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Aggressive Behavior (in press)
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An Evolutionary Perspective on Indirect Victimization in Adolescence:

The Role of Attractiveness, Dating and Sexual Behavior

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Key words: Indirect victimization; evolutionary perspective; adolescents; risk factors; promiscuity; maladjustment

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Submitted: August 6, 2007; Revised: January 29, 2008; Accepted: February 4, 2008

Abstract

We studied indirect victimization from an evolutionary perspective by examining links between this type of victimization and several indicators of attractiveness (past sexual behavior, dating frequency and physical appearance). A total of 2319 (56% female) students (ages 13-18) from a region of Southern Ontario, Canada, completed self-report measures of indirect victimization, physical appearance, dating frequency, recent sexual behavior (number of partners in previous month), and past sexual behavior (number of lifetime partners minus number of partners in previous month) as well as indexes of depression, aggression, and attachment security, which were used to control for psychosocial maladjustment. Consistent with an evolutionary framework, physical appearance interacted significantly with gender, wherein attractive females were at greater risk for indirect victimization, whereas for males physical attractiveness was a protective factor, reducing risk of victimization. Physical appearance also interacted with grade, being inversely related to indirect victimization for younger adolescents and having a non-significant association with victimization for older youth. Finally, recent sexual behavior was associated with increased risk of indirect victimization for older adolescents only, which we discussed with regard to peer perceptions of promiscuity and short-term mating strategies. These findings have important implications for the development of interventions designed to reduce peer victimization, in that victims of indirect aggression may represent a rather broad, heterogeneous group, including attractive individuals with no obvious signs of maladjustment.

An Evolutionary Perspective on Indirect Victimization in Adolescence: The Role of Attractiveness, Dating and Sexual Behavior

Recently, investigators have demonstrated the importance of studying indirect aggression, a form of aggressive behavior that is conceptually and empirically distinct from direct or overt aggression involving physical or verbal attacks (Little, Henrich, Jones, & Hawley, 2003; Marini, Dane, Bosacki, & YLC-CURA, 2006; Vaillancourt, Brendgen, Boivin, & Tremblay, 2003). Indirect aggression is a means of harming others through social manipulation and other circuitous behaviors, using strategies such as social exclusion and rumour spreading (Lagerspetz, Bjorkqvist, & Peltonen, 1988). To highlight its harmfulness, several studies have examined the psychosocial adjustment of children and adolescents victimized by indirect aggression. It has been found to be associated concurrently with anxiety, depression, drug use, aggression, delinquency, loneliness, peer rejection and post-traumatic stress (Craig, 1998; Crick, Casas, & Nelson, 2002; Crick, Ostrov, & Werner, 2006; La Greca & Harrison, 2005; Mynard, Joseph, & Alexander, 2000; Storch & Masia-Warner, 2004; Sullivan, Farrell, & Kliewer, 2006). Furthermore, in the few longitudinal studies available, indirect victimization predicted future problems with peer rejection and social phobia (Schafer, Werner, & Crick, 2002; Storch, Masia-Warner, Crisp, & Klein, 2005; Werner & Crick, 2004). Although the causal direction is unclear, these preliminary data are nevertheless consistent with children's perceptions, especially those of girls (Crick, Bigbee & Howes, 1996; Galen & Underwood, 1997), that victimization by indirect aggression is harmful and distressing, and hence, research into its origins is warranted as a first step toward developing effective prevention efforts.

Indirect aggression appears to be especially salient for females. Girls use it more often than physical aggression as a means of hurting others, though there is mixed evidence as to whether females are more indirectly aggressive than are males, with some research showing greater female involvement (Bjorkqvist, 1994; Bjorkqvist, Lagerspetz, & Kaukiainen, 1991; Cairns, Cairns, Neckerman, Ferguson, & Garipey, 1989; Hess & Hagen, 2006; Lagerspetz, et al., 1988; Osterman et al., 1998; Owens, Daly, & Slee, 2005; Rivers & Smith, 1994; Xie, Cairns, & Cairns, 2002)., whereas other studies indicate no gender differences (Osterman et al., 1994), or differences favouring males (Peets & Kikas, 2006; Salmivalli & Kaukiainen, 2004). Furthermore, some research shows that girls are more likely than boys to be victimized by indirect aggression (Lagerspetz et al., 1988; Owens et al., 2005), though some others have shown adolescent males to be more victimized than females (Morales & Crick, 1999), or have found no gender differences (Crick & Grotpeter, 1996; Paquette & Underwood, 1999). The consequences of indirect victimization may also be more severe for girls. Some research has shown that girls perceive instances of indirect aggression as more hurtful and distressing than do boys (Crick, 1995; Crick et al., 1996; Crick, Grotpeter, & Bigbee, 2002; Galen & Underwood, 1997), and in a related vein, females have also been found to be more adversely affected than males by negative interpersonal events (Leadbetter, Blatt, & Quinlan, 1995). However, studies have been inconsistent with respect to whether gender moderates the association between indirect victimization and children's psychosocial adjustment. For example, indirect victimization concurrently predicted diverse negative outcomes such as aggression, delinquency, social phobia, depression, post-traumatic stress, loneliness, and peer rejection for both males and females (Crick & Bigbee, 1998; Storch & Esposito, 2003; Storch, et al., 2005; Sullivan et al., 2006), whereas indirect maltreatment was positively linked to marijuana use, physical aggression, social anxiety, and negatively related to global self-worth only for girls (Crick & Bigbee, 1998; Paquette & Underwood, 1999; Sullivan et al., 2006). In sum, it appears that both males and females use indirect aggression, and are victimized and harmed by it as well, though the evidence also suggests that there may be important gender differences in the way that indirect aggression is practiced and experienced.

Several theories have been advanced to explain gender differences in the use of indirect aggression (for a brief review, see Vaillancourt, 2005). Some researchers have postulated that females employ indirect more than physical aggression because the closeness of female friendships affords more opportunities for social manipulation than do male friendships (Lagerspetz et al., 1988). Others suggested that social inclusion is highly valued by girls, whereas dominance is a key social goal for boys, and therefore physical and indirect aggression are effective means for males and females, respectively, to harm their peers (Crick & Grotpeter, 1995). Having greater social skills than boys in pre-adolescence and adolescence, females are thought by some researchers to be better able to employ indirect aggression, which requires greater social acumen than physical aggression, and which has the advantage of a better effect/danger ratio (Bjorkqvist, 1994). This latter consideration means that indirect attacks can be enacted covertly, such that the targeted peer can be hurt without the perpetrator suffering the social sanctions that might come from being revealed as the aggressor.

More recently, some authors have considered gender differences in indirect aggression from an evolutionary perspective (Campbell, 1999; Long & Pellegrini, 2003; Vaillancourt, 2005). A key assumption underlying this theory is that men and women use different strategies to obtain sexual partners because women invest more resources than men in their offspring (Trivers, 1972), and therefore need to be more selective in choosing a sexual partner. Consequently, human females engage in intrasexual competition to be able to select high-status males who possess the characteristics and motivation to provide social, material and psychological resources, which would maximize the likelihood of their offspring's survival (Buss, 1988). Men, for their part, are more likely than women to display or brag about their resources and to illustrate their strength and athleticism in order to demonstrate their worthiness as a potential mate (Buss, 1988). However, given that human mating systems often involve lengthy courtships and monogamous relationships, human males are also expected to be selective in choosing female sexual partners, though the primary criterion is thought to be female reproductive value, signaled by physical appearance and attractiveness (Buss, 1988). Consistent with this perspective, female undergraduates reported being more likely than men to enhance their physical appearance to attract sexual partners, using strategies such as wearing makeup, jewelry, and stylish clothes, dieting and grooming effectively (Buss, 1988). Additionally, it is more common for women to play hard to get, perhaps because it illustrates their fidelity and being choosy about mates demonstrates their desirability (Buss, 1988).

Investigators have proposed several reasons why indirect aggression may facilitate intrasexual competition for sexual partners among females. First, indirectly aggressive strategies such as rumour spreading may be used to accuse a rival of being promiscuous. According to evolutionary theory, females perceived as promiscuous may be regarded as less attractive because potential male partners may doubt the prospect of their fidelity, and may interpret their indiscriminate sexual liaisons as an indication that they are not sufficiently desirable to be selective in their choice of mates (Buss, 1988; Vaillancourt, 2005). A potential rival may also be less willing or able to compete for male romantic interest if they were debilitated by the negative outcomes often associated with being indirectly victimized, especially social anxiety and depression (Vaillancourt, 2005). In addition, research suggests that girls may enhance their social standing, and hence their access to desirable sexual partners, through the use of indirect aggression. Specifically, initial levels of relational aggression have predicted later measures of high social standing such as social impact and perceived popularity (Rose, Swenson & Waller, 2004; Zimmer-Gembeck, Geiger, & Crick, 2005).

Furthermore, for females, the effect/danger ratio is likely to be more favorable for indirect aggression than physical aggression. From an evolutionary perspective, females can more effectively protect and look after their children if they avoid physical injury, which is more likely to result from physical aggression (Long & Pellegrini, 2003; Vaillancourt, 2005). In addition, girls

perceive indirect aggression as more normative for girls than physical aggression (Crick et al., 1996), and accordingly, expect fewer rewards and greater sanctions compared to boys from the use of physical aggression (Perry, Perry, & Rasmussen, 1986; Slaby & Guerra, 1988). Consequently, it appears that it would be counter-productive for females to use physical aggression to compete for sexual partners, since it may harm their social standing rather than enhancing it. Lastly, the covert nature of indirect aggression may be crucial to its usefulness in female intra-sexual competition insofar as the social gains desired by the perpetrator may be contingent on avoiding the sanctions that might arise if peers were aware of their role as the aggressor.

Consistent with an evolutionary framework, two previous studies have presented evidence suggesting that the use of indirect aggression can enhance girls' access to dating partners. For example, Pellegrini and Long (2003) found that, for girls only, increases in peer-nominated relational aggression among students in grades 6 to 8 corresponded with increases in peer-nominated dating popularity over a two-year period. Similarly, additional research has shown that self-reported indirect aggression is positively related to number of romantic partners and negatively associated with the grade at which participants had their first boyfriends (Vaillancourt, Balshine, & Clark, 2003).

The purpose of the present study is to extend this previous research by examining indirect *victimization* from an evolutionary perspective. In keeping with the suggestion of Crick, Casas, et al. (2002), we felt it was important to identify factors that leave some children more vulnerable to indirect maltreatment, given the wide range of negative adjustment outcomes that have been linked in previous research to this form of victimization. To this end, we reasoned that the more females are perceived as rivals for male romantic interest the greater the likelihood of their being victims of indirect aggression, given its potential use as a means to facilitate intrasexual competition. Females may be perceived by peers as rivals or competitors for sexual partners if they manifest indicators of attractiveness, which might include having a desirable physical appearance, extensive involvement in dating, and being successful in attracting a number of sexual partners. Physically attractive females may be at heightened risk for indirect victimization, because, as stated previously, males are thought to select sexual partners primarily on the basis of appearance, which signals reproductive value (Buss, 1988). Furthermore, qualitative research has shown that envy over physical appearance is an important trigger of indirect aggression by adolescent females (Owens, Shute & Slee, 2000). Frequent dating and a history of some sexual experience were also considered markers that would flag female adolescents as potential rivals for male romantic interest, and hence increase susceptibility to indirect victimization, because they indicate that an individual has a track record of attracting romantic partners and implicitly suggest that she is in competition with other females for sexual partners. Although having a high number of sexual partners is a marker of being successful in attracting mates, we anticipated that it would only increase female vulnerability to indirect victimization if it were not perceived as promiscuity. This distinction was based on evidence that "hard to get" females may be seen by males as being more desirable, insofar as they can afford to be choosy and it may also be an indication of a tendency toward faithfulness (Buss, 1988). The reverse also appears to be true, in that adolescents appear to have negative perceptions of youth who have had a high number of sexual partners (Prinstein, Meade, & Cohen, 2003). To examine this hypothesis, we assessed both recent (number of partners in previous month) and past (number of lifetime partners minus recent partners) sexual behavior, and hypothesized that indirect victimization would be associated only with the latter. Some past sexual experience may increase the perception of a female adolescent as a rival for male romantic interest, in that it signals the ability to attract males and a willingness to compete for sexual partners, however, having several recent sexual partners may diminish perceptions of attractiveness, if it is construed as promiscuity. In summary, we hypothesized that indicators of attractiveness (i.e., physical attractiveness, dating

frequency, past sexual behavior) would be positively associated with indirect victimization for females but not males.

We also expected that indirect victimization would be more strongly associated with indicators of attractiveness for older female adolescents in the final years of high school as compared to younger adolescents just starting high school. This hypothesis stems from normative data indicating that the percentage of adolescents involved in dating relationships and sexual intercourse increases from 9th grade to 12th grade (Centers for Disease Control and Prevention (CDC), 2000; Crockett, Rafaelli, & Moilanen, 2003). Consistent with an evolutionary theory of indirect victimization, we anticipated that there would be greater intrasexual competition for male sexual partners as the percentage of females involved in dating and sexual activity increased, which may provide a greater impetus for using indirect aggression to neutralize rivals and to enhance one's access to sexual partners. In addition, as involvement in dating and sexual relationships becomes more normative, the salience of these activities may escalate, fueling competition for sexual partners and providing a context for indirect aggression.

An additional consideration addressed in the present research is that indirect victimization and some indicators of attractiveness may be commonly linked to indexes of psychosocial maladjustment, making it difficult to ascertain whether there is a spurious or actual relation between indirect maltreatment and markers of attractiveness. Specifically, studies have shown that maladjusted individuals, experiencing depression, insecure attachment and behavioral problems, are more likely to be indirectly victimized (Crick, Casas, et al., 2002; Marini et al., 2006), possibly because they are perceived by peers as easy targets (i.e., unlikely to resist or retaliate) and as likely to reinforce and perpetuate aggressive attacks by overreacting, given the emotional dysregulation underlying these psychosocial difficulties (Crick, Grotpeter, et al., 2002; Schwartz, Proctor, & Chien, 2001). In addition, research has also shown that adolescents manifesting depression, insecure attachment and behavioral problems tend to engage in sexual behavior earlier and more frequently (Crockett et al., 2003). Therefore, we controlled for depression, mother-adolescent attachment and behavioral difficulties in examining the association between indirect victimization and indicators of attractiveness, to eliminate this possible confound.

Method

Participants

The sample consisted of 2319 participants (56% females) from 25 high schools in a southern Ontario region of Canada, who completed a subset of measures from the larger Youth Resilience Questionnaire (YRQ). In regard to demographic factors, 93% of the adolescents were born in Canada, with British (18.0%), German (15.0%), French (12.7%), and Italian (10.5%) being the most common ethnic backgrounds reported apart from Canadian. Data on socioeconomic status indicated that the level of education for the mothers and fathers was 3.2 and 3.3 respectively, with 3 indicating some college, university or apprenticeship program and 4 indicating completion of a college/technical diploma. About 69% of participants were living in two-parent households (57% with both birth parents, 12% with one birth parent and one step-parent), 15% reported living with a single parent (usually mother), and the remaining adolescents reported living with relatives, foster parents, guardians, adoptive parents, in group homes, or on their own.

Measures

Sexual Behavior. Participants were asked to indicate how many people with whom they have had sexual intercourse in their lifetime and during the last month. For each item, participants were to respond on a six-point Likert scale ranging from zero to five or more people. Scores on the item indicating the number of sexual partners in the previous month were taken as a measure of participants' *recent sexual behavior*. A measure of *past sexual behavior* was derived by subtracting the number of lifetime partners from the number of partners in the previous month.

Dating Frequency. Participants indicated how often they date on a seven-point Likert scale (ranging from 0 to 6), with the options being never, once per year, a few times per year, once per month, a few times per month, once per week and a few times per week.

Attractiveness. Participants were asked to indicate how good looking they thought they were using a four-point Likert scale (ranging from 1 to 4), with the choices being not good looking, somewhat good looking, good looking, or very good looking.

Indirect Victimization. Indirect victimization was measured by a four-item scale adapted from Marini, Spear, and Bombay (1999). Participants were asked to indicate how often they had received hurtful and unsigned notes, been excluded from joining an activity, had rumours and untrue stories of them spread around, or had another student dare someone to hurt them during the past school year. Participants responded using a five-point Likert scale, with the options being never, a few times a year, a few times a month, a few times a week, or every day. Internal consistency for this scale has been reported to be .72 (Marini et al., 2006).

Depression. This measure consisted of a 20-item questionnaire asking students to respond to questions that assess the degree of depressive symptoms they may have experienced over the past two weeks (e.g., “I thought my life had been a failure”) [Centre for Epidemiological Studies Depression Scale (CES-D), 1972]. Participants rated the extent to which they experienced each depressive item on a 5-point Likert scale spanning from one to five, with options ranging from none of the time to most of the time. The scale proved to have a high internal consistency ($\alpha = .92$).

Aggression. Students were asked to complete a behavioral checklist on their involvement in direct and indirect aggression during the last school year, rating each item on a 5-point Likert scale (from one to five) ranging from never to a few times a day. Four items tapped direct aggression (e.g., how often have you pushed and shoved someone; $\alpha = .83$), and four additional items assessed indirect aggression (e.g., spread false rumours, or excluded someone from a group; $\alpha = .77$). The mean for direct aggression was strongly correlated with the mean for indirect aggression, $r = .64$. We combined these 8 items and calculated a mean aggression score, which had a high level of internal consistency, $\alpha = .85$.

Attachment Security. Attachment security was measured using a 17-item scale based on Armsden and Greenberg’s (1987) Inventory of Parent and Peer Attachment (IPPA), which assesses the degree of trust, communication, and alienation (reverse scored) within the parent-child relationship as perceived by the adolescents. The students responded to each item on a 4-point Likert scale, ranging from almost never to almost always. Internal consistency was high ($\alpha = .90$). A sum was calculated by adding items for trust and communication and subtracting items tapping alienation, yielding scores ranging from -13 to 38.

Procedure

Trained researchers administered the questionnaire to students in their classrooms. In order to ensure that all participants could participate in the study, those who had literacy difficulties were provided assistance by trained research staff. Participants were assured that their answers were completely confidential, their participation was voluntary and they could cease participating at any time without penalty.

Results

Plan of Analysis

Our hypotheses regarding the link between indicators of attractiveness and indirect victimization were tested with a logistic regression analysis, in which gender and grade were entered on the first step, and measures of psychosocial adjustment including mother-adolescent attachment security, depression and aggression on the second step, prior to entering the three indicators of attractiveness (i.e., past sexual behavior, dating frequency and attractiveness) plus recent sexual behavior on the third step. The variables were entered in this order to examine the

relation of indicators of attractiveness to indirect victimization independent of psychosocial adjustment. Two-way interactions between Step 3 predictors and gender or grade were entered on the fourth step, with three-way interactions involving Step 3 predictors, gender and grade inserted on the fifth step. Logistic regression was chosen as the appropriate statistical procedure because the outcome measure, indirect victimization, was dichotomized due to substantial skewness and kurtosis. In line with a great deal of research on aggression and victimization (e.g., Crick, Grotpeter, et al., 2002), we classified adolescents as indirectly victimized if their indirect victimization score exceeded one standard deviation above the mean.

Preliminary Analyses

Means and standard deviations for the study measures are reported in Table 1, as are zero-order inter-correlations. Zero-order relations between indicators of attractiveness and indirect victimization were either non-significant or of a small magnitude, in accord with logistic regression findings reported later in the paper, which suggest some links between indicators of attractiveness and indirect victimization are conditional on gender and grade. The inter-correlations also demonstrated the necessity of addressing measures of psychosocial adjustment (depression, attachment, aggression) as potential confounds, insofar as all three variables were significantly linked to both sexual behavior and indirect victimization.

Logistic Regression Analysis

As shown in Table 2, depression, attachment and aggression were uniquely related to indirect victimization independent of grade and gender, with the odds of victimization increasing by 78% and 81% for each one standard deviation increase in depression and aggression respectively, and the odds decreasing by 24% for every one standard deviation increase in attachment security. Recent and past sexual behavior, dating frequency and physical attractiveness were not significantly associated with indirect victimization. However, three significant two-way interactions were observed, with physical attractiveness interacting with gender and grade, and recent sexual behavior interacting with grade.

Following the procedures described by Jaccard (2001), we interpreted these interactions by calculating odds ratios for older adolescents (one standard deviation above the mean grade) and younger adolescents (one standard deviation below the mean grade), for physical attractiveness and recent sexual behavior. To unravel the interaction between gender and physical attractiveness, we ran the logistic regression analysis twice as specified by Jaccard (2001), coding males and then females as zero to alternate the reference group, and thereby derived odds ratios for physical attractiveness for both males and females. The results of these analyses are depicted in Figure 1. As shown, a one standard deviation increase in physical attractiveness increased the odds of females being indirectly victimized by 35% (OR = 1.35, B = .30, $p < .05$), whereas a similar one standard deviation increase in attractiveness decreased the odds of males being victimized by 25% (OR = .75, B = -.29, $p < .05$). The link between attractiveness and indirect victimization appeared to be conditional upon grade as well, in that a one standard deviation increase in attractiveness in younger adolescents reduced the odds of victimization by 20% (OR = .80, B = -.23, $p < .05$), whereas the odds increased by 15% for older adolescents, though not to a significant degree (OR = 1.15, B = .14, $p = .30$). Finally, a one standard deviation increase in recent sexual behavior for older adolescents resulted in a 35% (OR = 1.35, B = .30, $p < .05$) increase in the odds of indirect victimization, whereas a similar increase in recent sex behavior was associated with a slight 11% decrease (OR = .89, B = -.12, $p = .32$) in the odds of younger adolescents being victimized.

Discussion

Some results in the present study were consistent with the evolutionary perspective that female adolescents are more likely to be indirectly victimized if they are high in indicators of attractiveness (i.e., physically attractive, date frequently, high number of past sexual partners), and

consequently perceived as rivals in regard to intrasexual competition. Completely consistent with the hypothesis was the finding that females who rated themselves as highly attractive reported experiencing higher levels of indirect victimization. In contrast, two of the three indicators of attractiveness (dating frequency, past sexual behavior) were not associated with indirect victimization. Finally, whereas we did not make an explicit hypothesis regarding recent sexual behavior, having deemed it to be a weak indicator of attractiveness because being involved with a number of recent sexual partners might be construed as promiscuity, it was nevertheless positively related to indirect victimization for older adolescents.

Interestingly, the link between attractiveness and indirect victimization was more polarized along gender lines than we expected, insofar as the odds ratios were significant in opposite directions. Specifically, perceived physical attractiveness significantly increased the odds of female adolescents being indirectly victimized by 35%, whereas the odds for males significantly decreased by 25%. Attractiveness appears to function as a risk factor for females and a protective factor for males. Evolutionary theory seems to provide an explanation for this discrepancy. There are two lines of evidence that suggest physical appearance may be a more salient indicator of female attractiveness than of male attractiveness. First, as discussed above, males are thought to give more emphasis to physical appearance than do females in selecting sexual partners, because it is a good indicator of reproductive value, whereas females select male sexual partners on the basis of a wider spectrum of characteristics to ascertain whether males have the material, social and psychological resources to provision and protect their offspring (Buss, 1988). Second, in terms of intrasexual competition, females report more than do males using strategies to enhance their physical appearance as a means to attract sexual partners, such as wearing make-up, jewelry, and fashionable clothing (Buss, 1988). Therefore, given the salience of physical appearance as a marker of female attractiveness, it follows that the more attractive the female adolescent, the more they may be perceived by other females as a rival for male romantic interest. Thus, attractive female youth may be singled out as targets for indirect victimization, and hence be subject to unflattering rumours (e.g., accusations of promiscuity) that may reduce their appeal as potential sexual partners, or excluded from key social groups that may facilitate access to sexual partners. Using focus groups and interviews with adolescent females, researchers have provided some evidence to this effect, indicating that envy over physical appearance is one trigger for female indirect aggression (Owens et al., 2000).

Since females employ a wider range of criteria than do males in selecting sexual partners, as mentioned above, males may attend to different indicators of attractiveness than females in identifying rivals with whom they may engage in intrasexual competition. Indeed, Buss (1988) noted that male undergraduates were more likely than females to brag about their resources or display their strength and athleticism as a means to attract a sexual partner, and hence males may regard these characteristics as being more salient indicators of attractiveness in potential rivals than is physical appearance. Thus, males may be less likely than females to select a peer as a target for intrasexual competition on the basis of physical appearance. Moreover, males may be more inclined to use direct rather than indirect aggression to engage in intrasexual competition, since it is a way to display strength and athleticism, and achieve dominance. Furthermore, the factors that restrict female use of direct aggression do not apply to males, including its employment being less normative for females than males and the fact that direct aggression is more risky for females given their greater investment in their offspring (Trivers, 1972).

Although the foregoing may explain why physical attractiveness is not positively associated with indirect victimization in males, what remains unclear is why there is a significant negative association, indicating that an attractive appearance is a protective factor for males. A possible clue is offered in previous research showing that early adolescents perceived popular children as being

more attractive than peers who were not popular (de Bruyn & Cillessen, 2006). Thus, if attractive male adolescents are more well-liked on average than less attractive youth, they may be less susceptible than their peers to victimization that involves ostracism and social exclusion. In contrast, an attractive physical appearance may be a double-edged sword for female adolescents. Its link to popularity may buffer them from indirect victimization on the one hand, in that peers may be less motivated or willing to ostracize a well-liked female, and having an extensive and loyal circle of friends may afford some protection. However, this advantage may be negated because physical appearance is a more salient indicator of attractiveness for females than for males, marking attractive females as key rivals in the area of intrasexual competition. Furthermore, as outlined above, intrasexual competition among females is more likely to involve indirect aggression, whereas males tend to use direct aggression to this end, which may explain why indirect victimization is positively associated with physical attractiveness only for females. Although speculative, an alternative explanation is that males and females may judge their own attractiveness by different criteria, with females perhaps construing attractiveness more narrowly, linking it to specific physical attributes. This in turn could lead to differences in the relation between physical appearance and indirect victimization.¹

The link between attractiveness and indirect victimization also depended on grade level, with an attractive physical appearance being a protective factor for younger adolescents (OR = .80) whereas it was not significantly associated with indirect maltreatment (OR = 1.15) for older youth. As discussed elsewhere, sexual activity is less normative for younger adolescents, such that there may be less intrasexual competition for sexual partners in this age group. Consequently, indicators of attractiveness such as an attractive physical appearance may be less salient for younger adolescents as markers that identify rivals who may be targeted with indirect aggression. In addition, being attractive was a protective factor for youth in the lower grades insofar as a one standard deviation increase in attractiveness reduced the odds of indirect victimization by 20%. In an age group where sexual activity is a less salient feature of peer dynamics, an attractive physical appearance may facilitate positive peer relations, as suggested in previous research demonstrating a link between attractiveness and perceived popularity (de Bruyn & Cillessen, 2006).

Unlike physical appearance, our prediction that dating frequency and past sexual behavior would increase the risk of indirect victimization was not supported. Being easily observable, physical appearance may be a more salient indicator of attractiveness than are dating and sexual history, which one's peers would only know about if it were revealed to them through gossip or self-disclosure. An additional consideration is that there were subtle differences in our rationale for positing that physical appearance, dating frequency and past sexual behavior would be indicators of attractiveness, which might explain their differential relations with indirect victimization. Specifically, we reasoned that female adolescents who date frequently and have some past sexual experience may be seen by female peers as rivals, and possible targets for indirect aggression, because they have a track record of being able to attract romantic partners, and moreover dating and being sexually active implies that they are in the competition for sexual partners. In contrast, an attractiveness physical appearance indicates that female adolescents have the potential to attract and thus be competitors for sexual partners, because physical appearance is the primary criterion by which males select sexual partners, given its perceived association with reproductive value (Buss, 1988). In retrospect, the distinction between having actual dating and sexual experience versus having the strong potential to attract sexual partners may be critical in determining the likelihood of indirect victimization.

¹ We would like to acknowledge one of the anonymous reviewers for proposing an additional explanation for these findings.

Our findings do not seem to be in line with previous research linking indirect aggression to dating. Specifically, Long and Pellegrini (2003) noted that increases over a two-year period in a peer-nominated measure of indirect aggression were associated with concurrent increases in dating popularity among individuals in grades 6 to 8. Similarly, Vaillancourt et al. (2003) found that self-reported indirect aggression was positively related to number of romantic partners and negatively related to the grade at which participants had their first boyfriends. Thus, although previous research suggests that indirect aggression may enhance dating opportunities, we did not observe a similar finding on the other side of the coin; specifically, frequent dating did not appear to elevate the risk of female adolescents being indirectly victimized by individuals seeking to neutralize rivals for sexual partners. One reason for this inconsistency may be that dating is a somewhat imprecise term, in that it may be construed as a dyadic or group event. An example of the latter definition is the construct tapped by Long and Pellegrini (2003), who measured dating popularity by asking adolescents to nominate three opposite-sex people they would like to invite to a hypothetical party. Thus, some youth may define dating in a way that blurs the distinction between friendship and romantic relationships. The vagueness of this term may affect the extent to which dating is perceived as an indicator of attractiveness, and hence whether dating frequency would single an individual out as a target against whom indirect aggression may be used in intrasexual competition for sexual partners.

Unexpectedly, we found a link between recent sexual behavior and indirect victimization, which may best be explained as resulting from rejection and ostracism rather than processes of intrasexual competition for partners. The possibility that having multiple sexual partners in the previous month could be perceived as promiscuity led us to regard recent sexual behavior as a weak indicator of attractiveness, and we therefore did not expect it to stimulate intrasexual competition by means of indirect aggression. Our rationale for this expectation was based on research suggesting that promiscuous behavior can be perceived in a negative light by peers, whereas virtuous behavior may increase females' attractiveness to males. For example, Prinstein and colleagues (2003) noted that being sexually active was positively associated with social reputation but having a high number of sexual partners increased the likelihood of being perceived as unpopular. Furthermore, from the standpoint of evolutionary theory posited by Buss (1988), playing "hard to get" is a strategy that females were found to use to attract sexual partners, possibly because males may perceive women who can afford to be choosy in selecting mates as desirable, and it may signal a disposition toward faithfulness. Thus, rather than being seen as rivals with whom to engage in intrasexual competition for mates, adolescents with multiple recent sexual partners may be perceived as undesirable and be disliked or rejected by peers, which in turn may result in social exclusion and rumour spreading by peers who do not want to associate with them. In light of the evolutionary perspective put forward by Buss (1988), one might have assumed that only female promiscuity would be linked with indirect victimization, but in the present research this was true for both male and females. Notably, Prinstein et al. (2003) reported a similar finding, in that having a high number of sexual partners was inversely associated with social reputation for both male and female adolescents.

An additional possibility is that adolescent males employing short-term mating strategies may find females who have engaged in a high rate of recent sexual behavior to be attractive. According to sexual strategies theory (e.g., Buss & Schmitt, 1993; Schmitt, 2003), males using a short-term mating strategy are more likely than women to desire multiple sexual partners, consent to sex more quickly and seek short-term sexual relationships. Consequently, adolescent females with a recent history of multiple sexual partners may be perceived as desirable by males with a short-term mating strategy because less effort and time may be required to initiate a sexual relationship with them. From this perspective, frequent recent sexual behavior may be seen as an indicator of attractiveness, and hence, mark females with such a sexual history as potential targets for

intrasexual competition involving indirect aggressive attacks by other females seeing them as rivals for male romantic interest.²

It is critical to point out that recent sexual behavior was positively associated with indirect victimization only for older adolescents. Since this result was unpredicted, it is hard to know the reason for this developmental discrepancy, though two potentially relevant developmental trends may be worth noting. There is a normative developmental increase in the percentage of sexually active adolescents (CDC, 2000; Crockett et al., 2003), which may increase the salience of sexual behavior as an influence affecting the peer relations of older adolescents. In contrast, a recent longitudinal study indicated that there is a very high level of intra-individual stability in indirect aggression across grades 9 through 12 (Cillessen & Borch, 2006), and thus it seems unlikely the above finding could plausibly be attributed to changes in indirect aggression practices across the high-school grades.

It is also important to note that the link between recent sexual behavior and indirect victimization for older adolescents is independent of various indexes of psychosocial adjustment. In view of past research, we reasoned that psychosocial well-being was a potential confound, in that depression, attachment insecurity and behavioral problems may enhance the probability of both sexual activity and indirect victimization (Crick & Bigbee, 1998; Storch & Esposito, 2003; Storch et al., 2005; Sullivan, et al., 2006). Having controlled for these variables, we have eliminated the possibility that the connection between indirect victimization and recent sexual behavior is solely a function of a common negative relation with social competence or psychological well-being. In other words, it quite likely is linked to the sexual behavior per se.

Limitations

There are a few limitations that should be considered in interpreting the present results. The data are based on self-report measures, however, this methodology has been used extensively in this area of research, and it appears to yield reliable, valid and informative results that are comparable to peer reports (see Crick & Bigbee, 1998). Moreover, several constructs assessed in the present study could best be examined using self-report methods, especially sexual behavior, dating frequency, depression, attachment, and indirect victimization, given their covert, private and subjective nature. In addition, caution must be exercised in making conclusions regarding direction of causation because the data are cross-sectional.

Conclusion

The present research provides some evidence consistent with the evolutionary perspective that females with strong indicators of attractiveness may be identified as rivals for male romantic interest and thus be at greater risk of being victimized by indirect aggression. Along these lines, physically attractive females were at greater risk for indirect victimization than less attractive peers, whereas results pertaining to past sexual behavior and dating frequency were not consistent with evolution-based hypotheses. Contrary to our predictions, having a greater number of recent sexual partners also increased risk of indirect victimization. Given evidence that promiscuous sexual behavior may be perceived negatively by peers (Prinstein et al., 2003) and in women may signal lower faithfulness and desirability (Buss, 1988), we reasoned that this relation may be a function of rejection rather than intrasexual competition for partners.

Implications

The present results have several implications that deserve further attention. First, it appears that recent sexual behavior and physical attractiveness may be related to indirect victimization for different reasons--rejection and intrasexual competition for partners respectively--consistent with

² We would like to acknowledge and thank an anonymous reviewer for suggesting this alternative interpretation of this finding.

the concept of equifinality, which posits that individuals may follow different pathways toward the same outcome. This finding has important implications for the development of interventions designed to reduce peer victimization, in that victims of indirect aggression may represent a rather broad, heterogeneous group, including attractive individuals with no obvious signs of maladjustment. Consequently, it may be necessary to reconceptualize the characteristics of potential victims, given that much theory and empirical research would lead one to assume that attractive youth are likely to be popular and socially well adjusted (e.g., de Bruyn & Cillessen, 2006). Since potential victims may take heterogeneous forms, universal prevention programs, engaging all students within classrooms, may provide the best method of preventing indirect victimization, insofar as such programs may be used to promote respect and less tolerant attitudes towards indirect aggression amongst all students, thereby reducing the likelihood that perpetrators will find peers willing to support and collaborate with them (Leadbeater, Hoglund, & Woods, 2003; Marini & Dane, in press; Van Schoiack-Edstrom, Frey, & Beland, 2002).

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Authors' Notes

This research was supported by a grant from the Social Sciences and Humanities Research Council of Canada to The Youth Lifestyle Choices Community-University Research Alliance (YLC-CURA). The present research was carried out according to the Canadian Tri-Council Policy on the Ethical Conduct for Research Involving Humans, and was approved by the REB of Brock University. We gratefully acknowledge the support we received from Teena Willoughby and Heather Chalmers, co-directors of the YLC-CURA.

Table 1

Descriptive Statistics and Intercorrelations for Study Variable

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. Gender			-	.01	.09***	.05*	-.30***	-.14***	-.04**	.01	-.12***	-.10***
2. Grade	10.44	1.36		-	-.01	.01	-.07***	.09***	.16***	.17**	.05***	-.09***
3. Depression	2.00	0.71			-	-.42***	.15***	.17***	.11***	.04*	-.20***	.21***
4. Attachment	21.73	9.97				-	-.23***	-.11***	-.10***	-.06***	.14***	-.17***
5. Aggression	1.48	0.61					-	.29***	.14***	.12***	.08***	.28***
6. Recent Sexual Behavior	0.48	0.97						-	.25***	.31***	.17***	.12***
7. Past Sexual Behavior	0.30	0.86							-	.22***	.11***	.02
8. Dating Frequency	2.81	2.08								-	.23***	.01
9. Physical Attractiveness	2.57	0.84									-	-.04***
10. Indirect Victimization	NA	NA										-

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table 2
 Attractiveness, Dating, and Sexual Behavior as Predictors of Indirect Victimization

Predictors	Odds Ratio	95% Confidence Interval
Step 1		
Gender	1.82**	1.34 - 2.46
Grade	.70**	.60 - .82
Step 2		
Attachment	.76**	.64 - .89
Depression	1.78**	1.52 - 2.07
Aggression	1.81**	1.58 - 2.08
Step 3		
Attractiveness	.92	.77 - 1.09
Dating	.99	.83 - 1.19
Recent Sexual Behavior	1.08	.90 - 1.28
Past Sexual Behavior	.95	.81 - 1.12
Step 4		

Attractiveness by Grade	1.21**	1.01 - 1.43
Attractiveness by Gender	1.80**	1.29 - 2.52
Dating by Grade	.90	.74 - 1.09
Dating by Gender	.77	.53 - 1.11
Recent Sexual Behavior by Grade	1.23**	1.03 - 1.45
Recent Sexual Behavior by Gender	.94	.57 - 1.53
Past Sexual Behavior by Grade	1.08	.92 - 1.26
Past Sexual Behavior by Gender	.88	.61 - 1.27
Step 5		
Attractiveness by Gender by Grade	.96	.68 - 1.37
Dating by Gender by Grade	.92	.62 - 1.36
Recent Sexual Behavior by Gender by Grade	.81	.47 - 1.39
Past Sexual Behavior by Gender by Grade	.98	.69 - 1.39
Model	273.93***	

[Chi-square value for the overall model]

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Gender coded as follows: males = 0, females = 1

Figure Caption

Figure 1. Conditional odds ratios for indirect victimization in relation to attractiveness and recent sex behavior.

