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Original Article

A Multi-Informant Longitudinal Study on the Relationship between Aggression, Peer Victimization, and Dating Status in Adolescence

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Abstract: Adolescent peer-aggression has recently been considered from the evolutionary perspective of intrasexual competition for mates. We tested the hypothesis that peer-nominated physical aggression, indirect aggression, along with self-reported bullying behaviors at Time 1 would predict Time 2 dating status (one year later), and that Time 1 peer- and self-reported peer victimization would negatively predict Time 2 dating status. Participants were 310 adolescents who were in grades 6 through 9 (ages 11-14) at Time 1. Results showed that for both boys and girls, peer-nominated indirect aggression was predictive of dating one year later even when controlling for age, peer-rated attractiveness, and peer-perceived popularity, as well as initial dating status. For both sexes, self-reported peer victimization was negatively related to having a dating partner at Time 2. Findings are discussed within the framework of intrasexual competition.

Keywords: intrasexual competition, aggression, bullying, victimization, dating, adolescents

"Kyle's life took a devastating turn when a 16-year-old boy, jealous that Kyle was dating his previous girlfriend, came to his house and started a fight…. The boy came from behind and flipped him upside down onto his head…. shattering one of [Kyle's] vertebrae into eight pieces" (Boy paralyzed after fight over girl, 2001)

Introduction

Kyle's story is consistent with investigations of adolescent peer-aggression being used as a strategy for intrasexual competition (Benenson, 2009; Gallup, O'Brien, and Wilson, 2011; Leenaars, Dane, and Marini, 2008; Vaillancourt, 2005). Intrasexual competition is a key tenet of Darwin's (1871) theory of sexual selection, wherein members of the same-sex rival each other for mating access to members of the opposite sex.

Competitors who are successful in thwarting rivals are expected to gain a reproductive advantage, increasing the chance of passing their genes on to subsequent generations.

Recently, Griskevicius et al. (2009) found that both male and female use of aggression can be motivated by status and mating goals. From an evolutionary perspective, aggression toward rivals may have provided individuals with a competitive advantage by solving problems related to accessing status, resources, and mates (e.g., Archer, 2009; Buss and Shackelford, 1997; Daly and Wilson, 1988; Wilson and Daly, 1985). Indeed, in many societies males gain status through the use of aggression, and higher status males are typically more desirable to females (see Griskevicius et al., 2009; Li and Kenrick, 2006). Similarly, females have been shown to derogate female rivals (Vaillancourt and Sharma, 2011), and this behavior has been found effective in reducing male perceptions of the victimized women's attractiveness (Fisher and Cox, 2009). Approximately 85% of adolescent peer aggression occurs between same-sex conspecifics (Gallup, O'Brien, White, and Wilson, 2009) and thus peer aggression and victimization may be effective indicators of the intrasexual competition or rivalry that occurs among adolescents for social dominance and sexual access. In considering adolescent peer-aggression as a behavioural strategy meant to benefit one's own reproductive fitness, we examined the hypothesis that adolescent victims of peer aggression will be less likely to have a dating partner in the future (one year later), whereas perpetrators of peer aggression will be more likely to have a dating partner in the future.

The Necessity of Intrasexual Competition

Among humans, both males and females have been shown to compete intrasexually for access to mates (e.g., Buss and Shackelford, 1997; Campbell, 1995; Fisher, 2004; Vaillancourt and Sharma, 2011; Wilson and Daly, 1985) As in most mammalian species, females invest more obligatory parental resources toward offspring than do males (Trivers, 1972) and are thus choosier when selecting their mates (Geary, 2000). This higher selectivity, in turn, leads males to compete (sometimes fiercely and violently) for access to selective females (Campbell, 1995; Daly and Wilson, 1988). The theory of differential parental investment has aided our understanding of why males more than females engage in violent and risky behavior, typically against other males (Wilson and Daly, 1985).

It is critical to note, however, that unlike many other species, most males also participate in parental care and invest heavily in their offspring (compared to other mammalian species; Buunk and Fisher, 2009; Geary, 2000). Moreover, many males enter into and prefer monogamous relationships as opposed to relying solely on short-term sexual encounters (Miller, Putcha-Bhagavatula, and Pedersen, 2002). Important to the present study, this finding has also been shown in adolescents, many of whom appear to date monogamously (e.g., Thornton, 1990). Campbell (2004) suggested that "monogamy and biparental care reduce fitness variability among males" by constraining "a man's reproductive success to that of his partner" (p. 17). Accordingly, we can expect that males will also be discriminating in their mate choice, and that both sexes will compete for access to the highest quality mates (Buunk and Fisher, 2009; Campbell, 2004; Griskevicuis et al., 2009; Vaillancourt, 2005).

The ability to succeed in intrasexual competition may be especially useful during

adolescence. In this developmental period, one's social interactions shift from same-sex friendships that are typical of childhood relationships to more cross-sex interactions and friendships (Collins, Welsh, and Furman, 2009). Increased time is allocated during adolescence to dating-related thoughts and behaviors (Furman, 2002). For example, Connolly, Pepler, Craig, and Taradash (2000) found that 63% of students in grades 5-8 were involved in dating relations.

Monogamous dating relations seem to be an opportune scenario for adolescents to engage in sexual activity (Manning, Longmore, and Giordano, 2000). Adolescent girls perceive firm social norms that sexual behavior should not occur outside of dating relations (Collins et al., 2009); females who engage in sexual activity outside of dating relationships are often chastised and degraded (Baumeister and Twenge, 2002; O'Sullivan and Meyer-Bahlburg, 2003). Therefore, it is reasonable to presume that adolescent sexual behavior often occurs within a dating context. Furthermore, for early adolescents, having a dating partner provides social status and assists with "fitting in" (Collins et al., 2009). Being in a quality dating relationship during adolescence has also been linked to later involvement in committed relationships during adulthood (Seiffge-Krenke and Lang, 2002) and greater odds of being married or cohabiting before the age of 25 (Raley, Crissey, and Muller, 2007). This literature suggests that adolescent dating may confer reproductive benefits in the way of sexual access, status, and future dating opportunity.

Adolescent Peer-Aggression as a Form of Intrasexual Competition

Researchers have proposed that the frequency and cross-cultural universality of adolescent aggression may be fundamentally linked to intrasexual competition (e.g., Campbell, 1995; Gallup et al., 2009; Gallup, et al., 2011; Vaillancourt, 2005). Adolescent aggression typically takes two forms: direct/physical and indirect aggression. Direct aggression involves physical harm or associated threats or challenges (Archer and Coyne, 2005). Researchers have firmly established that direct aggression is a male-typical competitive strategy (e.g., Daly and Wilson, 1988); however, this does not preclude females from engaging in physical aggression (see Vaillancourt, 2005). For males lacking in status or resources (i.e., low mate-value), opportunity for reproduction may hinge on their ability to contest other males, even at the risk of physical injury (Daly and Wilson, 1988). Direct aggression can be considered a tactic that is employed when there are minimal moral constraints and few legal sanctions (Archer, 2009; Courtwright, 1996; Ruff, 2001). Under these circumstances, males can increase their status utilizing the threat of violence (Archer, 1994, 2000; Daly and Wilson, 1988). Specifically, physical aggression may have been be useful for improving male reproductive success through its effects on status hierarchy negotiation, inflicting costs on intrasexual rivals, deterring future attacks, as well as demonstrating good genes and an ability to protect offspring (e.g., Buss and Shackelford, 1997; Campbell, 1995; Daly and Wilson, 1988).

For females, mere access to a mate is less reliant upon intrasexual competition (Archer, 2009), and so they typically have more to lose in terms of reproductive fitness from potential physically damaging confrontations (Daly and Wilson, 1989). Campbell (1999, 2004) has suggested that females' greater parental investment also increases the costs associated with direct aggression; for females it is more important to remain alive in

order to rear their offspring (see also Björkqvist, 1994).

Although males are more directly aggressive than females, it is important to establish that direct physical aggression is comparatively rarer than less costly aggressive acts such as indirect or relational forms of aggression (Björkqvist, Osterman, and Lagerspetz, 1994). Moreover, the use of direct aggression by boys and girls decreases significantly by adolescence (e.g., Bjorkqvist, 1994; Côté, Vaillancourt, LeBlanc, Nagin, and Tremblay, 2006), while the use of indirect aggression represents a more common tactic that peaks and remains stable through the teenage years in both sexes (e.g., Card, Stucky, Sawalani, and Little, 2008; Miller, Vaillancourt, and Boyle, 2009). Indirect aggression is characterized by hurting others through purposeful and often covert manipulations of and harm to interpersonal relationships, such as through social exclusion or rumor spreading (Crick and Grotpeter, 1995; Lagerspetz, Björkqvist, and Peltonen, 1988). Indirect aggression might also hold significant adaptive value for both males and females (Archer and Coyne, 2005; Björkqvist, 1994; Björkqvist, Lagerspetz, and Kaukiainen, 1992; Lagerspetz et al., 1988; Vaillancourt, 2005). This often covert strategy is functional because it poses less danger to the perpetrator than direct aggression and yet harms the victim (Björkqvist, 1994). Indirect aggression is also harder to identify and thus retaliation, social and legal consequences are evaded more easily (Björkqvist 1994). It has been shown that both males and females engage in derogation of intrasexual rivals by targeting their status, attractiveness, or reputation (Buss and Dedden, 1990; Fisher, 2004; Vaillancourt and Sharma, 2011), making indirect aggression a potentially useful competition tactic for reproductive opportunity.

The Competitive Efficacy of Adolescent Peer-Aggression

Buss and Dedden (1990) have argued that successful intrasexual competition hinges upon rendering oneself more desirable to members of the opposite sex by (a) causing rivals to be less appealing and/or (b) enhancing one's own appeal. Such competition might also hinge upon excluding your target from mating opportunities (e.g., Daly and Wilson, 1988). Preliminary evidence suggests that adolescent aggression may relate to each of these conditions.

First, peer victimization (whether it be direct and/or indirect) is known to be associated with markers of low fitness (Gallup et al., 2009) such as depression, anxiety, low self-esteem, somatic and cognitive problems, loneliness, peer rejection, social dissatisfaction, school dropout, and suicide (e.g., Swearer, Espelage, Vaillancourt, and Hymel, 2010). Gallup et al. (2009) found that college men who reported being victimized in adolescence had fewer lifetime sex partners and fewer sex partners per year. Interestingly, victimized women had an earlier onset of sexual activity and more lifetime partners (Gallup et al., 2009). The authors posed two possible interpretations of their findings: (1) attractive women were more frequently victimized by other women as they pose the greatest threat to other women (e.g., Arnocky, Sunderani, Miller, and Vaillancourt, 2012; Hill and Buss, 2006; Vaillancourt and Sharma, 2011), and (2) victimized women were low in status and therefore yielded to the sexual wills of men.

Second, the use of direct or indirect aggression during adolescence could result in elevations in social status and/or self-esteem (Archer, 1994; Daly and Wilson, 1988; Gallup

et al., 2011; Vaillancourt and Hymel, 2006). Indirect aggression is associated with peer acceptance among both boys and girls (Salmivalli, Kaukiainen, and Lagerspetz, 2000; Vaillancourt and Hymel, 2006). For instance, Pellegrini and Long (2003) found that indirectly aggressive girls and socially-dominant boys in grades 6 – 8 were more likely to be invited to a hypothetical party by members of the opposite sex in the future. Given the finding that indirect aggression may be related to cross-sex social interactions, it is not also surprising that researchers have found that self-reported bullies (who presumably would be engaging in more direct and indirect aggression toward peers) were more likely to be dating earlier in life, more likely to be currently dating, engaged in more advanced dating behaviors such as spending time with opposite-sex others, and engaged in a wider array of dating activities in contrast with a less-aggressive (non-bullying) comparison group (Connolly et al., 2000).

In their examination of the potential reproductive benefits associated with adolescent peer aggression, Gallup et al. (2011) collected retrospective accounts of university students' previous aggression use and dating behaviors. The authors found that women who perpetrated higher levels of indirect aggression were more likely to have begun dating earlier in life, and indirectly aggressive men (non-physical aggression) reported having had more total dating partners. Earlier onset of mating behavior provides women with a fitness advantage (Gallup et al., 2011; Wood, 1994). For men, having multiple partners is associated with reproductive success (Jokela, Rotkirch, Rickard, Pettay, and Lummaa, 2010).

Although the aforementioned studies provide valuable evidence of a relationship between aggression and reproductive fitness indicators, the cross-sectional and retrospective nature of their design is a limitation that precludes conclusions about the directionality of this relationship. Accordingly, understanding the efficacy of adolescent aggression in achieving later reproductive benefits (i.e., being more likely to have a dating partner at follow-up), as well as the role of victimization in limiting later reproductive fitness (i.e., being less likely to have a dating partner at follow-up) is the topic of the present study.

The Current Study

As adolescents allocate significant time and energy toward attracting members of the opposite sex, and because successfully attracting a partner holds significant adaptive value, competitiveness among same-sex peers during this developmental period can be expected (Gallup et al., 2011). In the present study, we tested the hypothesis that aggression would positively predict adolescents' dating status at follow-up (one year later; H1). We also expected that adolescent victimization would negatively predict having a dating partner at follow-up (H2) and that these effects would remain significant in light of necessary control variables. Specifically, when testing H1 and H2 we controlled for initial (Time 1) dating status, as well as Time 1 physical attractiveness and peer-perceived popularity, all of which are known to relate to desirability to the opposite sex and/or to dating related behaviors (Ha, Overbeek, and Engels, 2010).

Adolescent peer aggression and victimization are typically measured using self-report methods, although it has been argued that peer-reports are superior to self-reports

(and teacher reports) for the assessment of aggression (see Crick, Casas, and Mosher, 1997 for review). Researchers have levied concerns that some youth may have difficulty understanding self-report questions, recalling emotionally sensitive information, and self-reporting bullying behavior honestly, without inflating or minimizing their actual involvement (see Cornell and Bandyopadhyay, 2010). Yet regarding victimization, Juvonen, Nishina, and Graham (2001) noted that "…self-reports should be relied upon because it is children themselves who are in the best position to know whether they are victimized" (pp. 105-106). Accordingly, we elected to use both peer-reports of direct aggression, indirect aggression, and peer-victimization, along with self-reports of bullying perpetration and victimization.

Materials and Methods

Participants

Participants were 350 adolescents in grades 6 – 9 (*M* age = 12.5 years, *SD* = 1.00) at Time 1. An approximately equal percentage of boys (49.2%) and girls (50.8%) participated in the study. As some participants were likely to be dating one-another (a potential violation of independence) we asked participants to also indicate who they were dating.[1] Participants were recruited from five elementary schools and one high school located in a small Canadian town. Parental consent was obtained for those individuals who had agreed to participate in the study. The participation rate was 97% of the entire student population. At Time 2, 89% of the students from the original sample participated (attrition rate = 40 students). The sample was reduced because some participants had moved, were absent on the day of data collection, had parents who did not give their consent, declined to take part, or did not complete the questionnaires correctly. We found no significant differences regarding Time 1 study variables between those who did versus did not continue on with the study through Time 2.

Sociometric Ratings of Aggression, Victimization, Attractiveness, and Peer-Perceived Popularity

A revised class play procedure (Masten, Morison, and Pellegrini, 1985) was used to obtain peer-nominations of (a) overt/direct aggression, (b) indirect aggression, and (c) physical attractiveness and peer-perceived popularity. The Revised Class Play is a psychometrically valid procedure in which students were asked to list an unlimited number of their same-sex and opposite-sex peers in their class (grades 6 and 7) or grade (grades 8 and 9) who exemplified the descriptions. Participants were given a roster with names of consent students (child and parent consent) and were told they could only nominate students on these rosters. Each indicator was then standardized by class (grades 6-7) or grade (grades 8-9) in order to account for variation in group sizes.

[1] Twenty of the 350 participants were dating another participant at Time 1 (10 couples). In order to determine whether these pairings violated assumptions of independence, we also ran our analysis without these participants in the sample. Results did not vary from those reported.

Three items comprised the direct aggression subscale: "Who threatens other people to get their way?", "Who starts fights and arguments with others?", and "Who hits others?" which were internally consistent (α = .88). The indirect aggression subscale was comprised of the following four items: "Who spreads mean rumors about someone to get others to stop liking the person?", "Who will make someone feel bad or look bad by making a face, or turning away, or rolling their eyes?", "Who tells others to stop liking a person to get even with them?", and "Who tries to control or dominate a person by keeping them out of the group?" which were internally consistent (α = .86). Victimization included 10 items: "Who has trouble making friends?", "Who often gets left out of things?", "Who is easy to push around?", "Who cannot get others to listen?", "Who would rather be alone than be with others?", "Who do people make fun of?", "Who does not like to take part in what others are doing?", "Who gets their feelings hurt easily?", "Who gets picked on by others?" and "Who gets hit and pushed by others?" (α = .95). Attractiveness was measured using the item "Who is good looking or attractive?" and peer-perceived popularity was measured using the item "Who are the most popular people in your grade?" Note that this measure is distinct from sociometric ratings of *social preference*, whereby students would nominate who they like, or with whom they prefer to be friends, whereas peer-perceived popularity is an indication of a child's visibility and influence in the hierarchy regardless of sociometric liking (see Vaillancourt and Hymel, 2006).

Self-Reports of Bullying and Victimization.

A 5-item self-report measure of bullying and bully-victimization behavior was used (Olweus, 1999). The self-report bullying measure consisted of the following two items: "How often have you taken part in bullying other students this semester?" and "About how many times have you taken part in bullying other students at school during the past week?" The inter-item correlation was r = .68. The victimization scale consisted of the following three items: "How often have you been bullied in school?", "How often have you been bullied by being left out and you end up being alone at recess?" and "About how many times have you been bullied at school during the past week?" The victimization scale was internally consistent (α = .77). Because each item used different response options along a 5-point Likert-type scale, we standardized each item in order to align the metric.

Dating Status

Because dating status is a variable that may be less obvious to peers in the classroom (i.e., if an adolescent was dating a student at another school, if an adolescent was keeping his/her relationship a secret, etc.) we used a self-reported of dating status at both Time 1 and Time 2. Participants answered 'yes' or 'no' the question "Are you going out with someone now?" Respondents who checked 'yes' were coded with a 1, and participants who checked 'no' were coded with a 0.

Results

Descriptive Statistics

We first ran a series of *t*-tests exploring potential sex differences among our

variables of interest. We found that girls (M = 0.26 SE = 0.23) were more likely to be nominated by their peers as perpetrators of indirect aggression than were boys (M = -0.60, SE = 0.14), t(1, 309) = 4.50, p < 0.001, d = 0.49, whereas boys (M= 0.53 SE = 0.51) were more likely to be nominated as perpetrators of direct aggression than were girls (M = -1.34 SE = 0.29), t(1, 308) = -3.20, p < 0.01, d = -0.36. We therefore considered interactions between sex and aggression in our analyses. Results from a one-way ANOVA showed that participants differed by grade on Time 2 dating such that grade 9 students were more likely to have entered into dating relationships compared to every other grade, F(3, 277) = 11.60, p < 0.001. Given these results, we controlled for participant age in all subsequent analyses. Students did not differ significantly by grade on any other variable.

Table 1 presents descriptive statistics and inter-correlations for each of the study variables. We found that participant attractiveness (r = .18, p < .01) and peer-perceived popularity (r = .16, p < .01) correlated with having a dating partner at Time 2. As hypothesized, higher use of indirect aggression at Time 1 was associated with having a dating partner at Time 2, (r = .25, p < .01). Time 1 physical aggression was correlated with Time 1 dating (r = .20, p < .01) but not Time 2 dating, (r = .06, ns). Self-reported victimization did not correlate significantly with Time 2 dating (r = -.10, ns), although the trend was in the hypothesized direction.

Table 1. Descriptive statistics and bivariate correlations among variables

	M / SD	1	2	3	4	5	6	7	8	9	10
1. Participant Age	12 / 1.00	-------									
2. Participant Sex	----------	.01									
3. T1 Dating	----------	-.15**	-.06								
4. T2 Dating	----------	.28**	-.05	.12							
5. T1 Attractiveness	0.02 / 0.10	.01	-.07	.15*	.18**						
6. T1 Peer Perceived Popularity	0.03 / 0.10	.00	-.08	.20**	.16**	.80**					
7. T1 PR Indirect Aggression	-0.16 / 1.80	-.02	-.24**	.16**	.25**	.18**	.25**				
8. T1 PR Physical Aggression	0.43 / 4.20	.05	.18**	.20**	.06	.24**	.34**	.46**			
9. T1 SR Bully	0.01 / 0.91	.13*	.16**	-.06	.08	-.01	-.06	.00	-.02		
10. T1 PR Victim	-0.04 / 2.20	-.06	.14*	.02	.06	-.15**	-.17**	.09	.11	-.05	
11. T1 SR Victim	0.01 / 0.82	.00	.12*	-.11	-.10	-.04	-.04	-.05	.04	.20**	.15*

Note: T1 = Time 1, T2 = Time 2, SR = Self-report, PR = Peer-report; *p < .05 (two-tailed), **p < .01 (two-tailed)

Longitudinal Analysis

As the criterion variable was dichotomous (dating versus not dating), a binary logistic regression was used to model participants' dating status at Time 2. We tested each of our hypotheses simultaneously. Participants' age, sex, physical attractiveness, social status scores, and Time 1 dating status were entered as control variables on Step 1 along with our mean-centered predictors: indirect aggression, direct aggression, and self-reported bullying perpetration, peer-reported victimization, and self-reported victimization. In order to determine whether sex moderated the relationships between our predictors and Time 2 dating status, we also entered five corresponding sex-by-predictor interaction terms on Step

2 (see table 2). Goodness of model fit is reported using the Hosmer and Lemeshow chi-square (where a non-significant chi-square represents adequate fit).

Table 2. Longitudinal effects of aggression and victimization on dating status at follow-up

	B	*S.E.*	Wald	Exp (*B*)	95% CI EXP (*B*)	
					Lower	Upper
Step One						
Participant Age	0.47*	0.21	5.13	1.60	1.07	2.40
Participant Sex	-0.09	0.24	0.14	0.92	0.57	1.46
SR T1 Dating Status	0.60	0.46	1.74	1.80	0.75	4.45
PR T1 Physical Attractiveness	0.34	0.32	1.13	1.40	0.75	2.59
PR T1 Popularity	0.25	0.34	0.55	1.28	0.66	2.48
PR T1 Indirect Aggression	0.40**	0.15	7.35	1.50	1.18	1.99
PR T1 Physical Aggression	-0.11	0.07	2.90	0.90	0.79	1.02
SR T1 Bully Perpetration	0.14	0.22	0.40	1.15	0.75	1.76
PR T1Victimization	0.12	0.11	1.13	1.12	0.91	1.40
SR T1 Bully Victimization	-0.87**	0.34	6.81	0.42	0.22	0.80
Step Two						
PR T1 Attractiveness X Sex	-0.06	0.32	0.04	0.94	0.50	1.76
PR T1 Popularity X Sex	-0.02	0.35	0.01	0.98	0.50	1.94
PR T1 Indirect Agg. X Sex	-0.16	0.14	1.19	0.86	0.65	1.13
PR T1 Physical Agg. X Sex	0.15*	0.06	5.78	1.17	1.03	1.32
SR T1 Bully Perp. X Sex	-0.06	0.22	0.09	0.94	0.61	1.44
PR T1 Victimization X Sex	-0.09	0.11	0.66	0.91	0.74	1.14
SR T1 Bully Victim X Sex	-0.21	0.34	0.38	0.81	0.42	1.57

Note: SR = Self-report, PR = Peer-report, T1 = Time 1; *$p < .05$ (two-tailed), **$p < .01$ (two-tailed)

In logistic regression, the variance of a dichotomous criterion depends on the frequency distribution of that variable. For this reason, there is no universally-conventional analog to the R^2 derived from OLS regression. Rather, a number of logistic R^2 indices have been proffered as approximations to OLS R^2. To this end we report Nagelkerke's R^2 along with the logistic classification scores. At the predictor level, we report unstandardized coefficients and the corresponding odds ratios Exp(*B*). Our results indicated that our model provided good fit to the data, Hosmer and Lemeshow $\chi^2(8, N = 266) = 7.32$, p = ns. At Step 1, the prediction success (classification) rate was 84%, Nagelkerke pseudo $R^2 = .25$, and at Step 2 (interactions with sex) the prediction success (classification) rate was 82%, Nagelkerke pseudo $R^2 = .29$.

Age, Social Status, Attractiveness, and Future Dating Status

Of our control variables, we found that age ($B = 0.47$, $p < .01$) significantly predicted Time 2 dating, consistent with the results reported above. For every year increase

in age, participants were 1.60 times more likely to be in a dating relationship at Time 2 than were younger participants, controlling for all other variables in the model. We did not find an effect for Time 1 dating status, peer-perceived popularity, or peer-perceived physical attractiveness.

Aggression and Future Dating Status

In support of our first hypothesis, indirect aggression significantly predicted individuals' dating status at Time 2, (B = 0.40, p < .001, Exp(B) = 1.50). We did not find a significant sex X indirect aggression interaction, suggesting that indirect aggression predicts later dating status for both boys and girls. Contrary to our initial prediction, we did not find an overall effect for peer-perceived physical aggression (B = -0.11, ns) or self-reported bullying (B = 0.14, ns) on Time 2 dating status. However, we did find a significant physical aggression X sex interaction. To further explore the physical aggression X sex interaction, we re-examined our model dummy-coding for sex. We found that for girls, physical aggression had no effect on dating status (B = 0.04, ns). For boys, physical aggression negatively predicted Time 2 dating status (B = -0.26, p < .01). This finding was contrary to our initial prediction that direct physical aggression would be a male-typical competitive strategy beneficial to later dating status.

Victimization and Future Dating Status

Within the same regression equation we concurrently tested our second hypothesis that peer-victimization would negatively predict having a dating partner at follow-up. Although at the bivariate level the negative link between self-reported victimization and dating status was not significant, we did find support for H1 at the multivariate level. Specifically, we found that self-reported experiences with being bullied negatively predicted Time 2 dating, (B = -0.87, p < .01, Exp(B) = 0.42). We did not find a significant interaction by sex. We found that peer-nominated victimization did not predict Time 2 dating outcomes, above and beyond our controls; nor was there a significant interaction.

Discussion

Successful intrasexual competition hinges upon rendering oneself more desirable to members of the opposite sex by causing rivals to be less appealing and/or enhancing one's own appeal (Buss and Dedden, 1990). The use of aggression has been proposed to be a natural expression of dominance that is likely to impose costs upon rivals and, ultimately, to benefit the perpetrator with more access to dating opportunities (Gallup et al., 2011). In testing our first hypothesis that aggressiveness would predict dating status at follow-up, we did not find the expected positive relationship between boys' perpetration of direct aggression and subsequent dating status. This finding is similar to that of Gallup et al. (2011), who also failed to find physical aggression as a factor beneficial to men's dating and sexual behavior. Perhaps this finding can be explained by the differential perceptions of males and females with regard to just how attractive male violence is. Recent research has found that men misunderstand what women prefer with respect to physical aggression. For instance, Vandello, Ransom, Hettinger, and Askew (2009) found that men believed

women prefer (find more attractive) a man who responds to intrasexual conflict aggressively. In reality, women reported a strong preference for a non-aggressive response. Moreover, Vandello et al. (2009) found that men who over-perceived women's support of physical aggression were more likely to report having used aggression in real life.

If females prefer males who are not physically aggressive during interpersonal conflict, then we might actually expect this behaviour to be unrelated or negatively related to dating status. Indeed, when we explored the weighted effects of sex we found that for boys, the perpetration of physical aggression at Time 1 negatively predicted having a dating partner at Time 2. In modern human society, direct aggression is negatively sanctioned in order to promote within-group cohesiveness. This likely represents a drastic shift from the longstanding mammalian trend for aggression to enhance reproductive success. It seems logical that the evolved tendency to aggress directly for reproductive opportunity has become vestigial in group-based societal living conditions, and is now often counterproductive (as shown by the results of the present study). As noted by Buss and Shackelford (1997), "The hypothesis that aggression sometimes serves the adaptive function of status elevation does not imply that this strategy works in all groups" (p. 610). One interesting hypothesis as to why some females find males' intrasexual violence to be unattractive is that it may be a particularly salient cue to the violent male's willingness to engage in intimate partner violence. Ozer, Tschann, Pasch, and Flores (2004) found that men who were aggressive toward peers were also more aggressive toward their dating partners (peer-aggressive boys engaged in more sexual aggression and dating violence). Like intrasexual violence, partner violence is also used as a strategy for thwarting someone else's reproductive strategy (in this case a romantic partners) when it conflicts with one's own.

Indeed it has generally been shown that the use of physical aggression predicts peer-rejection (Newcomb, Bukowski, and Pattee, 1993) and that such links may be circular, whereby greater rejection also predicts later physical aggression (Zimmer-Gembeck, Geiger, and Crick, 2005). However, physical aggression is not always maladaptive. Beyond the simplistic link between physical aggression and rejection, a key distinction may lie in the circumstances surrounding an adolescent boy's physical aggression, which is, in and of itself, a complex and multi-faceted construct (e.g., Little, Henrich, Jones, and Hawley, 2003). Angry and impulsive outbursts in the face of provocation are labeled *reactive aggression*, whereas goal-directed, predatory aggression that does not hinge on provocation is termed *proactive aggression* (Barker, Tremblay, Nagin, Vitaro, and Lacourse, 2006). Studies have shown that proactive aggression relates to peer-perceived popularity and social dominance (Hawley, 2003; Rodkin, Farmer, Pearl, and Van Acker, 2000), and reactive aggression is linked to peer-rejection (Card and Little, 2006). The peer-report measures of direct aggression in the present study do not specify whether the aggression served a proactive or reactive function. Thus, future research aimed at understanding links between aggression and reproductively-relevant variables may benefit from considering the moderating roles of reactive versus proactive aggression.

Perhaps if boys' violence toward peers functions as an indicator of risk for partner violence, we would expect girls to avoid selecting violent boys as dating partners. This is an interesting avenue for future researchers to undertake. For instance, female participants

might be exposed to the same scenario employed by Vandello et al. (2009) in which a male violently confronts another male. Researchers might then have females rate their fearfulness of the male, their beliefs that he would be more controlling/dominant in a romantic relationship, and their interested in dating him. Future research could further explore individual differences in females' attraction to intrasexually-aggressive males; identifying which factors predict a female's interest in a "bad boy."

In support of H1 we found a positive significant relationship between Time 1 indirect aggression and Time 2 dating status, controlling for all other predictors. The use of indirect aggression can decrease the social standing and perceived desirability of intrasexual competitors (Fisher and Cox, 2009; Vaillancourt and Hymel, 2006). Presumably, this action might grant the aggressor greater access to desirable dating partners. In line with this hypothesis, our findings suggest that indirect aggression perpetration can ultimately benefit the individual in terms of having a dating partner.

In support of our second hypothesis, results showed that for both boys and girls, self-perceived peer-victimization predicted not having a dating partner at follow-up. Perhaps the low status associated with victimization makes these individuals less appealing to members of the opposite sex (Vaillancourt, 2005). Peer victimization likely reduces the social standing of the target (e.g., spreading rumors about promiscuity; Buss and Dedden, 1990; Leenaars et al., 2008), and some victims might remove themselves from competition altogether for fear of being further victimized, or because of the negative symptoms associated with their victimization, such as depression or social anxiety renders them unable to compete (Vaillancourt, 2005). Peer victimization might also deter others from seeking to date the victims out of fear of being victimized themselves. If victims are socializing less with other students (both same and cross-sex students) then the opportunity to establish such relationships will be lessened. It follows that other non-victimized individuals ought to be more desirable within the social hierarchy.

Our findings contribute to and build upon the existing cross-sectional literature on adolescent sexual (White, Gallup, and Gallup, 2010) and dating behavior (Gallup et al., 2011) by showing that regardless of initial dating status, physical attractiveness, and peer-perceived popularity, indirectly aggressive adolescents were significantly more likely to have a future dating partner, whereas bullied adolescents were significantly less likely to have a future dating partner. Taken together, our findings support the hypothesis that peer-aggression during adolescence may fulfill the dyadic function of benefiting one's own adaptive fitness outcomes and detracting or deterring the fitness of intrasexual competitors (Buss and Dedden, 1990; Gallup et al., 2011).

Limitations and Future Directions

The present study supports evolutionary hypotheses of adolescent peer-aggression by showing longitudinal relationships between victimization, aggression, and dating status. However, there are limitations that may be addressed by future research. Although dating activity has been a focus of evolutionary theories of adolescent aggression and victimization (Gallup et al., 2011; Pellegrini and Long, 2003), some researchers have also examined the onset of sexual activity. For instance, historically, males who could gain sexual access to a number of females would have been more reproductively successful

(Campbell, 1999). If aggression can assist males in gaining sexual access to females, or if victimization can limit it, then the evolutionary hypothesis of aggression as a form of intrasexual competition would be further supported. Gallup et al. (2009) showed that male victimization in adolescence was negatively correlated with lifetime number of sex partners as well as the number of sex partners per year. Access to multiple sex partners has been linked to male reproductive success (Jokela et al., 2010). Our study was limited in the reproductively relevant outcomes examined. We did not collect information on adolescent sexual activity (e.g., have they had sexual intercourse, onset of first sexual encounter, and/or number of sex partners). Furthermore, the span of dating outcomes was limited in the present study and did not assess the range of potential dating activities or the amount of time spent with the opposite sex. Future longitudinal research might consider variables such as participation in and degree of sexual activity, number of sexual partners, as well as the length of both sexual and dating relationships.

We also recognize that while in this and other studies the constructs of bullying, indirect aggression, and peer-victimization (typically combined direct and indirect aggression) have been examined in relation to dating outcomes (Connolly et al., 2000), sexually coercive aggression has generally been neglected. Evolutionary theories suggest that sexually coercive behaviors may have evolved in part due to benefits to reproductive fitness (e.g., Goetz and Shackelford, 2006). The prevalence of such acts during adolescence (Jackson, Cram, and Seymour, 2000) suggests that future research in this area should consider the role of sexually-aggressive acts during this developmental timeframe.

Our study employed age as a control variable, presuming that as children gain pubertal maturity they will also become more interested in affiliating with the opposite sex. It is possible that both aggression and reproductively-relevant behaviors are instead a function of this pubertal development. Future research ought to consider a more comprehensive measure of pubertal development as a control or as a potential moderator to this relationship, perhaps through self-report ratings of the Tanner stages (e.g., Brooks-Gunn, Warren, Rosso, and Gargiulo, 1987). However, the relationship between puberty, hormones, and aggression is in and of itself complex. For instance, while testosterone relates to social dominance, it is inversely related to aggression in adolescent boys (Schall, Tremblay, Soussignan, and Susman, 1996).

Conclusion

A number of researchers have proposed that adolescent peer-aggression may be an expression of competition for reproductive opportunity. However, existing research on the issue has been cross-sectional in nature, precluding any directional conclusions about the relationship between aggression, victimization, and dating behavior. We conducted a longitudinal study examining if peer-aggression predicted future dating while controlling for a number of relevant demographic (age, sex) and individual-level (physical attractiveness, peer-perceived popularity) factors. We found evidence that victimization related to a lack of a dating partner at follow-up, whereas perpetrating indirect aggression (but not physical or bullying) predicted having a dating partner at follow-up. This finding suggests that indirect aggression may have evolved as a behavioral strategy to benefit reproductive viability. The growing body of literature supporting this theory should compel

researchers and educators to consider the potential ultimate causes of adolescent aggression in developing their intervention strategies.

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