

# Adolescent Bullying, Dating, and Mating: Testing an Evolutionary Hypothesis

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## Abstract

Traditionally believed to be the result of maladaptive development, bullying perpetration is increasingly being viewed as a potentially adaptive behavior. We were interested in determining whether adolescents who bully others enjoy a key evolutionary benefit: increased dating and mating (sexual) opportunities. This hypothesis was tested in two independent samples consisting of 334 adolescents and 144 university students. The data partly supported our prediction that bullying, but not victimization, would predict dating behavior. The data for sexual behavior more clearly supported our hypothesis that bullying behavior predicts an increase in sexual opportunities even when accounting for age, sex, and self-reports of attractiveness, likeability, and peer victimization. These results are generally congruent with the hypothesis that bullying perpetration is, at least in part, an evolutionary adaptive behavior.

## Keywords

bullying, evolution, dating, sex, sexual behavior

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## Introduction

Bullying is a behavior that appears to peak in adolescence, estimated to directly affect hundreds of millions of adolescents each year, worldwide (Volk, Craig, Boyce, & King, 2006). Examples of adolescent bullying are found in historical texts (Hsiung, 2005), among hunter-gatherers (Briggs, 1970), hunter-horticulturalists (Chagnon, 1983), and appears in every modern society in which it has been measured (Craig et al., 2009). In fact, the pervasiveness of bullying has led to suggestions that bullying (as opposed to victimization or bully victimization) is, at least in part, influenced by evolutionary mental adaptations (Kolbert & Crothers, 2003; Volk, Camilleri, Dane, & Marini, 2012). Indeed, Volk, Dane, and Marini (2014) outline further evidence for the adaptive nature of bullying behavior and propose that bullying be defined as a goal-oriented behavior that has theoretically evolutionarily adaptive roots. One such goal may be to increase one's dating and mating (sex) opportunities. Unfortunately, relatively little is known about the link between bullying and dating and sexual behavior among adolescents. We therefore sought to review the evidence for bullying as a potentially adaptive behavior prior to turning our attention to dating and sexual behavior. We then

present two studies that explore the potentially adaptive link between bullying perpetration (i.e., bullying) adolescent dating and sexual behavior.

## *Bullying as an Adaptive Behavior*

A behavioral genetics study calculated that 61% of the variability in bullying perpetration was due to genetic rather than environmental factors (Ball et al., 2008). Bullying is also significantly correlated with behavior traits known to have a significant genetic component, such as personality and temperament (Book, Volk, & Hosker, 2012; Farrell, Della

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Cioppa, Volk, & Book, 2014; Lewis & Bates, 2014; Marini, Dane, & Kennedy, 2010; Saudino & Micalizzi, 2015). These data do not suggest that an adaptive behavior (such as bullying) is purely genetically determined or that the most important factor in predicting bullying is genetics (Tooby & Cosmides, 1990). Rather, these data offer support the idea that there exist sufficient genetic linkages and individual variation to have allowed for natural and/or sexual selection to evolve facultative mental predispositions that, in combination with the right environmental cues, can result in behavior such as bullying (Ellis et al., 2012). That is, the presumably conditional nature of bullying relies on the right confluence of internal and external ecological factors (Hong & Espelage, 2012). We have predicted that bullying is associated with at least three benefits, reputation, resources, and reproduction, all of which are likely to be associated with passing on one's genes to future generations (Volk et al., 2014).

To begin with, bullies are perceived as being more popular than adolescents who do not bully others (Caravita, Di Blasio, & Salmivalli, 2010; de Bruyn, Cillessen, & Wissinck, 2010; Estell, Farmer, & Cairns, 2007; Salmivalli, 2010; Vaillancourt, Hymel, & McDougall, 2003; Veenstra, Lindenberg, Muniksma, & Dijkstra, 2010). They are also ranked as being more socially dominant (Vaillancourt et al., 2003). Moreover, a recent longitudinal study found that, over time, high levels of bullying were highly positively related to high social status as indexed by perceived popularity (Reijntjes et al., 2013). This study also demonstrated that bullies appeared to maintain modest to high levels of likeability among their peers, in contrast with previous literature (e.g., Salmivalli, 2010). Overall, effect sizes in the above-cited literature for dominance-related measures range from medium to large, suggesting that bullying is a potential path to gaining a powerful social reputation.

Although a dominant social reputation is the best studied benefit of bullying, there are other benefits to bullying that have been noted in the literature. Bullies can also gain access to greater economic (e.g., Flanagan, 2007) or physical resources (Turnbull, 1972). Under intense survival conditions, bullying for food access can be a matter of life or death (e.g., Turnbull, 1972). When compared to adolescents not involved with bullying, teens who bully others show as good or better mental health (Volk et al., 2006), physical health (Juvonen, Graham, & Schuster, 2003), and social skills (Garandeau, & Cillessen, 2006), including leadership (Vaillancourt et al., 2003). This is in stark contrast to victims of bullies and especially bully victims who show poorer mental and physical health than adolescents not involved in bullying, particularly once family and childhood risk factors have been taken into account (Grandeau & Cillessen, 2006; Shakoor et al., 2012; Wolke & Lereya, 2015).

Finally, as we have suggested, bullies may also benefit from having more mating success (Volk et al., 2012, 2014). Given that the selective regime used by evolution is whether a gene increases or decreases in frequency, reproduction is a key evolutionary variable (Dawkins, 1989). Thus, an important question for determining whether bullying is an evolutionarily

adaptive is whether or not it is associated with increased mating success. Prior to addressing this question, we briefly review the literature on adolescent dating and sexual behavior.

### *Adolescent Dating and Sexual Behavior*

Adolescence is a period of change that is greatly influenced by the development of sexual characteristics and sexual behavior (Baams, Dubas, Overbeek, & van Aken, 2015). It is not surprising therefore that adolescence is generally the period when most individuals begin to date and/or have sex. Dating is the most common expression of adolescents' newly developed interest in romantic relationships, with the normative mean age of onset for dyadic dating being approximately 13, and about 80% of adolescents reporting having had a date prior to graduating high school (Connolly, Nguyen, Pepler, Craig, & Jiang, 2013; Zimmer-Gembeck, 2002). Across several studies, 13% to 35% of youth have had sexual intercourse by the end of eighth grade (~13 years of age), and approximately 75% have had a sexual experience prior to leaving high school (Alan Guttmacher Institute, 2002; Zimmer-Gembeck & Helfand, 2008). Furthermore, dating is likely to afford opportunities for sexual behavior (Zimmer-Gembeck & Helfand, 2008). It is important to note that there is a wide individual variability in sexual behavior among adolescents in terms of both initial onset and frequency (Connolly, Craig, Goldberg, & Pepler, 2004; Zimmer-Gembeck, 2002).

In general, dating is a normative adolescent behavior that has significant links to adolescent development and psychosocial well-being (Collins, 2003). For many adolescents, dating is associated with positive outcomes for the individual and their social standing (Kuttler & LaGreca, 2004). However, there is also a potentially darker side to dating. It can be associated with an increase in victimization and violence at the hand of dating partners (Wekerle & Wolfe, 1999). It may also expose individuals to increased aggression from other adolescents who view the victim as a competitor (Leenaars, Dane, & Marini, 2008; Vaillancourt, 2013). What's more, initial research has demonstrated that the early onset of dating behavior can be associated with maladaptive psychosocial outcomes (Zimmer-Gembeck, Siebenbruner, & Collins, 2001). However, more recent research reveals a more nuanced picture, whereby the match between an individual's goals and behavior plays an important role in the strength and valence of social outcomes (Kelly, Zimmer-Gembeck, & Boislard-P, 2012). Many adolescents express goal-oriented desires related to dating and sexual satisfaction and report positive psychosocial outcomes related to pursuing these goals (Kelly et al., 2012). Interestingly, this same study found a positive link between social status seeking and sexual (but not dating) behavior (Kelly et al., 2012). As previously mentioned, status and sex are two goals that are also believed to be outcomes associated with bullying behavior (Volk et al., 2014). This suggests that perhaps there may be common goals that link some adolescents' desire to bully others (i.e., gain status) and their desire to have sex.

## ***Bullying, Dating, and Sexual Behavior***

Although the link between general aggression and dating/sex has been relatively well explored (Archer, 2009; Basile, Espelage, Rivers, McMahon, & Simon, 2009; Bjorklund & Hawley, 2014; Buss & Shackelford, 1997; Lalumière & Quinsey, 1996; Pellegrini, 2001; Pellegrini & Long, 2003; Wekerle & Wolfe, 1999; White, Gallup, & Gallup, 2010), few studies have examined the links between dating/sex and bullying specifically. Bullying is a special case of aggression that is primarily differentiated on the basis of power (Olweus, 1994; Vaillancourt et al., 2010; Volk et al., 2014; Ybarra, Espelage, & Mitchell, 2014). Specifically, individuals who bully are more powerful than their victims, who in turn have difficulty defending themselves (Vaillancourt et al., 2003), whereas individuals who employ general aggression are not necessarily more powerful than those they attack (Hawley, Stump, & Ratliff, 2010). From an evolutionary perspective, there are many potential reasons why bullies should enjoy increased reproductive benefits. Bullies generally elevated social and physical attributes may offer a signal of good genes (Vaillancourt et al., 2003; Volk et al., 2012). Furthermore, their social dominance and ability to control resources are also likely to be reasons why bullies appear more attractive to partners than nonbullies as a signal that they could provide for and protect their partner and potential offspring (Buss, 1988; Volk et al., 2012). In addition, the confluence of increased bullying (Volk et al., 2006) and dating (Zimmer-Gembeck, 2002) during adolescence may help explain why antibullying interventions often fail to work (or are iatrogenic) among older adolescents. They fail because they do not address the novel, sexually motivated goals of adolescents that foster new forms and goals of competition that are generally absent among younger children (Volk et al., 2014; Yeager, Fong, Lee, & Espelage, 2015).

In one of only a few studies to directly measure bullying and dating, Connolly, Pepler, Craig, and Taradash (2000) found that bullying (in both sexes) was associated with an earlier entrance into puberty and dating at a younger age, more activity with members of the opposite sex, greater dating opportunities, and being more likely to be in a dating relationship. However, Arnocky and Vaillancourt (2012) recently reported that while peer-reported indirect aggression was associated with increased reports of dating, self-reported bullying was not associated with any increase in reported dating. Peer-reported bullying was not examined in this study, although in most studies, peer reports of physical and indirect aggression correlated with peer reports of bullying at .50–.80 (e.g., Vaillancourt et al., 2003). Nevertheless, results from Arnocky and Vaillancourt's study raises some doubt about the link between bullying and reproductive success given that self-identified bullies did not report higher dating levels.

To the best of our knowledge, there are currently no studies that measure bullying in conjunction with reported sexual behavior. Although dating is an important variable relating to sexual behavior (Zimmer-Gembeck & Helfland, 2008), it represents an indirect proxy of evolutionary reproductive success.

Reports of sexual behavior may still be indirect as they do not directly measure number of viable offspring, but they are likely to be more strongly correlated with ultimate reproductive success than dating variables (Gangestad & Simpson, 2000).

## ***Current Study***

Given the aforementioned limitations, we conducted two studies in which the relation between bullying behavior and both dating and sexual behavior were examined in a sample of younger adolescents and a sample of older adolescents. Consistent with most of the previous literature on aggression, we predicted that dating and sexual behavior would be significantly related to bullying. We predicted that bullies would report higher levels of dating and sexual activity. We were also interested in the effects of bullying when compared to other known correlates of dating and sexual behavior such as attractiveness (Walster, Aronson, Abrahams, & Rottmans, 1966) or popularity (Hansen, 1977; Pellegrini & Long, 2003). Although both are positively related to dating (Arnocky & Vaillancourt, 2012), we predicted that bullying would still independently predict dating and bullying.

Given the lack of evidence for sex differences, as well as the lack of sex differences in previous literature (Connolly, Pepler, Craig, & Taradash, 2000), we used participants' sex as a control variable without any specific *a priori* predictions.

## ***Material and Method***

Because the two studies generally relied upon similar methodologies, we present them in a unified methods and results. However, we believe that the underlying differences between the samples are large enough for us to not combine the data into a single analysis yet still small enough to make a single presentation more parsimonious.

### ***Participants***

**Study 1.** A total of 334 adolescents (174 boys and 160 girls) between the ages of 11 and 18 ( $M = 13.6$ ,  $SD = 1.3$ ) involved in extracurricular athletic (e.g., hockey and gymnastics) or youth clubs (e.g., church youth groups, pathfinders/guides) from across Southern Ontario participated in the present study. The sample was primarily Caucasian (Caucasian 86%; 12% Asian; and 2% Black) and reported as belonging to the middle-class (63.8% middle class; 10.2% lower-class and 26% upper-class).

**Study 2.** A total of 143 first-year university students (39 men and 104 women) from an Ontario university were recruited under the condition that in the past year they had graduated from high school (age  $M = 18.55$ ,  $SD = 1.21$ ). The sample was primarily Caucasian (Caucasian 75%; 8% Asian; 6% Black; and 10% other) and middle-class (middle-class 58%; 20% lower class; and 22% upper class).

## Measures

Participants were asked to provide information on demographics, followed by questionnaires pertaining to social relationships in school and their primary organization or athletic group (the latter were used for a study of athletes' personal relationships).

**Bullying and victimization.** Participants filled out a bullying questionnaire regarding their school-based bullying behavior (adapted from Volk & Lagzdins, 2009). To measure victimization and bullying, respectively, participants were asked to rate their behavior associated with physical, verbal, social, cyber, and sexual bullying. For example, participants were asked "How often have you been hit, kicked, or punched by someone who was much stronger or more popular than you?" or "How often have you hit, kicked, or punched someone who was much weaker or less popular than you?" or "How often have you made sexual jokes, comments, or gestures aimed at someone much weaker or less popular last term?" Participants could answer with one of the five frequencies: not at all, only a few times this year, every month, every week, or many times a week. The scales showed good reliability for bullying ( $\alpha = .72$ ) and victimization ( $\alpha = .75$ ). These questions were phrased in the past tense ("Overall, how often did you hit, kick, or punch . . . ") for Study 2. The scales showed similar reliability (bullying  $\alpha = .75$  and victimization  $\alpha = .77$ ).

## Dating and sexual behavior

In both studies, participant dating behavior was assessed with the same set of several questions. Participants were first asked to rate how interested they were in dating on a Likert-type scale of 1–3 corresponding to *not very*, *somewhat*, or *very interested*. Participants then answered if they had started dating, and if so, at what age, and with how many different partners. To measure sexual behavior, participants were asked whether they had voluntary sexual activity of any kind since the age of 12 (see Tolman & McClelland, 2011, for a review of adolescent sexual behavior). If yes, they then answered at what age they first had sex and how many sexual partners they had.

**Self-reported likeability.** In both studies, likeability was assessed using an item from the Strengths and Difficulties Questionnaire (2001) that asked participants whether the following statement was not true, somewhat true, or certainly true: "Other people my age like me." Goodman's factor analysis (2001) suggested that the "likeability" item was less strongly related to the other items in the general peer relations factor, providing justification for our using it separately from other peer items (that include confounding factors for our study such as victimization).

**Self-perceived attractiveness.** In both studies, we measured self-perceived physical attractiveness by asking participants how physically attractive they felt on a scale of 1 (*lowest*) to 10 (*highest*).

## Procedure

**Study 1.** Local extracurricular organizations were contacted through existing connections with the researchers and through phone or e-mail solicitations. Adult extracurricular supervisors were briefed and asked to provide written consent to approach their adolescent participants. Researchers then visited participating clubs to brief participants about the study and its methods. To reduce participant bias, participants were told it was a study of peer relationships. Participants were given two envelopes to bring home. The first envelope contained a parental letter of information and consent. The second envelope contained a participant letter of assent and the questionnaires, which they completed in private, at a time of their choosing. Both parental consent and participant assent were required. Parents were asked to not discuss the study prior to its completion to avoid biasing their child's answers and to ensure confidentiality. Participants were protected from any personal liability associated with their answers, and participation was voluntary with no penalty for withdrawing.

At a predetermined date, the participants returned their forms and received a verbal debriefing. After this debriefing, participants were asked to complete a second assent form because of the incomplete initial briefing. The participants then received \$15 for their participation.

**Study 2.** Participants were recruited through the use of posters as well as the introductory psychology research participant program. Participants were brought to the lab where they were briefed, asked to give consent, and then fill out the various materials. Upon completion, participants were debriefed and given 1.0 credits (1% grade increase) for the participant pool or \$10. The methods of both studies were approved by a university research ethics board.

## Results

All analyses were conducted using SPSS 22's bootstrap analysis option, each bootstrap being performed with 1,000 iterations. To begin with, we examined the zero-order correlations. Given the ordinal or nominal nature of most of the data, we used Spearman's correlations to determine the relations between the variables (see Tables 1 and 2).

In both studies, victimization was modestly, positively correlated with bullying and number of dating partners. In Study 1, victimization was negatively associated with age of first dating and positively associated with having had sex. In Study 2, victimization was positively correlated with number of sexual partners and negatively correlated with self-perceived likeability.

In both studies, bullying was significantly positively correlated with having dated, number of dating partners, having had sexual activity, and number of sexual partners. In Study 1, it was positively associated with an interest in dating, and in Study 2, it was positively associated with self-perceived attractiveness and negatively associated with age of first sexual

**Table 1.** Study 1 Spearman Correlations for Victimization, Bullying, and Dating/Mating Variables.

	2	3	4	5	6	7	8	9	10	11
1	<b>.36*</b>	.06	-.10	-.16*	<b>.15*</b>	<b>.14*</b>	.15	.12	-.11	-.03
2	—	<b>.17*</b>	<b>.23*</b>	-.14	<b>.28*</b>	<b>.21*</b>	-.02	<b>.24*</b>	.03	-.03
3		—	<b>.45*</b>	-.06	<b>.42*</b>	<b>.23*</b>	.23	<b>.26*</b>	.10	.00
4			—	.06	<b>.75*</b>	<b>.32*</b>	-.04	<b>.34*</b>	<b>.15*</b>	-.05
5				—	-.62*	.11	<b>.45*</b>	.03	-.02	.02
6					—	<b>.31*</b>	-.17	<b>.42*</b>	<b>.14*</b>	-.02
7						—	-.20	<b>.79*</b>	.09	.06
8							—	-.32*	-.11	.04
9								—	.12	.04
10									—	<b>.21*</b>

Note. Overall victimization frequency:

1. Overall bullying frequency
2. Interest in dating
3. Have dated or not
4. Age of first dating
5. Number of dating partners
6. Have sexual experience or not
7. Age of first sexual experience
8. Number of sexual partners
9. Physical attractiveness
10. Likeability

\* $p < .05$ . Significant values are bolded.

**Table 2.** Study 2 Spearman Correlations for Victimization, Bullying, and Dating/Mating Variables.

	2	3	4	5	6	7	8	9	10	11
1	<b>.36*</b>	.09	-.03	-.08	<b>.23*</b>	-.11	.12	<b>.18**</b>	-.03	-.14*
2	—	.06	<b>.23*</b>	-.10	<b>.28**</b>	<b>.27**</b>	-.27**	<b>.23**</b>	<b>.15*</b>	-.05
3		—	-.09	.04	<b>.14*</b>	-.05	.01	-.03	.07	.05
4			—	.09	<b>.43**</b>	<b>.45**</b>	.02	<b>.17*</b>	-.11	<b>.18*</b>
5				—	-.36**	.09	<b>.39**</b>	-.20**	-.19**	.05
6					—	<b>.43**</b>	-.08	<b>.35**</b>	<b>.21**</b>	<b>.18*</b>
7						—	.15	<b>.51**</b>	<b>.33**</b>	<b>.23**</b>
8							—	-.37**	-.03	.05
9								—	<b>.18**</b>	.06
10									—	.04

Note. Overall victimization frequency:

1. Overall bullying frequency
2. Interest in dating
3. Have dated or not
4. Age of first dating
5. Number of dating partners
6. Have sexual experience or not
7. Age of first sexual experience
8. Number of sexual partners
9. Physical attractiveness
10. Likeability

\* $p < .05$ . \*\* $p < .01$ . Significant values are bolded.

experience. The only significant sex differences among the victimization and bullying correlations were that in Study 1, the association between bullying and dating interests was stronger for girls ( $r_s = .28$ ) than for boys ( $r_s = .03$ ;  $z = 2.59$ ,  $p < .05$ ), and in Study 2, the association between bullying and number of dating partners was stronger for women ( $r_s = .50$ ) than for men ( $r_s = .13$ ;  $z = 1.69$ ,  $p < .05$ ).

There were different patterns of correlations among the remaining variables between the two studies. Attractiveness

was positively related to having dated, number of dating partners, and self-perceived likeability in Study 1, while in Study 2, attractiveness was positively associated with bullying, number of dating partners, having had sex, and number of sexual partners, as well as being negatively correlated with age of first dating. In Study 1, likeability was only correlated with attractiveness, whereas in Study 2, it was negatively correlated with victimization and positively correlated with number of dating partners and having had sex.

Our second analysis focused on exploring the relation between a dimensional measure of bullying and victimization and having dated (dating experience) or having had sexual activity (sexual experience) while controlling for the potential influence of participants' sex, age, attractiveness, and likeability. For each of the two studies, we conducted two separate logistic regressions for having dated and for having had sexual activity. In the first step, we included age and sex, with bullying perpetration and peer victimization in Step 2, and attractiveness in Step 3. We present our results without likeability as the final step because likeability was not a significant multivariate predictor of dating or sexual behavior and its inclusion did not alter any of the patterns of our results. With that in mind, Table 3 shows that in Study 1, being younger, male, and attractive were related to having dated in the final model, while in Study 2, bullying was the only significant predictor in the second step of the model (the model was no longer significant once attractiveness was added).

Table 3 also shows that bullying was predictive of number of dating partners. In Study 1, it was only significant in the second step of the model (adding attractiveness lowered the significance of the model), whereas in Study 2, in the final step of the model, it was significant alongside attractiveness. In both studies, being older was a significant predictor of having had a sexual experience.

Our third analysis focused on exploring the relation between measures of bullying and victimization and number of dating or sexual partners while controlling for the potential influence of sex, age, and attractiveness (as again, likeability was not a significant multivariate factor in any of the analyses). This allowed us to test whether bullying predicted a quantitative relation with dating and sex as compared to the qualitative difference of having had dated/sexual experience or not. The hierarchical linear regression for Study 1 revealed that being male and being a victim were positive multivariate predictors of number of dating partners, with the final model explaining 14% of the variance. Interestingly, despite being a larger univariate predictor, bullying was not a significant multivariate predictor of number of dating partners. We ran a follow-up regression adding a fourth step testing for a Bullying  $\times$  Victim interaction, but no significant effect was found (we repeated this in all the other regressions with similar null results). In Study 2, being male, a bully, a victim, or attractive were all positive predictors of number of dating partners (combining to explain roughly 30% of the variance in the model). The data for number of sexual partners were more congruent between the two studies, with both final models revealing bullying to be a positive predictor of number of sexual partners (age was also a positive predictor in Study 1). The overall effect sizes were modest in both Studies 1 (19% of the variance) and 2 (10%) of the variance.

## Discussion

We predicted that as an evolutionarily adaptive behavior, bullying would be positively associated with dating and sexual

behavior. Our results offer mixed support for our hypothesized positive link between bullying and dating behavior but more clearly supported our hypothesized positive link between bullying and sexual behavior.

### *Bullying and Dating Behavior*

There were several significant univariate relations between bullying and dating, suggesting that bullying is related to an increased interest in dating (Study 1), an increased likelihood of having dated, and a greater number of dating partners. Although dating is a more distal indicator of reproductive success than sexual behavior, our univariate data nonetheless offer some supporting evidence regarding the potential role of bullying from an adaptive context. Our multivariate data are more mixed, as bullying was a significant predictor of having dated and number of dating partners in Study 2, but not Study 1.

We are therefore somewhat cautious regarding the data on dating and bullying, as the data are not entirely consistent across studies, particularly at the multivariate level. There were some interesting differences between the two studies that may lend some context to our results. The links we observed between age and dating/sexual activity in Study 1 were not surprising given that only a minority of our sample had actually engaged in dating (46%), a prevalence rate that is consistent with previous developmental research on adolescent dating (Connolly et al., 2013). Therefore, the young age of the participants in Study 1 made a positive correlation between age and sexual activity very likely and the strength of this relation likely accounted for most of the variance in the multivariate analyses. In contrast, the majority of participants in Study 2 had begun dating (82%), making age a less salient variable for this sample. Age may also have played a role in the link between victimization and number of dating partners as research has shown that early dating is in fact a risk factor for psychosocial well-being (Zimmer-Gembeck et al., 2001). It may be that during early adolescence, when dating is less normative, dating multiple partners triggers retaliatory same-sex aggression from peers who view the high dating individual as a sexual competitor worth targeting (Leenaars et al., 2008; Vaillancourt, 2013). In their experimental study of undergraduate women, Vaillancourt and Sharma (2011) found strong support for women's intolerance of female peers who were perceived to be sexually available. Another possibility is that individuals who have numerous dating partners at a young age are placing themselves in low-quality relationships that open themselves up to victimization from their partner and/or hinder their own psychological development to a point where they become targets for their peers (Connolly et al., 2000; Wekerle & Wolfe, 1999). These views promote a hypothesis of increased dating as the cause of victimization that is in contrast to, but can coexist with, a hypothesis that bullying causes increased dating. The difference between these two outcomes may rest on individual factors such as social dominance. For example, a dominant bully may be able to safely date frequently without being harassed while a subordinate peer might be victimized

**Table 3.** Study 1 and Study 2 Hierarchical Logistical Regressions Between Having Dated ( $N = 301$ ; 141) or Being Sexual Experienced ( $N = 292$ ; 141) and Bullying, Victimization, and Attractiveness.

Predictor	Dated or Not		Sexual Experience or Not	
	Model Chi-Square	Odds Ratio	Model Chi-Square	Odds Ratio
Step 1	<b>45.46**</b> ; <b>4.86*</b>		<b>57.73**</b> ; 2.56	
Age		<b>1.62**</b> ; <b>1.96*</b>		<b>2.94**</b> ; .93
Sex		<b>.37**</b> ; .72		.75; .47
Step 2	<b>16.10**</b> ; <b>7.17*</b>		<b>8.38*</b> ; <b>9.56**</b>	
Age		<b>1.62**</b> ; 1.88		<b>2.90**</b> ; .86
Sex		<b>.35**</b> ; .94		.73; .52
Bullying		<b>1.33*</b> ; <b>1.93*</b>		<b>1.27*</b> ; <b>1.77**</b>
Victimization		1.11; .95		1.08; 1.06
Step 3	<b>6.28*</b> ; 1.49		3.00; <b>9.18**</b>	
Age		<b>1.68**</b> ; 1.91		<b>3.04**</b> ; .90
Sex		<b>.40**</b> ; 1.10		.81; .63
Bullying		<b>1.32*</b> ; <b>1.85*</b>		<b>1.25*</b> ; <b>1.59*</b>
Victimization		1.12; .94		1.12; 1.10
Attractiveness		<b>1.21*</b> ; 1.22		1.22; <b>1.61**</b>

\* $p < .05$ . \*\* $p < .01$ . Significant values are bolded and Study 2 values are italicized.

for their attempts to date frequently. However, given the inconsistency of the findings across the studies, we are cautious in further interpretations of these data.

Attractiveness and likeability were more prominent predictors of dating and sexual behavior in Study 2, perhaps because of the importance of age as a predictor in our younger sample. Likeability was a significant univariate predictor in Study 2 only, and it was a significant multivariate predictor in neither. This suggests that likeability's associative variance is accounted for by other factors. The results for attractiveness suggest that it predicts having dated at a young age, but when dating may be more normative (i.e., at older ages in Study 2), it instead predicts number of dating partners. Being male was sometimes related to dating, as it significantly predicted having started dating in Study 1 (but not Study 2) and number of partners in Study 2 (but not Study 1).

Thus, with regard to dating, our results somewhat agree with past theoretical predictions (Volk et al., 2012), as well as with the data from Connolly et al. (2000), historical data (Volk et al., 2012), and accounts of general aggression and dating (Pellegrini & Long, 2003). Interestingly, our data also partly agree with the data reported by Arnocky and Vaillancourt (2012) who reported no link between self-reported bullying and whether one was currently dating or not. Our data suggest, at least at the multivariate level, bullying may be a relatively good predictor in some samples (older) but not others (younger). We believe this may be explained, in part, by the increased experience with dating in our older sample, as well as the somewhat variable potential definitions of dating. For example, dating could be interpreted to mean holding hands between classes, or going for coffee, or other similarly low-intensity behavior. Conversely, it could also mean living together, being in a long-term relationship, or being engaged to marry. The range of potential interpretations of dating, combined with our mixed findings and the mixed findings in the literature, suggest that

researchers need to be careful in explicitly measuring specific interpretations of dating and that age (as a proxy for experience with dating) needs to be considered. If our younger participants in Study 1 interpreted dating differently than our older participants in Study 2, or differently than did the participants in Connolly et al. (2000) or Arnocky and Vaillancourt (2012), this could account for the variability in the published data on bullying and dating, as might varying interpretations of bullying and its effects (e.g., physical vs social bullying).

### Bullying and Sexual Behavior

Across both studies, the univariate data revealed numerous correlations between bullying and sexual behavior. In both sets of logistic regressions, bullying was a statistically significant predictor of sexual behavior. The effect sizes suggest that bullying is a modest predictor of sexual behavior at the univariate level in both younger and older adolescents. Our data suggest that bullying is associated with a 1.5–2x greater likelihood of having had sexual intercourse (see Table 3). Bullying was also a small but statistically significant predictor of the number of sexual partners in both linear regressions (see Table 4). These findings, in two separate samples, offer converging support for our prediction that bullying would be related to sexual opportunities, independent of age, sex, self-reported attractiveness, victimization, and likeability. They suggest that the act of bullying itself, or some intrinsic character of bullies beyond those mentioned above, predispose and/or facilitate bullies' access to sexual opportunities. In particular, it is noteworthy that victimization had few univariate links with sexual behavior and was not a multivariate predictor in any of our regressions.

The link we observed between age and sexual activity in the logistic regression for Study 1 was not surprising, given the similar age-experience trends as was witnessed by our dating data. In Study 1, only 15% of the sample had experienced

**Table 4.** Study 1 and Study 2 Hierarchical Linear Regressions for Number of Dating Partners ( $N = 220$ ; 133) or Sexual Partners ( $N = 174$ ; 129) and Bullying, Victimization, and Attractiveness.

Predictor	Number of Dating Partners		Number of Sexual Partners	
	Study 1; Study 2	$b^*$	Study 1; Study 2	$b^*$
Step 1 ANOVA	<b>8.21**</b> ; <b>3.76*</b>		<b>14.20**</b> ; .18	
$\Delta r^2$	<b>.07*</b> ; <b>.06*</b>		<b>.14**</b> ; .00	
Age		-.13; .08		<b>.36**</b> ; .00
Sex		-.21**; -.21*		-.03; -.15
Step 2 ANOVA	<b>7.93**</b> ; <b>10.53**</b>		<b>8.73**</b> ; <b>2.67*</b>	
$\Delta r^2$	<b>.06*</b> ; <b>.19**</b>		<b>.03*</b> ; <b>.08**</b>	
Age		-.11; -.08		<b>.33**</b> ; -.01
Sex		-.23**; -.20*		-.02; -.05
Bullying		-.11; <b>.24**</b>		<b>.19*</b> ; <b>.26**</b>
Victimization		<b>.17*</b> ; <b>.27**</b>		n/a; .04
Step 3 ANOVA	<b>6.68**</b> ; <b>10.21**</b>		<b>7.78**</b> ; <b>2.60*</b>	
$\Delta r^2$	<b>.01</b> ; <b>.04**</b>		.02; .02	
Age		-.11; .10		<b>.33**</b> ; .01
Sex		<b>.22**</b> ; -.17*		.08; .00
Bullying		-.11; <b>.21*</b>		<b>.17*</b> ; <b>.25*</b>
Victimization		<b>.19*</b> ; <b>.27**</b>		-.02; .03
Attractiveness		.08; <b>.20**</b>		.14; .13
Total $r^2$	<b>.03</b> ; <b>.29**</b>		<b>.19**</b> ; <b>.10*</b>	

\* $p < .05$ . \*\* $p < .01$ . Significant values are bolded. Study 2 values are italicized.

sexual activity, while 74% of the participants in Study 2 had at least one sexual experience. The absence of age as a significant predictor in Study 2 suggests that the only stable predictor of sexual behavior in our two studies was bullying. There were patterns related to age and attractiveness, but they did not hold constant across both studies and/or regressions. This lends fairly reliable support to the unique importance of bullying as a positive predictor of sexual behavior and for the hypothesis that bullying may be (at least in part) a behavior designed to meet evolutionarily adaptive goals. In light of previous research illustrating a common link between motives for status seeking and sexual behavior (Kelly et al., 2012), bullying behavior may be a means to achieve both of these goals. Given that adolescence is a period in which dating and sexual behavior emerge, bullying and victimization peak in frequency, and social status has a heightened importance, adolescence may be a critical developmental context for studying and understanding bullying and victimization.

### Limitations

Although we view our results as making an important contribution to the bullying and evolutionary literature, there are several potential limitations to our study. One limitation of this study is that self-report data were used, particularly for bullying, which can be difficult to adequately define (e.g., Vaillancourt et al., 2008). However, previous studies have shown that self-report adolescent data on bullying can be valid (Pellegrini & Bartini, 2000) as can self-report adolescent data on sexual activity (Brener, Billy, & Grady, 2003) and likeability (Lease, Musgrove, & Axelrod, 2002). Furthermore, the bullying measure used in this study has

demonstrated good construct validity (Book et al., 2012). Thus, while we cannot eliminate the possibility that our results are due to biased self-reports, we do have a significant degree of confidence in their external validity. One exception may be for attractiveness, as self-reports of attractiveness are somewhat less reliable, particularly for males (Kościński, 2011). Certainly there are numerous instances of construct validity among the variables in our two studies that supports the more general validity of our self-report measures (see Tables 1 and 2), with the possible exception of our dating measures (as noted earlier). In particular, the fact that sexual behavior remained correlated across the two samples, despite wide differences in age and sexual experience, lends confidence to our findings.

Along with our good construct validity, and in accordance with suggestions by Podsakoff, MacKenzie, Lee, and Podsakoff (2003), our use of different response formats for different questionnaires, counterbalancing questionnaire orders, and protecting participant confidentiality reduce the likelihood of shared-method variation problems. Thus, while we cannot completely eliminate the possibilities of bias, social desirability, or common method variance due to the cross-sectional, self-report nature of the data (Lindell & Whitney, 2001), we are reasonably confident in the reliability and validity of our methods and measures.

A further limitation is that we did not assess the quality of the dating or sexual experiences. Thus we are unable to determine whether the more frequent dating and/or sexual opportunities result in an overall increase in fitness either through productive procreation or choosing quality mating partners. We also lack data on how individual pubertal status relates to our results.



## Conclusion

Bullying is an important social phenomenon that is estimated to affect hundreds of millions of adolescents worldwide. Researchers have recently proposed that bullying is in fact associated with, at least in part, evolutionary mental adaptations (Ellis et al., 2012; Volk et al., 2012, 2014). A critical prediction of that hypothesis is that bullying should be positively associated with reproductive opportunities and success. We present data illustrating that bullying, but not victimization, is associated with increased sexual behavior in young adolescents. The effects of bullying on sexual behavior appear to be generally independent of individual perceptions of attractiveness, likeability, age, and sex. We found several univariate and multivariate links between bullying and dating as well (especially among an older, more experienced sample), but the overall picture for our dating data is less clear (as it is in the general literature's data).

Taken together, results from the present study offer mixed, but generally positive, support for our hypothesis that bullying is an evolutionarily adaptive behavior. The links between bullying and dating/sexual outcomes are (for the most part) not simply a function of common variance with attractiveness and age or sex, although those variables do play a role in dating and sexual behavior. We appreciate that neither dating nor general sexual behavior are direct indicators of increased genetic fitness. But we argue that it is reasonable to assume that they are at least correlated with ancestral, if not actual, genetic fitness (Gangestad & Simpson, 2000). This is particularly true for sexual behavior, which also had the clearer link to bullying.

Although our data provide support to an evolutionary hypothesis of bullying, much work remains to be done to fully explore the relation between bullying and dating and/or mating behavior. Measures of quality, duration, and partner characteristics need to be collected, as do data regarding the potential costs and drawbacks that may moderate the link between bullying and dating or mating. These data should ideally be measured longitudinally. Bullying research may benefit from adding sexual behavior as both a cause and outcome of bullying, victimization, and social status. Unravelling the developmental and causal relations between these three factors may be of significant aid in understanding, and ultimately preventing, bullying.

In the meantime, bullying research and interventions should be increasingly cognizant of the fact that bullying may indeed be, at least in part, due to evolved mental adaptations that predispose some individuals to harm others to obtain personal goals (e.g., Garandeau, Lee, & Salmivalli, 2014). These goals may go beyond social dominance and extend specifically toward obtaining sexual partners. Sexual goals have largely been ignored in the bullying intervention literature (see Volk et al., 2012 for a review). This makes their inclusion a priority for interventions that attempt to alter the costs and/or benefits of bullying (e.g., KiVa, Garandeau et al., 2014). If bullying does indeed lead to an increase in sexual opportunities, it will no doubt be difficult to shift the behavioral patterns of

adolescents who enjoy such an outcome. Nevertheless, there may be more prosocial ways of obtaining sexual opportunities that are as successful, if not more so, than the antisocial methods of bullying. For both short- and long-term partners, both sexes report honesty and kindness as being highly desirable attributes in a partner (Stewart, Stinnett, & Rosenfeld, 2000), while Hawley (2003) reported that prosocial strategies are more popular than mixed prosocial/aggressive strategies. It may be that by teaching adolescents more profitable prosocial strategies, we can shift their behavior without altering their goals (Ellis et al., 2012).

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