity, oppositional-defiance disorder and conduct problem behaviors in their quantitative analysis were excluded. Studies with an exclusive focus on aggression, without consideration for additional conduct problem behavior, were also excluded.

A study definition of Juvenile Delinquency (JD) included research articles that included in their sample population children or adolescents adjudicated for behaviors considered illegal if committed by an adult, whether or not the adolescent currently resided at a residential treatment or detention facility. This definition was inclusive to status offenses; those offenses not considered illegal if committed by an adult, as children or adolescents may be adjudicated for these offenses also. Due to the high rate of Conduct Disorder in adjudicated delinquents, and the similar if not greater prevalence rate of Conduct Disorder diagnosis in female juvenile delinquents (O'Keefe, Carr, & McQuaid, 1997; Silverthorn, Frick, & Reynolds, 2001), it was necessary to examine this population regarding risk and outcome trajectories to obtain a comprehensive profile.

Research studies examining self-reported delinquent behavior in general in a community sample, without specifically including adjudicated delinquents in the sample population or in the quantitative analysis were excluded from this analysis. Excluded from this analysis were research studies specifically addressing substance use/abuse and drug offenses, without regard to concurrent delinquent behaviors.

An effort was made to preserve similar levels of uniformity in cultural background, circumstance, and social definitions of delinquency and social norms. Criteria for inclusion were studies originating in the United States or largely comparable English-speaking country (e.g., Canada, Australia, New Zealand, Britain, Sweden, Ireland). Conduct Disorder and Juvenile Delinquent participants were not required to have English as a first language. Studies investigating refugee or immigrant populations with length of stay in the United States less than one year were excluded as these populations may have adjustment difficulties and different cultural and social norms.

Research studies also excluded were those reporting statistical information aggregated across gender, and those in which results were based entirely upon male subjects. This methodology resulted in the inclusion of sixty-two research studies for analysis. Table 1 presents a description of studies included in this analysis. Results were evaluated separately for reports in which multiple studies were described in a single paper, or distinctly different populations were evaluated.

Coding

Each study was coded by this researcher for forty-seven variables based on reported information included in the text of identified articles (see Appendix A for study-level coded variables and Appendix B for effect-size level coding variables). In order to

represent a difference between two groups, a meta-analysis summarizes the statistical difference between a 'treatment' group and a 'control' group, without regard for statistical significance (e.g., $p < .05$) (Cooper, 1984). The effect size utilized in this analysis is Hedges and Olkin's (1985) unbiased estimate of the effect size, d . This effect size represents, in standard deviation units, the amount which a 'treatment' group performs differently than a 'control' group on any given outcome variable (Lipsey & Wilson, 2001). The direction of this difference was coded. The effect size was coded with a positive value (+) if the female conduct problem group performed 'better' on an outcome variable, and coded with a negative value (-) if the comparison group performed 'better'. However, as this particular research study examined the risk and negative outcome of conduct problem/antisocial behavior, 'better' performance on an outcome variable indicates greater prevalence of risk. Studies reporting nonsignificant differences between the two groups, without reporting quantitative data, were coded as zero (+0) with a positive value. As this research analysis attempted to determine if differences exist between conduct problems females and the related comparison group, the resulting negative bias across effect sizes was determined acceptable rather than discarding the missing data altogether (Lipsey & Wilson, 2001). Separate meta-analyses were conducted for between-gender differences and within-gender differences, with effect sizes results reported separately according to gender. Assumptions based upon the range of these differences will be addressed in the Conclusion section.

Calculation of Formulas and Effect Sizes

In calculation of the effect sizes the standardized mean difference, g -index, was computed by subtracting each study's treatment group (females with conduct problems)

mean score on a dependent variable versus a comparison group (females without conduct problems or males with conduct problems) mean score divided by the pooled standard deviation (Hedges & Olkin, 1985, p.78, equation 3):

$$g = (M_E - M_C) / s_{\text{pooled}}$$

where g = standardized difference between two means and

M_E = female conduct problem group mean and

M_C = comparison group mean and

s_{pooled} = average standard deviation of the two groups

The average standard deviation of the two groups was calculated using the square root of:

$$s_{\text{pooled}} = \left((n_E - 1)(s_E)^2 + (n_C - 1)(s_C)^2 \right) / (n_E + n_C - 2)$$

where n_E = number of subjects in the female conduct problem group and

n_C = number of subjects in the comparison group

s_E = standard deviation of the female conduct problem group and

s_C = standard deviation of the comparison group

As the results of the standardized mean difference have a small positive sample bias, the g -index was transformed into the d -index, an unbiased estimator of the effect size using the Hedges and Olkin (1985, p. 81, equation 10) correction:

$$d \cong (1 - 3 / 4(N - 9)) g$$

where $N = n_E + n_C$

Effect sizes may be interpreted as small (.20), medium (.50), and large (.80) group differences (Lipsey & Wilson, 2001). An effect size of zero indicated no difference between conduct problems females and comparison females or males on a particular outcome variable.

When insufficient information for statistical analysis were reported, the following methods was used to estimate effect sizes: (a) an effect size of (+.0) was used for studies reporting nonsignificant group differences applicable quantitative data: (b) an attempt was made to derive effect-size values from inferential statistics such as t -tests, F , χ^2 , or r values;

$$g = 2t / \text{square root of } df_{\text{error}}$$

where t = value of the t -test for the comparison

df_{error} = degrees of freedom associated with the t -test

(Cooper, 1984, p. 99, equation 6)

$$g = \text{square root of } F / \text{square root of } df_{\text{error}}$$

where F = the F value with ($df = 1$ in the numerator)

df_{error} = degrees of freedom associated with the F value

(Cooper, 1984, p.100)

$$g = \text{square root of } (\chi^2 / n)$$

where χ^2 = value associated with the chi-square statistic

n = total number of observations in the comparison

(Cooper, 1984, p. 101, equation 8)

$$g = 2r / \text{square root of } (1 - r^2)$$

(Cooper, 1985, p.101, equation 9)

(c) Odds ratios within each study were calculated from reported row proportions when statistical analysis is not appropriate for meta-analytic procedures (e.g., χ^2 $df = 3$) or when available from summary tables using:

$$OR = p_E(1-p_C) / p_C(1-p_E)$$

where p_E = the female proportion of interest and

p_c = the comparison group of interest, either female or male

All analyses are performed on the natural log of the odds ratio (Lipsey & Wilson, 2001, p.53) using:

$$L_{OR} = \text{Log}_e(OR)$$

Odds ratios were then transformed into d using the d_{COX} index (Sánchez-Meca, Marín-Martínez, & Chacón-Mascoso, 2003):

$$d_{COX} = L_{OR} / 1.65$$

where L_{OR} is the natural log of the odds ratio

This index, d_{COX} , provides an unbiased estimate of the population standardized mean difference, δ , and produces a close approximation of values estimated by d (Sánchez-Meca, et al., 2003) assuming a normal distribution of the data.

As studies included in the meta-analysis did not have the same sample size, multiple effect sizes were calculated on separate outcomes within a single study, or separate studies utilized the same sample population in independent analyses, studies were given different weights before synthesizing information across studies. The weighted d -index (d_+) is weighted by the inverse of the variance (w_i) associated with the comparison (Cooper, 1998, p.137, equation 5.11):

$$w_i = 2(n_{i1} + n_{i2}) n_{i1}n_{i2} / 2(n_{i1} + n_{i2})^2 + n_{i1}n_{i2}d_i^2$$

where n_{i1} and n_{i2} = the number of data points in group 1 and group 2 of the comparison and

d_i = the d -index of the comparison

then multiplying the d -index by the weighted value for each individual effect size ($d_i w_i$) and dividing the total sum of the products ($\sum d_i w_i$) by the total sum of the weighted values ($\sum w_i$) to obtain a weighted d -index (d_+) (Cooper, 1998, p.139, equation 5.12).

A confidence interval around the effect size was estimated by calculating the square root of the inverse sum of w_i added to d_+ (± 1.96) constructing a 95% CI (Cooper, 1998, p.139, 5.13). This value indicates that 95% of values will be expected to fall within the calculated range. If $d = 0$ falls within the calculated range of values, then one may conclude that no relationship exists between the variables of interest.

This analysis assumes a fixed-effects model, that effect sizes from individual studies are coming from a fixed population, rather than one that is random. As such, assumptions of homogeneity must be met. Hedges and Olkin, (1985, p.123, equation 25), provide the Q_i statistic which indicates whether or not studies included in the analysis of effect size come from some common population, and compares the observed variance to that expected from sampling error (Cooper, 1998, p. 146, equation 5.16):

$$Q_i = \sum w_i d_i^2 - (\sum w_i d_i)^2 / \sum w_i$$

This Q_i statistic determines whether the observed variance in effect sizes is significantly different from that expected by sampling error alone (Cooper, 1998, p. 145). If Q_i is significant at $p < .05$, then the effect sizes display greater variability than would be expected by chance alone. If Q_i is not significant then the effect sizes are assumed to come from a common population. Significance of the Q_i statistic indicates a heterogeneous sample, and warrants a search for variables moderating the strength of the effect size. If Q_i was a significant value, it was assumed that this sampling error was systematic and may be derived from individual differences between studies (Lipsey &

Wilson, 2001). Practically, in this analysis, the test of homogeneity indicated whether the strength of the mean effect size was stronger in some studies than in others. If Q_t was significant, the analog to the ANOVA was used to test whether specific categorical variables were responsible for greater mean effect-size strength.

If the sample was heterogeneous, then subgroups or clusters of studies were created along a specific outcome variable (e.g., harsh parenting, maternal overprotection, or covert behaviors). Q_t was further separated into a between-group variance (Q_b) and a within-group variance (Q_w) (Cooper, 1998, p. 148):

$$Q_b = Q_t - Q_w$$

where Q_w is the sum of the separate Q_i for each subgroup.

As this research study attempted to determine the clinical profile of conduct problems in females within and between gender, the search for moderating variables was determined within the individual and psychosocial correlate level only. Specific study-level characteristics, which could moderate effect sizes, are beyond the scope of this analysis.

This research study only included published articles in the analysis. As such, it was important to determine if the final analysis suffers from publication bias, bias from the systematic omission of hard to find studies, or studies excluded from the analysis. Fail-safe N, determination of the number of studies needed to reduce the average effect sizes to zero, was calculated by (Lipsey & Wilson, 2001, p. 166):

$$k_0 = k(\text{mean } d / d_c) - 1$$

where k_0 = the number of effect sizes with a value of zero need to reduce the mean effect size (d) to the criterion effect size (d_c) level and k is the total number of studies in the mean effect size

mean d = the weighted mean effect size and

d_c = criterion effect size level, set at .1 for within-gender studies and

d_c = criterion effect size level, set at .01 for between-gender studies.

The criterion effect size level was set at .1 for within-gender studies in order to determine the number of studies necessary to reduce the mean effect size to a weak strength level.

The criterion effect size level was set at .01 for between-gender studies in order to determine the number of studies necessary to reduce the mean effect size to near zero, indicating no differences between males and females on a given category of interest.

Calculation of the standardized mean difference, g , were determined through the use of the Meta-Analysis Calculator (Lyons, 1998, <http://www.lyonsmorris.com/MetaAnalysis.htm>). Synthesis of research data utilized the Comprehensive Meta-Analysis™ (Borenstein & Rothstein, 1999) computer program.

Table 1
Research articles included in study analysis

Author(s)	Date	Journal	Sample Source	DSM Criteria Utilized	Diagnostic Criteria	Gender
Bagley & Young	1987	Canadian Journal of Community Mental Health	Adjudicated delinquent	DSM-III	Silbert Questionnaire; Middlesex Hospital Questionnaire; Coopersmith Scale; EMBU; Standardized measures of mental health & psychological adjustment	Within Gender
Bagley, Bolitho, & Bertrand	1995	Crisis	Ontario Child Health Study		Ontario Child Health Study norms	Within Gender
Brickman, McManus, Grapentine, & Alessi	1984	Journal of the American Academy of Child Psychiatry	Adjudicated delinquent	DSM-III-R	Hollingshead-Redlich two-factor scale; Luria-Nebraska Neuropsychological Battery (LNNB); WISC; WAIS, WRAT	Between Gender
Burket & Myers	1995	Bulletin Of the American Academy of Psychiatry & Law	In-patient psychiatric	DSM-III-R	DICA-R-A; Schedule for Affective Disorders for School-Age Children, Epidemiologic Version (K-SADS-E); SIDP-R	Between Gender
Calhoun	2001	Journal of Offender Rehabilitation	Adjudicated delinquent		Behavioral Assessment System for Children- Self Report of Personality-Adolescent (BASC-SRP-A)	Between Gender
Campbell	1987	Journal of Youth & Adolescence	Adjudicated delinquent		Home Life questionnaire (Hirschi, 1969); Self-report delinquency (Gibsen et al., (1970), West & Farrington (1973)	Within Gender
Cauffman, Feldman, Waterman, & Steiner	1998	Journal of the American Academy of Child & Adolescent Psychiatry	Adjudicated delinquent	DSM-III-R	Weinberger Adjustment Inventory (WAI); PTSD module of the Revised Psychiatric Diagnostic Interview	Between Gender
Cote, Zoccolillo, Tremblay, Nagin, & Vitaro	2001	Journal of the American Academy of Child & Adolescent Psychiatry	Community sample	DSM-III-R	Age 6: Social Behavior Questionnaire (SBQ), parent & teacher; K-6 assessment-disruptive behavior scale; Adolescence- Diagnostic Interview Schedule for Children-2 (DISC-2); Study inclusion-at least 3 childhood assessments; CD diagnosis and symptoms	Both

Table 1 (cont'd).

Cote, Tremblay, Nagin, Zoccolillo, & Vitaro	2002	Journal of the American Academy of Child & Adolescent Psychiatry	Community sample	DSM-III-R	Social Behavior Questionnaire (SBQ); Diagnostic Interview Schedule for Children (DISC-2) French version	Both
Darby, Allan, Kashani, Hartke, & Reid	1998	Journal of Family Violence	Adjudicated delinquent		Record review; mental health needs assessment; Diagnostic report; Psychiatric review	Between Gender
Dembo, Dertke, La Voie, Borders, Washburn, & Schmeidler	1987	Journal of Adolescence	Adjudicated delinquent		Physical/sexual abuse questionnaire (Gelles (1979); Straus (1979); Staus, Gelles & Steinmetz (1980); Straus (1983); sexual victimization (Finkelhor, 1979); Roseberg (1965) Self-Esteem Scale; NIDA drug abuse survey	Between Gender
Dembo, Williams, Schmeidler, Berry, Wothke, Getreu, Wish, & Christensen	1994	Violence & Victims	Adjudicated delinquent		Inclusion with initial & follow-up study reports; Survey-physical abuse, sexual abuse; Marijuana/hashish use, delinquent behavior by self-report	Between Gender
Dolin, Kelly, & Beasley	1992	Journal of Adolescence	Adjudicated delinquent		Chronic Self-Destructiveness Scale (CDCS); MMPI Psychopathic Deviate Scale (Pd) & Hypomania Scale (Ma) and Harris -Lingoes subscales	Both
Eppright, Dashani, Robison, & Reid	1993	American Journal of Psychiatry	Adjudicated delinquent	DSM-III-R	Diagnostic Instrument for Children & Adolescents – Revised (DISC-R); Structured Clinical Interview for DSM-III-R Personality Disorders (SCID-II)	Between Gender
Evans, Albers, Macari, & Mason	1996	Child & Adolescent Social Work Journal	Adjudicated delinquent		Self-report survey-suicide ideation, suicide attempts, sexual and physical abuse	Between Gender
Famularo, Fenton, Kinscherff, Barnum, Bolduc, & Bunschaft	1992	American Journal of Psychiatry	Adjudicated delinquent referral to mental health		WISC-R; Wide Range Achievement Test-R (WRAT-R-II); Memory for Designs Test-Revised; Rey-Osterrieth Complex Figure Test; Bender Gestalt; Hooper Visual Organization Test; Delinquent or status offender group membership	Within Gender

Table 1 (cont'd).

Fehon, Becker, Grilo, Walker, Levy, Edell, & McGlashan	1997	Comprehensive Psychiatry	Inpatient psychiatric	DSM-III-R	Schedule for Affective disorders and Schizophrenia for School-Aged children-Epidemiologic Version; Personality Disorders Examination (PDE); Global Assessment of Functioning	Both
Fergusson & Woodward	2000	Journal of Child Psychology & Psychiatry	Chirstchurch Health & Development Study		(HOME inventory); Age 13: Rutter & Conner's parent 7 teacher questionnaires; Age 18- assessment educational outcomes; Self Report Delinquency Inventory (Elliott & Huizinga, 1989); DSM-IV substance us & mental health; WISC-R; Progressive Achievement Test (PAT)-reading & math; Test of Scholastic Abilities (TOSCA)	Within Gender
Giancola, Mezzich, & Tarter	1998	Journal of Abnormal Psychology	Outpatient psychiatric	DSM-III-R	Kiddie-Schedule for Affective disorders & Schizophrenia-Expanded (K-SADS-E); Dx by clinician; Team evaluation; Porteus Maze Test; Vigilance task; Motor Restraint task; Stroop Color-Word task; WISC-R/WAIS-R block design, picture arrangement, object assembly; Dimensions of Temperament Survey-Revised (DOTS-R).	Within Gender
Giancola & Mezzich	2000	Aggressive Behavior	Adjudicated delinquent	DSM-III-R	Dx reported and assessed for accuracy by team, urine alcohol/drug screen; Kiddie-Schedule for Affective Disorders and Schizophrenia-Expanded (K-SADS-E); Test of Language Competence-Expanded (TLC-E); Porteus Maze Test; Vigilance Task; Motor Restraint Task; Stroop Color-Word Task; WISC-R subtests- Block Design, Picture Arrangement, Object Assembly; or WAIS-R; Youth Self-Report Inventory (YSR); Andrew Scale; Nonviolent delinquent behavior; Antisocial Behavior Questionnaire; Hollingshead Four Factor Index	Within Gender

Table 1 (cont'd).

Giancola & Mezzich	2000	Journal of Studies on Alcohol	Outpatient psychiatric	DSM-III-R	Kiddie-Schedule for Affective Disorders & Schizophrenia-Expanded (K-SADS-E); Dx by clinician; Team evaluation; WISC-R/WAIS-R; Porteus Maze Test; Vigilance Task, Motor Restraint Task, Stroop Color-Word Task; Test of Language Competence-Expanded (TLC-E); Peabody Individual Achievement Test-Revised (PIAT-R); Hollingshead's Four Factor Index (1975)	Within Gender
Glowinski, Bucholz, Nelson, Fu, Madden, Reich, & Heath	2001	Journal of the American Academy of Child & Adolescent Psychiatry	Missouri Adolescent Female Twin Study	DSM-IV	Child Semi-Structured Assessment for the Genetics of Alcoholism (C-SSAGA) telephone adaptation; DSM-IV computer algorithms	Within Gender
Goodman	1995	European Child & Adolescent Psychiatry	Inpatient psychiatric	ICD-9	Maudsly Item sheet; WISC-R; WPPSI; WAIS-R; Neale Analysis of Reading Ability	Between Gender
Goodyer, Kolvin, & Gatzanis	1986	Journal of Child Psychology & Psychiatry	Inpatient psychiatric	ICD-9	Diagnosis assigned by treating psychiatrist according to operational criteria; Kolvin's (1984) adaptation of Coddington's life events scales; ICD-9	Both
Graham-Bermann & Levendosky	1998	Journal of Interpersonal Violence	At-risk sample	DSM-IV	DSM-IV criteria for PTSD; CBCL Perceived Competence Scales for Children; Conflict Tactics Scale (CTS); Violence Against Women Scale	Between Gender
Green, Russo, Navratil, & Loeber	1999	Journal of Child & Family Studies	Inpatient psychiatric	DSM-IV	Diagnostic Interview Schedule for Children (DISC); Widom (1994) & Strauss (1979) questionnaire on reported abuse (adolescent/parent)	Within Gender
Hipwell, Loeber, Stouthamer-Loeber, Keenan, White, & Kroneman	2002	Criminal Behavior & Mental Health	Pittsburgh Girls Study	DSM-IV	Child Symptom Inventory-4, CD diagnosis; Children's Global Assessment Scale (C-GAS); Self-Reported Antisocial Behavior (SRA); Antisocial Behavior Scale (AS); Psychopathy Screening Device (PSD); Children's Peer Relationship Scale (CPRS)-relational aggression subscale; Your Neighborhood (YN)	Within Gender
Jaffe, Leschied, Sas, Austin, & Smiley	1985	The Ontario Psychologist	Adjudicated delinquent		Child history/parent, record review; Basic Personality Inventory	Between Gender

Table 1 (cont'd).

Joffe, Offord, & Boyle	1988	The American Journal. of Psychiatry	Ontario Child Health Study	DSM-III	Psychiatric diagnosis; McMaster Family Assessment Device-General Functioning Scale	Between Gender
Kelly, Lynch, Donovan, & Clark	2001	Suicide & Life-Threatening Behavior	Inpatient & outpatient psychiatric	DSM-IV	Assessment of suicidal behavior; Structured Clinical Interview : Schedule for Affective Disorder & Schizophrenia-children/parent (K-SADS); Family Assessment Measure (FAM); Interpersonal Support Evaluation (ISE); Life Events Questionnaire (LEQA)	Within Gender
Kratzer & Hodgins	1999	Criminal Behavior & Mental Health	Stockholm 1953 birth cohort		Swedish National Police criminal offenses record of convictions	Both
Kroupa	1988	Adolescence	Adjudicated delinquent		Featherman & Stevens' (1982) SES scale; Shipley-Hartford Scale; Marlowe-Crowne Social Desirability Scale; National Youth Survey Self-Report Delinquency Measure (SRD); Family Relations Inventory (FRI)	Within Gender
Lewis, Shanok, & Pincus	1982	Journal of the American Academy of Child Psychiatry	Adjudicated delinquent		Subjective rating of violence; Clinical team evaluation; WISC; Metropolitan Achievement Test; California Achievement Test; WRAT; Auditory or visual hallucinations, paranoid ideation assessment; Medical history review - abuse or witness extreme violence; Major neurological abnormality, psychomotor epileptic symptomatology	Between Gender
Mace, Rohde, Gnau	1997	Journal for Juvenile Justice & Detention Services	Adjudicated delinquent	DSM-III-R	Self-report questionnaire (SRQ)- unspecified; Schedule for Affective Disorders & Schizophrenia for School-Age Children (K-SADS, K-SAD-E, SADS-P); Beck Depression Inventory(BDI); Hamilton Rating Scale for Depression(HRSD); Personality Disorder Examination (PDE)	Between Gender
Mak	1996	Journal of Family Studies	Adjudicated delinquent		Parental Bonding Instrument	Both

Table 1 (cont'd).

Mason, Zimmerman, Evans	1998	Child Abuse & Neglect	Adjudicated delinquent		Assessed sexual abuse, physical abuse, sexual behavior, number of partners, onset age for sex, contraceptive use, and pregnancy	Between Gender
McCabe, Lansing, Garland, & Hough	2002	Journal of the American Academy of Child Psychiatry	Outpatient psychiatric	DSM-IV	Diagnostic Interview Schedule for Children-IV (computer assisted); Composite International Diagnostic Interview-Substance Abuse Module (CIDI-SAM); Family History section of Service Utilization & Risk Factors Interview; Childhood Trauma Questionnaire, short form (CTQ). CBCL; Youth Self-Report (YSR); Columbia Impairment Scale	Between Gender
McManus, Alessi, Grapentine, & Brickman	1984	Journal of the American Academy of Child & Adolescent Psychiatry	Adjudicated delinquent	DSM-III	Delinquency checklist (DCL), record review, SADS, RDC and DSM-III diagnosis; Hamilton Rating Scale for Depression; Carroll Self-Rating Scale of Depression; Global rating of depression; Hollingshead-Redlich two-factor scale	Both
Nadon, Koverola, & Schludermann	1998	Journal of Interpersonal Violence	Adjudicated delinquent		Sexual Assault Experiences Questionnaire; sexual victimization scales of Silbert (1980), Finkelhor (1979) & Rutnz (1987); Physical abuse assessment; Runaway behavior assessed; Interpersonal violence assessed; Family Adaptability & Cohesion Evaluation Scales (FACES-III); Children of Alcoholics Screening Test (CAST); Substance & alcohol use assessed; Coopersmith Self-Esteem Inventory; Blishen's SES index; Eysenck's Lie Scale- short form	Within Gender
O'Keefe, Carr & McQuaid	1998	Irish Journal of Psychology	Adjudicated delinquent	DSM-IV	Intake sheet review; CD dx-meeting 3 criteria from DSM-IV and ICD-10; Overt-Covert Behavior scale (Loeber & Schmaling, 1985); Axis 5 of ICD-10; Global Assessment of Functioning (GAF); Global Assessment of Relational Functioning scale (GARF)	Between Gender

Table 1 (cont'd).

Pleydon & Schner	2001	Adolescence	Adjudicated delinquent		Hindelang, Hirschi, Weis (1981) Delinquency Scale (DS); Friendship Qualities Scale (FQS); Peer Attachment Inventory (PAI); Girodano, Cernkovich, & deMaris (1993) Peer Pressure & Intimacy Scale	Both
Reebye, Moretti, Wiebe, & Lessard	2000	Canadian Journal of Psychiatry	Inpatient psychiatric	DSM-III-R	Diagnostic Interview for Children & Adolescents (DICA-R)	Between Gender
Ritter, Stewart, Bernet, Coe, & Brown	2002	Journal of Traumatic Stress	At-risk sample	DSM-III-R	Structured Clinical Interview; Customary Drinking & Drug Use Record (CDDR); Conduct Disorder Questionnaire (CDQ); Self-Esteem Questionnaire (SEQ); Conflict Tactics Scale (CTS)	Both
Rogeness, Amrungi, Macedo, Harris, & Fisher	1986	Journal of the American Academy of Child Psychiatry	Inpatient psychiatric	DSM-III	Psychiatric diagnosis; Direct evaluation, history, school or source referral, observation; DSM-III checklist;	Both
Siegel & Williams	2003	Journal of Research in Crime & Delinquency	At-risk sample		Emergency room record search to match sexually abused and control samples; Self report arrest history; Dependency hearing assessment	Within Gender
Silverthorn, Frick, & Reynolds	2001	Journal. of Psychopathology & Behavioral Assessment	Adjudicated delinquents	CBCL	Adolescent Symptom Inventory-4/Youth inventory-4 (ASI/YI-4); modified Self-Report Delinquency Scale (SRD); Psychopathy Screening Device (PSD);	Between Gender
Skitka, Piatt, Ketterson, & Searight	1993	Social Behavior & Personality	Adjudicated delinquent		Self-report questionnaire (not specified); Missouri Criminal Code; MMPI L-scale (lie scale)	Both
Tarter, Hegedus, Winsten, & Alterman	1984	Journal of the American Academy of Child Psychiatry	Adjudicated delinquents		WISC-R; WAIS-R; Peabody Individual Achievement Test (PIAT); Detroit Tests of Learning Aptitude (DTLA); Pittsburgh Initial Neuropsychological Test System (PINTS); Matching Familiar Faces Test (MFFT); MMPI; Devereux Adolescent Behavior Scale (DABS); Family Environment Scale (FES); Family and developmental history	Within Gender
Teplin, Abram, McClelland, Dulcan, & Mericle	2002	Archives of General Psychiatry	Northwestern Juvenile Project	DSM-III-R	DISC, v2.3 computer algorithms to calculate diagnosis rates; Children's Global Assessment Scale	Between Gender

Table 1 (cont'd).

Tibbetts & Piquero	1999	Criminology	Adjudicated delinquents		Offense onset, low birth weight, disadvantaged environment (SES & weak family structure)	Between Gender
Tiet, Wasserman, Loeber, McReynolds, & Miller	2001	Journal of Child & Family Studies	Columbia University At-Risk study (1992)	CBCL	Child Behavior Check List (CBCL)- subscales aggression, delinquency, social and attention problems; Indicators of Conduct Problems (ICP) (Loeber et al., 1998)	Between Gender
Timmons-Mitchell, Brown, Schulz, Webster, Underwood, & Semple	1997	Behavioral Sciences and the Law	Adjudicated delinquent	DSM-IV	Diagnostic Interview Schedule for Children (DISC); Symptom Checklist-90-Revised (SCL-90-R); Millon Adolescent Clinical Inventory (MACI)	Between Gender
Thompson & Dodder	1986	Adolescence	Adjudicated delinquent		Modified Nye's Self-Report Delinquency Scale; Long (1976) perception of containers in containment theory	Both
Trautman, Rotheram-Borus, Dopkins, & Lewin	1991	Journal of the American Academy of Child & Adolescent Psychiatry	Outpatient psychiatric		Schedule for Affective Disorders and Schizophrenia for School-Aged Children-Present Episode (K-SADS-P); WISC-R; computer algorithm diagnosis	Within Gender
Walrath, Ybarra, Holden, Manteuffel, Santiago, & Leaf	2003	Journal. of Adolescence	Outpatient psychiatric		Demographic information; Individual and family correlates, school correlates	Both
White, Moffitt, & Silva	1989	Journal .of Consulting & Clinical Psychology	Dunedin Multidisc. Health & Development Study		WISC-R; Self-Report Early Delinquency (SRED) protocol; Parent/Teacher report on the Rutter Child Scales; Parent report Socialized Aggression subscale of the Quay & Peterson (1983) Revised Behavior Problems Checklist; Police contact records	Both
Whitmore, Mikulich, Thompson, Riggs, Aarons, & Crowley	1997	Drug & Alcohol Dependence	Adjudicated delinquent	DSM-III-R	Inclusion: at least 3 lifetime CD symptoms, not a threat to self or have other primary diagnosis, at least 1 non-tobacco abuse or dependence diagnosis; CICI-SAM; Diagnostic Interview for Children-2.1; Lifetime CD diagnosis; Comprehensive Addiction Severity Index-Adolescents (CASI-A); Hollingshead & Redlich's (1958) SES	Both

Table 1 (cont'd).

Widom, Katkin, Stewart, & Fondacaro	1983	Journal of Research Crime & Delinquency	Adjudicated delinquent		Special Hospitals Assessment of Personality and Socialization (SHAPS): Thematic Apperception Test (TAT); Background questionnaire (not specified); Measure of fantasy aggression (Winter, 1973); Hollingshead & Redlich's ('58) categories	Both
Williams & McGee	1994	Journal. of Child Psychology & Psychiatry	Dunedin Multidisc. Health & Development Study	DSM-III	Burt Word Reading Test; Prose reading test; Spelling test; Child Scale A (parent) B (teacher)plus additional measure of antisocial behavior; Self-reported delinquency, parent report by Moffitt & Silva (1988) scale; Revised Behavior Problem Checklist (RBPC); measure of family disadvantage	Both
Woodward & Fergusson	1999	Development & Psychopathology	Chirstchurch Health & Development Study		Age 8: Rutter & Conner parent/teacher questionnaires; WISC-R; HOME inventory	Both
Zoccolillo, Tremblay, & Vitaro	1996	Journal of the American Academy of Child & Adolescent. Psychiatry	Community sample	DSM-III DSM-III-R	Age 5: Social Behavior Questionnaire; age 7-12: Persistence of antisocial behavior-follow up assessments w age appropriate questions; Age 8: impairment assessment; Age 10: Diagnostic Schedule for Children	Both

IV RESULTS

Approximately 900 studies were identified from the literature search as potentially relevant. Of these, 62 articles met the inclusion criteria and pool of 635 effect sizes was extracted. To maintain statistical independence all effect sizes were coded on the study level, with a shifting unit of analysis. Effect sizes representing similar constructs from a single study were averaged and presented as a single unit. For example, a single study presenting data separated by parent and teacher report were averaged to represent a single effect size on a childhood conduct problems. In addition, studies reporting disaggregated data on child-onset Conduct Disorder and adolescent-onset Conduct Disorder were collapsed and presented as a single unit. This decision was made because relatively few studies have investigated whether specific differences exist between two subgroups. While this difference is clinically important, two of the within gender studies were from the same longitudinal study and, as statistical independence is an important assumption in a meta-analytic synthesis, collapsed values were determined to be more useful. Multiple effect sizes were extracted from a number of studies reporting a range of risk categories for Conduct Disorder and Juvenile Delinquency. These effect sizes could be cumulated into an overall analysis of a particular risk category. Whenever appropriate, multiple effect sizes from a single study were further condensed in the overall analysis. Tables are presented in a hierarchal format, representing overall analyses first and further breaking down constructs separated on area of interest. Tests of effect-size homogeneity (Q_i) were conducted on all analyses. Significant results indicate that the effect sizes represent a greater degree of heterogeneity than would be expected by chance. Specifically, this test indicates whether the association between the particular risk

variable and antisocial behavior is stronger in some studies than others. Between (Q_b) and within (Q_w) values of homogeneity represent the amount of effect-size variability that exists across outcomes and within each particular category. Results from within and between gender studies were analyzed and are presented separately.

Within-Study Comparisons

Individual Correlates

Race. Table 2 displays the effect size estimates and diagnostic statistics for race. Eleven studies reported data on race of sample, which could be analyzed. Effect sizes from these studies indicate a small significant effect of race as a predictor for conduct problems. The test of homogeneity was significant for the overall category. The homogeneity test between Conduct Disorder and Juvenile Delinquency categories was not significant, suggesting that the overall main effect of race is similar for both groups. Further analysis indicates a greater likelihood of being Caucasian than any other race comparison for both Conduct Disorder and Juvenile Delinquency. Specifically, Caucasian females were significantly more likely to be diagnosed with Conduct Disorder than African Americans females. However, due to the small number of effect sizes and the small overall number of studies needed to diminish this significance, race should be interpreted as a weak predictor of Conduct Disorder and Juvenile Delinquency.

Table 2
Hedges *d* Effect sizes

Individual Correlate	K	N	<i>d</i>	95% CI	<i>Q_i</i>	<i>k₀</i>
Race	11	1,329	.312***	.190, .434	72.23***	23
By Diagnostic Category					<i>Q_b</i>	0.843
Conduct Disorder	6	783	.303***	.152, .453	<i>Q_w</i>	60.72***
Juvenile Delinquency	5	546	.328**	.122, .536	<i>Q_w</i>	11.47*
CD					<i>Q_b</i>	17.03***
Caucasian vs African American	4	619	.476***	.302, .649	<i>Q_w</i>	43.69***
Caucasian vs Hispanic	1	82	-.416	-.861, .028	<i>Q_w</i>	.000
Hispanic vs African American	1	82	-.070	-.510, .369	<i>Q_w</i>	.000
JD					<i>Q_b</i>	
Caucasian vs African American	3	450	.253*	.019, .488	<i>Q_w</i>	9.14*
Caucasian vs Hispanic	1	65	.503	-.015, 1.03	<i>Q_w</i>	.000
Hispanic vs African American	1	31	.868	-.043, 1.78	<i>Q_w</i>	.000

Note: Positive effect sizes indicate greater risk of being Caucasian as compared to second group. Negative effect size indicates less risk of being Caucasian than the second group. K = total number of studies. N= total sample size
*.p<.001*** p<.01** p<.05**

Cognitive ability. Table 3 represents comparisons of effect sizes and diagnostic statistics on cognitive ability. Six studies investigated the predictive role of cognitive ability in Conduct Disorder and Juvenile Delinquency. The test of homogeneity was significant overall.

Conduct Disordered and Juvenile Delinquent females have, on average, statistically significant lower composite IQ scores than comparison females. Although few studies have examined cognitive ability, this effect appears especially robust and applies equally well to both groups. Homogeneity tests for Juvenile Delinquent samples were non-significant. Diminished cognitive ability appears to be a significant predictor of Conduct Disorder and Juvenile Delinquency in females, and is especially predictive of Conduct Disorder.

Table 3Hedges *d* Effect sizes

Individual Correlate	K	N	<i>d</i>	95% CI	Q_i	k_o
Cognitive Ability	8	7,218	.600***	.503, .704.	20.18**	40
By Diagnostic Category					Q_b	1.76
Conduct Disorder	6	1,254	.659***	.529, .789	Q_w	15.79**
Juvenile Delinquency	2	5,964	.525***	.378, .6730	Q_w	2.63
CD					Q_b	8.76
Executive cognitive functioning	3	737	.796***	.637, .956	Q_w	2.12**
Full scale	3	517	.377**	.149, .605	Q_w	4.9

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. *K* = total number of studies. *N* = total sample size.

p < .001 *** *p* < .01 ** *p* < .05 *

The strongest association between cognitive ability and antisocial behavior is specifically related to executive cognitive functioning. Homogeneity tests were significant within this variable, indicating that this variable contributes to the majority of explained variance within the Conduct Disorder subgroup. Executive cognitive functioning is a composite measure of language skills and neuropsychological functioning (Giancola & Mezzich, 2000a). This diminished capacity appears to be a significant factor mediating the relationship between cognitive ability and antisocial behavior.

Temperament. Table 4 presents effect size comparisons and diagnostic statistics for childhood and antisocial temperament. Seven studies investigated the relationship between childhood conduct problems and hyperactivity, and the development of adolescent antisocial behavior and Conduct Disorder diagnosis. Homogeneity tests were significant on all levels of analysis. Childhood temperament, characterized by 'bullying', 'fighting', 'aggression', and 'hyperactivity', is significantly predictive of the development of Conduct Disorder in adolescence. In this analysis, childhood hyperactivity has a greater predictive strength than conduct problems, although very few

studies contributed. However, although childhood conduct problems may be regarded as a 'medium' effect, this difference in standard deviation indicates a clinically significance difference in childhood behavior pattern between conduct problem and 'normal' girls.

Table 4
Hedges *d* Effect sizes

Individual Correlate	K	N	<i>d</i>	95% CI	Q_t	k_0
Childhood Temperament	7	3,257	.703***	.628, .778	127.49***	42
					Q_b	53.82***
Childhood conduct problems	5	2,134	.513***	.422, .603	Q_w	26.20***
Childhood hyperactivity	2	1,123	1.12***	.983, 1.25	Q_w	47.48***
Adolescent Temperament	9	1,079	1.00***	.864, 1.14	53.82***	81
By Diagnostic Category					Q_b	13.06***
Conduct Disorder	2	534	1.31***	1.09, 1.52	Q_w	21.37***
Juvenile Delinquency	7	545	.790***	.610, .969	Q_w	19.39**
Overall					Q_b	16.27***
Antisocial	2	204	1.10***	.791, 1.41	Q_w	0.331
Externalizing	3	615	1.21***	1.02, 1.41	Q_w	25.34***
Internalizing	2	142	.669***	.327, 1.01	Q_w	1.12
Poor interpersonal relationships	2	118	.471*	.090, .851	Q_w	10.76***

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. K = total number of studies. N= total sample size.

*p<.001*** p<.01** p<.05**

Nine studies investigated the temperament of antisocial females. With the exception of antisocial personality type and internalizing problems, homogeneity tests were significant on all levels. Although significant differences exist between Conduct Disorder and Juvenile Delinquents samples, too few studies investigating the personality type of the Conduct Disordered female exist to allow for appropriate individual interpretation. Conduct Disorder samples contributed to the majority (2) of the externalizing variable. Antisocial females are significantly more likely to be chronically self-destructive, callous, aggressive, hostile, extraverted, 'psychopathic', and have problems with authority. Antisocial females are also significantly more likely to have poor impulse control, and a 'difficult' temperament, and are more likely to suffer from clinically significant levels of depression, anxiety, and low self-esteem.

As a result, antisocial females tend to suffer greater peer rejection, social alienation, and self-alienation. It is especially interesting that the antisocial and internalizing personality types are homogenous variables, suggesting a consistent association with antisocial and conduct problem behavior.

Psychosocial Correlates

Familial Risk. Table 5 presents mean effect sizes and diagnostic statistics for overall familial dysfunction and corresponding Conduct Disorder and Juvenile Delinquent subgroup familial dysfunction risk correlates. Fifty eight studies reported data on familial risk. Homogeneity tests for overall familial dysfunction, categorized by familial and parental dysfunction were significant. Familial dysfunction was characterized by a general measure of instability (single parent family, high parent change, broken home, and uneducated teenage mother at birth) and low socio-economic status. Parental dysfunction was characterized by physical and sexual abuse; familial violence and high parental conflict; inappropriate parenting (overprotection, lack of supervision, harsh discipline, lack of emotional bond); and parental history of drug and alcohol abuse, antisocial behavior or conviction history, and history of mental illness.

At the overall level, the association between familial risk and antisocial behavior was significantly stronger for familial dysfunction than parental dysfunction. Contrasts of effect sizes with the Bonferonni method of inequality ($z = 2.32^*$) suggest that familial dysfunction is more significantly predictive of antisocial behavior overall than is parental dysfunction. Further analysis of the familial dysfunction subgroup suggests significant differences exist between categorical variables. Homogeneity tests were significant between the subgroups of instability and low SES, on the combined antisocial level and

were also significant between the separate Conduct Disorder and Juvenile Delinquent subgroups.

Table 5
Hedges *d* Effect sizes

Psychosocial Correlates	K	N	<i>d</i>	95% CI	<i>Q_i</i>	<i>k₀</i>	
Overall Familial Dysfunction	58	14,598	.580***	.538, .601	322.61***	110	
					<i>Q_b</i>	5.40*	
Familial Dysfunction	14	4, 185	.658***	.580, .736	<i>Q_w</i>	55.86***	32
Parental Dysfunction	44	10,413	.549***	.500, .598	<i>Q_w</i>	261.34***	77
Familial Dysfunction					<i>Q_b</i>	26.02***	
Instability	6	1,634	.944***	.809, 1.08	<i>Q_w</i>	2.99	24
Low SES	8	2,551	.514***	.419, .610	<i>Q_w</i>	26.85***	13
CD Familial Dysfunction	8	2,253	.612***	.513, .711	9.70		17
					<i>Q_b</i>	5.74*	
Instability	2	591	.858***	.633, 1.08	<i>Q_w</i>	0.193	7
Low SES	6	1,662	.553***	.442, .663	<i>Q_w</i>	3.77	11
JD Familial Dysfunction	6	1,932	.734***	.607, .860	43.96***		16
					<i>Q_b</i>	20.87***	
Instability	4	1,043	.994***	.824, 1.17	<i>Q_w</i>	1.9	16
Low SES	2	889	.397***	.205, .590	<i>Q_w</i>	21.19***	2

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. K = total number of studies. N= total sample size.
 $p < .001$ *** $p < .01$ ** $p < .05$ *

Homogeneity tests were not significant within the instability category on either the combined or Conduct Disorder or Juvenile Delinquent levels of analysis. This suggests that familial instability offers a consistently predictive association for the development of antisocial behavior. Familial instability appears especially predictive, with a robust mean effect size and nonsignificant homogeneity test, suggesting a specific association for the development of antisocial behavior for both Conduct Disorder and Juvenile Delinquency. Interestingly, low socio-economic status was predictive also, although a much stronger relationship was indicated for Conduct Disorder than for Juvenile Delinquency. Homogeneity tests were significant within the low SES subgroup at the combined and Juvenile Delinquency levels of analysis. Homogeneity tests were not significant for low SES within the Conduct Disorder subgroup. Low socio-economic

status contributed a large amount of variance to the overall analysis, which may contribute to conclusions drawn in the research literature that this risk variable is not, in itself, associated with antisocial behavior.

There appear to be different risk pathways to antisocial behavior for Conduct Disorder and Juvenile Delinquency regarding parental dysfunction. Table 6 presents the mean effect sizes and diagnostic statistics for parental dysfunction. Homogeneity tests representing the overall parental dysfunction subgroups and between Conduct Disorder and Juvenile Delinquent subgroups were significant. Mean effect sizes were significantly greater for Conduct Disorder than for Juvenile Delinquency across all levels of parental dysfunction. For Conduct Disorder, mean effect sizes were stronger for the association of familial violence, parental conflict, parental drug use, and a history of parental mental illness or antisocial behavior than for physical and sexual abuse or inappropriate parenting. However, the mean effect sizes for abuse and inappropriate parenting indicate a strong predictive association. Bonferonni contrasts indicate that familial violence and parental conflict were more significantly predictive ($z = 4.88^{**}$) than physical and sexual abuse for Conduct Disorder. Parental history of mental illness or antisocial behavior was also more significantly predictive ($z = 3.51^{**}$) than inappropriate parenting as a risk correlate for Conduct Disorder. Contrasts between familial violence and parental conflict and inappropriate parenting indicate no critical differences. Critical differences do not exist between familial violence and parental conflict, and dysfunctional parental history as risk variables. Homogeneity tests associated with the Conduct Disorder subgroup were nonsignificant, with the exception of inappropriate parenting. Physical and sexual abuse, familial violence and parental conflict, and dysfunctional parental history appear to

present a more consistent associative relationship for the development of Conduct Disorder.

Table 6
Hedges *d* Effect sizes

Psychosocial Correlates	K	N	<i>d</i>	95% CI	<i>Q_i</i>	<i>k_o</i>
Parental Dysfunction	44	10,413	.549***	.500, .598	261.34***	77
					<i>Q_b</i>	9.26*
Abuse (physical & sexual)	11	3,500	.492***	.413, .571	<i>Q_w</i>	56.53*** 16
Familial conflict/violence	6	1,542	.509***	.368, .649	<i>Q_w</i>	53.71*** 9
Inappropriate parenting	22	3,210	.651***	.569, .733	<i>Q_w</i>	65.76*** 50
Parental History	5	2,161	.483***	.357, .610	<i>Q_w</i>	76.10*** 7
CD Parental Dysfunction	17	4,320	.791***	.717, .865	86.24***	50
					<i>Q_b</i>	23.21***
Abuse (physical & sexual)	4	1,221	.648***	.532, .765	<i>Q_w</i>	.420 9
Familial conflict/violence	3	652	.985***	.777, 1.19	<i>Q_w</i>	5.42 12
Inappropriate parenting	7	1,816	.748***	.622, .874	<i>Q_w</i>	51.96*** 19
Parental history	3	631	1.19***	.979, 1.41	<i>Q_w</i>	5.23 15
JD Parental Dysfunction	27	6,093	.336***	.302, .431	103.21***	18
					<i>Q_b</i>	33.29***
Abuse (phys & Sex)	7	2,279	.359***	.251, .467	<i>Q_w</i>	43.30*** 6
Familial conflict/violence	3	890	.109	-.082, .300	<i>Q_w</i>	11.24** <1
Inappropriate parenting	15	1,394	.580***	.472, .688	<i>Q_w</i>	9.87 29
Parental history	2	1,530	.099	-.058, .256	<i>Q_w</i>	5.51* <1
JD Abuse	20	3,782	.472***	.395, .550	61.47***	27
					<i>Q_b</i>	11.40**
Emotional	7	626	.533***	.373, .694	<i>Q_w</i>	6.06 12
Neglect	6	877	.659***	.500, .817	<i>Q_w</i>	1.97 14
Physical	3	934	.275**	.093, .457	<i>Q_w</i>	21.24** <1
Sexual	4	1,345	.404***	.271, .538	<i>Q_w</i>	20.80*** 4
CD Inappropriate Parenting	7	1,816	.748	.622, .874	51.96***	19
					<i>Q_b</i>	17.00***
Harsh discipline	4	940	1.00***	.828, 1.17	<i>Q_w</i>	19.24*** 16
Lack of emotional bond	3	876	.473***	.291, .655	<i>Q_w</i>	15.66*** 4
Harsh discipline					<i>Q_b</i>	15.25***
Maternal	3	655	.783*	.578, .988	<i>Q_w</i>	2.37 9
Parental	1	285	1.62***	1.27, 1.96	<i>Q_w</i>	.000 7
Lack of emotional bond					<i>Q_b</i>	15.25***
Maternal	2	591	.229*	.009, .448	<i>Q_w</i>	.413 <1
Parental	1	285	1.00***	.682, 1.33	<i>Q_w</i>	.000 4

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. K = total number of studies. N = total sample size.
*p < .001*** p < .01** p < .05**

Further analysis of the inappropriate parenting variable within the Conduct Disorder subgroup, characterized by harsh discipline and lack of emotional bond, suggests significant differences between the two variables. Harsh discipline appears more predictive of the development of Conduct Disorder than a lack of parental emotional bond. Harsh maternal discipline was more strongly associated with the development of Conduct Disorder than the lack of maternal emotional bond, which showed a weak relationship. However, as few studies investigated the relationship between maternal attachment and the development of Conduct Disorder, this finding should be interpreted with caution. Further analysis of the Conduct Disorder abuse category was not appropriate as a limited number of studies investigating the impact of parental abuse meeting the inclusion criteria for this analysis exist.

In the overall analysis of parental dysfunction for Juvenile Delinquency, inappropriate parenting was more strongly associated with the development of antisocial behavior than abuse, familial violence and parent conflict, or dysfunctional parent history. For Juvenile Delinquent females, two variables were not predictive of the development of antisocial behavior. Juvenile Delinquent females were not more likely to come from risky homes characterized by familial violence and parental conflict, and dysfunctional parental history than 'normal' females. However, this finding should also be interpreted with caution as less than one study would be needed to change the impact of these variables. A stronger predictive relationship ($z = 2.83^{**}$) was indicated for inappropriate parenting (characterized by harsh discipline, parental overprotection, lack of supervision, and lack of parental attachment) than for physical and sexual abuse. Homogeneity tests were not significant for inappropriate parenting, and were significant

for physical and sexual abuse, suggesting that these two variables offer distinctly different associations to the pattern of development of antisocial behavior. Inappropriate parenting presents a more consistently predictive risk for female Juvenile Delinquency than physical and sexual abuse.

A distinctly different risk pattern was also indicated in further analysis of abuse classification for Juvenile Delinquency. Across levels of physical, sexual abuse and neglect, parental neglect indicated significantly greater predictive risk for the development of antisocial behavior than physical ($z = 3.12^{**}$) and sexual abuse ($z = 2.41^{*}$). Emotional abuse was more significantly predictive of antisocial behavior than physical abuse ($z = 2.08^{*}$). Comparisons of mean differences between neglect and emotional abuse, and emotional and sexual abuse were nonsignificant. Homogeneity tests for neglect and emotional abuse were nonsignificant, but were significant for physical and sexual abuse. The nonsignificant homogeneity tests for the neglect and emotional abuse categories indicate a more consistent risk relationship for the development of antisocial behavior. The risk for the development of antisocial behavior in females appears to be specifically associated with parental neglect and emotional abuse. It is surprising to find the more modest association of physical and sexual abuse, as the research literature generally indicates a robust relationship between these two abuse types and Juvenile Delinquency in females. However, it is important to recognize that Juvenile Delinquent females are significantly more likely to have been sexually and physically abused compared to 'normal' females.

Social risk. Table 7 displays the mean effect sizes and diagnostic statistics for the social risks of antisocial behavior. Forty-seven studies reported usable data on

adolescent outcome variables for Conduct Disorder and Juvenile Delinquent females. Homogeneity tests were significant at the overall level. Homogeneity tests between Conduct Disorder and Juvenile Delinquent subgroups were not significant and a significantly relationship between risk variables was equally strong, suggesting that the specific outcome risk is similar for both groups. Specific outcome mean effect sizes are presented as a combination of Conduct Disorder and Juvenile Delinquent subgroups.

Antisocial Behavior. Eleven studies reported data on antisocial behavior. In the overall analysis, mean effect sizes were greatest for antisocial behavior. Conduct Disorder and Juvenile Delinquent females have an especially strong risk for antisocial behavior. This relationship is equally robust and significant across all categories of antisocial behavior. Homogeneity tests were significant at the overall level, nonsignificant between, and only delinquent behavior indicated significant homogeneity within categorical variables. Running away, truancy, and violent acting-out behaviors appear to present a consistent, equally significantly, risk for antisocial behavior. The fact that an equally strong risk relationship to antisocial behavior exists between measures of more covert behavior, running away and truancy, and violent behaviors is surprising as the research literature suggests that antisocial females are more likely to be at increased risk for covert behavior problems than overt behaviors. The risk association for violent behavior may have been attenuated in the research literature by collapsing violent behaviors into a general category of overt behavior in an overall measure of delinquency. The fail-safe N ($N = 110$) for measures of antisocial behavior is considered large, as research investigating antisocial behavior in Conduct Disorder and adjudicated female

samples is scarce and it is unlikely that such a number of contrasting studies exist that would be able to diminish this effect.

Table 7
Hedges *d* Effect sizes

Psychosocial correlates	K	N	<i>d</i>	95% CI	Q_i	k_o
Overall Social Risk	47	17,003	.764***	.727, .801	641.84***	312
By Diagnostic Category					Q_b 0.027	
Conduct Disorder	37	14,193	.765***	.726, .805	Q_w 576.40***	246
Juvenile Delinquency	10	2,810	.756***	.649, .862	Q_w 65.41***	66
Social Risk Variables Combined						
Academic failure	12	3,817	.407***	.325, .488	81.88***	37
					Q_b 1.11	
Low academic skills	4	877	.472***	.325, .619	Q_w 6.05	15
Low academic performance	8	2,940	.378***	.279, .476	Q_w 74.73***	22
Antisocial behavior	11	3,149	1.10***	1.01, 1.19	113.7***	110
					Q_b 4.92	
Delinquency	3	939	1.06***	.902, 1.21	Q_w 101.29***	29
Running away	3	934	1.02***	.835, 1.21	Q_w 5.18	28
Truancy	3	622	1.03***	.808, 1.25	Q_w 2.26	28
Violent acting out	2	654	1.27***	1.09, 1.44	Q_w .050	23
Social risk	10	3,007	.589***	.491, .688	71.54***	49
					Q_b 10.76**	
Comorbidity	3	714	.200*	.018, .383	Q_w 10.58**	3
Sexual risk	3	876	.578***	.397, .760	Q_w 5.61	14
Substance use	4	1,417	.872***	.717, 1.03	Q_w 24.7***	31
Peer risk	7	1,362	.752***	.611, .893	4.52	46
					Q_b 0.506	
Deviant peer affiliation	4	695	.802***	.605, .999	Q_w 2.48	28
Low peer group intimacy	3	667	.700***	.498, .902	Q_w 1.53	18
Suicidal behavior	7	5,668	.867***	.809, .925	218.54***	54
					Q_b 91.81***	
Ideation	2	882	.284***	.151, .417	Q_w 1.42	4
Attempt	5	4,786	1.00***	.941, 1.07	Q_w 125.30***	45

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. K = total number of studies. N= total sample size.

$p < .001$ *** $p < .01$ ** $p < .05$ *

Peer risk. Seven studies reported usable data on specific peer risks for antisocial behavior. Homogeneity tests were nonsignificant overall. Antisocial females are significantly more likely to have deviant peer affiliation than 'normal' females, with mean effect sizes indicating a strong relationship. A strong significant association also

exists between low peer group intimacy and antisocial behavior. Conduct Disorder and Juvenile Delinquent females are more likely to experience peer pressure, and lack communication, trust, and intimacy in their social relationships with their peers than are 'normal' females

Academic failure. Twelve studies reported data on the specific academic risk and its relationship to antisocial behavior. Homogeneity tests were nonsignificant overall, with the exception within the academic performance variable. Mean effect sizes show a significant relationship between academic failure and antisocial behavior, although this effect is relatively modest. Conduct Disorder and Juvenile Delinquent females are more likely to lack academic skills (reading, math and spelling) than to exhibit low levels of academic performance, although this relationship is significant also. It is interesting that the effect size strength for academic failure is not stronger, given the relatively strong effect size strength for significantly lower cognitive ability and executive cognitive functioning.

Social risk. Ten studies reported usable data on the relationship between social risk factors and antisocial behavior. Homogeneity tests were significant overall, with the exception of sexual risk. The strongest relationship exists between substance use and antisocial behavior. Antisocial females are more likely to engage early, and more frequent, alcohol and illicit drug use. There appears to be a specific significant sexual risk for antisocial females, characterized by teenage pregnancy, sexual precocity, and multiple sexual partners. The comorbidity mean effect sizes indicate a weak relationship between antisocial behavior and the dual diagnosis of Conduct Disorder females. This effect should be interpreted with caution as comorbidity data was collapsed into an overall

category, resulting from relatively few numbers of available studies reporting usable data. Comorbidity included substance use disorders (SUD) and depression (MDD) and anxiety disorders. The mean effect for a dual diagnosis of CD x SUD was strong ($g = .986^{***}$) while the effect strength CD x MDD or CD x Anxiety Disorder was relatively weak, although still significant ($g = .267^{***}$). This suggests that females with Conduct Disorder are somewhat more likely to suffer from depressive and anxiety disorders than 'normal' females, but have a significantly greater likelihood of being diagnosed with dual Substance Use Disorders and Conduct Disorder.

Suicide risk. Seven studies reported usable data on the risk relationship between suicidal behavior and Conduct Disorder and Juvenile Delinquency. Homogeneity tests were significant, with the exception of current suicide ideation. The strength of association between antisocial behavior and suicidal behavior is especially startling. Suicidal behavior is significantly associated with Conduct Disorder and Juvenile Delinquency. While current suicide ideation shows a weak significant relationship, past history of suicide attempt has a very strong significant association. Conduct disorder and Juvenile Delinquent females are significantly more likely to have made suicide attempts, regardless of their current level of suicide ideation. The fact that the strongest predictive association for Conduct Disorder and Juvenile Delinquency was between antisocial behavior and suicidal behavior is of great concern, and speaks to the clinical levels of chronic self-destructiveness experienced by these females.

Between Gender

Individual correlates

Cognitive ability. Table 8 presents mean effect sizes and summary data for cognitive ability. Fifteen studies reported usable data. Homogeneity tests were significant at the overall level, within the Juvenile Delinquency category, and between the categorical levels of cognitive ability. Homogeneity tests were not significant for Conduct Disorder. Conduct Disorder and Juvenile Delinquent females have, on average, significantly lower measures of cognitive ability than antisocial males. Although Conduct Disorder females mean effect sizes were larger when analyzed as a unit, the difference in cognitive ability was not significant. This result may suggest that while Conduct Disorder females have diminished cognitive ability compared to males, the predictive value of this association with antisocial behavior has less impact.

Table 8
Hedges *d* Effect sizes

Individual Correlate	K	N	<i>d</i>	95% CI	Q_i	k_i
Overall Cognitive Ability	15	4,037	.130*	.047, .213	28.32*	180
By Diagnostic Category					Q_b	1.04
Conduct Disorder	5	213	.281	-.023, .585	Q_w	7.1 136
Juvenile Delinquency	10	3,824	.118**	.031, .204	Q_w	20.18* 108
Cognitive Ability Combined					Q_b	10.51**
Full scale	9	1,561	.187**	.058, .317	Q_w	11.09 159
Verbal	3	1,238	-.08	-.234, .075	Q_w	1.24 27
Performance	3	1,238	.259**	.104, .413	Q_w	5.47 75

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. Negative (-) effect sizes indicate greater risk for male Conduct Disorder and Juvenile Delinquent samples.

K = total number of studies. N = total sample size.

*p < .001*** p < .01** p < .05**

Juvenile Delinquent females, on the other hand, have significantly diminished cognitive ability when compared to males. This subgroup was also responsible for the variance which exists in the population, although the significance levels were not very

high ($p = .0168$). Antisocial males appear at specific risk for diminished verbal ability, although this difference was not significant.

Temperament. Twenty-one studies reported usable data on the personality type of antisocial males and females. Table 9 displays mean effect sizes and diagnostic statistics.

Table 9
Hedges d Effect sizes

Individual Correlate	K	N	d	95% CI	Q_i	k_o
Overall Adolescent Temperament	21	5,175	.186***	.125, .247	72.37***	
By Diagnostic Category					Q_b	0.279
Conduct Disorder	4	842	.147	-.012, .305	Q_w	6.89 55
Juvenile Delinquency	17	4,333	.193***	.127, .259	Q_w	65.20*** 311
Temperament Variables Combined					Q_b	17.11**
Antisocial personality	5	719	.030	-.122, .182	Q_w	9.97* 10
Impulse control	4	1,186	.120	-.013, .252	Q_w	17.78*** 44
Internalizing	5	1,414	.387***	.269, .506	Q_w	3.67 188
Poor social relations	3	858	.113	-.040, .265	Q_w	19.42*** 30
Poor sense of self	4	998	.174*	.035, .312	Q_w	4.42 65

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. Negative (-) effect sizes indicate greater risk for male Conduct Disorder and Juvenile Delinquent samples.

K = total number of studies. N = total sample size.

$p < .001$ *** $p < .01$ ** $p < .05$ *

Homogeneity tests were significant for overall temperament. Homogeneity tests were nonsignificant between Conduct Disorder and Juvenile Delinquent subgroups, suggesting similar strength of association between antisocial temperament and antisocial behavior. Homogeneity tests were significant within the Juvenile Delinquent samples, and within personality variables of antisocial personality, impulse control, and poor social relations. The strongest effect size, and the only significant personality variable, was for internalizing behaviors. Homogeneity tests within this variable were not significant. This suggests that Conduct Disorder and Juvenile Delinquent females are significantly more likely than males to be at greater consistent risk for high levels of

anxiety, depression, and somatization, as well as increased levels of borderline tendencies and post-traumatic stress symptoms. Antisocial females are also more likely to experience lower levels of self-esteem and greater self-derogation, although significant this effect size strength was weaker compared to internalizing disorders. Homogeneity tests within this variable were nonsignificant.

Relatively few differences exist between males and females on the antisocial personality and impulse control variables. Homogeneity tests were significant within these variables, although the mean effect sizes were not significant. Conduct Disorder and Juvenile Delinquent females are as likely as males to be chronically self-destructive, aggressive, hostile, sensation seeking, and psychopathic. Antisocial females also show a tendency toward greater difficulty with impulse control than males.

Psychosocial Correlates:

Familial Risk. Nineteen studies reported usable data on the association between familial risk and antisocial behavior. Table 10 reports mean effect sizes and summary data for familial instability, low socioeconomic status and the impact of dysfunctional parental history. Homogeneity tests were significant at the overall level, and nonsignificant for Juvenile Delinquent groups. The homogeneity test significance reported within the Conduct Disorder subgroup is due to parent history of mental illness ($d = -1.06^{**}$) of which only one effect size was reported. This variable is also responsible for the significant homogeneity within the combined category. With this exception, homogeneity tests were nonsignificant for Conduct Disorder. Variables for Conduct Disorder could not be analyzed separately in any meaningful manner, due to the low number of studies available. Three studies available for familial instability ($d = -.098$)

were included in the combined analysis. Homogeneity tests were nonsignificant at the combined levels of familial dysfunction variables, with the noted above exception of parent history of mental illness and familial instability. Familial instability is a measure of weak family structure, single parent family, high parental change, and parental conflict and familial violence. Within the Conduct Disorder subgroup, males tend to experience slightly more risk through familial instability, although the mean effect sizes were not significant.

Table 10
Hedges *d* Effect sizes

Psychosocial Correlates	K	N	<i>d</i>	95% CI	<i>Q_t</i>	<i>k_o</i>	
Overall Familial Dysfunction	19	3,641	.162***	.088, .236	34.91**		289
By Diagnostic Category					<i>Q_b</i>	5.84*	
Conduct Disorder	5	242	-.144	-.404, .117	<i>Q_w</i>	10.54*	77
Juvenile Delinquency	14	3,399	.190***	.112, .267	<i>Q_w</i>	18.53	251
Familial Dysfunction Combined					<i>Q_b</i>	.189	
Familial instability	8	1,000	.158*	.025, .291	<i>Q_w</i>	15.43*	118
Parent history of criminal conviction	3	994	.139	-.012, .289	<i>Q_w</i>	3.03	38
Parent history of mental illness	5	1,088	.183*	.041, .325	<i>Q_w</i>	15.82**	86
Low SES	3	559	.171	-.009, .352	<i>Q_w</i>	.440	48
JD Familial Dysfunction					<i>Q_b</i>	1.15	
Familial instability	5	852	.207**	.062, .353	<i>Q_w</i>	12.46*	98
Parental history of criminal conviction	3	994	.139	-.012, .289	<i>Q_w</i>	3.03	39
Parental history of mental illness	4	1,048	.241**	.096, .387	<i>Q_w</i>	1.85	93
Low SES	2	505	.151	.040, .342	<i>Q_w</i>	0.044	28

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. Negative (-) effect sizes indicate greater risk for male Conduct Disorder and Juvenile Delinquent samples.

K = total number of studies. *N* = total sample size.

p < .001*** *p* < .01** *p* < .05*

With this exception, antisocial females are more significantly affected by familial instability and a parental history of mental illness. It appears the association between

single parent status, parental change, familial conflict, violence, and historical mental illness are important consistent predictors in the trajectory toward antisocial behavior.

Table 11 displays the mean effect sizes and summary statistics regarding familial abuse and antisocial behavior. Twenty-two studies met the inclusion criteria and reported usable data.

Table 11
Hedges d Effect sizes

Psychosocial Correlates	K	N	d	95% CI	Q_i	k_o
Overall Familial Abuse	22	5,962	.500***	.436, .564	229.74***	1,078
By Diagnostic Category					Q_b 55.07***	
Conduct Disorder	5	360	-.326**	-.554, -.098	Q_w 31.62***	168
Juvenile Delinquency	17	5,602	.572***	.505, .639	Q_w 143.04***	955
Abuse Type Combined					Q_b 88.36***	
Emotional	1	625	.379***	.173, .584	Q_w .000	36
Neglect	3	823	.048	-.126, .222	Q_w 36.93***	12
Physical	10	2,360	.337***	.236, .438	Q_w 35.70***	327
Sexual	8	2,154	.893***	.785, 1.0	Q_w 68.74***	706
CD Abuse Type					Q_b 26.19***	
Neglect	1	127	-1.18***	-1.16, -.728	Q_w .000	119
Physical	2	139	-.335	-.679, .010	Q_w 1.61	70
Sexual	2	94	.415	-.005, .836	Q_w 3.82	81
JD Abuse Type					Q_b 62.64****	
Emotional	1	625	.379***	.173, .584	Q_w .000	36
Neglect	2	696	.264**	.075, .453	Q_w 3.14	51
Physical	8	2,221	.401***	.30, .507	Q_w 17.80*	313
Sexual	6	2,060	.928***	.816, 1.04	Q_w 59.46***	551

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. Negative (-) effect sizes indicate greater risk for male Conduct Disorder and Juvenile Delinquent samples.

K = total number of studies. N= total sample size.

*p<.001*** p<.01** p<.05**

Homogeneity tests were significant overall and at the combined abuse level of analysis. Homogeneity tests representing the between level of analysis for Conduct Disorder and Juvenile Delinquent subgroups were significant, as well as for the between level of combined abuse type. Homogeneity tests were nonsignificant within the Conduct Disorder abuse categories, and within emotional abuse and neglect categories for the

Juvenile Delinquent group. The strongest significant relationship occurred between sexual abuse and Juvenile Delinquency for females. Emotional and physical abuse was also significantly predictive of Juvenile Delinquency for females, although this relationship is not as strong as that for sexual abuse. Familial neglect is also significantly associated with antisocial female Juvenile Delinquency. Although the generally weaker mean effect size may indicate that female and male adolescents experience similar levels of neglect, familial neglect is more predictive of antisocial behavior for females than for males.

The relationship between familial abuse and antisocial behavior is quite different for Conduct Disorder. Neglect is more significantly predictive of Conduct Disorder for males, and although not a significant difference, physical abuse also tends to be predictive for male adolescents. The mean effect size association for sexual abuse suggests that sexual abuse tends to be predictive of Conduct Disorder for females, although not significantly different from males. Both physical and sexual abuse were significant at ($p = .0567$, $p = .0528$, respectively). The relationship between familial risk and Conduct Disorder tends to have more significant impact on the development of antisocial behavior for males. Specifically, familial instability, parental history of mental illness, neglect and physical abuse tend to be more predictive of the development of Conduct Disorder for males than for females.

Antisocial behavior. Eleven studies reported usable data on the association between Conduct Disorder and Juvenile Delinquency and antisocial behavior. Data regarding conviction rates were extracted from Juvenile Delinquent studies, no conviction data were available in the Conduct Disorder literature. Similarly, the covert

behavior data were extracted from the Conduct Disorder literature; no usable data on covert behavior for Juvenile Delinquency was available. In order to maintain categorical purity, only studies reporting distinctly separate covert and overt behavior data were utilized. Total scores on delinquency measures could not be utilized as covert and overt behavior data were aggregated into a composite score. This data is utilized in the section on *Severity Risk*. Table 12 displays the mean effect sizes and summary statistics.

Homogeneity analysis was significant for the overall level, and significant at all other levels with the exceptions of JD conviction rate, CD covert behavior, and between the Conduct Disorder and Juvenile Delinquent subgroups.

Table 12
Hedges *d* Effect sizes

Psychosocial Correlates	K	N	<i>d</i>	95% CI	<i>Q_t</i>	<i>k₀</i>
Overall Antisocial Behavior	11	3,189	.005	-.08, .094	68.76***	6
By Diagnostic Category					<i>Q_b</i> .104	
Conduct Disorder	5	738	-.018	-.182, .1460	<i>Q_w</i> 11.83*	14
Juvenile Delinquency	6	2,451	.014	-.09, .117	<i>Q_w</i> 56.83***	3
Antisocial Behavior Combined					<i>Q_b</i> 20.81***	
Conviction rate	3	1,566	-.238***	-.374, -.102	<i>Q_w</i> 1.71	74
Covert behavior	3	389	.147	-.079, .372	<i>Q_w</i> 6.63*	41
Overt behavior	5	1,234	.185**	.052, .317	<i>Q_w</i> 39.60***	87
CD Antisocial Behavior					<i>Q_b</i> 4.41*	
Overt behavior	2	349	-.205	-.446, .035	<i>Q_w</i> 0.783	43
JD Antisocial Behavior					<i>Q_b</i> 30.97***	
Overt behavior	3	885	.356***	.197, .516	<i>Q_w</i> 24.15***	103

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. Negative (-) effect sizes indicate greater risk for male Conduct Disorder and Juvenile Delinquent samples.

K = total number of studies. N = total sample size.

*p < .001*** p < .01** p < .05**

Overall, there does not appear to be significant differences in the manner in which males and females participate in antisocial activity. Significant differences were not indicated between Conduct Disorder and Juvenile Delinquent youth overall. However, significant differences were apparent at the categorical level. Juvenile Delinquent males

were significantly more likely to be convicted for antisocial behavior. However, Juvenile Delinquent females were significantly more likely to participate in violent acts. This was not indicated in the Conduct Disorder subgroup. Males diagnosed with Conduct Disorder tend to violently act out more; however, this difference was not significant. That homogeneity tests were significant for Juvenile Delinquent overt behavior suggests that this relationship is stronger in some studies than in others. However, on average, antisocial females are significantly more likely to participate in violent behavior than are males. The data on covert behavior reveal that antisocial males and females do not report engaging in covert behaviors in a dissimilar manner. No significant differences were indicated. These two findings are contrary to what is indicated in the general research literature.

Comorbidity. Twenty-nine studies reported usable data on the association between Conduct Disorder and Juvenile Delinquent and comorbid diagnosis. Table 13 displays mean effect sizes and diagnostic statistics. Homogeneity tests were significant at the overall level. All of the research studies in the Juvenile Delinquent subgroup reporting usable data on comorbidity utilized adjudicated males and females diagnosed with Conduct Disorder. Overall, antisocial females are significantly more likely to have a dual diagnosis than are antisocial males. This mean effect size was stronger for Conduct Disorder subgroup than the Juvenile Delinquent subgroup, although both relationships were significant. Homogeneity tests were significant within each subgroup and nonsignificant between. The strongest mean effect size was for the significant association between Conduct Disorder and Internalizing disorders. This relationship was also significant for the Juvenile Delinquent subgroup, although at a weaker level.

Table 13
Hedges *d* Effect sizes

Psychosocial Correlates	K	N	<i>d</i>	95% CI	<i>Q_i</i>	<i>k_o</i>
Overall Comorbidity	29	15,205	.164***	.129, .198	104.33***	446
By Diagnostic Category					<i>Q_b</i> 1.24	
Conduct Disorder	8	372	.284**	.068, .501	<i>Q_w</i> 22.69**	220
Juvenile Delinquency	21	14,833	.161***	.126, .196	<i>Q_w</i> 80.40***	316
CD Comorbidity					<i>Q_b</i> 13.39***	
Externalizing	2	116	-.320	-.713, .073	<i>Q_w</i> 4.76*	3
Internalizing	6	253	.552***	.292, .812	<i>Q_w</i> 4.53	325
JD Comorbidity					<i>Q_b</i> 23.36***	
Externalizing	9	7,524	.075**	.025, .124	<i>Q_w</i> 35.92***	58
Internalizing	12	7,309	.247***	.198, .297	<i>Q_w</i> 21.13*	284
Comorbidity Diagnosis Combined					<i>Q_b</i> 60.75***	
CD & ADHD	5	2,617	.147***	.064, .231	<i>Q_w</i> 11.85*	69
CD & Anxiety	3	1,901	.307***	.213, .401	<i>Q_w</i> 1.22	89
CD & Depression	6	2,637	.327***	.243, .410	<i>Q_w</i> 3.81	190
CD & ODD	2	2,451	.149***	.062, .236	<i>Q_w</i> 0.158	28
CD & Personality	6	2,148	.130**	.041, .218	<i>Q_w</i> 11.49*	72
CD & PTSD	3	879	.276***	.119, .436	<i>Q_w</i> 2.55	80
CD & SUD	4	2,572	-.089*	-.173, -.004	<i>Q_w</i> 12.49**	32

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. Negative (-) effect sizes indicate greater risk for male Conduct Disorder and Juvenile Delinquent samples.

K = total number of studies. N = total sample size.

*p < .001*** p < .01** p < .05**

Conduct Disorder males tended to have more externalizing diagnoses, although this relationship was not significant. On the other hand, Juvenile Delinquent females were significantly more likely to be diagnosed with externalizing disorders. Conduct Disorder females were significantly more likely to be dually diagnosed in all diagnosis categories, with the exception of Substance Use Disorders.

Homogeneity tests within diagnosis categories were not significant for Anxiety, Depression, Oppositional Defiant Disorder (ODD), and Post-Traumatic Stress Disorders (PTSD). Homogeneity tests were significant for Personality (including Borderline and Psychotic Disorders), ADHD, and Substance Use Disorders. The strongest relationship existed between Depression and Anxiety comorbidity, with Post-Traumatic Stress

Disorder following. ADHD, ODD, and Personality Disorder mean effect sizes were generally weaker, although still significant.

Social Risk. Eighteen studies reported usable data on outcome risk and antisocial behavior. Table 14 displays mean effect sizes and diagnostic statistics.

Table14
Hedges *d* Effect sizes

Psychosocial correlates	K	N	<i>d</i>	95% CI	<i>Q_i</i>	<i>k_o</i>
Overall Adolescent Outcome	18	4,043	.203***	.129, .277	134.35***	347
By Diagnostic Code					<i>Q_b</i>	46.33***
Conduct Disorder	6	595	-.178	-.356, .003	<i>Q_w</i>	14.63* 113
Juvenile Delinquency	12	3,448	.280	.199, .361	<i>Q_w</i>	99.17*** 324
Risk variables					<i>Q_b</i>	55.47***
Low academic skills	3	214	-.282*	-.559, -.006	<i>Q_w</i>	8.46* 88
Low academic performance	3	525	.291**	.102, .480	<i>Q_w</i>	27.06*** 84
Deviant peer affiliation	2	94	-.046	-.468, .376	<i>Q_w</i>	8.64** 11
Substance use	4	850	-.103	-.253, .048	<i>Q_w</i>	9.51* 45
Suicide ideation	3	1,113	.228**	.074, .382	<i>Q_w</i>	11.74** 65
Suicide attempt	3	1,247	.571***	.428, .715	<i>Q_w</i>	13.48** 168

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. Negative (-) effect sizes indicate greater risk for male Conduct Disorder and Juvenile Delinquent samples.

K = total number of studies. *N* = total sample size.

p < .001*** *p* < .01** *p* < .05*

Homogeneity tests were significant for adolescent outcome overall. Homogeneity tests were significant within and between each level of analysis. As the Conduct Disorder subgroup contributed only study to each category, the analysis is presented at the combined level. Overall males diagnosed with Conduct Disorder experience more risk from antisocial behavior than females, although this difference was not significant. The strongest mean effect size was for a past history of suicide attempt. Antisocial females have significantly higher levels of suicidal behavior, significantly higher levels of suicidal ideation and a greater likelihood of past suicide attempt. Although antisocial

males were significantly more likely to have poor academic skills, antisocial females are significantly more likely to be at increased risk for poor academic performance.

Antisocial males tend to be more likely to have deviant peers and to experience substance abuse, although these differences were not significant.

Severity Risk. Twenty-five studies reported usable data on the level of severity risk for Conduct Disorder and Juvenile Delinquent adolescents. Table 15 displays mean effect sizes and summary statistics. Severity risk was categorized by Conduct Disorder diagnosis prevalence among adjudicated youth, amount of distress, age of onset, and total number of behavior problems for both Conduct Disorder and Juvenile Delinquent samples. The total distress and total behavior problems categories utilized composite scores from standardized instruments in the reporting study. Measures of distress included severity of symptom scores for Post-Traumatic Stress, global levels of functioning, positive stress index, total psychopathy, and levels of external control. This category also included measures of past psychiatric hospitalization, total numbers of DSM-IV disorders, and global measures of depression and anxiety. The total behavior problem category encompassed total scores on behavior problem checklists and measures of total delinquent involvement.

Homogeneity tests were significant at the overall level, but nonsignificant between Conduct Disorder and Juvenile Delinquent subgroups. Overall, Conduct Disorder and Juvenile Delinquent females have a significantly greater severity risk. Homogeneity tests were significant at the combined level between the categorical variables of severity risk, and for the distress and total behavior problem within-group measures. The strongest mean effect size association was for total behavior problems,

followed by measures of distress. Antisocial males with Conduct Disorder have a slight tendency toward increased distress, primarily familial relational functioning, although this relationship was not significant.

Table 15
Hedges *d* Effect sizes

Psychosocial Correlates	K	N	<i>d</i>	95% CI	<i>Q_i</i>	<i>k_o</i>
Overall Severity Risk	25	7,825	.175***	.126, .225	92.43***	413
By Diagnostic Category					<i>Q_b</i>	.006
Conduct Disorder	10	1,102	.170**	.038, .303	<i>Q_w</i>	54.21*** 160
Juvenile Delinquency	15	6,723	.176***	.123, .229	<i>Q_w</i>	38.21*** 249
Severity Variables Combined					<i>Q_b</i>	14.68**
CD Diagnosis Prevalence	6	2,726	.068	-.014, .151	<i>Q_w</i>	7.32 35
Distress	8	3,128	.246***	.169, .323	<i>Q_w</i>	23.09** 189
Age of onset	4	710	.079	-.088, .245	<i>Q_w</i>	6.1 27
Total behavior problems	7	1,261	.302***	.171, .432	<i>Q_w</i>	41.25*** 204
CD Severity					<i>Q_b</i>	5.25
Distress	2	51	-.251	-.843, .342	<i>Q_w</i>	5.86* 43
Total behavior problems	5	565	.187*	.005, .368	<i>Q_w</i>	37.44*** 88
JD Severity					<i>Q_b</i>	2.72
Distress	6	3,077	.255***	.177, .332	<i>Q_w</i>	14.35* 146
Total behavior problems	2	696	.426***	.237, .615	<i>Q_w</i>	.583 83

Note: Positive effect sizes indicate greater risk for female Conduct Disorder and Juvenile Delinquent samples. Negative (-) effect sizes indicate greater risk for male Conduct Disorder and Juvenile Delinquent samples.

K = total number of studies. N = total sample size.

*p < .001*** p < .01** p < .05**

Homogeneity tests were not significant for Conduct Disorder prevalence and age of onset. These nonsignificant homogeneity tests indicate that early onset age and Conduct Disorder prevalence (for adjudicated females) are a consistent risk for Conduct Disorder and Juvenile Delinquent females. Interestingly, in this analysis, antisocial females were not at less risk for early onset conduct problems or antisocial behavior, nor were Juvenile Delinquent females at less risk for Conduct Disorder diagnosis. No significant differences were reported for Conduct Disorder prevalence and age of onset between males and females, although antisocial females have a tendency toward greater

severity. Nonsignificant homogeneity tests for age of onset and prevalence suggests that, for this specific population, a consistent predictive risk exists for the development of Conduct Disorder in childhood and that these adolescents are equally likely to be at risk for antisocial behavior as adolescents. These findings have not been indicated in the general research literature. In community studies, Conduct Disorder is more prevalent among male children and adolescents, and they are generally regarded as exhibiting more severe levels of behavior problems.

In this study, comparisons between Conduct Disorder and Juvenile Delinquent males and females on levels of severity risk show significantly higher mean levels of total behavior problems. The significant within-group homogeneity tests for the Conduct Disorder total behavior problem comparison indicated that this average is not consistent across all studies included in this analysis. However, the nonsignificant homogeneity tests for the Juvenile Delinquent total behavior problem comparison indicated that greater female total behavior problem severity is a consistent risk for Juvenile Delinquent females. Mean effect sizes for the total behavior problem category indicate a significantly greater risk for both Conduct Disorder and Juvenile Delinquent females. This association is stronger for Juvenile Delinquent females than for Conduct Disorder females, although Conduct Disorder subgroup mean effect size was also significant. Antisocial females exhibit significantly greater severity risk for a wider variety and greater number of behavior problems than antisocial males.

These results indicate that among diagnosed Conduct Disorder and adjudicated adolescents, females are at more specific risk for severe levels of behavior problems and distress than male adolescents.

V. Discussion

This current research investigation attempted to determine if a clinical profile exists for females with conduct problems, and if specific risks could be identified which are different from normal females or males with similar conduct problems. In this discussion, 'antisocial' is used to refer to both Conduct Disorder and Juvenile Delinquent females equally. Where differences exist, the specific diagnostic group will be identified. Table 16 presents risk associations for the within-gender comparisons. Table 17 presents risk associations for the between-gender comparisons. Risk variables are listed in order of magnitude of predictive risk for the corresponding risk category.

The development of female antisocial behavior is complex and is significantly related to interactions between the youth and their environment. Inherent antisocial temperament and a limited cognitive ability predispose these children act out in aggressive ways and become viewed as more difficult. As a result, these children are more vulnerable to parents who lack sufficient resources or skills to manage their behavior. In adolescence, the stability of antisocial temperament and neuropsychological deficits predispose these youth to extremely poor social outcomes.

Diminished neuropsychological capacity predisposes these females to antisocial behavior. Across both diagnostic groups, antisocial females have lower cognitive ability and language skills. These findings are consistent when compared to similarly at-risk antisocial males and 'normal' females. Lower global intelligence appears to be predictive of antisocial behavior in adolescence. This diminished cognitive ability does not appear to allow for the development of adequate social-information processing skills necessary to inhibit antisocial behavior. Deficits in executive-cognitive functioning may make it more

difficult for antisocial females to accurately interpret social cues and inhibit aggressive behavioral responses. Antisocial females seem to have particular difficulty with long term memory, comprehension, abstract reasoning, attention, planning, and cognitive flexibility, skills which are necessary for appropriated behavioral regulation. It is apparent that these females do not possess the ability to successfully navigate their social world. These results are consistent with social-information processing models of antisocial behavior (e.g., Crick & Dodge, 1994).

Coupled with a disadvantaged social environment, this diminished neuropsychological capacity appears related to the development of a difficult temperament in childhood (Giancola, et al., 1998; Moffitt et al, 2001). Contrary to some research findings, low socio-economic status is predictive of antisocial behavior, both for Conduct Disorder and Juvenile Delinquency. Low socio-economic status appears to be predictive of the development of antisocial behavior perhaps by influencing the relationship between familial circumstance and environmental disadvantage. Lack of enriched environment supportive of cognitive development, combined with parents experiencing economic stress and lacking parenting skills necessary to intercede, supports the development of a difficult temperament in childhood.

Conduct problems in childhood are significantly predictive of the development of Conduct Disorder in adolescence. Females who have high levels of fighting, bullying, aggression, and hyperactivity in childhood are more likely to be antisocial as adolescents. For this population, antisocial behavior appears consistent across the age range of childhood and adolescence. Current research literature does not support this finding, as distinctions have been drawn between the child and adolescent-onset of antisocial

behavior. This research design combined both types of onset classifications in the analysis. In both childhood and adolescence, the persistence of antisocial behavior was a consistent finding. This finding is not the result of population specificity related to inclusion criteria, as all research reports investigating Conduct Disorder in females across age-range and classification-types were included.

This difficult temperament was consistently persistent in adolescence. There appears to be a specific antisocial personality type predictive of antisocial behavior in adolescence. Antisocial females are different from 'normal' females in that they are significantly more likely to be chronically self-destructive, aggressive, hostile, callous, and have difficulty controlling their impulses. Conduct Disorder and Juvenile Delinquent females seem to be unable to control their impulse to lash out aggressively in social situations or to engage in damaging behaviors. An antisocial temperament predisposes these females to perceive ambiguous social situations in a hostile manner or to lack empathy for others. Antisocial females are equally as likely to suffer from an antisocial personality type as are antisocial males. The relationship of antisocial personality to antisocial behavior may be mediated by diminished cognitive ability. Antisocial females have an inherent deficit to process social cues and regulate their behavior in a socially acceptable manner. Coupled with psychopathic predisposition, these females are more likely to react to environmental situations in an aggressive, hostile manner. Perhaps as a consequence of their behavior and the resulting social alienation, antisocial females are significantly more likely to suffer from depression, anxiety, and low self-esteem.

A disadvantaged familial environment also predicts antisocial behavior in females. An unstable family structure, characterized by single parent status, broken

home, familial violence, parent conflict, and negative social circumstance, is the strongest predictor of antisocial behavior in both Conduct Disordered and Juvenile Delinquent females. Current research literature has implicated inappropriate parenting as more predictive of antisocial behavior, and while it is very predictive of antisocial behavior across both diagnostic classifications, in this study, familial instability has the stronger predictive relationship. Enmeshed within familial instability, parental history of criminal behavior or mental illness is also strongly predictive of antisocial behavior. This relationship of familial instability and parental mental illness is sustained when females are compared with antisocial males also. The most significant risk for the development of female antisocial behavior in adolescence is the environmental disadvantage of familial instability and parental mental illness.

The relationship between familial abuse and antisocial behavior is complex. Familial abuse is predictive of Conduct Disorder and Juvenile Delinquency, however the relationship appears stronger for Conduct Disorder. Interestingly, when compared to antisocial males, physical and sexual abuse is a significant risk for Conduct Disorder males only. While physical and sexual abuse is associated with the development of Conduct Disorder in females, males experiencing similar abuse have more specific developmental risk. Although abuse is strongly associated with antisocial behavior, inappropriate parenting, characterized by harsh discipline, lack of supervision, and overprotection, appears to be more robustly predictive. Analyses by abuse classification, indicates that a more significant risk exists for neglect than for physical, sexual or emotional abuse for Juvenile Delinquent females. This relationship is especially important as current research has drawn assumptions on the stability of the predictive

relationship of physical and sexual abuse. Female Juvenile Delinquents do have more specific risk for physical, and especially sexual, abuse when compared to antisocial males. In this comparison, sexual abuse is highly predictive of Juvenile Delinquency in females. The relationship with neglect is not as robust in this comparison. It may be that while predictive of antisocial female behavior, antisocial males and females experience similar levels of familial neglect. Dysfunctional parental interactions, characterized by neglect and inappropriate parenting style support the development of antisocial behavior in adolescence.

The outcome risks for Conduct Disorder and Juvenile Delinquency are very poor. Antisocial females are at extreme mental health risk. These females are more likely to obtain comorbid diagnoses and experience more distress than males. Antisocial females are also significantly more likely to be more socially at-risk due to poor academic performance, high use of alcohol and illicit drugs, and deviant peer association, and sexually at-risk for teenage pregnancy and sexual precocity. Of paramount concern is the extremely high risk of antisocial females for suicide. Diminished cognitive ability, problems with impulse control, lack of societal and parental bond, high rates of substance use, and high rates of depression and anxiety seem to culminate in suicide attempt for antisocial females. This robust relationship was indicated both within and between gender.

Antisocial females are extremely likely to be at risk for antisocial behavior, across all levels of overt and covert behavior. Antisocial females are equally at risk for general delinquency, running away, truancy, and violent behavior. Running away and truancy are generally viewed as traditional female antisocial behaviors. This conclusion is supported

in this analysis. However in this analysis, Conduct Disorder and Juvenile Delinquent females were equally likely to act out violently as they were to participate in less violent delinquent activities. This relationship was also supported in the between-gender analysis. Overall, antisocial males and females have the same tendency to engage in antisocial activity. There was not a significant difference in the level of engagement for covert or overt behavior, with the exception of Juvenile Delinquent females. These females are significantly more likely to engage in violent aggressive activities than Juvenile Delinquent males, although the males tend to be convicted at higher rates. Both Conduct Disorder and Juvenile Delinquent female subgroups are also more likely to have more behavioral difficulty, engaging in a wider variety and greater number antisocial activities than males.

The above conclusions point to a selective female affliction for Conduct Disorder and Juvenile Delinquency (Eme, 1992). This hypothesis theorizes that one gender is more vulnerable to risk leading to greater prevalence numbers in the more vulnerable sex. Within this vulnerability, a critical threshold exists for affliction. Regarding Conduct Disorder, as males have greater prevalence they are viewed as the more vulnerable sex and have a lower critical threshold to be affected by risk. Female Conduct Disorder is less prevalent due to less female vulnerability and a higher critical threshold to be affected by risk. From this theoretical perspective, females require more adverse circumstance, both genetic and environmental, in order for Conduct Disorder or antisocial behavior to develop (Eme, 1992). Greater behavioral severity is required for females to manifest Conduct Disorder or antisocial behavior because of their higher critical threshold for risk vulnerability. A definitive conclusion drawn by this research is the gender paradox for

antisocial behavior. Greater total numbers of males were sampled in the study populations; however, antisocial females, both Conduct Disordered and Juvenile Delinquent, demonstrated greater behavioral severity and more severe levels of distress than antisocial males.

Table 16 Within-Gender Antisocial Risk Correlates	
Individual Correlates <ul style="list-style-type: none"> • Adolescent Temperament <ul style="list-style-type: none"> Poor Impulse Control Antisocial Personality Internalizing Disorders Poor Interpersonal Relationships • Childhood Temperament <ul style="list-style-type: none"> Hyperactivity Conduct Problems • Impaired Cognitive Ability • Caucasian Race 	
Familial Correlates <ul style="list-style-type: none"> • Familial Instability • Parental Dysfunction: <ul style="list-style-type: none"> Conduct Disorder Dysfunctional Parental History Familial Violence & Parental Conflict Inappropriate Parenting Physical & Sexual Abuse Low Socio-Economic Status 	Juvenile Delinquency <ul style="list-style-type: none"> Inappropriate Parenting Parental Neglect Emotional Abuse Sexual Abuse Physical Abuse Low SES
Outcome Risk Correlates <ul style="list-style-type: none"> • Antisocial Behavior • Suicide • Substance Use • Deviant Peer Affiliation • Sexual Risk • Academic Failure 	

Table 17
Between-Gender Antisocial Risk Correlates

Individual Risk

- Internalizing Disorders
- Impaired Cognitive Ability
- Poor Sense of Self

Familial Risk

- Parental History of Mental Illness
- Familial Instability
- Abuse

Outcome Risk Correlates

- Suicide Attempt
- Greater Total Behavior Problems
- Greater Total Distress
- Low Academic Performance
- Suicide Ideation
- Comorbidity

No Significant Risk Differences

- Antisocial Personality
- Substance Use
- Deviant Peer Affiliation
- Covert Behavior

Also indicative of greater severity, Juvenile Delinquent females had slightly greater prevalence of Conduct Disorder than did Juvenile Delinquent males, and the age of onset for Conduct Disorder was not significantly different between gender. Antisocial females experience greater neuropsychological deficits and more familial distress than antisocial males. Once afflicted, antisocial females are more severely violent and have greater behavioral difficulty than antisocial males.

The assumption in the research literature that female antisocial behavior is less severe than male antisocial behavior is erroneous and does serious harm to clinical treatment philosophy. Antisocial females are in greater need of significant mental health treatment, evidenced by the more severe levels of distress experiences and greater likelihood of suicide. The majority of research studies included examined Conduct

Disorder and Juvenile Delinquency using the DSM-III-R or DSM-IV criteria. This criteria has been criticized in the research literature (Zoccolillo et al., 1996). As such, these females needed to be a more severe population to meet the critical threshold for inclusion. It is important to recognize that since these females have greater behavioral severity than similarly diagnosed antisocial males and greater severity of outcome, females who do not meet the inclusion criteria may be experiencing similar mental health urgency that is not being addressed because they do not meet the criterion cut-off.

Because the social and individual consequences of antisocial behavior are grim, it is imperative that appropriate diagnostic criteria and treatment programming exist. Antisocial females have greater potential negative societal impact than do antisocial males. There exists greater social-sexual risk for these females to become teenage mothers. Environmental disadvantage, in the form of familial instability and parental history of mental illness, is the strongest predictor of future antisocial behavior. There exists a greater probability for a teenage mother to rear her child in a disadvantaged environment. Therefore, the potential societal consequences of inadequate treatment are dire. The consequences of a child to be raised in an economically-disadvantaged instable home with a young, uneducated substance-abusing teenage antisocial mother who lacks the social and personal resources to positively parent a child, only perpetuates the cycle of antisocial behavior.

Limitations. Unfortunately, there is a paucity of available research literature for some of the domains investigated. As such, the validity of the conclusions drawn in this report may not be as viable as if greater numbers of studies were available. In addition, the fact that some of the effect sizes remained significantly heterogeneous at the

categorical level is indicative of the influence of other variables not investigated in this report. The conclusions drawn in this study may also not be applicable to the general population of antisocial females. Specifically related to Conduct Disorder, longitudinal studies and retrospective or cross-sectional studies of referred populations were included. In this manner, results relating specifically to Conduct Disorder may be generalized. As inclusion criteria was limited to adjudicated delinquents, utilizing prospective, retrospective and cross-sectional studies, results may not be applicable to the Juvenile Delinquent population in general. Results should be interpreted as applicable to the female offender population.

Even so, specific conclusions may be drawn that a specific clinical profile does exist for antisocial females. This study utilized inclusion criteria specific to a distinct population of antisocial females. As such, the specific conclusions drawn in this investigation may be more relevant to the female antisocial population in general than other empirical research which has not defined antisocial behavior explicitly. It has been noted that some of these research conclusions in this investigation are not supported in the research literature. Research studies excluded in this investigation were those that did not distinguish between different types of childhood or adolescent conduct problems or lacked specificity in their definitional criteria. Research studies that lack definitional precision may be responsible for some of the ambiguity and conflicting results found in the literature on female antisocial behavior. The definitional criteria utilized in this analysis were specific and explicit. The results of this analysis may be in contrast to those in the general research literature as a direct result of definitional specificity.

Future Directions. The early identification and treatment of at-risk females is important for the prevention of future antisocial behavior. As such, it is imperative that diagnostic instruments exist to reliably identify girls who exhibit early antisocial tendencies. Research on effective treatment programs, designed specifically for females, beginning in early childhood and extending across adolescence, is also essential. In addition, vital to the prevention of future antisocial behavior is the effective intervention and support of at-risk families to reduce the negative consequences of familial dysfunction.

As current researchers attempt consensus on Conduct Disorder diagnosis, the focus should not concentrate solely on gender differences in prevalence. This diminishes the clinical significance of female antisocial behavior. The focus should consist of an attempt to determine if there are meaningful differences between the psychopathology of Conduct Disorder and serious delinquency with regard to the development and persistence of antisocial behavior. Are there meaningful distinctions between child or adolescent onset types across and within both subgroups of antisocial females? Due to the relatively low prevalence of Conduct Disorder and Juvenile Delinquent females in this study population, there is a need for the replication of these results with nonclinical samples. It is important to determine if there is a clinical distinction between antisocial girls referred for court or mental health services and those outside of the referral process.

Conclusion. The development of female antisocial behavior is complex and is significantly related to interactions between these females and their environment. A specific clinical profile does exist in the development of female antisocial behavior. Inherent antisocial temperament and a limited cognitive ability predispose these females

to act-out in aggressive ways and become viewed as more difficult. As a result, these females are more vulnerable to parents who lack sufficient resources or skills to manage their behavior. In adolescence, the constancy of antisocial temperament and neuropsychological deficits predispose these females to extremely poor social outcomes.

The development of female antisocial behavior is significantly different from normal females or antisocial males. Conduct Disorder and Juvenile Delinquent females are at greater specific risk for the development of antisocial behavior due to a greater vulnerability for difficult temperament and neuropsychological deficits. Conduct Disorder and Juvenile Delinquent females are also at greater specific risk for the development of antisocial behavior from environmental familial disadvantage than are antisocial males or normal females. This research supports the conclusion that female antisocial behavior is a clinically important mental health disorder. Conduct Disorder and Juvenile Delinquent females experience significantly more severe mental health distress than do antisocial males or normal females. Conduct Disorder and Juvenile Delinquent females are also more likely to exhibit greater behavioral severity. This research supports the hypothesis of a selective female affliction for antisocial behavior.

Appendix A

Study-Level Coding Form

Study ID number: Assigned unique reference from Endnote bibliography program record number. If a report presents two independent studies (two independent outcomes utilizing different participants), added letter subscript (a or b) to distinguish each study. Separate studies published within a single report were coded independently.

1. Recorded author(s) of journal publication
2. Publication Date: Full digits of publication year. Duplicate studies (published utilizing same participants and same outcomes in two separate journals) will only be coded once using the more formally published report.
3. Journal title. Recorded journal of article publication.
4. Country of participant origin.
 - 1 USA
 - 2 Canada
 - 3 International
5. Researcher(s) Gender:
 - 1 male
 - 2 female
 - 3 mixed- mostly male
 - 4 mixed- mostly female
 - 5 mixed- even numbers of males and females

6 can't estimate

6. Professional affiliation. Recorded researcher(s) professional affiliation, if available. If multiple professional affiliations were reported, first and second author affiliation were recorded.
7. Research date. Recorded time period during which research data was collected, if available. Data was recorded according to year research was conducted, even if research did not encompass entire 12 month span.
8. Sample type: participants were coded regarding Conduct Disorder and Juvenile Delinquency status or risk.
 - 1 community sample of non-delinquent "normal" children/adolescents
 - 2 non-delinquent children/adolescents with risk factors (no evidence of juvenile justice or police contact but at-risk due to poverty, low socio-economic status, parent impairment...)
 - 3 adjudicated delinquents, not in institutionalized setting, with or without comparison community control group. If community control group is present, indicate by 3, CC.
 - 4 juvenile delinquents incarcerated at detention center, either for long-term placement or waiting placement or court appearance.
 - 5 adjudicated delinquents incarcerated at residential facility
 - 6 clinical outpatient treatment participants
 - 7 clinical inpatient treatment participants
 - 8 mixed- 'normal' and adjudicated delinquents incarcerated at detention or residential facility, specify setting.

9 mixed- 'normal' and clinical inpatient or clinical outpatient participants, specify treatment type.

10 mixed- adjudicated delinquent and clinical inpatient/outpatient, specify treatment type.

9. Sample source. Source of sample information was recorded, if available.

Additional information on whether study sampled a particular population (e.g. children of alcoholics, number of public schools) or population-based longitudinal design popularly titled in research literature (e.g., Ontario Child Health Study) was recorded to supplement knowledge of data set.

10. Sample assignment: recorded information on the selection of participants method.

1 random

2 population/community sample

3 birth cohort

4 inclusion criteria

5 volunteer/recruited

6 clinical referral

7 matched sample

8 stratified sample

9 mixed- inclusion criteria and random sample of comparison group

10 consecutive admission

11 systematic selection

11. Place sampled. Recorded information on specific location of data sampling, if available

12. Diagnostic criteria utilized

1 DSM-III

2 DSM-III-R

3 DSM-IV

4 CBCL

5 delinquency measure, specify type

6 other, specify type

7 not reported

13. Diagnostic Instrument(s). Recorded information on specific diagnostic instrument(s) utilized, if available.

14. Instrument range and descriptors. Recorded information on specific range of instruments utilized, as well as study specific descriptors and outcome variable definitions, if available.

15. Diagnosis Code. Recorded information on whether the research obtained information regarding Conduct Disorder populations or Juvenile Delinquent populations.

16. 1 CD (Conduct Disorder)

2 JD (adjudicated Juvenile Delinquents)

17. Study design. Recorded information on type of study design, if available. In addition, information regarding study-specific definitional time periods for information and events occurring prior to research implementation (e.g., conduct disorder symptoms over the past 12 months) was recorded, if available.

1 longitudinal

2 cross-sectional

3 retrospective

18. Procedure. Recorded information on reported procedural method to obtain data, if available.

1 structured interview

2 adolescent self-report

3 parent self-report

4 teacher self-report

5 mixed- combination of child/adolescent, parent, and/or teacher self-report

6 mixed- combination of parent/teacher self-report, parent/child/teacher self-report

7 mixed- structured interview and self-report data (either child/adolescent, parent, or teacher)

8 systematic record review

9 semi-structured psychiatric interview

19. Time lag. Recorded information for longitudinal or follow-up studies that sampled data in specific waves. Study specific time period(s) and assessment information at each specific wave (time period) was recorded, if available.

20. Gender. Gender of full sample was recorded, if available.

1 female

2 mixed- both genders included in full sample

21. Full sample N. Recorded information on total final sample (N) included in the research study.

22. Female (n). Recorded information on total final female sample included in the research study.
23. Comparison (n). Recorded information on total final comparison sample (regardless of gender) included in the research study.
24. Participation/Attrition rate. Recorded information regarding the participation or attrition rates of study participants from the population pooled at research onset, if available. Included information on participants excluded from the analysis, if available.
25. Sample Differences. Recorded information reported on whether significant differences existed between participants included in the research study, if available. In addition, if available reported differences between study participants and non-participants were recorded.
26. Age of sample. Specified the exact age, age range, or exact mean of sample participants. Studies reporting grade levels instead of chronological age were approximated.
- 7 not reported
27. Ethnicity. Recorded predominate race of participants.
- 1 greater than 60% Caucasian (or non-Hispanic White)
- 2 greater than 60% African American
- 3 greater than 60% Hispanic
- 4 mixed- not greater than 60% for any one group
- 5 mixed, two classes greater than 40%
- 6 mixed- can't estimate

7 not reported

28. SES. Recorded the predominant socio-economic status of the sample

1 greater than 60% low SES

2 greater than 60% middle SES

3 greater than 60% high SES

4 mixed- greater than 60% low and middle SES

5 blended- two classes not more than 60%

6 mixed-can't estimate

29. Area. Recorded information on the specific area level where the research was conducted, if available.

1 urban

2 suburban

3 rural

4 mix- of above three areas, predominant area recorded

5 state

6 county

7 geographical region

8 population-based/national sample

9 not reported

30. Outcome of analysis. Recorded a description of the individual study outcome from quantitative analysis. Written data.

31. Biases & Limitations. Recorded information on specific limitations of the individual research study, addressing threats to validity, if available.

Appendix B

Effect-Size Level Coding Form

Study ID number and effect size number: Assigned unique reference based on Endnote bibliography program record number. Studies with multiple effect sizes within a single report will be numbered in sequential order (e.g., 999.1, 999.2, 999.3, for three effect sizes within a single report). Single effect sizes within a single report will not be assigned a sequential number after the Study ID number.

1. Sample N. Recorded total number of participants for each effect size used in the analysis.
2. Female (n). Recorded total number of female study participants for each effect size used in the analysis.
3. Comparison (n). Recorded total number of comparison group participants (either male or female) for each effect size used in the analysis.
4. Nature of comparison group. Effect size analyses will be analyzed separately according to gender.
 - 1 within gender comparison
 - 2 between gender comparisons
5. Outcome variable. Recorded the outcome variable for d for each category of outcome.
 - 1 antisocial behavior
 - 2 risk factors (individual and psychosocial correlates)
 - 2a demographic (race, economic disadvantage)
 - 2b temperament (childhood temperament, adolescent temperament)

2c cognitive abilities

2d childhood onset of antisocial behavior

2e familial risk factors (inappropriate parenting, lack of parental bond, familial violence, familial discord, physical/sexual/emotional abuse, neglect)

2f deviant peer affiliation

3 comorbidity

4 adolescent outcome of conduct problem behavior

6. Recorded description of outcome variable. Written data
7. Type of data effect size is based on. Written data.
8. Recorded t-test, F test, χ^2 , r, or Odds Ratio value. t-test, F test, and χ^2 (df, numerator) = 1.
9. df. Recorded value associated with degrees of freedom for the comparison
10. Recorded female participant mean
11. Recorded female participant standard deviation
12. Recorded comparison group mean
13. Recorded comparison group standard deviation
14. Recorded g index
15. Recorded d index. Value of d is reported to 3 decimals with an algebraic sign. A positive value ($+d$) was assigned if greater strength of the comparison favors the female conduct problem group, a negative value ($-d$) was assigned if greater strength of comparison favors the comparison group. Research studies reporting

nonsignificant findings in the comparison were coded as (+.0), if the report failed to provide quantitative values.

16. **Diagnosis code.** Recorded information on whether the research obtained information regarding Conduct Disorder populations or Juvenile Delinquent populations. Studies reporting results utilizing adjudicated delinquents diagnosed with Conduct disorder, through standardized psychological measurement or psychiatric assessment, as the sample participants were coded = 1 CD.

1 CD (Conduct Disorder)

2 JD (adjudicated Juvenile Delinquents)

17. Recorded information on whether statistical value was constructed or reported in research study.

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