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Abstract

Teen dating violence is a pervasive issue in adolescence and has been linked to maladjustment (Temple, Shorey, Fite, et al., 2013). Physical dating violence is a particularly significant problem with one in five adolescents reporting experiencing physical teen dating violence (TDV; Wincentak et al., 2016). Acceptance of violence has been suggested to increase the risk of TDV; however, most studies to date have been cross-sectional. The purpose of the current study is to examine patterns of acceptance of dating violence and TDV victimization across time. Participants were ethnically diverse teenagers (N = 1,042; ages 13 – 18) who were followed over a four-year period. Multivariate latent growth curve modeling techniques were used to determine trajectories of physical TDV victimization and attitudes accepting of dating violence. Results showed two trajectories for physical TDV victimization, linear and quadratic, and two trajectories for acceptance of dating violence, non-linear and quadratic. Parallel models investigating the interplay between TDV victimization and acceptance demonstrated two possible trends; however, we did not find any evidence for a longitudinal relationship between the two variables, suggesting that change in acceptance was not related to change in physical TDV victimization. Instead, our results suggest a significant amount of heterogeneity in these trajectories. These findings suggest studies are still needed to further explore longitudinal patterns of TDV to better understand how to reduce the risk of teen dating violence.

Changes in Acceptance of Dating Violence and Physical Dating Violence Victimization in a Longitudinal Study with Teens

Introduction

Teen dating violence (TDV) is common among adolescents (Wincentak, Connolly, & Card, 2016) and has been strongly associated with a host of negative psychosocial outcomes (Banyard & Cross, 2008; Greenman & Matsuda, 2016; Silverman, Raj, Mucci, & Hathaway, 2001; Smith, White, & Holland, 2003; Temple & Freeman, 2011; Temple, Shorey, Fite, Stuart, & Le, 2013). Previous studies suggest childhood exposure to violence and attitudes accepting of violence are associated with a higher risk for TDV; however, most studies have been cross-sectional. In the current study, we investigate the interplay among childhood exposure to violence (i.e., witnessing interparental violence), acceptance of dating violence, and physical TDV victimization across a four-year period.

Teen Dating Violence

Prevalence of TDV varies by the type of abuse, as well as the gender of the perpetrator and victim. In a meta-analytic review of 101 published studies between 1980 and 2013 (i.e., 96 studies for physical TDV and 31 for sexual TDV), Wincentak et al. (2016) found that 20% of teens ages 13-18 reported physical TDV and 9% reported sexual TDV. Studies examining past-year incidence rates found that one in three teenagers were victims of physical and/or psychological TDV and one in five were perpetrators (Coker et al., 2014). In adolescents with a history of maltreatment or abuse, TDV rates have been documented to be higher than in adolescents with no such history. For instance, Wolfe, Scott, Wekerle, and Pittman (2001) found that 25% of teenage girls and 40% of teenage boys with a history of childhood maltreatment were victims of physical TDV.

With respect to gender, teenage girls (14%) are more likely than boys (8%) to be victims of sexual TDV and boys are overwhelmingly the perpetrators of sexual TDV (10% vs. 3%; Wincentak et al., 2016). However, for physical and psychological TDV, the results are more mixed. Some studies suggest that girls are more likely to be the victims and the perpetrators of physical and psychological TDV (Coker et al., 2014), which may at least partly be due to methodological issues with under- and/or overreporting (Wincentak et al., 2016). Other studies suggest higher rates of physical TDV perpetration among girls (25% vs. 13%) but similar rates for physical victimization (21%; Wincentak et al., 2016). On the other hand, studies have fairly consistently shown that boys generally report perpetrating more severe and injurious TDV, and are less impacted by their own victimization (Molidor & Tolman, 1998). Although victim and perpetration rates differ by gender, many adolescent relationships are characterized by mutual violence (e.g., perpetration and victimization). In Coker's study, for example, the highest rates were for victimization only (17.6%) followed by mutual TDV (15.8%) and then perpetration only (4.4%). Similarly, Taylor and Mumford (2016) conducted a national survey with early to late adolescents (ages 10 – 18) and found psychological and sexual TDV victimization was correlated to psychological and sexual perpetration (r = .30 - .86).

Experiencing TDV is associated with increased risk for substance use, risky sexual behavior, psychological distress, poor school functioning, difficulties with future relationships, and TDV perpetration (Banyard & Cross, 2008; Greenman & Matsuda, 2016; Silverman, et al., 2001; Smith, et al., 2003; Temple & Freeman, 2011; Temple, Shorey, Fite, et al., 2013). For instance, Temple and Freeman (2011) found older adolescents who experienced physical TDV were 2.5 to 4 times more likely to report smoking cigarettes, drinking alcohol, and using other illicit substances compared to non-victimized youth. Silverman et al. (2001) found that

adolescent girls who reported physical and/or sexual TDV were at an increased risk, compared to non-victimized counterparts, for substance use, suicidality, and risky sexual behavior three years later. TDV has also been associated with violence in adulthood (Cui, Gordon, Ueno, & Fincham, 2013; Exner-Cortens, Eckenrode, Bunge, & Rothman, 2017; O'Leary, Malone, & Tyree, 1994; Smith et al., 2003). In a longitudinal study that spanned over eight years with over 5,500 adolescents who had been in a dating relationship, Exner-Cortens, Eckenrode, and Rothman (2013) found that participants who experienced psychological or physical (or both) victimization were more likely to report long-term adverse health outcomes than participants without a history of TDV. A similar study by Ackard, Eisenberg, and Neumark-Sztainer (2007) found that adolescent girls who experienced physical or sexual TDV (or both) were at higher risk for depressive symptoms, cigarette use, and suicidality five years later.

Changes in physical TDV over time. While mounting research has examined the antecedents and consequences of TDV, less is known about how TDV develops over time. A recent study found that TDV statuses are fairly stable in adolescence (Choi, Weston, & Temple, 2017). The researchers examined different types (e.g., psychological, sexual, and physical) and patterns (e.g., perpetration and victimization) of violence and found evidence for five distinct but homogenous groups of teens: non-violence (40.7%), emotional and verbal abuse (30.6%), forced sexual contact (11.7%), psychological and physical violence (8.7%), and psychological abuse (8.3%). These groups differed in terms of several psychosocial factors (e.g., gender and SES) and mental health outcomes, suggesting prevention and intervention efforts might need to be tailored toward specific TDV patterns.

To our knowledge, only three studies have investigated longitudinal patterns of physical TDV victimization (Brooks-Russell, Foshee, & Ennett, 2013; Choi et al., 2017, Orpinas, Hsieh,

Song, Holland, & Nahapetyan, 2013). Orpinas et al. (2013) investigated TDV trajectories using the *Healthy Teens Longitudinal Study* dataset, which followed 588 6th graders for seven consecutive years. The investigators found that TDV trajectories differed between boys and girls. For boys, there were two trajectories for physical TDV victimization: high and low victimization; 62% of the boys were in the low victimization group. Similarly, there were two trajectories for physical TDV victimization for girls, and the majority (71%) were in the low victimization group. The second group of girls showed an increase in victimization over time.

Brooks-Russell and colleagues (2013; N =2,566) investigated trajectories of physical TDV victimization in a sample of 8^{th}-12^{th} graders. Results indicated that girls' physical victimization over time was best conceptualized into three distinct classes: 1) girls who reported no victimization or lower levels of physical TDV victimization over time (89% of the sample), 2) girls who reported lower levels of physical TDV victimization at the beginning and the end of the study with higher, moderate levels in the middle (8% of the sample), and 3) girls who reported higher levels of physical TDV victimization with the highest levels during the middle of the study (3% of the sample). Importantly, all three groups showed an increase in victimization during the middle of the study and a decrease towards the end of the study. The trajectories for physical TDV victimization were different for boys. A two-class model was the best fit, with the first class showing a similar pattern to the girls' first class (e.g., no or low levels of physical TDV victimization; 94% of the sample) while the second class reported moderate to high levels of physical TDV victimization that increased during the beginning of the study, decreased during the middle, and then increased again at the end of the study (6% of the sample).

Similarly, longitudinal studies on physical TDV perpetration have found support for a curvilinear pattern (Foshee et al., 2009; Reyes, Foshee, Bauer, & Ennett, 2011). Orpinas et al.

(2013) study, on the other hand, showed two types of linear trajectories, "low perpetration" (73% of the boys and 68% of the girls) and "increasing perpetration." When Orpinas et al. (2013) investigated physical TDV victimization and perpetration together, they found three patterns over time for boys and two patterns for girls. The boys' physical TDV was grouped into: a) low victimization and perpetration (62% of the boys), b) high victimization and increasing perpetration (27% of the boys), and c) high victimization and low perpetration (11% of the boys). The girls also had a low victimization and perpetration trajectory (65% of the girls), while the second trajectory showed an increase in victimization and perpetration over time.

Overall, previous research on physical TDV trajectories suggest that the majority of adolescents are not involved in violent relationships or report low levels of violence. Patterns of TDV tend to differ by gender and role (victim, perpetrator, both). Adolescents who are involved in physically violent relationships tend to show one of the following patterns: a high, fairly stable involvement in violence over time, an increase in violence over time, or an increase during the middle of adolescence (e.g., curvilinear pattern).

Acceptance of Dating Violence

Studies have shown that childhood exposure to violence, through witnessing interparental violence or child abuse, is linked to subsequent partner violence victimization and perpetration in adolescents and adults (Duke, Pettingell, McMorris, & Borowsky, 2010; Ehrensaft, Cohen, Brown, Smailes, Chen, & Johnson, 2003; Widom, Czaja, & Dutton, 2014). A recent meta-analysis of 124 studies showed small effects between childhood exposure to violence and subsequent dating violence victimization and perpetration as adults (Smith-Marek et al., 2015). Although there is support for the intergenerational transmission of violence, not all children exposed to violence become involved in violent relationships (Margolin & Gordis, 2004).

Several potential mediators have been investigated in the literature, with evidence supporting psychological distress (Cascardi, 2016), maladaptive schemas (Calvete, Gámez-Guadix, Fernández-González, Orue, & Borrajo, 2018), and acceptance of violence (Temple, Shorey, Tortolero, Wolfe, & Stuart, 2013) as partial or full mediators between childhood exposure to violence and subsequent dating violence in longitudinal studies.

In general, studies have found that children exposed to family violence are more accepting of family violence compared to children not exposed to family violence (Kinsfogel & Grych, 2004). Similarly, adolescents and young adults who have been in violent dating relationships are more accepting of dating violence compared to individuals without those experiences (Price & Byers, 1999). Moreover, greater acceptance of dating violence is associated with greater likelihood of being a perpetrator and a victim of TDV (Josephson & Proulx, 2008; Malik, Sorenson, & Aneshensel, 1997). Results of these studies have also found that males are more accepting of TDV than females and that people are less accepting of male perpetrated violence than female perpetrated violence (Karlsson, Temple, Weston, & Le, 2016; Price & Byers, 1999). To our knowledge, there are only two studies that has investigated changes in acceptance of dating violence over time among teenagers. Shorey, Fite, Torres, Stuart, and Temple (2018), using structural equation modeling, reported that attitudes accepting of TDV were fairly stable across a 6-year time period. This was true for both acceptance of female-to-male and male-to-female perpetrated dating violence. Orpinas and colleagues (2013), using latent class mixture modeling, found that acceptance of female-to-male and male-to-female perpetrated dating violence showed a linear trend over time with a decrease in acceptance from 6th to 12th grade. Neither of these studies, however, investigated whether patterns of acceptance of violence were related to TDV victimization across time.

Changes and Interactions between TDV and Acceptance Over Time

Few studies have investigated the longitudinal relation between acceptance of violence and TDV, with only one study investigating TDV victimization (Orpinas et al., 2013). More studies have focused on TDV perpetration, but results are mixed. While some researchers have found that adolescents' attitudes towards partner violence predicted TDV perpetration prospectively, especially for male adolescents (Brendgen, Vitaro, Tremblay, & Wanner, 2002; Foshee, Linder, Macdougall, & Bangdiwala, 2001), others have not (Wolfe, Wekerle, Scott, Straatman, & Grasley, 2004). In a high school-based sample, Wolfe et al. (2004) found male adolescents who had a more accepting attitude towards partner violence were more likely to endorse TDV perpetration (i.e., physical abuse, emotional abuse, and threatening behaviors). More accepting attitudes at baseline predicted more accepting attitudes at the 1-year follow-up for both males and females. However, attitudes towards violence at baseline did not predict TDV perpetration at follow-up for neither males nor females. Interestingly, another study found TDV perpetration (physical and sexual abuse) predicted greater acceptance of partner violence three months later, but acceptance of partner violence did not predict TDV perpetration over the same timeframe (Mueller, Jouriles, McDonald, & Rosenfield, 2013). Lastly, Shorey and colleagues (2018) reported TDV perpetration (physical and psychological) and attitudes accepting of TDV were fairly stable across a 6-year time period with limited evidence showing any relationship between these two factors from adolescence into young adulthood.

The longitudinal link between acceptance of violence and TDV involvement may differ by severity of the violence. Using latent class mixture modeling, Orpinas et al. (2013) examined trajectories of physical TDV victimization (low and high) and perpetration (low and increasing perpetration). Overall, adolescents who reported fewer TDV victimization and perpetration

experiences reported lower acceptance of TDV perpetration, and adolescents who reported more TDV experiences reported greater acceptance of TDV perpetration. Also, all groups reported a decrease in acceptance of TDV perpetration across time whereas TDV victimization and perpetration trajectories increased or remained flat. The relationship between acceptance of violence and TDV may also differ by gender. Orpinas et al. (2013) found male adolescents who followed the low victimization and low perpetration trajectory reported less acceptance of female-to-male TDV perpetration compared to males in the high victimization and low perpetration trajectory and the high victimization and increasing perpetration trajectory. Moreover, male adolescents who followed the high victimization and increasing perpetration trajectory were more accepting of male-to-female and female-to-male violence as compared to other trajectory groups. Among female adolescents, female-to-male and male-to-female TDV perpetration was more accepted by those who followed an increasing victimization and increasing perpetration trajectory compared to females in the low victimization and low perpetration trajectory.

Purpose & Hypotheses

Dating violence is common among adolescents (Wincentak et al., 2016) and can lead to a range of psychosocial issues (Banyard & Cross, 2008; Greenman & Matsuda, 2016; Silverman, et al., 2001; Smith, et al., 2003; Temple & Freeman, 2011; Temple, Shorey, Fite, et al., 2013). Given the significant implications of future adjustment, patterns of TDV need to be studied so that prevention programs can be better designed to eliminate or reduce the risk of TDV. To date, several factors have been associated with a higher risk for experiencing violence in intimate relationships, including previous exposure to violence (e.g., childhood exposure through witnessing interparental violence and/or child abuse; Duke et al., 2010; Ehrensaft, et al., 2003;

Widom, et al., 2014) and attitudes accepting of violence (Karlsson, et al., 2016; Temple, Shorey, Tortolero, et al., 2013). Previous studies have also found positive associations between acceptance of violence and risk for dating violence, but these studies have primarily been cross-sectional and focused on TDV perpetration, not victimization. The current study fills a gap in the literature by examining patterns of acceptance of dating violence and TDV victimization across a four-year period.

The first purpose of this study is to examine the relationship between acceptance of dating violence and TDV victimization, cross-sectionally and over time. Cross-sectionally, we hypothesized a positive relationship between acceptance of dating violence and TDV victimization. Because prior research on how acceptance and victimization relate over time are limited in number, we did not set a priori hypothesis for how these variables were related longitudinally. The second purpose of this study was to examine whether witnessing interparental violence predicted the initial level of TDV and acceptance of dating violence. Based on previous literature on the intergenerational transmission of violence, we hypothesized that adolescents who had been exposed to interparental violence would have higher initial levels of attitudes accepting of violence and TDV victimization. We used age, gender, and race as predictors of initial level of acceptance and TDV victimization, as well as predictors of change in acceptance and TDV, in order to explore factors that might impact initial levels and changes in acceptance and victimization over time.

Method

Participants and Procedure

Participants included adolescents (N = 1,042) recruited from multiple high schools in southeast Texas. As part of an ongoing longitudinal study of health, adolescents participated in

eight annual waves of data collection beginning in 2010. Students were initially recruited from mandated classes and completed questionnaires during school hours. Participants who left their initial school or who graduated completed the questionnaire via a web-based platform. The present study utilized data from the initial four waves. During the first wave of data collection, adolescents were primarily 9th and 10th graders. They ranged in age from 13 to 18 (M = 15.00, SD = 0.79), and 56% were females. They were ethnically diverse as 30% identified themselves as African American, 30% as White, and 32% Hispanic. During the first wave of data collection, 918 students reported current or past dating relationships. The second wave included 964 participants (92.5% retention rate), the third wave included 894 participants (85.8% retention rate from time 1), and the fourth wave included 776 participants (74.5% retention rate from Time 1). See Table 1 for demographic information at T1-T4. Participants received gift cards in the amount of $10, $10, $20, and $20 for Times 1, 2, 3, and 4, respectively.

Measures

Dating violence victimization. For the current study, we used four items from the Conflict in Adolescent Dating Relationships (CADRI; Wolfe, Scott, Reitzel-Jaffe, et al., 2001) measuring physical victimization (e.g., “He/she threw something at me”, “He/she kicked, hit, or punched me”) any time before Time 1 and in the past year for Times 2-4. Item responses were *yes*/*no*, which were then summed to construct a continuous measure of victimization. Although prevalence was low at each wave, variability occurred in which participants reported victimization. In other words, different participants reported victimization across waves. The internal consistency for the physical victimization subscale used in the analyses ranged from a low of α = .73 (Time 2) to a high of α = .80 (Time 4). The current study focuses on physical victimization, as internal consistency was low for sexual victimization. There were also low

correlations between physical, sexual, and psychological victimization (all measured by the CADRI).

Acceptance of dating violence. The Acceptance of Couple Violence Scale (ACV; Foshee et al., 1996) was used to measure acceptance of dating violence. This is an 11-item self-report questionnaire designed to measure the acceptability of dating violence and has three subscales: acceptance of male-to-female violence (3 items), acceptance of female-to-male violence (3 items), and acceptance of general violence (5 items). Item responses ranged from 1 = *strongly disagree* to 4 = *strongly agree*, where lower scores indicated less acceptance of dating violence. Internal consistency for the acceptance of male-to-female violence subscale (Times 1-4 α range = .69 - .78), acceptance of female-to-male violence subscale (α = .76 - .80), and general subscale (α = .80 - .83) were acceptable. In this study, we used the general acceptance subscale.

Witnessing interparental violence was measured by asking participants if they witnessed aggressive behaviors (e.g. pushed, grabbed, shoved) between their parents. One question assessed mother-to-father violence and the other question assessed father-to-mother violence. Answer options included *never, 1 or 2 times, 3 – 20 times,* and *20 or more times.* This was used to calculate a witness severity measure for each parent (e.g., witnessing mother-to-father and father-to-mother). At Time 1, participants were asked about lifetime witnessing (e.g., if they had ever witnessed interparental violence), which was used for these analyses.

Analyses

This study examined the trajectories of TDV acceptance and physical victimization using multivariate latent growth curve modeling techniques. Analyses were conducted using Mplus version 7.2 (Muthen & Muthen, 1998 – 2014). A structural equation model framework was utilized where intercept and slope were latent constructs and each time point was an observed

data point for the latent constructs. To test our hypotheses, a parallel process latent growth curve model was utilized to estimate growth separately in both acceptance and victimization. The parallel process growth model enabled us to examine change over time in each of the two repeated measures as separate models and then test whether the intercept and slope for acceptance were associated with the intercept and slope for victimization over time. Witnessing interparental violence was used as a time-invariant covariate where the level of interparental violence at Time 1 predicted the initial level of acceptance. The hypothesized model is presented in Figure 1.

Assumptions. The assumptions of multivariate normality were analyzed using SPSS. However, transformations were not made as TDV victimization is not expected to be normally distributed in the population. Maximum likelihood estimation was used to adjust for the non-normal distribution of these variables by adjusting the standard error and using a scaled chi-square. Missing data were estimated using the full information likelihood function.

Model Estimation. It was expected that the independence model that tests the null hypothesis of no growth and variability of intercepts equal to zero would be rejected. After testing the independence model, model building progressed by testing models of varying intercepts, varying slopes, varying both intercept and slopes, and adding covariates, following steps outlined by Bollen and Curran (2006). Because of the large sample size, additional model fit indices (RMSEA, CFI, SRMR, and NNFI) were used to test goodness of fit (Hu & Bentler, 1999).

Results

Descriptive Statistics and Preliminary Analyses

The rates of physical TDV victimization ranged over time for males (24.3% at Time 1 to 14.9% at Time 4) and females (19.5% at Time 1 to 18.2% at Time 4). Males and females, generally, did not differ significantly in the amount of physical TDV victimization as there were only significant differences at Time 2, where females experienced more physical TDV victimization than males ($t = 2.24$, $p < .05$). Females reported less acceptance of dating violence than males at Time 1 ($t = -2.81$, $p < .01$), Time 3 ($t = -2.40$, $p < .05$), and Time 4 ($t = -3.77$, $p < .01$). Ethnic groups significantly differed in both acceptance and experiences of dating violence. Specifically, at Time 2 ($F = 4.39$, $p < .01$) and Time 3 ($F = 7.02$, $p < .001$), Hispanic and White adolescents reported less physical TDV victimization than their African American counterparts. Furthermore, African Americans indicated greater acceptance of dating violence than Hispanic and White adolescents at Time 1 ($F = 4.64$, $p < .01$) and Time 4 ($F = 5.68$, $p < .001$), and greater acceptance than White adolescents at Time 2 ($F = 2.66$, $p < .05$) and Time 3 ($F = 5.20$, $p < .001$). Finally, age was weakly positively correlated with physical TDV at Time 1 ($r = .09$, $p < .05$) and Time 3 ($r = .08$, $p < .05$), and acceptance at Time 1 ($r = .10$, $p < .01$). See Table 2 for correlations among all continuous variables as well as means and standard deviations.

Latent Growth Curve Model: Physical Teen Dating Violence

The physical TDV victimization measure at Times 1 through 4 was used in the first latent growth curve model. This model described the initial level of physical TDV victimization and rate of change over time. We estimated models in a series of steps as recommended by Bollen and Curran (2006), including testing whether error variance in indicators should be constrained, whether random effects for the intercept and slope should be estimated, and whether linear or nonlinear change occurred. Indices of fit indicated that both a linear model of change and a quadratic model of change fit the data well (see Table 3). For the linear model, the initial average

level of TDV victimization among adolescents was .73. There was unexplained variance in both the intercept and slope of the linear model which indicated individuals varied significantly in the initial level of dating violence and rate of change. The correlation between the initial level of TDV and rate of change was small but significant, which suggested that individuals who had higher initial levels of physical TDV victimization changed at a slower rate (r = - 0.43, p < .001).

For the quadratic model, the initial average level of physical TDV victimization among adolescents was .95. In this model, there was no unexplained variance indicating individuals did not vary in their initial levels of dating violence, rate of change, or acceleration of change. Further, the correlations between the initial level of TDV victimization and rate of change as well as acceleration of change were not significant, suggesting that initial level of TDV was not related to either variable.

Latent Growth Curve Model: Acceptance of TDV

An acceptance of dating violence latent growth curve was also estimated, using the repeated measure of general acceptance of dating violence for Times 1 through 4. The model described the initial level and rate of change for acceptance of dating violence over time. Again, following steps suggested by Bollen and Curran (2006), indices of fit indicated that both a nonlinear and a quadratic model of change fit the data well (Table 3). In the nonlinear model, the first two factor loadings from the slope to the acceptance of dating violence measures remained fixed at 0 and 1 for Times 1 and 2, respectively, but were freely estimated for Times 3 and 4. In the resulting model, factor loadings for Times 3 and 4 were *B*s = 1.50 and 1.93 (*SE*s = 0.23 and 0.31, respectively) indicating growth that is nonlinear but not occurring in a known function of change such as in a quadratic model. The initial average level of acceptance was 3.71, and

acceptance of TDV declined by an average of approximately 19% over time (-0.72/3.71; see Table 3). The initial level of acceptance was correlated with the slope in acceptance (r = -0.56; p < .001), suggesting that individuals who had higher initial levels of acceptance changed less over time than individuals with lower initial levels of acceptance. There was unexplained variance in the intercept, but not in the slope, indicating that adolescents differed significantly in their initial level of acceptance of dating violence, but they did not differ in their rate of change.

For the quadratic model, the initial average level of acceptance was 4.05, and acceptance of dating violence declined on average by approximately 23% over time (-.94/4.05; see Table 3). The rate of decline was not significantly different from zero. In this model, there was no unexplained variance in the slope or quadratic parameter indicating that individuals did not vary in the rate or acceleration of change. However, the intercept variance was significant, indicating that individuals differed significantly in their initial level of acceptance of dating violence. The correlations between the initial level of acceptance of dating violence and rate of change and the quadratic parameter were not significant suggesting that initial level of acceptance is not related to these variables.

Parallel Process Model: Physical Teen Dating Violence with Acceptance of TDV

Given the association between physical TDV victimization and acceptance of dating violence, we aimed to model how physical TDV victimization and acceptance change together over time in a parallel process growth model (see Figure 1). Because there were two growth models that fit the data well for both TDV and acceptance of TDV, many combinations of parallel growth were modeled. However, many of the models did not converge or had a negative covariance matrix. Therefore, we present the two models that did converge.

Model 1a: Parallel process of the quadratic growth physical teen dating violence model and nonlinear growth acceptance model. The quadratic growth model for physical TDV victimization and the nonlinear growth model for acceptance were retained, X^2 (20, N = 1,042) = 69.64, $p < .001$, RMSEA = 0.049 (0.04, 0.06), CFI = 0.96, SRMR = 0.04. Estimates of error variance were not constrained to equality across times, and variance was freely estimated for intercepts and slopes. Parameter estimates are included in Table 4. There was also an inverse relationship between the initial level of acceptance and the slope of acceptance (r = -.48; $p <$ .001), where individuals who started with higher levels of acceptance changed less over time. Initial level of physical TDV victimization was positively related to the initial level of acceptance, where higher initial levels of victimization were associated with higher initial levels of acceptance of dating violence (r = .38; $p < .001$; see Table 4). Initial level of physical TDV victimization was not associated with the rate of change in physical TDV victimization. In addition, the rate of change in physical TDV victimization was not associated with changes in acceptance of TDV.

Model 1b: Conditional parallel process model. We considered many predictors of initial level and rate of change of acceptance and experiences of physical TDV victimization. Demographic variables such as race, age, and gender, as well as witnessing parental violence and dating status were considered as time-invariant predictors of initial level and rate of change of acceptance and physical TDV victimization. A final model (Model 1b) that included age, gender, and race as predictors was an acceptable fit to the data, X^2 (36, N = 924) = 94.81, $p < .001$, RMSEA = 0.042 (0.03, 0.05), CFI = 0.94, SRMR = 0.04. Witnessing interparental violence and dating status did not significantly predict acceptance or experience of physical TDV victimization and were removed from the final model. In the final model, African Americans had

higher initial levels of acceptance of dating violence than their White and Hispanic counterparts (r = .18, p < .001). In addition, older age was associated with higher levels of initial TDV victimization (r = .09, p <.05). Males were more likely to have higher initial levels of acceptance (r = .10; p < .05),and were more likely to experience less victimization than females over time (r = -.40, p < .05). In addition, African American students were more likely than White and Hispanic students to experience increased levels of TDV victimization over time (r = .61, p < .01), and were also more likely to experience a decelerated rate of change (r = -.56, p < .01) than Whites and Hispanics.

Model 2: Parallel process of the linear growth physical teen dating violence model and nonlinear growth acceptance model. The linear growth model for physical TDV victimization and the nonlinear growth model for acceptance were retained. The fit of the parallel process model was good, X^2 (22, N = 1,042) = 76.67, p < .001, RMSEA = 0.049 (0.04, 0.06), CFI = 0.96, SRMR = 0.04. Estimates of error variance across time points were unconstrained in this model also based on prior steps in model building. The variances estimated for initial level of acceptance, initial level of physical TDV victimization, and the rate of change of physical TDV victimization were all significant, suggesting that adolescents differ in the initial levels of acceptance, TDV victimization, and rate of change in TDV victimization (see Table 4; see Figure 2 for the overall growth trajectories). Initial level of physical TDV victimization was inversely associated with the rate of change (i.e., slope) of physical TDV victimization (r = -0.43 p < .001; see Table 4). These results suggest that people who have higher initial levels of physical TDV victimization also report slower rates of change in TDV victimization. In addition, the initial level of physical TDV victimization was related to the initial level of acceptance, where adolescents who reported higher initial levels of physical TDV

victimization also reported higher levels of acceptance ($r = 0.36$ $p < .001$). Furthermore, the initial level of acceptance was associated with change in acceptance ($r = -0.48$; $p < .001$), indicating that individuals who had higher initial levels of acceptance changed less than individuals who had lower levels of acceptance.

As in model 1, race, age, gender, dating status, and witnessing parental violence were considered as time-invariant predictors of initial level and rate of change of acceptance and physical TDV victimization. A final model (Model 2b) that included age, gender, and race as predictors was an acceptable fit to the data, X^2 (33, $N = 1,042$) = 99.51, $p < .001$, RMSEA = 0.044 (0.03, 0.05), CFI = 0.95, SRMR = 0.04. Witnessing interparental violence and dating status did not significantly predict acceptance of or experience with physical TDV victimization and were removed from the final model. Like Model 1b, age was associated with the initial levels of TDV victimization ($r = .12$, $p < .05$) and acceptance ($r = .11$, $p < .05$), where older adolescents were more accepting and experienced higher levels of TDV victimization. Gender was associated with initial levels of acceptance ($r = .10$, $p < .05$), where male adolescents reported higher levels of acceptance of dating violence. Race was associated with the initial levels of TDV victimization ($r = .17$, $p < .001$) and acceptance ($r = .18$, $p < .001$). Specifically, African American adolescents reported higher initial levels of acceptance and higher initial levels of TDV victimization than White and Hispanic adolescents. Although race was a significant predictor of change in Model 1b, race was not a significant predictor of change in TDV victimization or acceptance in this model.

Discussion

Consistent with previous studies (Brooks-Russell et al., 2013; Orpinas et al., 2013), a majority of adolescents in the current study did not report any physical TDV victimization (80-

90% at any time point). However, different participants reported victimization at different times. Both linear and quadratic trends fit the observed changes over time in TDV victimization, which is consistent with previous literature (Brooks-Russell et al., 2013; Foshee et al., 2009; Reyes et al., 2011; Orpinas et al., 2013). Also consistent with prior research, both of our models suggest participants did not report a significant change in the amount of physical TDV victimization they experienced over a four-year period (Orpinas et al., 2013). We also found evidence for a nonlinear and a quadratic function of acceptance of dating violence over time. Although participants differed significantly in their initial level of acceptance, they generally evidenced a significant reduction in acceptance of dating violence over time. While this latter finding is consistent with the study by Orpinas and colleagues (2013), the fact that a non-linear and a quadratic slope fit our data well is inconsistent with what they found with respect to acceptance of dating violence over time (Orpinas et al., 2013).

When investigating how physical TDV victimization and acceptance of dating violence interacted over time, we found evidence for two different types of models. In one model, there was a quadratic pattern of change for physical TDV victimization and a nonlinear pattern of change for acceptance. For the second model, there was a linear pattern of change for physical TDV victimization and again a nonlinear pattern of change for acceptance of dating violence. In both models, there was an overall significant reduction in acceptance of dating violence over time, while the change in physical TDV victimization was, again, not significant. Moreover, initial levels of TDV victimization and acceptance of dating violence were correlated such that adolescents with higher initial rates of physical TDV victimization also reported being more accepting of dating violence. Overall, these findings support an initial cross-sectional relationship between TDV victimization and acceptance; however, we did not find any evidence

for a longitudinal relationship between the two variables. The lack of association suggests that change in acceptance was not related to change in physical TDV victimization. Therefore, our first hypothesis was only partially supported, and, our second hypothesis was not supported, as we predicted that acceptance of dating violence and physical TDV victimization would decrease contemporaneously over time.

Our findings suggest there are individual trajectories in longitudinal patterns of physical TDV victimization and attitudes accepting of dating violence, and that there appear to be multiple possible variables affecting these individual trajectories. For instance, gender predicted initial levels of acceptance as well as change in TDV victimization, such that males were more accepting of dating violence and they experienced greater reductions in TDV victimization over time. These findings are consistent with previous research that has demonstrated differences between males and females (Brooks-Russell et al., 2013; Orpinas et al., 2013). Evidence from previous studies suggest some gender neutral and some gender specific features both in terms of trajectories and predictors of those trajectories. For instance, Orpinas and colleagues (2013) found that a majority of male and female adolescents experience no or low TDV victimization and that acceptance of dating violence was a predictor of TDV early but not later in development. Brooks-Russell and colleagues (2013) found that peer victimization predicted TDV for males and females but alcohol use and anxiety were unique predictors for females.

In addition to gender, we found evidence for age and race affecting adolescents' trajectories cross-sectionally and longitudinally. Older adolescents were more likely to report TDV victimization experiences and, in one of the models, they were also more accepting of dating violence. Race also affected initial levels of acceptance and TDV victimization, such that African American teenagers reported higher acceptance and, in one of the models, they also

reported higher TDV victimization. Moreover, in one of the parallel models, African-American adolescents evidenced an increase and a slower change in TDV victimization over time. This is consistent with findings from the Orpinas and colleagues' (2013) study showing a higher percentage of African-American youth in the group that evidenced an increase in TDV victimization and perpetration. Our results also fit within a larger body of research that suggests African-American youth are at a higher risk for TDV – perhaps because they receive greater exposure to stressful race-related experiences (e.g., racism, discrimination), greater exposure to familial and community violence, and are more likely than other races to come from socioeconomically disadvantaged backgrounds (see Henry & Zeytinoglu, 2012, for a review).

Overall, more research is needed to clarify TDV trajectories among youth. Specifically, researchers should use sophisticated person-centered methods (e.g., latent class analysis) to examine trajectories. By using advanced methods, researchers may be able to untangle the heterogeneity of findings related to TDV. Person-centered methods can also be useful in examining the effect of multiple types of predictors of TDV, such as: a) early versus late developmental predictors (e.g., acceptance of TDV); b) chronic (e.g., poverty, parental education) versus acute (e.g., recent homelessness, onset of mental health problems) predictors; c) individual versus context specific (e.g., school, home environment) predictors; d) gender-specific versus gender-neutral predictors; and e) risk (e.g., delinquency) versus protective (parent-child communication) predictors.

The lack of evidence for a longitudinal relationship between TDV victimization and acceptance of dating violence was contrary to expectations. One reason for this finding may be because although acceptance of dating violence changed over time, victimization did not. The stability of TDV found in this study and other research (Orpinas et al., 2013) is important to

consider further. While not measured here, future research should measure dynamics of adolescent relationships, including transient nature, changes in partners, and relationship satisfaction. Research questions may include, 1) do adolescents who experience TDV change relationships more often (and continue to experience violence across relationships) or do they tend to stay in the same abusive relationship? And 2) How do TDV experiences change their perception of dating relationships? Also, most studies have focused on heterosexual relationships (Reuter, Sharp, & Temple, 2015) and therefore more research is needed to investigate how gender identity and sexual orientation might affect adolescents' trajectories.

Peer groups are likely another important variable to study to improve our understanding of how peer relationships intertwine with dating experiences. Previous studies have found that peers' involvement in violent relationships predict TDV experiences (Arriaga & Foshee, 2004; Ellis, Chung-Hall, & Dumas, 2013), and that peers' TDV involvement is a better predictor of an individual adolescent's TDV experiences than witnessing interparental violence (Arriaga & Foshee, 2004). Shorey and colleagues (2017) found that teens' perception of their peers' involvement in TDV perpetration was related to their own TDV perpetration, especially for males. Overall, these outcomes could explain our finding that witnessing interparental violence was not a long-term predictor of TDV victimization and attitudes accepting of dating violence.

Another possible reason for the lack of a longitudinal relationship between TDV victimization and acceptance of dating violence is, in general, participants in the current study were generally unaccepting of dating violence (mean ratings were between 1 = *strongly disagree* and 2 = *disagree*). Thus, although there is evidence suggesting attitudes accepting of dating violence may influence behavior, it appears most adolescents do not accept the use of violence in intimate relationships (Orpinas et al., 2013). Another possibility is adolescents do accept the use

of violence but responded in a socially desirable way. Alternatively, it is possible that teenagers do not connect the measures and questions used in research to their own experiences in dating relationships. For instance, they might not consider their own relationships violent despite endorsing items that suggest otherwise. They might also respond more generally (e.g., violence is not acceptable) as opposed to relating their response to their own experiences (e.g., it is not acceptable that my boyfriend pushes me or that I push him) when answering questions about dating violence. Another possibility is that other factors beyond attitudes about violence are more important in predicting TDV experiences. Future studies could benefit from investigating how well youth's reported attitudes about dating violence match their true attitudes as well as whether they match their actual dating behaviors.

Implications

Based on current findings, several suggestions are made for prevention and intervention efforts. First, since older teenagers were more likely to experience TDV victimization, prevention efforts should start early and preferably prior to youth entering dating relationships (e.g., middle school). Second, prevention efforts may benefit by targeting youth with more accepting attitudes toward violence. Indeed, we found adolescents with more accepting attitudes changed their attitudes at a slower rate and may therefore benefit from ongoing interventions to reduce risk for TDV. Moreover, since adolescents who experience TDV are at heightened risk for continuing to experience dating violence, they would benefit from early identification and efforts to prevent further violence. Third, findings suggest programs might need to be adapted to specific groups for males, females, and African Americans. For instance, our results suggest programs designed for African-American youth may need to emphasize changing acceptance of TDV attitudes and monitoring closely their change across time.

Limitations of the current study

The current study was an exploration of how adolescents' experiences of dating violence victimization and acceptance of dating violence change over time. Because there is little data indicating how TDV victimization and acceptance change over time, we utilized a data driven approach to model building. This approach indicated that more than one model fit the data well. Due to model building difficulties (i.e., non-convergence, negative covariance matrices), some models could not be examined. In addition, some models became very complex as predictors of initial level and change were added to the model. This complexity significantly changed our fit indices (i.e. BIC) and reduced the amount of parsimony in the model. In addition, because this was a parallel process model, the relationship among TDV victimization and acceptance are correlational. Therefore, we cannot attest to any causal links between acceptance and victimization. Also, although gender was a significant predictor of initial level of acceptance, initial level of victimization, and change in victimization, we are not able to make conclusions about the gender of the perpetrator in these relationships as sexual preference and partner gender were not part of the model. Moreover, although we considered conducting a multilevel SEM, we opted not to use this analysis given the reduction in power due to the small (for MLM) number of schools. However, multi-level modeling may be good to use in the future given its ability to control for differences among schools. Lastly, this study focused exclusively on physical TDV victimization. This decision was based on the poor internal consistency for sexual TDV victimization as well as low correlations between the three types of TDV measured in the current study (i.e., physical, sexual, and psychological). Nevertheless, the focus on physical TDV is another limitation as previous research has shown that adolescents tend to experience more than one type of TDV (Coker et al., 2014). On a related note, the current study's focus on

victimization is also a limitation as many adolescents report experiencing both victimization and perpetration (Coker et al., 2014; Taylor & Mumford, 2016). However, this decision was made because of the limited research on longitudinal patterns of TDV, especially victimization, and therefore the need to start simpler (e.g., focus on one direction of the violence) before investigating more complex patterns (e.g., bidirectional violence).

Conclusions

The present study contributes to the literature in many ways. First, by utilizing longitudinal data from a large sample of ethnically diverse adolescents, we were able to examine how different variables interrelated over time. We were also able to illustrate the effect of initial levels on the rate of change of TDV victimization and dating violence acceptance, as well as how these variables intersect over time. In general, we found evidence for a linear and a quadratic pattern in physical TDV victimization and a non-linear and a quadratic trend for acceptance of dating violence over time. Both of these variables decreased over time, but only acceptance decreased in a significant way. When investigating how TDV victimization and acceptance of dating violence changed together over time, there was support for two types of models: non-linear pattern for acceptance and quadratic or linear for TDV victimization. Although initial levels of TDV victimization and acceptance were associated, there was no evidence for a longitudinal relationship between the two. Furthermore, exploratory analyses suggest that these patterns differed by gender, age, and race. Findings from the current study suggest that prevention programs could benefit from targeting children at an early age prior to any dating experiences to reduce risk for those with more accepting attitudes. Programs could also benefit from gender specific approaches as trajectories appear to differ by gender. More research is

needed to determine factors that increase risk for TDV other than acceptance of violence, as there is limited evidence linking TDV and acceptance of dating violence over time.

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Table 1

Demographic Variables for Each Assessment Point

	Time 1	Time 2	Time 3	Time 4
Variables	M (SD) /n (%)	n (%)	n (%)	n (%)
N / n	1042	964	894	776
Gender				
Male	459 (44.0%)	425 (44.1%)	395 (44.2%)	328 (42.3%)
Female	583 (56.0%)	539 (55.9%)	499 (55.8%)	444 (57.2%)
Race				
White/ not Hispanic	306 (29.4%)	292 (30.3%)	267 (29.9%)	232 (29.9%)
African-American	291 (27.9%)	256 (26.6%)	237 (26.5%)	199 (25.6%)
Hispanic	327 (31.4%)	306 (31.7%)	286 (32.0%)	249 (32.1%)
Asian/ Pacific Islander	38 (3.6%)	33 (3.4%)	34 (3.8%)	33 (4.3%)
Mixed/ other	80 (7.7%)	77 (8.0%)	70 (7.8%)	67 (8.6%)
Age	15.09 (.79)			
Living situation				
Both parents	474 (45.5%)	447 (46.4%)	415 (46.4%)	348 (44.8%)
Parent and step-parent	213 (20.4%)	182 (18.9%)	158 (17.7%)	131 (16.9%)
Mother only	250 (24.0%)	226 (23.4%)	208 (23.3%)	177 (22.8%)
Father only	38 (3.6%)	32 (3.3%)	32 (3.6%)	21 (2.7%)
Grandparent(s)	31 (3.0%)	32 (3.3%)	28 (3.1%)	29 (3.7%)
Girlfriend/wife or boyfriend/husband				30 (3.9%)
Alone				21 (2.7%)
Other	36 (3.5%)	45 (4.7%)	53 (5.9%)	17 (2.2%)
Plan to attend college				
Yes	911 (87.4%)	874 (90.7%)	795 (88.9%)	540 (69.6%)
No	16 (1.5%)	18 (1.9%)	23 (2.6%)	26 (3.4%)
Don't know	0 (0%)	72 (7.5%)	76 (8.5%)	41 (5.3%)
Already in college				158 (20.4%)
Graduated HS; no plan for college				9 (1.2%)

Note: M = mean. SD = standard deviation. N/n = number of participants.

Table 2

Correlations and Descriptive Statistics for Continuous Variables

Measure	1	2	3	4	5	6	7	8	9	*M*	*SD*
1. CADRI Time 1	–									.40	.89
2. CADRI Time 2	.29**	–								.36	.85
3. CADRI Time 3	.23**	.35**	–							.38	.93
4. CADRI Time 4	.16*	.26**	.40**	–						.34	.87
5. ACV Time 1	.20**	.20**	.15**	.15**	–					1.40	.52
6. ACV Time 2	.21**	.25**	.10**	.17**	.46**	–				1.31	.48
7. ACV Time 3	.12**	.22**	.22**	.19**	.44**	.52**	–			1.26	.45
8. ACV Time 4	.08	.10*	.05	.24**	.38**	.44**	.47**	–		1.21	.41
9. Witnessing IPV	.18**	.13**	.11**	.09*	.09*	.06*	.08*	.10**	–	.86	1.31

Note. CADRI = Conflict in Adolescent Dating Relationships; ACV = Acceptance of Couple Violence Scale; Witnessing IPV = Witnessing Interparental Violence.

** $p < .01$; * $p < .05$

Table 3

Unconditional Latent Growth Curve Models for Physical Teen Dating Violence (TDV) and for Acceptance of Dating Violence

	Linear Growth TDV (X^2 = 6, 7.49, RMSEA = 0.02, CFI = 0.99, SRMR = 0.02)	Quadratic Growth TDV (X^2 = 1, .97, RMSEA = 0.01, CFI = 1.00, SRMR = 0.00)	Non-Linear Growth Acceptance (X^2 = 3, 5.46, RMSEA = 0.03, CFI = 0.99, SRMR = 0.00)	Quadratic Growth Acceptance (X^2 = 1, 0.18, RMSEA = 0.00, CFI = 1.00, SRMR = 0.00)
	Parameter Estimate	Parameter Estimate	Parameter Estimate	Parameter Estimate
Mean initial level	.73***	.95***	3.71***	4.05***
Mean rate of change	-.03	-.06	-.72***	-.94
Acceleration/Deceleration of rate of change		.01		.41
Initial level variance	.28***	.17	.14***	.12***
Rate of change variance	.05***	.04	.01	.01
Acceleration/Deceleration of rate of change variance		.01		.00
Correlation between initial level and rate of change	-.43***	.90	-.56***	.03
Correlation between initial level and acceleration/deceleration of rate of change		-.73		-.32

Note: RMSEA = Root Mean Square Error of Approximation. CFI = Confirmatory Fit Index. SRMR = Standardized Root Mean Square Residual. ***$p < .001$; **$p < .01$; *$p < .05$

Table 4

Parallel Process Latent Growth Curve Models for Physical Teen Dating Violence (TDV) and Acceptance of Dating Violence

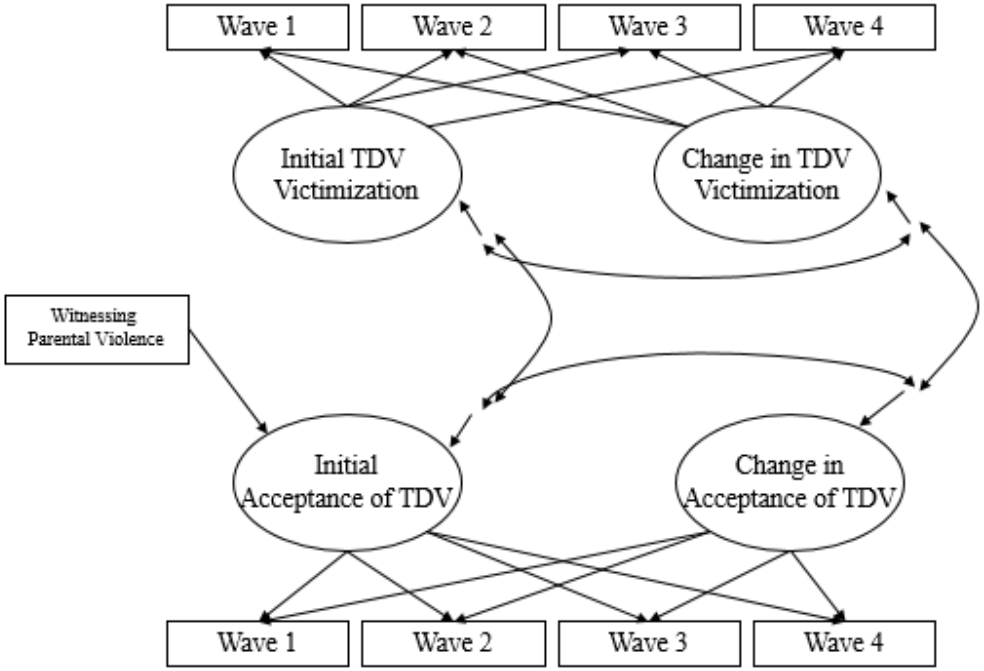
Initial Level and Rate of Change	Model 1a Parameter Estimate	Model 1b Parameter Estimate	Model 2a Parameter Estimate	Model 2b Parameter Estimate
Mean initial level				
TDV	.78***	.78***	.72***	.72***
Acceptance	3.86***	3.86***	3.86***	3.86***
Mean rate of change				
TDV	-.06	-.06	-.01	-.01
Acceptance	-.76***	-.76***	-.76***	-.76***
Acceleration/Deceleration of rate of change TDV	.06	.06		
Initial level variance				
TDV	.24***	.24***	.28***	.30***
Acceptance	.13***	.13***	.13***	.13***
Rate of change variance				
TDV	.03	.03	.05***	.05***
Acceptance	.01	.01	.01	.01
Acceleration/Deceleration of rate of change variance	.002	.002		
Initial TDV and Slope TDV[a]	-.61	-.61*	-.43***	-.53***
Initial TDV and Initial Accept	.38***	.36***	.36***	.33***
Initial Accept and Slope Accept	-.48***	-.52***	-.48***	-.53***
Slope TDV and Slope Accept[a]	.31	.17	.14	.07
Covariates				

Witnessing with Initial Accept	.05	.05
Age with Initial TDV	.09*	.12*
Age with Initial Accept	.06	.11*
Gender with Initial TDV	.06	.02
Gender with Initial Accept	.10*	.10*
Gender with Slope TDV	-.40*	-.11
Gender with Slope Accept	.05	.05
Race with Initial TDV	.10	.17**
Race with Initial Accept	.18***	.18**
Race with Slope TDV	.61**	.04
Race with Slope TDV[a]	-.56**	
Race with Slope Accept	.07	.08

Note: ***$p < .001$; **$p < .01$; *$p < .05$

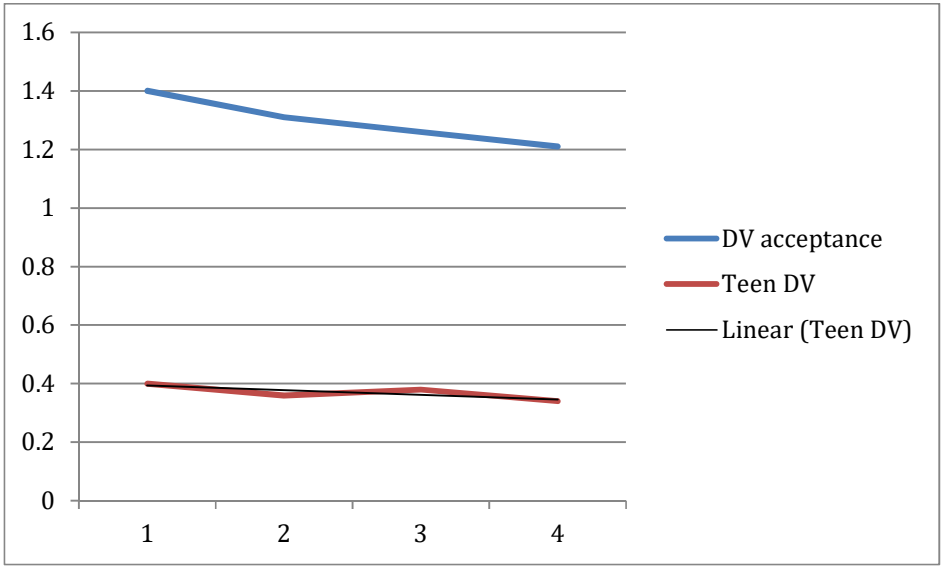
[a] Quadratic parameter

Figure 1. The Hypothesized Model.



Note: TDV = teen dating violence.

Figure 2. Growth Trajectories for Model 2 (Linear TDV and Non-Linear Acceptance).



Note: TDV = teen dating violence.