



Published in final edited form as:

J Res Adolesc. 2009 September 1; 19(3): 380–400. doi:10.1111/j.1532-7795.2009.00593.x.

The Development of Four Types of Adolescent Dating Abuse and Selected Demographic Correlates

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Abstract

This study determined the shape of trajectories from ages 13 to 19 of four types of dating abuse perpetration and examined whether the demographic characteristics of sex, minority status, socioeconomic status, and family structure systematically explained variation in the trajectories. The data are from 5 waves of data collected from 973 adolescents participating in the control group of a randomized trial. The mean trajectory for psychological dating abuse was positive linear, but the mean trajectories were curvilinear for moderate physical, severe physical, and sexual dating abuse. At all ages, boys reported more severe physical and sexual dating abuse than girls, minorities reported more moderate and severe physical dating abuse than whites, adolescents in single-parent-households reported more psychological and severe physical dating abuse than those in two-parent-households, and parental education was negatively associated with psychological and moderate physical dating abuse perpetration. The findings have implications for future research and for practice.

Dating relationships play an important role in adolescent development by influencing identity development, providing social support, influencing development of secure attachment, facilitating partner sorting and selection, and influencing developmentally-appropriate transformations in family and peer relationships (Bouchey & Furman, 2003; Carver, Joyner, & Udry, 2003; Collins, 2003; Furman & Shaffer, 2003). For most adolescents, dating relationships facilitate healthy development (Furman & Shaffer, 2003), although for others, dating experiences may be detrimental. Between 9% and 12% of adolescents report being physically abused and 29% report being psychologically abused by dates in the previous year. In addition, between 4 and 14% report using forms of violence against dating partners that are likely to result in serious injury, such as hitting a partner with an object, beating up a partner, and using a knife or gun against a partner. From 1% to 13% of adolescents have been forced by a date to have sex, and from 15% to 77% of girls have been forced into other types of sexual activity by a date (For reviews of dating abuse prevalence see Foshee & Matthew, in press; Foshee, Reyes, & Wyckoff, in press).

Although there has been speculation that being involved in an abusive dating relationship can interfere with the developmental tasks of adolescents (Bouchey & Furman, 2003), no

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studies have empirically tested those assumptions. An initial step to understanding the developmental impact of dating abuse is to understand how dating abuse develops over the course of adolescence, suggesting the need to examine developmental trajectories of the behavior, which requires longitudinal data. To date, adolescent dating abuse research has been limited primarily to cross-sectional studies or to longitudinal studies with only two data collection points, precluding the investigation of dating abuse from a developmental perspective. Further, we know very little about how developmental trajectories of dating abuse vary by basic demographic characteristics.

In this study, random coefficient regression analysis, which is a subset of the mixed model that is useful for answering developmental research questions, will be used to address two study aims. The first aim is to determine the appropriate shape of the mean trajectories, from ages 13 to 19, of four types of dating abuse perpetration: moderate physical, severe physical, psychological, and sexual. Although these four types of dating abuse are inter-related in that they have been found to co-occur (Cano, Avery-Leaf, Cascardi, & O'Leary, 1998; O'Leary & Slep, 2003; Ozer, Tschann, Pasch, & Flores, 2004), variation in the prevalence for each suggests that they may develop differently. The second aim is to determine whether selected demographic characteristics, namely minority status, socioeconomic status, family structure, and sex are associated with the four trajectories. These four demographic variables have consistently been associated with trajectories of other types of aggression, particularly aggression against peers, yet no study has examined how minority status, socioeconomic status, or family structure influences developmental trajectories of dating abuse and only one has examined how sex influences dating abuse trajectories. We determine if individual differences in the development of each type of dating abuse relate systematically to the demographic characteristics (Curran, 2000).

Trajectories of Dating Abuse

Behavioral trajectories can be characterized by many different forms, including flat lines, positive and negative linear slopes, and positive and negative quadratic slopes. Prior studies provide conflicting evidence on which form best characterizes the development of dating abuse over the course of adolescence. Studies with two assessment points have found stability in dating abuse perpetration over time, suggesting that dating abuse may be best characterized by a flat line (Cano et al., 1998; Foshee, Benefield, Ennett, Bauman, & Suchindran, 2004; O'Leary & Slep, 2003). With only two time points and a limited time span between, however, these findings do not provide any information about underlying trajectories that develop as a continuous function of time. Based on multiple cross-sectional studies conducted with various age groups, O'Leary (1999) proposed that dating abuse increases steadily from ages 10 to 25, when it peaks and then declines, thus suggesting a quadratic pattern from late childhood through adulthood and a linear and positive pattern from early through late adolescence. However, individual developmental trajectories of dating abuse may follow an entirely different pattern than that suggested by repeated cross-sectional studies.

The only study that examined growth trajectories of adolescent dating abuse (Wolfe, Wekerle, Scott, Straatman, Grasley, & Reitzel-Jaffe, 2003) suggests still another pattern. In

that study, the mean trajectories for physical dating abuse and emotional dating abuse were characterized by negative linear slopes: a steady decrease in both types of perpetration from the first assessment (ages 14 to 16) to the seventh and final assessment (ages 16 to 18). However, trajectories were estimated by wave of assessment (with multiple ages included at each wave), rather than age, potentially masking important developmental patterns, and the findings from that study have limited generalizability because data from control and treatment groups were combined in analyses and the sample was limited to adolescents with a history of maltreatment. Further, the trajectories observed could have been influenced by substantial attrition that occurred after baseline.

More research has used random coefficient models to examine trajectories of aggression against peers (Bongers, Koot, van der Ende, & Verhulst, 2003; Farrell & Sullivan, 2004; Farrell, Sullivan, Esposito, Meyer, & Valois, 2005; Meeus, Branje, & Overbeek, 2004; Sampson, Morenoff, & Raudenbush, 2005). Because aggression against peers and dates are correlated (Andrews, Foster, Capaldi, & Hops, 2000; Capaldi, Dishion, Stoolmiller, & Yoerger, 2001), we draw on that literature, which suggests still another pattern of dating abuse development. Almost all of the studies that examined trajectories of aggression during adolescence and young adulthood found a curvilinear or negative quadratic relationship, with aggression increasing to a peak point and then declining. The peak age of aggression, however, differed across the studies with peak ages occurring at 17 (Sampson et al., 2005), between 15 and 17 (Meeus et al., 2004), and around age 13 (Farrell & Sullivan, 2004; Farrell et al., 2005).

The first aim of this study is to determine the appropriate shape of the mean trajectory of each of the four types of dating abuse from ages 13 to 19. If a negative quadratic relationship characterizes the data the best, then the peak age of each type of dating abuse perpetration will be determined.

Demographic Correlates of Dating Abuse Trajectories

The second aim of the study is to determine whether the demographic characteristics of minority status, socioeconomic status, family structure and sex systematically explain variation in trajectories of the four types of adolescent dating abuse.

Minority Status, Socioeconomic Status, and Family Structure and Dating Abuse Trajectories

Trajectory studies of non-dating aggression, generally find that minority status, socioeconomic status, and family structure influence the intercept (or initial level), with more aggression by minorities (Aber, Brown, & Jones, 2003; Sampson et al., 2005), adolescents of low socioeconomic status (Aber et al., 2003), and adolescents whose parents are not married (Sampson et al., 2005), but that these demographic characteristics do not influence the slope: That is, the form of the physical violence trajectory is the same for all sub-groups of adolescents with minority adolescents, adolescents of low socioeconomic status, and adolescents whose parents are not married reporting more aggression at all ages.

Because no prior study has examined the influence of minority status, socioeconomic status, or family structure on trajectories of adolescent dating abuse, we draw on the non-dating aggression literature to hypothesize that these three demographic characteristics are associated with the intercepts but not the slopes of the four types of dating abuse. Consistent with findings of non-dating aggression trajectories, at all ages we expect more of each type of dating abuse perpetration by minorities, adolescents of low socioeconomic status, and adolescents living in single parent households.

Sex Differences in Dating Abuse Trajectories

An examination of sex differences in adolescent dating and adult partner abuse perpetration has been a central focus of many studies. The findings from those studies suggest that the influence of sex on trajectories of dating abuse may vary depending on the type of dating abuse considered. Here, we elaborate on our expectations of how sex will influence trajectories of each of the four types of dating abuse.

During adolescence, sex differences in the prevalence of physical dating violence perpetration are pronounced with most studies reporting more perpetration by girls than boys, even when considering severe forms of dating violence (For reviews see Foshee & Matthew, in press; Foshee, Reyes, & Wyckoff, in press). However, based on a meta-analysis of 82 adult partner violence studies, Archer (2000) found that although women were more likely than men to report using acts of violence against their partners, those differences were very small. Further, women were significantly more likely than men to be injured by partners, suggesting that adult men are more likely than adult women to perpetrate severe forms of partner violence.

It is possible that adolescent girls are more likely than adolescent boys to use physical violence against their partners because of sex differences in negotiation styles. Studies have found that the strategies used with partners to express needs, desires, and wishes differ for males and females. Males tend to use direct strategies with partners such as overtly asking, stating, telling or discussing needs and desires (Falbo & Peplau, 1980), whereas females tend to use indirect strategies with partners such as negative or positive affect, hinting, or withdrawal (Falbo, 1982; Gryl, Stith, & Bird, 1991). Indirect strategies have been found to be less effective in getting what one wants from a partner than direct strategies (Lloyd, 1987). Scanzoni and Polonko (1980) suggest that when indirect methods of negotiation don't work people will resort out of frustration to more coercive strategies such as indirect aggression like psychological abuse or overt aggression like physical violence. Thus, adolescent girls may use violence out of frustration to communicate and connect and as a last resort after using other strategies. As adolescents become young adults, however, gender differences in physical size emerge and these differences may discourage the use of violence by girls, which may explain the smaller sex differences in partner abuse perpetration noted in adulthood.

In the only study to examine the association between sex and trajectories of dating abuse, Wolfe et al., (2003) found that sex influenced both the intercept and slope of physical dating violence perpetration; females reported more perpetration of physical dating violence than boys at all ages, but the significance of those differences decreased over time such that by

the final wave, when adolescents were ages 16 to 18, sex differences were no longer significant. However, important sex differences in the development of dating abuse could have been masked in this study because the measure of physical dating violence included assessments of mild, moderate, and severe dating violence combined, and as noted earlier trajectories were modeled by wave, with multiple ages assessed at each wave, rather than by age.

Based on the above findings, we hypothesize that when modeling moderate and severe physical dating violence trajectories from ages 13 to 19, as we do in this study, sex will influence both the intercept and the slope. We hypothesize that girls will report more moderate physical dating violence than boys at younger ages, but that sex differences will diminish over time. We further hypothesize that girls will report more severe physical dating violence than boys at younger ages, but that boys will report more severe physical dating violence than girls at older ages.

When considering psychological dating abuse, Wolfe and colleagues (2003) found that sex influenced the intercept, in that females reported more perpetration of psychological abuse than males, but not the slope: At all ages, females reported significantly more psychological dating abuse than males. A number of recent studies have found that female adolescents are more likely than male adolescents (Owens, Shute, & Slee, 2006) and female adults are more likely than male adults (Archer, 2004; Hess & Hagan, 2006) to use indirect forms of aggression. These findings may reflect the male and female differences in negotiation strategies described earlier. Whereas physical dating abuse by girls may be deterred as physical differences in size emerge in later adolescence and young adulthood, psychological abuse may not be deterred by such physical differences. Thus, we hypothesize that sex is associated with the intercept but not the slope of psychological dating abuse, such that girls report more psychological dating abuse than boys at all ages.

No studies have examined sex differences in trajectories of sexual dating violence perpetration, but point estimate studies consistently find that males perpetrate more sexual dating violence than females as adolescents (Bennett & Fineran, 1998; Foshee, 1996; Poitras & Lavoie, 1995) and adults (Tjaden & Thoennes, 2000). Thus, we hypothesize that sex is associated with the intercept but not the slope of sexual dating violence, such that boys report more sexual dating violence than girls at all ages.

Methods

Design

The analyses for this paper are limited to 973 adolescents who were in the control group of a randomized trial evaluating the effects of a dating abuse prevention program (Foshee, Bauman, Ennett, Suchindran, Benefield, & Linder, 2005). Eighty one percent of the 8th and 9th graders from 14 schools in a primarily rural county in North Carolina participated in the trial. The control group adolescents were from 7 schools and ranged in age from 13 to 15 years old at baseline. Prior analyses (Foshee, Bauman, Arriaga, Helms, Koch, & Linder, 1998) indicated that there were no significant differences in the treatment and control groups on baseline demographics (age, gender, race) and dating violence victimization and

perpetration. Follow-up data were collected 1 month (wave 2), 1 year (wave 3), 2 years (wave 4), and 3 years (wave 5) after the program was completed in the treatment group. Data were collected in schools from trained research staff. With five waves of data collection, the study spans ages 13 to 19 and age was centered at 13 years. Of the 973 adolescents in the analyses, 478 (49.13%) are boys, 782 (80.37%) are from two-parent households, and 724 (74.41%) are white. Of the 249 minority adolescents, 176 (70.68%) are black and the other 73 are Asian, American Indian, or mixed race adolescents.

Parents could provide consent for their child's participation by either signing an informed consent form or by verbally consenting over the telephone. Most parents provided written consent. Those who gave verbal consent were mailed a confirmation of consent letter that indicated the name of the parent that gave consent, the name of the research staff that conducted the telephone consent procedures, the date the telephone call was made, a copy of the consent form, and the telephone number of the research office for parents to call if any of the information was incorrect. Adolescents signed assent forms before each survey administration.

Measures

At each wave, four behavioral outcomes anchored to the previous year were measured. For each outcome, for descriptive purposes, we created a dichotomous variable at each wave to indicate the percent of adolescents who reported using a particular type of dating abuse in the previous year, and for the modeling, we created continuous composite variables for each type of dating abuse at each wave.

Psychological abuse perpetration was measured by asking the adolescent "During the last year, how often have you done the following things to someone you had a date with?" Fourteen acts were listed (e.g., "damaged something that belonged to them," "insulted them in front of others") and response options ranged from 0 for "never" to 3 for "very often" (Foshee, 1996). The dichotomous variable was created to indicate the percent of adolescents reporting the use of at least one of the fourteen psychologically abusive acts in the previous year. Responses to the fourteen items were summed to create the composite measure of psychological abuse perpetration (baseline alpha = .87).

Moderate physical, severe physical, and sexual dating violence perpetration were measured by asking "During the last year, how many times have you done the following things to a person that you had a date with? Only include when you did it to him/her first. In other words, don't count it if you did it in self-defense." Eighteen acts were listed and response options ranged from 0 for "never" to 3 for "10 or more times." Moderate physical dating violence included scratching, slapping, biting, pushing, grabbing, kicking, or shoving the partner, twisting the partner's arm, slamming the partner against the wall, bending back the partner's fingers, dumping them out of a car, and throwing something at the partner. The dichotomous moderate physical abuse variable was created to indicate the percent of adolescents reporting the use of at least one of these acts in the previous year. The responses to these items were summed to create the composite measure of moderate physical dating violence (baseline alpha = .93). Severe physical violence included choking, burning, or beating up a partner, hitting the partner with a fist or something else hard, and assaulting the

partner with a knife or weapon. The dichotomous severe physical abuse variable was created to indicate the percent of adolescents reporting the use of at least one of these acts in the previous year. Responses to these items were summed to create the composite measure of severe physical dating violence (baseline alpha = .92). Sexual perpetration included forcing someone to have sex or to do something else sexual that the partner did not want to do. The dichotomous sexual abuse variable was created to indicate the percent of adolescents reporting the use of at least one of these two acts in the previous year and the two items were summed to create the composite measure of sexual perpetration (baseline alpha = .95).

The demographic variables are sex, race, socioeconomic status, and family structure. Sex is coded 0 = male and 1 = female. Minority status is coded 0 = white and 1 = minority. Parental education, which has been found to be associated with other indicators of socioeconomic status among adolescents (Goodman, 1999) was used as a proxy for socioeconomic status. A time-varying parental education variable was created by taking the maximum of the mother and father's education at each wave with a value of 1 indicating that the parent had not completed high school, 2 indicating he/she completed high school but did not complete college, and 3 indicating that he/she completed college or more. The mean baseline parental education level is 2.45 (STD = .66). A time-varying family structure variable was coded with 0 = two-parent households (adoptive, biological, or step) and 1 = single-parent-households at each wave.

Data Analysis

To minimize attrition bias, multiple imputation procedures (Rubin, 1987) using PROC MI and PROC MIANALYZE in SAS Version 9.1 (SAS Institute, 2003) were used to fill in missing data. Five sets of imputations were specified. All models had relative efficiencies larger than .90 indicating that the number of imputations specified was sufficient for achieving stable parameter estimates (Horton & Lipsitz, 2001).

Random coefficient analyses using SAS PROC MIXED (SAS Institute, 2003) were used to address the study aims. All analyses specify two-level models, with time nested within individuals and control for clustering by schools. First, analyses were conducted to determine the shape of the trajectory for each outcome and identify the most appropriate random effects to specify in the models. The unconditional models included the variables "age" to test for linear patterns and "age-squared" to test for quadratic patterns of development. The fixed effects from these models were used to determine the mean shape of each trajectory. Goodness of fit indicators¹ were compared for four models with differing random effects.² Our goal was to identify a model with good fit in which all specified random effects could be estimated for all four outcomes. The best model fit was for the model specifying a random intercept only.

¹For each model tested, Akaike's Information Criterion (AIC), the Schwartz's Bayesian Criteria (SBC), and Restricted Log Likelihood (RLL) were examined. Because of using multiple imputation procedures, each model tested produced 5 AIC's, SBC's, and RLL's, one for each of the five imputations. The mean for each goodness of fit indicator across imputations was calculated. Models that fit better have smaller values on these statistics.

²Model 1 specified random effects for the intercept, linear slope (age), and quadratic slope (age-squared), and the co-variation between each of those terms; Model 2 similarly specified random effects for the intercept, linear slope, and the quadratic slope, but the co-variation parameters were set to 0; Model 3, specified random effects for the intercept only; Model 4 specified random effects for the linear slope (age) only; and Model 5 specified random effects for the quadratic slope (age-squared) only.

To assess the effect of the demographic variables on the trajectories of dating abuse, each of the four outcome variables was regressed on sex, minority status, the time-varying parental education and family structure variables, and age and age-squared, and the interaction of each demographic variable with age and age-squared.³ The interaction terms with the age variables test whether or not the demographic variables influence the slopes of the trajectory.

Two different backward elimination procedures were conducted, the first using two 4-degree-of-freedom-tests considering all the interactions with age-squared as the first group and all interactions with age as the second group. For the second approach, we conducted four 2-degree-of-freedom-tests considering each demographic-specific interaction as a group. For example sex by age, and sex by age-squared was one group. The terms retained in the final models were identical using both approaches. Condition numbers from collinearity testing were all well within guidelines of acceptability (Belsley, Kuh, & Welsch, 1980).

Results

Prevalence of Perpetration Types

For descriptive purposes only, Table 1 presents the prevalence of each perpetration type at each wave. At each wave, the most prevalent type of dating abuse perpetration is psychological abuse, followed by moderate physical dating abuse, then severe physical dating abuse, and finally sexual dating abuse perpetration.⁴

Trajectories of Dating Abuse

Table 2 presents the fixed effects for the unconditional models for each of the four outcomes. For moderate physical, severe physical, and sexual dating abuse perpetration, the quadratic slope is negative and statistically significant, indicating that the mean trajectory of each of these types of dating abuse is curvilinear, such that it increases to a certain peak age and then declines. The peak age of perpetration for each of these three outcomes was determined by maximizing the trajectory function. Because the peak is a non-linear function of the parameter estimates, a Taylor approximation was used (Sen & Singer, 1993) to compute the variance and associated 95% confidence interval. The peak age for moderate physical dating abuse perpetration was 17.1 years (SE = .81; CI = 15.50, 18.69); the peak age for severe physical dating abuse perpetration was 16.3 years (SE = .52; CI = 15.26, 17.28); and the peak age for sexual dating abuse perpetration was 16.3 years (SE = .57; CI = 15.22, 17.46). The quadratic slope for psychological dating abuse perpetration is not statistically significant, but the linear slope is positive and statistically significant, indicating that adolescents 13 to 19 years old, in general, increased their use of psychological dating abuse over time. The mean trajectories for each of the four outcomes are presented in Figure 1.

³The two-way interaction between sex and minority status and the three-way interactions between sex, minority status and the age variables when predicting each of the four outcomes were initially included because of the findings of Gutman & Eccles (2007) that sex by race interactions influenced both the intercepts and slopes of problematic outcomes. In our study none of these interactions were statistically significant and therefore they were dropped.

⁴Note that these prevalences do not map onto the random coefficient modeling because they are a) based on non-imputed data, b) presented by wave and not age, and c) based on the dichotomous not the continuous composite variable.

Demographic Correlates of Dating Abuse Trajectories

The results from the final models for testing the hypotheses related to demographic correlates of trajectories are presented in Table 3 (the conditional models).

Minority status, socioeconomic status, and family structure and dating abuse trajectories

We hypothesized that minority status, socioeconomic status and family structure would be associated with the intercepts but not the slopes of the four types of dating abuse and we expected to see more perpetration at each age by minorities, adolescents of lower socioeconomic status and adolescents living in single parent households. None of the interactions between the demographic characteristics and age or age-squared were statistically significant, and therefore they were dropped from the final models in Table 3. Thus, as hypothesized, none of these three demographic characteristics influenced the slopes of any of the dating abuse outcomes. The influences of these demographic variables on the intercepts, however, varied by dating abuse outcome. The findings related to each demographic variable are presented separately below.

Minority status is associated with the intercept of both moderate and severe physical dating abuse perpetration. At each age, minority adolescents have predicted means on moderate physical dating abuse perpetration that are 0.40 points higher than the predicted means for white adolescents, and predicted means on severe physical dating abuse perpetration that are 0.25 points higher than the predicted means for white adolescents. However, minority status is not associated with the intercepts for psychological dating abuse or sexual dating abuse perpetration. Thus, at all ages, white adolescents reported as much psychological dating abuse perpetration and sexual dating abuse perpetration as minority adolescents.⁵

Parental education is associated with the intercepts of psychological dating abuse and moderate physical dating abuse perpetration. At each age, adolescents with parents who did not complete high school had a predicted mean on psychological dating abuse that was 0.31 points higher than the predicted mean for adolescents with parents who completed high school (but who did not complete college). Likewise, adolescents with parents who completed high school but not college had a predicted mean on psychological dating abuse that was 0.31 points higher than the predicted mean for adolescents whose parents had completed college. Thus, there was a difference of 0.62 points in the predicted means on psychological dating abuse perpetration between adolescents whose parents never completed high school and adolescents whose parents were college graduates. As with psychological dating abuse perpetration, the predicted means for moderate physical dating abuse perpetration are lower with increasing parental education. However, parental education is not associated with serious physical and sexual dating abuse perpetration at any age.

Family structure is associated with the intercepts of psychological dating abuse and severe physical dating abuse perpetration. For each age, adolescents who lived in two-parent

⁵Follow-up analyses were conducted by limiting the sample to only white and black adolescents. The findings were the same, in that black adolescents reported more moderate and severe physical dating violence than white adolescents at all ages, and there were no differences between black and white adolescents in perpetration of psychological or sexual dating abuse at any age. There were too few minority adolescents who were not black to obtain stable parameter estimates in models comparing them to white adolescents.

households had a predicted mean on psychological dating abuse perpetration that was 0.82 points lower than the predicted means for adolescents who lived in single-parent households. At all ages, adolescents from single-parent households have predicted means on severe physical dating abuse perpetration that are 0.16 points higher than the predicted means for adolescents in two-parent households. However, family structure is not associated with moderate physical or sexual dating abuse perpetration at any age.

Sex differences in dating abuse trajectories

We hypothesized that sex would influence the intercept and the slope of moderate physical dating abuse and that girls would report more moderate physical dating violence than boys at younger ages, but that sex differences would diminish over time. However sex did not influence either the slope or the intercept of moderate physical dating abuse; there were no sex differences in moderate physical dating abuse perpetration at any age.

We hypothesized that sex would influence the intercept and the slope of severe physical dating abuse and that girls would report more severe physical dating violence than boys at younger ages, but that boys would report more severe physical dating violence than girls at later ages. Counter to what was hypothesized, sex did not influence the slope of severe physical dating abuse but it did influence the intercept. At all ages, the predicted means for severe physical dating abuse perpetration for girls is 0.16 points lower than the predicted mean for boys.

We hypothesized that sex would be associated with the intercept but not the slope of psychological dating abuse such that girls would report more psychological dating abuse than boys at all ages. However, sex did not influence the slope or intercept of psychological dating abuse; there were no sex differences in psychological dating abuse perpetration at any age.

As hypothesized, sex did not influence the slope of sexual dating abuse perpetration but it did influence the intercept and as predicted, at all ages, the predicted means for sexual dating abuse perpetration for girls is 0.14 points lower than the predicted mean for boys.

Discussion

Consistent with other studies of adolescents, psychological abuse is the most prevalent and sexual abuse is the least prevalent type of adolescent dating abuse (Foshee & Matthew, in press; Foshee, Reyes, & Wyckoff, in press). Also, as would be expected, the perpetration of moderate dating abuse perpetration is more prevalent than the perpetration of severe forms of dating abuse.

The first aim of this study was to determine the most appropriate shape of the mean trajectory of each of four types of dating abuse perpetration. From ages 13 to 19, the development of moderate physical, severe physical, and sexual dating abuse perpetration was best characterized by a curvilinear pattern, with peak ages of perpetration ranging from 16 to 17 years old. The exception to the quadratic pattern was psychological dating abuse perpetration which was best characterized by a positive linear slope.

The quadratic pattern of the three physical dating abuse trajectories (moderate physical, severe physical, and sexual) mirror Moffitt's (1993) adolescence-limited pattern of antisocial behavior development, which she describes as being the most common developmental pattern of antisocial behavior, and as being characterized by an acceleration of antisocial behavior followed by a deceleration, all during adolescence. According to Moffitt, the onset and deceleration of antisocial behaviors for this pattern are governed by the perceived reward structure for various behaviors at various points in adolescent development. Early adolescents participate in various deviant behaviors because those behaviors are perceived as adult-like and as leading to power and prestige. As the adolescent matures, there is greater awareness of the rewarding aspects of pro-social behaviors. The perceived importance of maintaining romantic relationships increases across adolescence (Brown, 1999; Connolly, Craig, Goldberg, & Pepler, 2004) and thus the negative impact on romantic relationships of using physical violence against dates may become more apparent as well, and that greater awareness may be responsible for the deceleration around ages 16 and 17 of physical dating violence. Perhaps psychological dating abuse does not desist during adolescence because the perceived negative consequences of that type of abuse on relationships are not as apparent. This is suggested by the fact that psychological partner abuse was the most prevalent type of dating abuse reported.

The second aim was to determine whether the four demographic variables systematically explain variation in the four dating abuse trajectories as hypothesized. As hypothesized, minority status, socioeconomic status, and family structure did not influence the slopes of any outcomes. Thus, the pattern of the development of each type of dating abuse was the same for all adolescents regardless of demographic sub-group. The hypotheses related to the influence of these variables on the intercepts, however, were only partially supported in that these demographics influenced the intercepts of some dating abuse outcomes but not others. Minority status influenced the intercepts for moderate and severe physical dating violence; parent education influenced the intercepts for psychological and moderate physical dating abuse; and family structure influenced the intercepts of psychological and severe physical dating abuse, all in the expected directions. By age 13, minority adolescents, adolescents whose parents had low education levels, and adolescents living in single family households were already perpetrating more of certain types of dating abuse than their demographic counterparts and that increased involvement in dating abuse perpetration remained throughout adolescence. Prior studies of adolescent dating abuse perpetration have tended to use a single dating abuse outcome that combines indicators of multiple types of dating abuse. Our findings suggest that that approach likely obscures important associations. Why demographic characteristics have differential effects depending on the type of dating abuse is unclear and requires further study.

Even though only one of the hypotheses related to the association between sex and trajectories of dating abuse was supported, our findings make important contributions to the gender debate in adolescent dating abuse research. The findings suggest that, as with the other demographic variables, sex does not influence the pattern of development of any of the types of dating abuse; the developmental trajectories for all four types of dating abuse perpetration are the same for males and females, suggesting that the reward and punishment systems for the use of dating abuse described earlier may be the same for males and females.

As noted earlier, the majority of adolescent dating abuse studies found that females reported more physical dating abuse perpetration than males, even when considering severe forms of dating abuse. The explanation usually given for those counterintuitive findings is that many of the acts reported by females are likely perpetrated in self-defense. However, because acts scales typically do not distinguish acts that are offensive from those that are in self-defense, researchers have had little evidence to support their suspicions. Using a measure that was designed specifically to rule out acts perpetrated in self-defense, we found that boys and girls perpetrated the same amount of moderate physical dating abuse at each age and that at all ages boys perpetrated more severe physical dating abuse, and as hypothesized, more sexual dating abuse than girls. Of course, it is possible that boys and girls have different definitions of self-defense that produce differences in reporting, but that assumption has not yet been tested empirically. Also, we found that boys and girls perpetrated the same amounts of psychological dating abuse at each age. By examining four different types of dating abuse, we uncovered important gender distinctions.

The findings can guide the development of dating abuse prevention efforts in a number of ways. An understanding of the typical pattern of the development of dating abuse informs prevention efforts by indicating developmental periods when programming should be initiated. From the graphs presented in Figure 1 it is clear that efforts at the primary prevention of all four types of dating abuse need to begin as early as 13 years old. That adolescents desist in their use of the three physical types of dating abuse around ages 16 or 17 suggests that those ages may be developmentally opportune times to initiate secondary dating abuse prevention interventions. The demographic results identified high risk groups to target for prevention of particular types of dating abuse.

The findings suggest many areas for future research that could guide the development of dating abuse prevention interventions. Identifying factors that predict the desistance in the three physical dating abuse types and determining why psychological abuse against dating partners does not desist during adolescence could inform the content of secondary dating abuse prevention efforts targeted at 16 to 17 year old adolescents. Demographic characteristics are generally considered to be markers of contextual factors that put people at high or low risk for negative outcomes (Sampson et al., 2005). An examination of the contextual factors that mediate the association between demographic characteristics and dating abuse trajectories could make substantial theoretical and practical contributions to dating abuse research because mediators are often amenable to change through intervention. Such research could inform interventions targeted at high risk groups based on demographic characteristics and could also contribute to understanding why demographic characteristics have differential effects depending on the type of dating abuse. The development of most types of dating abuse perpetration followed a pattern similar to the development of non-dating aggression found in other studies. The propositions of many theories of adolescent problem behaviors imply that adolescent problem behaviors develop similarly (for a review see Petraitis, Flay, & Miller, 1995). Thus, a direct comparison of the development of dating and non-dating aggression is indicated. Also, in this study we used random coefficient modeling to determine the shape of the *mean* trajectory of each type of dating abuse in this population. In future studies, a different approach called growth mixture modeling (Nagin & Tremblay, 2001) could be used to determine if for each outcome there are a number of

different types of trajectories representing different patterns of how dating abuse develops across adolescence represented in the data and to determine if demographic characteristics are related to membership into the different trajectory types.

The limitations of the study relate primarily to measurement. Self-reports of dating violence were used but the alternatives for measuring dating violence have severe limitations because adolescent dating violence is rarely witnessed by others, adolescents typically do not tell others about dating violence (Foshee et al., 1998), and dating violence rarely appears in the law enforcement system. Also, having measures of socioeconomic status in addition to parental education, such as parental income and occupational status would have been preferable. However, those dimensions of socioeconomic status were not tapped on the questionnaire because adolescents often do not know their parent's income and cannot make the distinctions required to code the status of parent jobs. However, parent education has been found to be strongly associated with other indicators of socioeconomic status among adolescents (Goodman, 1999). Also, the data did not allow for making distinctions in family structure that were finer than single-versus two-parent-households. And, the sample size was not large enough to make finer distinctions in race/ethnicity.

However, this study makes many unique contributions to adolescent dating abuse research. It is the first to identify developmental trajectories of multiple types of dating abuse in a general sample of adolescents and to determine how basic demographic characteristics influence trajectories of dating abuse. The association between each demographic variable and trajectories of dating abuse were examined controlling for the other demographics that could confound relationships. A measure of dating abuse was used that eliminated reports of dating abuse perpetrated in self-defense whereas most measures of adolescent dating abuse do not make that distinction. The findings from this study lay a foundation for future developmental research on adolescent dating abuse.

Acknowledgments

This study was funded by the Centers for Disease Control and Prevention, Cooperative Agreement Number U81/CCU409964. This study was reviewed and approved by The University of North Carolina, School of Public Health, Institutional Review Board for the Protection of Human Subjects. Active parental consent and adolescent assent were obtained from all study adolescents.

References

- Aber JL, Brown JL, Jones SM. Developmental trajectories toward violence in middle childhood: Course, demographic differences, and response to school-based intervention. *Developmental Psychology*. 2003; 39(2):324–348. [PubMed: 12661889]
- Andrews JA, Foster SL, Capaldi D, Hops H. Adolescent and family predictors of physical aggression, communication, and satisfaction in young adult couples: a prospective analysis. *Journal of Consulting and Clinical Psychology*. 2000; 68(2):195–208. [PubMed: 10780119]
- Archer J. Sex differences in aggression between heterosexual partners: A meta-analytic review. *Psychological Bulletin*. 2000; 126:651–680. [PubMed: 10989615]
- Archer J. Sex differences in aggression in real-world settings: A meta-analytic review. *Review of General Psychology*. 2004; 8(4):291–322.
- Belsley, DA.; Kuh, E.; Welsch, RE. *Regression Diagnostics*. New York: John Wiley & Sons, Inc; 1980.
- Bennett L, Fineran S. Sexual and severe physical violence among high school students—power beliefs, gender, and relationship. *American Journal of Orthopsychology*. 1998; 68:645–652.

- Bongers IL, Koot HM, van der Ende J, Verhulst FC. The normative development of child and adolescent problem behavior. *Journal of Abnormal Psychology*. 2003; 112(2):179–192. [PubMed: 12784827]
- Bouchey, H.; Furman, W. Dating and romantic relationships in adolescence. In: Adams, GR.; Berzonsky, M., editors. *The Blackwell Handbook of Adolescence*. Oxford, U.K.: Blackwell Publishers; 2003.
- Brown, BB. ‘You’re going out with who?’: Peer group influences on adolescent romantic relationships. In: Furman, W.; Brown, BB.; Feiring, C., editors. *The development of romantic relationships in adolescence*. New York: Cambridge University Press; 1999. p. 291-329.
- Cano A, Avery-Leaf S, Cascardi M, O’Leary KD. Dating violence in two high school samples: Discriminating variables. *Journal of Primary Prevention*. 1998; 18:431–446.
- Capaldi DM, Dishion TJ, Stoolmiller M, Yoerger KL. Aggression toward female partners by at-risk young men: The contribution of male adolescent friendships. *Developmental Psychology*. 2001; 37:673.
- Carver, K.; Joyner, K.; Udry, R. National estimates of adolescent romantic relationships. In: Florsheim, P., editor. *Adolescent Romantic Relations and Sexual Behavior: Theory, Research and Practical Implications*. Mahwah, NJ: Lawrence Erlbaum Associates; 2003.
- Collins W. More than myth: The developmental significance of romantic relationships during adolescence. *Journal of Research on Adolescence*. 2003; 13(1):1–24.
- Connolly J, Craig W, Goldberg A, Pepler D. Mixed-gender groups, dating, and romantic relationships in early adolescence. *Journal of Research on Adolescence*. 2004; 14(2):185–207.
- Curran, PJ. A latent curve framework for the study of developmental trajectories in adolescent substance use. In: Rose, JS.; Chassin, L.; Presson, CC.; Sherman, SJ., editors. *Multivariate applications in substance use research: New methods for new questions*. Mahwah, NJ: Lawrence Erlbaum Associates; 2000. p. 1-42.
- Falbo T. PAQ types and power strategies used in intimate relationships. *Psychology of Women Quarterly*. 1982; 6:399–405.
- Falbo T, Peplau L. Power strategies in intimate relationships. *Journal of Personality and Social Psychology*. 1980; 38:618–628.
- Farrell AD, Sullivan TN. Impact of witnessing violence on growth curves for problem behaviors among early adolescents in urban and rural settings. *Journal of Community Psychology*. 2004; 32(5):505–525.
- Farrell AD, Sullivan TN, Esposito LE, Meyer AL, Valois RF. A latent growth curve analysis of the structure of aggression, drug use, and delinquent behaviors and their interrelations over time in urban and rural adolescents. *Journal of Research on Adolescence*. 2005; 15(2):179–204.
- Foshee VA. Gender differences in adolescent dating abuse prevalence, types, and injuries. *Health Education Research*. 1996; 11:275–286.
- Foshee VA, Bauman KE, Arriaga XB, Helms RW, Koch GG, Linder GF. An evaluation of Safe Dates, an adolescent dating violence prevention program. *American Journal of Public Health*. 1998; 88:45–50. [PubMed: 9584032]
- Foshee VA, Bauman KE, Ennett ST, Suchindran C, Benefield T, Linder GF. Assessing the effects of the dating violence prevention program “Safe Dates” using random coefficient regression modeling. *Prevention Science*. 2005; 6(3):245–258. [PubMed: 16047088]
- Foshee VA, Benefield TS, Ennett ST, Bauman KE, Suchindran C. Longitudinal predictors of serious physical and sexual dating violence victimization during adolescence. *Preventive Medicine*. 2004; 39:1007–1016. [PubMed: 15475036]
- Foshee, VA.; Matthew, R. Adolescent dating abuse perpetration: A review of findings, methodological limitations, and suggestions for future research. In: Flannery, Daniel; Vazonsyi, Alexander; Waldman, I., editors. *The Cambridge Handbook of Violent Behavior and Aggression*. New York: Cambridge University Press; (in press)
- Foshee, VA.; Reyes, HL.; Wyckoff, SC. Approaches to preventing psychological, physical, and sexual partner abuse. In: O’Leary, Daniel; Woodin, Erica, editors. *Understanding Psychological and Physical Aggression in Couples: Existing Evidence and Clinical Implications*. Washington, D.C.: American Psychological Association; (in press)

- Furman, W.; Shaffer, L. The role of romantic relationships in adolescence. In: Florsheim, P., editor. *Adolescent romantic relations and sexual behavior: Theory, research and practical implications*. Mahwah, NJ: Laurence Erlbaum Associates; 2003.
- Goodman E. The role of socioeconomic status gradients in explaining differences in U.S. adolescents' health. *American Journal of Public Health*. 1999; 89(10):1522–1528. [PubMed: 10511834]
- Gryl F, Stith S, Bird G. Close dating relationships among college students: Differences by use of violence and by gender. *Journal of Social and Personal Relationships*. 1991; 8:243–264.
- Gutman LM, Eccles JS. Stage-environment fit during adolescence: Trajectories of family relations and adolescent outcomes. *Developmental Psychology*. 2007; 43(2):522–537. [PubMed: 17352557]
- Hess NH, Hagan EH. Sex differences in indirect aggression: Psychological evidence from young adults. *Evolution and Human Behavior*. 2006; 27:231–245.
- Horton NJ, Lipsitz SR. Multiple imputation in practice: Comparison of software packages for regression models with missing variables. *The American Statistician*. 2001; 55:244–254.
- Lloyd S. Conflict in premarital relationships: Differential perceptions of males and females. *Family Relations*. 1987; 36:290–294.
- Meeus W, Branje S, Overbeek GJ. Parents and partners in crime: A six-year longitudinal study on changes in supportive relationships and delinquency in adolescence and young adulthood. *Journal of Child Psychology and Psychiatry*. 2004; 45(7):1288–1298. [PubMed: 15335348]
- Moffitt TE. Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*. 1993; 100(4):674–701. [PubMed: 8255953]
- Nagin D, Tremblay R. Analyzing developmental trajectories of distinct but related behaviors: A group-based method. *Psychological Methods*. 2001; 6:18–34. [PubMed: 11285809]
- O'Leary KD. Developmental and affective issues in assessing and treating partner aggression. *Clinical Psychology: Science and Practice*. 1999; 6:400–414.
- O'Leary KD, Slep AS. A dyadic longitudinal model of adolescent dating aggression. *Journal of Child and Adolescent Psychology*. 2003; 32:314–327.
- Owens L, Shute R, Slee P. "I'm in and you're out...." Explanations for teenage girl's indirect aggression. *Psychology Evolution, and Gender*. 2006; 2:19–46.
- Ozer EJ, Tschann JM, Pasch LA, Flores E. Violence perpetration across peer and partner relationships: Co-occurrence and longitudinal patterns among adolescents. *Journal of Adolescent Health*. 2004; 34:64–71. [PubMed: 14706407]
- Petratis J, Flay BR, Miller TQ. Reviewing theories of adolescent substance use-organizing pieces of the puzzle. *Psychological Bulletin*. 1995; 117(1):67–86. [PubMed: 7870864]
- Poitras M, Lavoie F. A study of the prevalence of sexual coercion in adolescent heterosexual dating relationships in a Quebec sample. *Violence & Victims*. 1995; 10:299–313. [PubMed: 8703842]
- Rubin, DB. *Multiple imputation for non-response in surveys*. New York: Wiley; 1987.
- Sampson RJ, Morenoff JD, Raudenbush SW. Social anatomy of racial and ethnic disparities in violence. *American Journal of Public Health*. 2005; 95(2):224–232. [PubMed: 15671454]
- SAS Institute. *Statistical Analysis Software (SAS), Version 9.1* [computer program]. Cary, NC: SAS; 2003.
- Scanzoni J, Polonko K. A conceptual approach to explicit marital negotiation. *Journal of Marriage and the Family*. 1980; 42:31–44.
- Sen, PK.; Singer, JD. *Large sample methods in statistics: An introduction with applications*. New York: Chapman & Hall; 1993.
- Tjaden P, Thoennes N. Prevalence and consequences of male-to-female and female-to-male intimate partner violence as measured by the National Violence Against Women Survey. *Violence Against Women*. 2000; 6:142–161.
- Wolfe DA, Wekerle C, Scott K, Straatman AL, Grasley C, Reitzel-Jaffe D. Dating violence prevention with at-risk youth: A controlled outcome evaluation. *Journal of Consulting and Clinical Psychology*. 2003; 71:279–291. [PubMed: 12699022]

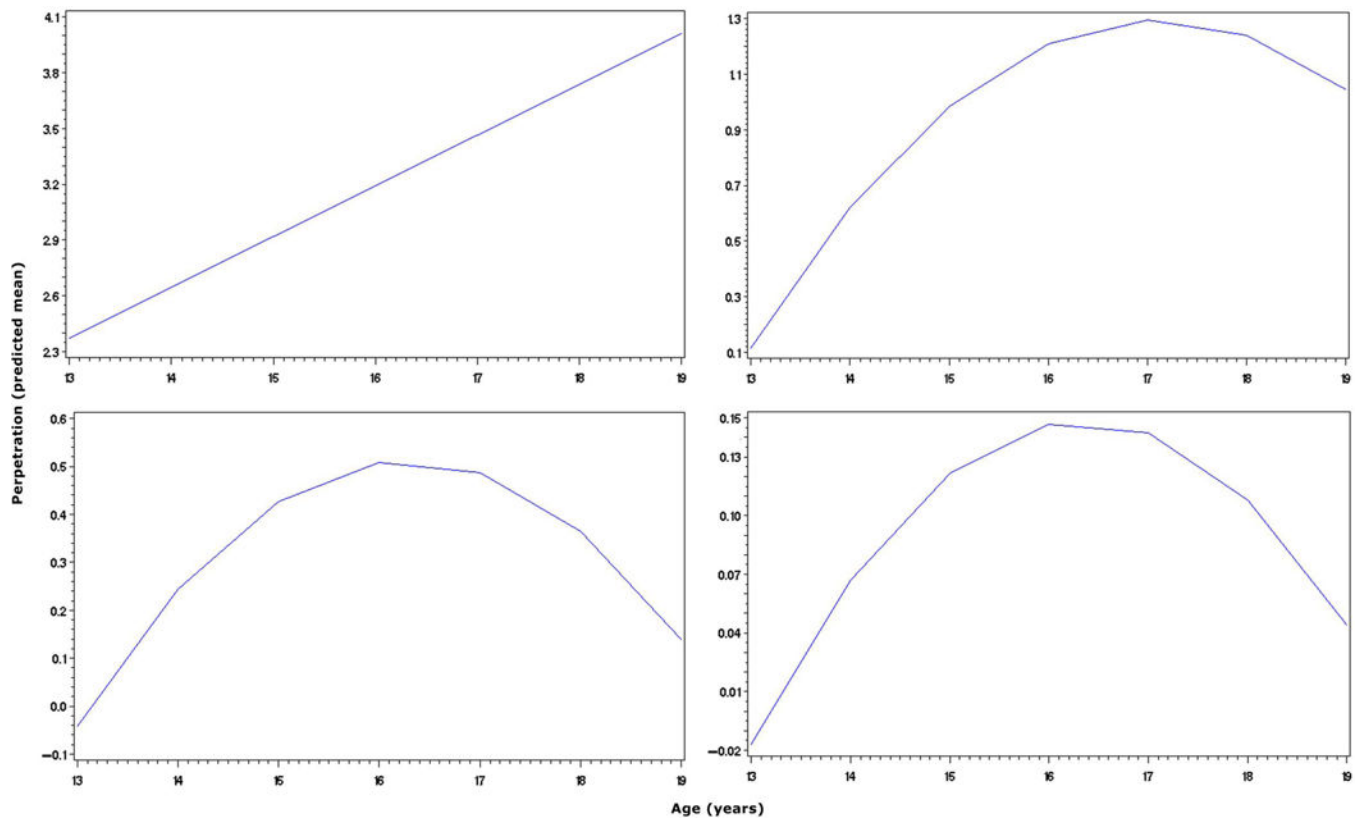


Figure 1. Trajectories of dating abuse perpetration. Psychological abuse perpetration (top left) was linear, and moderate physical (top right), severe physical (bottom left) and sexual abuse perpetration (bottom right) were quadratic.

Table 1

Prevalence of Perpetration by Wave and Type of Perpetration

Wave	Psychological dating abuse	Moderate physical dating abuse	Severe physical dating abuse	Sexual dating abuse
	n(%)	n(%)	n(%)	n(%)
Wave 1	404(42)	126(13)	47(5)	17(2)
Wave 2	377(42)	130(14)	64(7)	25(3)
Wave 3	370(43)	178(21)	74(9)	34(4)
Wave 4	232(43)	112(21)	51(9)	26(5)
Wave 5	265(47)	120(21)	42(7)	15(3)

Note. Prevalences are based on non-imputed data so available sample size varies by wave

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Table 2

Unconditional Models

Model term	Psychological dating abuse		Moderate physical dating abuse		Severe physical dating abuse		Sexual dating abuse	
	B	95% CI	B	95% CI	B	95% CI	B	95% CI
Intercept	2.372**	(1.862, 2.883)	0.116	(-0.286, 0.518)	-0.041	(-0.275, 0.194)	-0.017	(-0.098, 0.064)
Age	0.273*	(0.105, 0.040)	0.575**	(0.275, 0.874)	0.336**	(0.160, 0.512)	0.099**	(0.038, 0.160)
Age-squared	—	—	-0.070**	(-0.122, -0.018)	-0.051**	(-0.082, -0.021)	-0.015**	(-0.026, -0.004)

Note. CI = confidence interval.

* $p < .05$.

** $p < .01$.

Table 3

Reduced Conditional Models

Model term	Psychological dating abuse		Moderate physical dating abuse		Severe physical dating abuse		Sexual dating abuse	
	B	<u>95% CI</u>	B	<u>95% CI</u>	B	<u>95% CI</u>	B	<u>95% CI</u>
Intercept	2.257**	(1.192, 3.321)	0.206	(-0.302, 0.713)	0.103	(-0.185, 0.391)	0.070	(-0.028, 0.168)
Sex	0.167	(-0.370, 0.705)	0.020	(-0.272, 0.312)	-0.162*	(-0.317, -0.007)	-0.135**	(-0.188, -0.082)
Minority status	0.454	(-0.180, 1.087)	0.394*	(0.056, 0.732)	0.249**	(0.066, 0.432)	0.018	(-0.043, 0.080)
Parent education	-0.312*	(-0.565, -0.059)	-0.222**	(-0.392, -0.051)	-0.068	(-0.172, 0.036)	-0.032	(-0.065, 0.001)
Family structure	-0.819**	(-1.431, -0.207)	-0.264	(-0.548, 0.019)	-0.161*	(-0.325, 0.003)	-0.028	(-0.085, 0.028)
Age	0.763**	(0.120, 1.326)	0.572**	(0.269, 0.875)	0.336**	(0.160, 0.512)	0.098**	(0.037, 0.159)
Age-squared	-0.089	(-0.203, 0.025)	-0.070**	(-0.123, -0.017)	-0.052**	(-0.083, -0.021)	-0.015**	(-0.025, -0.004)

Note. CI = confidence interval.

* $p < .05$.

** $p < .01$.