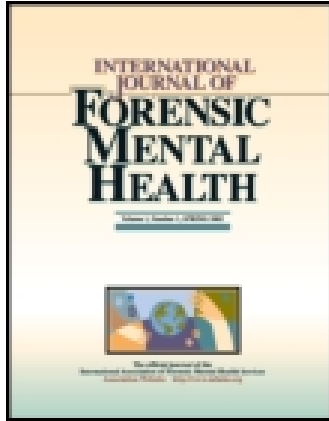


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Aggressive and Antisocial Girls: Research Update and Challenges

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Aggressive and Antisocial Girls: Research Update and Challenges

Candice L. Odgers and Marlene M. Moretti

There is a growing recognition that a significant number of young women engage in highly aggressive and antisocial behaviors. This acknowledgement has created demands on both policy and program development. The response to these demands, however, has been delayed due to the fact that we still know relatively little about aggressive and antisocial behavior in girls. In this article, we briefly review trends in the rates of aggressive and antisocial acts among female youth, address the issue of gender specific forms of aggression, and discuss research on the role of risk and protective factors. We emphasize the importance of understanding female aggression and antisocial behavior through a dynamic developmental framework that recognizes the cumulative and transactional impact of risk and protective factors over time. Our review focuses on adolescent girls in keeping with research that suggests that the risk for aggressive and antisocial behavior in girls is most acute during this developmental period.

Despite the universal acknowledgement that males are more heavily involved in serious forms of violence than females (Dell & Boe, 1998; Duffy, 1996; Snyder & Sickmund, 1999), the participation of adolescent females in aggressive and antisocial behavior has recently emerged at the forefront of research, policy, and programming agendas (Artz, 1998a; Budnick & Shields-Fletcher, 1998; Reitsma-Street, 1999). This shift in focus has been largely attributed to increasing rates of violent offending among female youth over the past two decades (OJJDP Statistical Briefing Book, 2000; Savioe, 2000; Snyder & Sickmund, 1999; Statistics Canada, 2001). In addition, changes in the conceptualization of aggression to include indirect and relational forms has led to the conclusion that aggressive behaviors are indeed more common in young women than previously believed (Bjorkqvist & Niemela, 1992; Crick, 1995; Crick & Grotepeter, 1995; Moretti, Holland, & McKay, 2001). As a result, adolescent females are now considered an important population in the study of aggression and antisocial behavior. In this article, we briefly review trends in the rates of female aggression, address the issue of gender specific forms of aggression and discuss research on the role of risk and protective factors. We

emphasize the importance of understanding female aggression and related antisocial behaviors through a dynamic developmental framework that recognizes the cumulative and transactional impact of risk and protective factors over time. Our review focuses on adolescent girls in keeping with research that suggests that the risk for aggression and antisocial behavior in girls is most likely acute during this developmental period.

RATES AND PREVALENCE

What is known about the prevalence of violence and aggression among girls?

As previously noted, the most consistent finding throughout the literature is that fewer girls than boys are involved in *serious* forms of violence (Dell & Boe, 1998; Duffy, 1996; OJJDP Statistical Briefing Book, 2000; Snyder & Sickmund, 1999; Savioe, 2000; Statistics Canada, 2001; Totten, 2000; U.S. Department of Health and Human Services, 2001). This finding is consistent across cultures and across varying measurement procedures including observational measures, as well as self, parent, and peer

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reports (Bettencourt & Miller, 1996; Budnick & Shields-Fletcher, 1998; Department of Justice Canada, 1998; Moffitt, Caspi, Rutter, & Silva, 2001; Rutter, Giller, & Hagell, 1998). When outcome measures are restricted to severe physical forms of aggression, the male-to-female ratio is at its peak. For instance, in the United States the Violent Index Offence arrest rate, which records serious forms of violence such as aggravated assault, robbery and murder, is 5.8 times greater among male than female youth (Snyder & Sickmund, 1999). Police charge statistics also indicate that males are more likely to be involved in the most serious types of violent crimes, whereas females are more likely to be charged with lower level assaults. For example, Statistics Canada arrest data indicate that in 1999, common assault accounted for two-thirds of the violent crime charges among female youths but less than half (46%) of the charges for violent crime among male youths (Savioe, 2000). Thus, according to police charge statistics, males still continue to account for the majority of charges across all types of violent offences; however, when females do engage in violence they are more likely than their violent offending male counterparts to engage in less serious forms of violence.

Due to the inherent biases in official statistics, it is helpful to consider whether similar trends exist within self-report data which includes aggressive acts that are unlikely to be represented in official charge data. Again, self-report survey research affirms that males are more likely than females to be involved in serious forms of aggressive and violent behavior. However, when minor forms of aggression (such as pushing, shoving and weapon carrying) are considered, as opposed to more serious violent acts (such as robbery, aggravated assault and homicide), females move closer to males with respect to rates of participation. The male-to-female ratio typically ranges from 2:1 to 4:1, depending on the seriousness of the behavior and other contextual factors such as whether the aggression occurred within the context of romantic relationships (Moffitt et al., 2001; Huizinga et al., 1995; Webster, Gainer, & Champion, 1993). For example, data from national surveys concerning weapon carrying estimate a 3:1 male-to-female ratio (U.S. Department of Justice, 2000), although equal rates of weapon carrying are reported within selected inner-city schools (Webster, Gainer

& Champion, 1993). Finally, when the definition of aggression is expanded to include indirect or relational forms of aggression, characterized by its covert nature and intent of damaging others through social relationships, the disparity between males and females decreases even further (Crick, 1995; Crick & Grotepeter, 1995; Everett & Price, 1995; Scheithauer & Petermann, 2002), with researchers finding equivalent (Bjorkqvist & Niemela, 1992), and in some cases greater (Cote, Valliancourt, Farhat, & Tremblay, 2002) rates of female participation.

Is violence among female youth increasing?

According to official statistics, rates of violent crime among female youth have increased over the last decade. Within the United States, charges for serious violent crimes (murder, robbery, aggravated assault) among female youth increased 28% between 1991 and 2000. This change represents a sharp increase between 1991 and 1995 from 112 to 158 charges per 100,000 girls, followed by a consistent decrease each year to the current rate of 117 charges per 100,000 girls (OJJDP Statistical Briefing Book, 2000). The trend for simple assault charges laid against female adolescents in the United States has not followed the same pattern of rapid escalation and moderate decline; instead, there was a 77% increase between 1991 and 2000 (FBI Uniform Crime Report, 2000), with rates exponentially increasing from 299 to 464 charges per 100,000 girls (OJJDP Statistical Briefing Book, 2001). Similarly, over the last decade within Canada there has been a 66% increase in violent crime charges among female youth. Between 1991 and 2000, the violent crime arrest rate increased from 322 to 481 charges per 100,000 girls. Although Canadian statistics combine serious and minor forms of violence into one violent crime measure, further analysis of these data indicate that, similar to the United States, the most significant increase has been observed in simple assaults as opposed to more serious forms of violent offending (Dell & Boe, 1998; Savioe, 2000). Thus, even though crime statistics in the United States and Canada classify violent crime somewhat differently, the trends in the two countries point to the same conclusion of increasing levels of moderately violent crime among female youth.

During this same period rapidly increasing trends have not been observed in boys. Instead, rates of violent crime among boys have remained relatively stable, with a decreasing trend reported in some regions. Between 1991 and 2000 in the United States, there was a 23% decrease in Violent Crime Index offences (FBI Uniform Crime Report, 2000), representing a rate change from 792 to 492 charges per 100,000 boys (OJJDP Statistical Briefing Book, 2001). Although the arrest rate for simple assault among boys in the United States rose 24% during this time period (FBI Uniform Crime Report, 2000), from 902 to 967 charges per 100,000 boys, the increase was greater among female than male youth in terms of both percentage (77% versus 34%) and rate (165 versus 65 per 100,000) of increase. Again, a similar pattern was evident in Canada where violence among male youth, as measured through a combined index of serious and minor forms of assault, increased slightly (7%), from 1328 to 1341 charges per 100,000 boys. These figures are in contrast to the large percentage (66%) and rate (100 per 100,000) increases for Canadian females reported over the last decade (Statistics Canada, 2000).

Consistent with official crime statistics, self-report measures of aggression also support the view that the gap is closing between girls and boys with respect to their engagement in aggressive behavior. According to the Surgeon General's recent report on youth violence, the male-to-female ratio for self-reported violence decreased from 7.5:1 in 1983 to 3.5:1 in 1998 (U.S. Department of Health and Human Services, 2001). It is important to note that this change is due to increasing numbers of females reporting involvement in violent acts as opposed to decreasing reports of violence among males (Maguire & Pastore, 1999; U.S. Department of Health and Human Services, 2001). Overall, then, official and self-report data indicate that girls' aggression has consistently risen across the past decade. It is important to keep in mind, however, that female violence is not skyrocketing and girls continue to be underrepresented as perpetrators of serious forms of overt aggression.

ALTERNATIVE FORMS OF AGGRESSION

Are there gender specific forms of aggression?

Aggression and violence are commonly assumed to be expressed through overt physical acts. In terms of physical aggression, there is little question that in early childhood boys are more physically or overtly aggressive than are girls (Fabes & Eisenberg, 1992; Maccoby & Jacklin, 1980; Parke & Slaby, 1983). In recent years there has been a growing recognition that aggression can be expressed through covert acts and damaging others through social relationships. Crick and Grotpeter (1995) argue that girls are just as aggressive as boys if gender differences in the expression of aggressive behavior are recognized. Thus, although 27% of boys are aggressive versus 22% of girls (Crick & Grotpeter, 1995), girls tend to display this aggressive behavior through covert, relational acts (e.g., spreading rumors and excluding others from social groups) and boys through overt, physical acts (e.g., hitting or threatening to hit others). According to Crick and colleagues, these gender differences in aggression emerge because of fundamental differences between the social goals of males and females: males' social goals emphasize instrumentality and physical dominance, whereas females' goals are more focused on interpersonal issues.

Consistent with this model, studies of pre-school children (Crick, Casas, & Ku, 1999; Crick, Casas, & Mosher, 1997), middle-age children (Crick, 1996; Crick & Bigbee, 1998; Cunningham et al., 1998; Rys & Bear, 1997) and young adults (Werner & Crick, 1999) show that relational aggression is more common than overt aggression in girls. Although both relational and overt aggression are viewed as equally hostile, relationally aggressive acts have been shown to be particularly distressing for girls independent of whether such acts occurs in conjunction with overt aggression (Crick & Bigbee, 1998; Paquette & Underwood, 1999).

Yet, not all research supports the view that girls and boys express aggression differently. Several studies have found that girls and boys engage in relational aggression to the same extent (Crick & Grotpeter, 1995; Rys & Bear, 1997). For example,

in a recent study of sexual harassment in young adolescent boys and girls, McMaster, Connolly, Linder, Crick and Collins (2002) found that young adult males and females reported engaging in equal levels of relational aggression within romantic relationships. Similar results have been reported by Pepler and Craig (2002). Some studies have even found that boys are more relationally aggressive than are girls (Craig, 1998; Henington, Huges, Cavell, & Thompson, 1998; Roecker, Caprini, Dickerson, Parks, & Barton, 1999; Wolke, Woods, Bloomfield, & Karstadt, 2000). Moreover, results differ depending on whether peer nominations or self-reports are utilized for assessment. Peer nominations produce the classic split in gender specific forms of aggression as outlined by Crick and colleagues: boys are more frequently nominated over girls as perpetrators of physical aggression, and girls are more frequently nominated over boys as perpetrators of relational aggression. Studies using self-reports, however, find that whereas boys report more overt aggression than do girls, girls and boys report similar levels of relational aggression (Crick, 1996; 1997).

In sum, it is incorrect to assume that relational aggression is exclusively a female form of aggressive behavior. The research does show, however, that the difference in types of aggressive behavior is clearest when comparing within rather than between genders: that is, in general girls engage in higher levels of relational than overt aggression and boys engage in higher or similar levels of overt than relational aggression.

How important is relational aggression?

Is relational aggression of any real importance in a discussion of youth aggression and violence? Arguably, an understanding of relational aggression assists the study of youth violence in two ways. First, it is clear that relationally aggressive acts cause serious and lasting psychological harm (Crick & Bigbee, 1998; Paquette & Underwood, 1999). Second, significantly elevated levels of relational aggression may be a marker of other forms of concurrent aggressive behavior. A review of studies shows that the correlation between relational and overt aggression is typically very high. For example, in a study of 245 third to sixth grade children, Crick

(1996) found a correlation of .77 between relational and overt aggression. Although studies show that relational aggression has unique consequences on social-emotional functioning in girls and boys independent of overt aggression (Crick & Bigbee, 1998; Paquette & Underwood, 1999), the high correlation indicates that these two forms of aggression often co-occur. Similar results were found in our study of conduct disordered adolescents (Moretti et al., 2001). Girls engaged in significantly higher rates of relational aggression than did boys; however, they did not engage in lower levels of overt aggression and assaultive behavior. Moreover, a strong correlation was observed between relational aggression and engagement in serious assaultive behavior for girls ($r = .47, p < .001$), but not for boys ($r = -.12, n.s.$). These results suggest that very high levels of relational aggression in girls may be a marker of other forms of serious aggressive behavior—that is, relational aggression may form the interpersonal context in which acts of severe physical aggression are perpetrated by girls. Qualitative researchers (Artz, 1998b; Campbell, 1984; Chesney-Lind & Sheldon, 1998) describe the social relationships of violent girls as focused on issues of power and dominance designed to secure their position within a tenuous social milieu. These girls are often highly controlling and manipulating of their social networks (i.e., relationally aggressive), and once provoked they can respond with acts of physical aggression and violent retaliation. Relational aggression may also be important as a predictor of future violent behavior even if such behavior is not present at the current time. For example, young girls who engage in a high degree of relational aggression may go on to develop physically aggressive and violent behavior in adolescence.

Other debates about gender specific forms of aggression also remain unresolved. Perhaps the most pressing issue is how various definitions of aggressive behavior relate to each other. Prior to Crick's distinction, Björkqvist and Niemela (1992) differentiated indirect from direct aggression and proposed that the expression of these two forms of aggression differed among males and females. Recently, Underwood, Galen, and Paquette (2001) coined the term "social aggression" to capture aggressive acts which are intended to harm others through damage to social relationships. Björkqvist

(2001) claims that the recent distinctions made between indirect and relational or social forms of aggression are redundant. Other researchers have offered distinctions based on the motivations underlying aggressive behaviors—for example, reactive versus instrumental aggression (Dodge, 1991). Research on gender and aggression will be impeded unless these streams of research and related constructs can be integrated into a meaningful model that provides a common ground and common measurement strategy for researchers. Fortunately, recent efforts by Little and colleagues (in press) offer a productive integration of these constructs and a new measure that differentiates between the forms (i.e., relational versus overt) and functions (i.e., reactive versus instrumental) of aggression.

RISK FACTORS

The search for risk and protective factors has become one of the most common forms of research in the study violence among youth. Recent meta-analyses (e.g., Lipsey & Derzon, 1998; U.S. Department of Health and Human Services, 2001) and reviews (Hann & Borek, 2001; Leschied et al, 2001; Odgers, Vincent, & Corrado, 2002; Reppucci, Fried, & Schmidt, 2002; U.S. Department of Health and Human Services, 2001) provide comprehensive inventories of various risk and protective markers of physical violence among youth. As useful as these summaries may be in estimating cumulative level of risk, they are of limited value in the absence of models that help us understand the differential impact of risk factors and interactions between risk factors across development. The weight of one risk factor always depends on the context in which it occurs. By itself it may have relatively little impact, but in conjunction with a host of other risk factors, and at certain points in development, it may exert a powerful influence on adjustment. As such, there is a need to move beyond a simple listing of risk factors and towards a more integrative understanding of the processes through which risk factors across multiple domains and levels interact over time. This type of strategy takes us beyond the examination of linear and additive effects to the consideration of more complex models of development.

There is also a need to specify the types of populations that models of risk are developed from and validated on. Previous research findings are difficult to interpret, in part, due to sample heterogeneity. As such, the pooling of results across samples (i.e., normative, clinical, juvenile justice) to synthesize information and assess the weight of various risk factors may result in misleading conclusions.

Keeping these limitations in mind, we now turn to a brief discussion of the existing literature. Our review is focused primarily on high-risk girls, specifically young women who are presently, or have recently been, in the care of a juvenile justice or mental health system. We note, however, the results of studies using normative samples where available. We recognize that the nature of the selection process governing which girls end up in high-risk settings limits the generalizability of these findings. In particular, studies of high-risk samples are limited in providing adequate tests of the impact of risk and protective factors on the development of aggression. On the other hand, the majority of girls who engage in severely aggressive and antisocial behavior are found in high-risk samples. Therefore, a careful examination of such samples provides important descriptive information and can contribute to our understanding of aggression and violence in girls when considered alongside studies of normative samples.

GENDER AND RISK MARKERS FOR AGGRESSION AND ANTISOCIAL BEHAVIOR

There are two primary questions that have been raised concerning the application of classic risk factors to the understanding of highly aggressive and antisocial behavior in girls. The first is, are the relationships between risk factors and aggression different for boys and girls? The second is, are gender specific risk factors needed to explain severely aggressive and antisocial behavior among girls?

With respect to the first question, whether or not risk factors for aggression differ for boys and girls depends on the type of sample examined. Pepler and Sedighdeilami (1998) examined gender differences in risk factors for overt and relational forms of aggressive behavior in a large national sample of

Canadian youth and concluded that aggressive girls and boys do not differ significantly with respect to exposure to risk factors. Similarly, one of the central conclusions from the Dunedin Longitudinal Study was that risk factors for antisocial behavior were remarkably similar for females and males (Moffitt et al., 2001). A number of other researchers have also argued that the risk factors that give rise to female antisocial behavior are the same as those that lead to antisocial and aggressive behavior in males (Fergusson & Horwood, 2002; Rowe, Vazsonyi, & Flannery, 1995; Simourd & Andrews, 1994).

These findings from normative samples contrast sharply with results from research with juvenile justice and conduct disorder (CD) samples. Here, although high-risk boys and girls demonstrate the *presence* of similar types of risk factors, such as maltreatment, family dysfunction, low SES and substance use, girls are more likely to exhibit co-occurring and elevated levels of risk across multiple domains (Bergsmann, 1989; Corrado, Odgers & Cohen, 2000; Moretti et al., 2001; Rosenbaum, 1989; Viale-Val & Sylvester, 1993). For instance, girls in these samples are more likely to have experienced severe physical and sexual victimization. Rates of sexual abuse among incarcerated females range from 45% to 75%, versus a range of 2% to 11% for incarcerated males (Bergsmann, 1989; Chesney-Lind & Sheldon, 1998; Corrado et al., 2000; Crawford, 1988; Lewis, Yeager, Cobham-Portorreal, & Klein, 1991; Rosenbaum, 1989; Warren & Rosenbaum, 1986; Viale-Val & Sylvester, 1993). Similarly, reported levels of physical abuse are also extremely high among girls in jail, with rates ranging between 40% and 75% in girls versus 20% to 60% in boys (Bergsman, 1989; Calhoun et al., 1993; Corrado et al., 2000; Odgers & Reppucci, 2002; Viale-Val & Sylvester, 1993). Conduct disordered girls are also more likely than their male counterparts to experience maltreatment and abuse. For example, studies have found that CD girls are more likely to be placed outside the home in foster care or other such facilities, to be removed from the home earlier than boys, and to be exposed to sexual abuse (Moretti et al., 2001), whereas boys are more likely to have witnessed assaults on others (Reebye, Moretti, Wiebe, & Lessard, 2000).

With respect to the second question, although studies of normative samples provide little empirical

evidence to support the need for gender specific risk factors, it should be noted that the majority of research to date has included small numbers of girls, resulting in low statistical power, and has tended to include risk factors identified and tested within male-only samples. Only recently have researchers begun to empirically investigate the form and predictive utility of gender-specific risk factors (Levene et al., 2001). Despite the lack of empirical evidence in this area, several researchers have advocated for the consideration of gender-specific risk factors in treatment and programming development; particularly when addressing the needs of girls within high-risk samples (Chesney-Lind & Sheldon, 1998; Reitsma-Street, 1999; Totton, 2000). Girls within high-risk samples are often seen as being both *at risk to* and *at risk from* others (Corrado et al., 2000). Although they are typically involved in a substantial number of violent and non-violent transgressions against others, high-risk girls also constitute an extremely vulnerable population and often require protection from hostile family, street, and social environments (Chesney-Lind & Sheldon, 1998; Corrado et al., 2001; Moretti et al., 2001). In sum, research from high-risk populations supports the idea that the majority of these girls live on the margins of society and are likely to be exposed to a number of unique risk factors that may increase their vulnerability throughout development. In particular, issues related to the high prevalence of co-occurring mental health problems and insecure attachment and disaffiliation have consistently emerged within the growing body of criminological and psychological literature focusing on high-risk girls. The implications of these unique domains of risk are now considered in more depth.

Co-occurring Mental Health Problems

As the severity of any given mental health problem or disorder increases, the likelihood of comorbidity also increases, therefore, comorbidity estimates are typically higher in clinical than normative samples (Caron & Rutter, 1991; Goodman et al., 1997). There are many causes of comorbidity. Comorbidity can reflect the existence of a shared commonality between two disorders; thus, high levels of comorbidity between two disorders

sometimes raise doubts about the distinctiveness of disorders and the diagnostic taxonomy. There are other factors that give rise to comorbidity. For example, two disorders may share common risk factors, or one disorder can create conditions that increase the probability of other conditions developing. Although high levels of comorbidity in clinical populations are commonly attributed to selective sampling and are viewed as an impediment to research, an alternative view is that comorbidity is an understandable outcome of developmental processes. It makes sense that the presence of one disorder will alter developmental trajectories toward increasing pathology (Gottlieb & Halpern, 2002; Sroufe, 1990). The more development is skewed by the presence of multiple risk factors and emergent disorders over time, the more likely development will continue to proceed along a pathological course. From this perspective it is not surprising that different levels of comorbidity are observed in normative populations versus high-risk samples (Carron & Rutter, 1991).

Studies examining psychiatric disorders in aggressive girls drawn from high-risk samples suggest that they suffer from a wide range of mental health problems. In one of the first papers to address this issue, Loeber and Keenan (1994) reviewed studies examining comorbidity with CD, noting effects related to age and gender. Where possible, general population studies were selected but studies using high-risk and clinical samples were noted as well. Odds ratios showed that girls with CD were more likely to suffer from comorbid conditions of attention-deficit hyperactivity disorder (ADHD), anxiety disorder, depression and substance use disorder than were their male counterparts. Similarly, in a study of conduct disordered girls and boys with comparable patterns of conduct disordered behavior, we found a higher prevalence of several other psychiatric disorders among girls. The majority of boys were diagnosed with either CD alone or CD + ADHD. In contrast, more than half of the girls met criteria for four or more psychiatric disorders. Similar findings were found regardless of whether analyses focused on results from diagnostic interviews or from independent caregiver reports (Moretti & Holland, 2002).

Studies of youth in detention centers also support the view that incarcerated girls are more likely than

boys to have a broad array of mental health problems. In particular, high rates of suicidal ideation and suicide attempts (Bergsmann, 1989; Lewis et al., 1991) have been reported in these samples. In a self-report study conducted by the American Correctional Association Task Force on the Female Offender, over half of the girls reported attempting suicide (Crawford, 1988). A seven-year follow up study of female offenders, conducted by Lewis et al. (1991), found that close to 90% of these girls had attempted suicide. In addition, higher rates of substance use disorders (Ellickson, Saner, & McGuigan, 1997; Jasper, Smith, & Bailey, 1998; Kingery, Mirzaee, Pruitt, Hurley, & Heuberger, 1991) and hard drug use have consistently been found among incarcerated girls (Corrado et al., 2000; Crawford, 1988; Horowitz & Pottieger, 1991).

A few studies have specifically examined comorbidity between CD and post-traumatic stress disorder (PTSD) as a test of the hypothesis that exposure to trauma is associated with both delinquent behavior and PTSD. Cauffman, Feldman, Waterman, and Steiner (1998) found that approximately 60% of incarcerated female juvenile offenders met partial (12%) or full (49%) criteria for PTSD. These rates were significantly higher than those noted for male juvenile delinquents. Furthermore, compared to males, females were more likely to report being victims of violent acts (15% for males versus 51% for females) rather than witnesses to such acts (48% for males versus 17% for females). Similar findings were reported by Reebye et al. (2000). Girls diagnosed with CD met criteria for PTSD more frequently than did boys. Girls more frequently reported exposure to sexual assault, while boys were more likely to report exposure to physical assaults, being involved in accidents and witnessing the death of a loved one.

Although the majority of studies examining high-risk samples show a consistent pattern of far greater psychiatric comorbidity for girls than boys, it is important to note that such findings do not necessarily emerge in studies of normative samples. Moffitt and colleagues (Moffitt et al, 2001) found few gender differences in comorbid psychiatric conditions for youth who showed behaviors consistent with a diagnosis of CD. Results did show, however, that, compared to boys, girls with CD were at significantly greater risk for depression once they

reached age 15 and subsequently through age 21. At age 18, girls with CD symptoms were also more likely than boys to experience anxiety-related symptoms. These findings notwithstanding, Moffitt et al. (2001) make a strong case against the notion of greater comorbidity in conduct disorder girls than boys. They argue that greater comorbidity among girls is not always found, and that when such findings emerge they are based on non-representative samples. At the same time, it is important to note that Moffitt et al. (2001) did find some evidence of greater mental health problems among girls with CD compared to boys; also, comorbidity with certain disorders, such as PTSD, was not assessed. Clearly, more studies are required to understand developmental trajectories to conduct disorder for boys and girls. It is not only important to determine which disorders occur and the sequence with which they unfold, but how certain disorders instigate the onset of others.

Insecure Attachment and Disaffiliation

Not surprisingly, delinquent and conduct disorder girls commonly experience familial and social rejection. For instance, Rosenbaum (1989) reported that 97% of girls committed to the California Youth Authority came from non-intact families, and that 76% had family members with previous records of arrest. Likewise, Corrado et al. (2000) found significantly higher levels of familial dysfunction (i.e., parental drug and alcohol abuse, parental experience of sexual and physical abuse) and conflict (i.e., leaving home, being kicked out of home) among girls versus boys in custody. Other researchers have reported similar findings (see Bergsmann, 1989; Shaw & Dubois, 1995; Smith & Thomas, 2000). Girls with CD fare no better. Moretti and Holland (2002) report that girls with CD were more likely to be living away from their families than their male counterparts, and they were more likely to have experienced separation from their families at an earlier age.

Research on gender differences in socialization suggests that experiences of rejection and maltreatment within close relationships may have a greater impact on the psychological development and social functioning of girls than that of boys. Sex-typed

socialization practices encourage girls to regulate themselves in relation to close interpersonal relationships (Cross & Madson, 1997). For example, mothers are more likely to discuss others' feelings with their daughters than their sons (Parke, 1967), and by two years of age girls are more likely to talk about feelings than are boys (Dunn, Bretherton, & Munn, 1987). Parents also encourage their daughters, more than their sons, to attend to others' feelings by using induction techniques that help them understand the impact of their behavior on others (Grusec, Dix, & Mills, 1982; Smetana, 1989).

The view that women are socialized to attend to others standards for them is consistent with theories that stress the relational context in which females develop a sense of self. According to Miller (1976), women tend to define and experience themselves in terms of their relationships with others. Chodorow (1978) suggests that this occurs because female self-development takes place within a context that emphasizes relatedness to others, particularly mothers, whereas male self-development emphasizes independence, autonomy, and differentiation from others.

Because girls are socialized differently than are boys, exposure to abuse and rejection in close relationships may have significant and lasting effects on how girls develop a sense of identity and their ability to establish and maintain healthy relationships with others. Indeed, research shows that girls with CD are more likely than their male counterparts to hold an extremely negative and derogatory view of themselves and to believe that their parents and peers also view them negatively (Moretti et al., 2001). Girls and boys with CD also differ in the types of attachment insecurity they experience in their relationships with their caregivers. Whereas a higher proportion of girls are classified as anxious-preoccupied about their relationship with parents, a higher proportion of boys are classified as avoidant and dismissing (Moretti & Holland, 2002). In other words, despite experiences of abuse and rejection, many girls with CD tend to idealize their parents, worry about loss, and actively pursue re-engagement with their parents. In contrast, a significant number of boys with CD tend to minimize the importance of their relationships and take steps to avoid thinking about them.

The tendency of these girls to view themselves negatively, and to desperately pursue relationships with others, despite experiences of abuse within these relationships, may contribute to a re-victimization cycle. Moffitt et al. (2001) note that girls who reach sexual maturation early are at increased risk for developing antisocial behavior, and that this may occur through their affiliation with older delinquent males. Girls in such situations are easy targets for being lured into abusive and exploitative relationships because of their intense need for acceptance from others. They are often willing to do whatever it takes to maintain their relationships (Artz, 1998b; Downey, 2002), but at the same time they are highly sensitive to rejection from others and prone to lashing out aggressively.

As previously noted, a comprehensive understanding of the contribution of these risk domains to the understanding of aggressive and antisocial behavior in girls requires the inclusion of a developmental framework. A substantial degree of debate exists, however, with respect to the most appropriate developmental model of antisocial behavior among girls. The utility of existing developmental taxonomies for use within female populations is now reviewed.

DEVELOPMENTAL MODELS

The most well-established developmental taxonomy in the study of youth aggression is the distinction between life-course persistent (LCP) versus adolescent-limited (AL) antisocial behavior (Moffitt, 1993). LCP antisocial behavior occurs as a result of interactions between children with inherited or acquired individual deficits (i.e., hyperactivity, cognitive deficits) and high-risk social environments (i.e., poverty, maltreatment, poor family bonds). In contrast, AL offenders enter a delinquent lifestyle during puberty, due largely to delinquent peer influence and normative developmental processes, and typically desist from involvement in antisocial behavior as they transition into adulthood (Fergusson, Harwood & Nagin, 2000; Moffitt et al., 2001).

Although this taxonomy was developed based on the broad outcome measure of antisocial behavior, researchers have also demonstrated a highly stable pattern of aggressive behavior among LCP offenders

from early childhood through adulthood (Stanger, Achenbach, & Verhulst, 1997). In particular, persistence is most common for boys who exhibit severely aggressive behavior in early childhood; approximately 95% of these boys continue to show aggressive behavior thereby lending some degree of credence to the model (Loeber & Stouthamer-Loeber, 1998; Tremblay, 2000).

What Proportion of Girls are LCP versus AL?

Moffitt et al. (1993) argue that the LCP and AL taxonomy applies equally well to males and females; however, research examining gender differences is quite limited. Research suggests that few females follow the LCP trajectory. For example, only 6 of the approximately 450 females (1.3%) from the Dunedin Longitudinal Study were identified as LCP offenders, whereas 78 (17%) were identified as AL. Consistent with this finding, the gender gap in rates of CD is greater in childhood than in adolescence (for reviews see Cohen et al., 1993; Lahey et al, 2000; Moffitt et al., 2001; Zoccolillo, 1993). The narrowest gender gap across studies is at approximately age 15, where the male-to-female ratio ranges from 1:1 to 2:1. Before and after age 15, estimates of the male to female ratio of conduct disorder diagnosis are approximately 3:1 and 4:1 respectively. Findings of gender differences in the onset of antisocial behavior and CD also mirror findings from studies of developmental shifts in aggressive behavior in normative samples. Specifically, boys are more physically aggressive early in childhood (Maccoby & Jacklin, 1980) and decrease in aggression as they develop (Haapsalo & Tremblay, 1994), whereas girls have low levels of physical aggression in childhood that increases over time (Boothe, Bradley, Flick, Keough, & Kirk, 1993; Cameron, deBruijne, Kennedy, & Morin, 1994; Dobb & Sprott, 1998). In sum, research across these three domains points to the same conclusion: Girls are less likely to be aggressive in childhood than in adolescence.

The fact that adolescent-onset aggression is more common in girls than is childhood-onset aggression has led some researchers to suggest that the classic distinction between LCP versus AL is not fully applicable to girls (Loeber & Loeber-Stouthamer, 1998; Silverthorn & Frick, 1999). Silverthorn and

Frick (1999) propose that the delayed-onset pattern in girls is equivalent to the early-onset pattern in boys in terms of risk markers, stability, and persistence to adulthood. In support of the LCP/AL distinction, Moffitt and Caspi's (2002) prospective analysis of data for 1,037 youth indicate that the risk factors that contribute to CD in LCP and AL boys and girls are more similar than they are different. It is concerning, however, that only 6 girls were classified as LCP in their sample, thereby limiting the statistical power to detect any important differences that may exist between girls and boys that followed the LCP pathway. Conversely, Silverthorn, Frick and Reynolds (2001) claim that AL onset girls are more equivalent to LCP than AL boys. They cite evidence from a retrospective study of 72 adjudicated youth, and from other research (Silverthorn & Frick, 1999), showing that adolescent-onset antisocial girls resemble LCP boys on measures of personality traits and neurocognitive problems, such as impulse control and callous and unemotional interpersonal style. These equivocal findings may be due to differences in sampling procedures, and further research is required to determine whether girls who begin participating in antisocial behavior during adolescence are indeed comparable in risk factors to LCP boys. There is also a need to examine the degree of heterogeneity *within* groups of adolescent-limited offenders. For example, Fergusson and Horwood (2002) identified three subgroups of AL offenders within their analysis of a 21-year longitudinal study of 896 youths and concluded that AL offenders are unlikely to be a homogeneous group.

The prognosis for adolescent-onset girls also remains an issue of debate. Though it is generally assumed that early onset girls are equally at risk for life course persistence as are early onset boys, the consequences of adolescent onset in girls for later development are unclear. In general, antisocial and aggressive females are more likely than their aggressive male counterparts to desist with respect to both frequency and range of violent offending during the transition to adulthood (Lanctot et al, 2002). Nonetheless, there is growing evidence that these girls do not function well in other domains. In particular, aggressive girls are more likely to suffer from a multitude of mental health problems in

adulthood, including substance dependence, poor physical health, involvement in abusive relationships, antisocial personality disorder, and social welfare dependence (Bardone, Moffitt, Caspi, Dickson, & Silva, 1996; Moffitt et al., 2001; Robins, 1986; Silverthorn & Frick, 1999).

Is a gender specific model required to explain the more typical pattern of adolescent onset aggressive and antisocial behavior in girls? Moffitt and Caspi (2002) propose that the same model applies to the development of antisocial behavior in girls and boys, and that the delayed onset in girls simply reflects the slower rate of accumulated risk factors for girls. In particular, the higher prevalence of neurocognitive and temperamental risk markers in boys than girls exerts a significant impact on early development and results in boys reaching a threshold of risk for antisocial behavior more quickly than do girls (Moffitt & Caspi, 2002). Research on developmental trajectories related to other forms of psychopathology may be of value to consider in determining whether a gender specific model is required to understand the onset of aggressive and antisocial behavior in females. For example, it is well known that the risk of depression significantly increases for girls as they enter adolescence (Nolen-Hoeksema & Girgus, 1994). A number of different models have been advanced to explain this shift, but the most promising is a stress-diathesis model that implicates gender-specific adolescent risk factors. For example, sexual development in girls, unlike in boys, leads to negative social outcomes, including concern about body image and sexual victimization. Unfortunately, the impact of sexual victimization was not specifically addressed by Moffitt et al. (2001) in their discussion of sex differences in risk factors related to antisocial behavior. Further research using both normative and high-risk samples needs to consider risk factors that may occur more frequently and have unique significance in the lives of girls.

Whether or not the weight and interaction of risk factors operates similarly for girls and boys is also unclear. Moffitt and Caspi (2002) assume a linear and additive model of risk; however, other models should be considered. Some risk factors may have gender-specific impacts, or may interact with other risk factors in a gender specific way. There is simply too little research to confidently conclude that the

risk models developed primarily on boys are accurate in predicting onset and developmental course in girls.

FUTURE RESEARCH DIRECTIONS

The emergence of girls as a relevant research population in the study of aggressive and antisocial behavior has encouraged careful consideration of both traditional and newly emerging domains of risk. In addition, recent debates surrounding the utility of existing developmental taxonomies for girls have raised a number of important research questions, many of which require the use of advanced longitudinal data analysis techniques and a reconsideration of previous measurement and sampling strategies. With recent theoretical advancements in mind, we now turn to a brief summary of recommendations for future research within this area.

Improve the specificity, scope and measurement of aggressive and antisocial behavior

The field of youth aggression and antisocial behavior is plagued by the failure of researchers to develop a common definition of terms and a common measurement strategy. Regardless of the population sampled, researchers need to adopt standardized assessment procedures that differentiate delinquent and antisocial behavior from highly aggressive and violent behavior. One solution may be to develop a diagnostic protocol or rating system that selectively draws items tapping aggressive behavior from other measures of CD, aggression, and violence. The adoption of this type of standardized measurement framework is essential for establishing equivalence in the construct of aggression across normative and high-risk populations.

From a data analysis point of view, the first step is to ensure that we are measuring the same construct (i.e., aggression) within both high-risk and normative samples. It may be the case that even when the same measures are used, the underlying construct that they are tapping into is *qualitatively* different. The most common means of establishing measurement equivalence is to demonstrate factorial invariance;

specifically, the factor loading patterns from observed indicators of aggression to the latent construct of aggression must be equal across the samples. If equivalence between the samples is established, then comparisons of the relationships between various risk factors and aggressive outcomes can be made *between* groups. However, if the factor loading patterns differ significantly, any comparisons between the samples must recognize that two *qualitatively* different constructs (i.e., forms of aggression) have been measured (McArdle, 1996). This strategy is of particular importance in reconciling the often contradictory findings that emerge from high-risk versus normative populations of girls: simply put, it is possible that we may be comparing apples and oranges when discussing the impact of individual risk factors on aggressive outcomes across samples.

There is also a need to *expand the range of outcome measures* that have typically been employed in the study of violence among boys. Traditionally, the primary outcome variables have been restricted to measures of physical violence gathered through official records and self-report interviews. Recent findings from longitudinal studies of both high risk and normative samples of girls, however, have demonstrated that girls with elevated levels of aggressive behavior are at high risk for poor adjustment within multiple domains as they move into adulthood. For example, girls exhibiting aggressive and antisocial behavior in adolescence were more likely to suffer from mental health problems, require medical attention, experience economic and social marginalization and be involved in abusive relationships when assessed during early adulthood (Lanctot, 2002; Moffitt et al., 2001).

The inclusion of alternative forms of aggression within future research is also important given the growing body of research which indicates that relational aggression may be a marker of future violence and is likely to cause negative social and emotional consequences within victims. Researchers are beginning to accept the difficult task of disentangling the various components of aggressive and violent behavior. As previously noted, a promising strategy adopted by Little and colleagues (in press) has been to distinguish between the forms and functions of aggressive behavior.

Specify the impact of sample selection and sample heterogeneity on equivocal findings

To integrate findings from high-risk and normative populations there is a need to clearly articulate sample characteristics and selection processes. In particular, it is necessary to determine the degree of heterogeneity that exists *within* samples. Traditionally, very few studies have made the distinction between minor and serious forms of aggression among youth, and this is especially true for girls (Heimer & de Coster, 1999). Instead, most studies treat girls that engage in antisocial behavior or delinquency as a homogeneous group. Although there have been numerous criminological studies of male youth that have sought to identify sub-types of offenders (see Loeber & Farrington, 1998), there have been very few attempts to differentiate among aggressive or delinquent girls. Promising research strategies in this area include dimensional classification schemes that allow individuals to move between latent classifications on the construct of aggression (Little et al, in press). Recent advancements in longitudinal data analysis also allow for testing taxonomic theories of group differences through the identification of a smaller number of latent groups within the data (Nagin & Land, 1993; Nagin, 1999). In this case, a determination can be made regarding whether males and females differ with respect to their probability of group membership, and whether the correlates of violence and aggression differ across groups.

The integration of results from high-risk and normative samples also requires a comprehensive understanding of both the level *and* function of various risk factors. For example, it is quite plausible that the relationship between risk exposure and highly aggressive behavior is nonlinear and that interactions between risk factors exert exponential effects that increase the likelihood that girls will reach threshold. The distinct possibility also exists that at the extreme end of the risk continuum, after young women have surpassed the threshold for involvement in highly aggressive and antisocial behavior, that the relationship between various risk factors and aggression changes form. Thus, risk factors that are related to mildly aggressive behavior may be quite different from those related to highly aggressive and violent behavior. Alternatively, the

factors may be the same but statistical tests will lack the power to clearly test this hypothesis due to low numbers of girls who engage in highly aggressive and violent behaviors.

It is clear that researchers are struggling to understand which samples are best suited to investigate the development of highly aggressive and antisocial behavior and how findings from normative and high-risk samples can be integrated. This is a common problem in the study of psychopathology. It may be a more serious problem in the study of aggressive girls, however, because of the relatively lower base rate of these problems in girls and consequent discontinuities in the relationships between risk factors and mildly versus seriously aggressive behavior. Ideally, research from both normative and high-risk samples can be productively integrated, but this will require careful thought about how best to understand divergent findings from these two sources of information.

FUTURE INTERVENTION STRATEGIES

The recognition that many girls engage in highly aggressive and antisocial behaviors has provoked a call for the development of intervention strategies for girls. The field seems split between those who believe that programs developed for boys should be equally effective when applied to girls and those who believe that an entirely unique approach must be developed. Our review of the literature suggests that many of the factors that are linked to aggressive and antisocial behavior in boys influence girls in a similar manner. From this perspective it makes sense to retain whatever intervention strategies have proven effective in meeting the needs of aggressive and antisocial boys. On the other hand, there is some evidence to suggest that highly aggressive and antisocial girls are more likely to have been traumatized through sexual abuse and other forms of maltreatment than are their male counterparts, and that girls are influenced differently by factors within close relationships. These findings suggest that a slightly different approach may be required for girls, one that addresses trauma related processes and emphasizes the nature of attachment in each girl's life. The field is only beginning to grapple with the issue of programming and evaluation of treatment

efficacy for girls who exhibit aggressive and antisocial behavior. The lessons we learn through this process may be informative in better understanding unresolved etiological questions.

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