

A LONGITUDINAL EXAMINATION OF OUTCOMES OF TEEN DATING
VIOLENCE VICTIMIZATION

A Thesis

Presented to the Faculty of the Graduate School
of Cornell University

In Partial Fulfillment of the Requirements for the Degree of
Master of Arts

by

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January 2011

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ABSTRACT

Teen dating violence (TDV), the physical, sexual or psychological violence that occurs within the context of heterosexual or same-sex dating relationships, is a substantial public health problem in the United States. While the association of TDV victimization with adverse outcomes is documented in a number of cross-sectional studies, longitudinal work on this topic is limited. The present study examined the association of TDV with a broad range of adverse outcomes 5 years post-victimization, using the first three waves of the National Longitudinal Study of Adolescent Health (n=5,681). Physical and psychological TDV victimization were assessed at Wave 2 when participants were in grades 8-12, and adverse outcomes were assessed approximately 5 years later (Wave 3), when participants were aged 18-27. Outcomes explored in this study included substance use (smoking, heavy episodic drinking, marijuana use and other drug use), sexual risk, depression, self-esteem, adult intimate partner violence (IPV) victimization, suicidal behaviors (attempts and ideation), antisocial behaviors and extreme weight control behaviors. Data were analyzed using multivariate linear and logistic regression models. Compared to participants reporting no TDV at Wave 2, participants reporting Wave 2 TDV victimization had increased rates of depression, other drug use, heavy episodic drinking, antisocial behaviors, suicidal ideation and IPV victimization at Wave 3, when controlling for race, age, socioeconomic status, child maltreatment, pubertal status and gender. We also considered results for the subset of victims experiencing psychological aggression only and for the subset of victims experiencing both physical and psychological aggression. In the psychological aggression subgroup, Wave 2 victimization was related to substance use, antisocial behaviors, suicidal ideation and IPV victimization at Wave 3, while in the subset of individuals experiencing both

physical and psychological aggression at Wave 2, victimization was related to increased Wave 3 smoking, IPV victimization, suicidal ideation and depression. In gender-stratified analyses, we found that Wave 2 psychological victimization was related to Wave 3 marijuana use, antisocial behaviors, suicidal ideation and IPV victimization in males, while for females in this sub-group, Wave 2 victimization was only related to Wave 3 heavy episodic drinking and IPV victimization. For females experiencing both physical and psychological aggression at Wave 2, victimization was related to increased Wave 3 smoking, depression, suicidal ideation and IPV victimization; for males in this subgroup, Wave 2 victimization was only related to increased Wave 3 IPV victimization. The results from the present analyses suggest that TDV victimization during adolescence is related to adverse outcomes in both males and females 5 years after victimization. These findings also imply that certain outcomes may be more strongly related to certain sub-types of TDV, and that this relationship may differ by gender. Results are discussed in terms of directionality of adverse effects, and within the context of a stress and coping framework. Findings from this study can be used to improve secondary prevention programs offered to victims of TDV.

BIOGRAPHICAL SKETCH

Deinera Exner is currently a second-year M.A./Ph.D. student in Developmental Psychology in the Department of Human Development at Cornell University. Prior to coming to Cornell, Deinera completed a B.Sc. in Cellular, Molecular and Microbial Biology at the University of Calgary in Calgary, Alberta, Canada, and a Master of Public Health at Boston University in Boston, Massachusetts. Deinera's primary research interests include teen dating violence and adolescent health and health risk behaviors.

To my family

ACKNOWLEDGMENTS

This thesis could not have been completed without the excellent guidance of my committee. I would like to especially thank my chair, John Eckenrode, for his wonderful mentorship and advice. He has challenged me to think in new ways about this topic, and has contributed greatly to my growth as a student. I would also like to thank the minor members of my committee, Dawn Schrader and Emily Rothman, for their thoughtful comments and suggestions. The individual contributions of each member of my committee have strengthened this thesis, and my academic development, in unique and important ways. I am very grateful to have each of them as advisors and mentors. Thanks also to my family for their continuing encouragement and support.

This research was partially supported by a master's thesis grant from the Department of Human Development, Cornell University and by funding from the Family Life Development Center, Cornell University.

This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwistle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (<http://www.cpc.unc.edu/addhealth>). No direct support was received from grant P01-HD31921 for this analysis.

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LIST OF ABBREVIATIONS

TDV	Teen Dating Violence
IPV	Intimate Partner Violence
Add Health	National Longitudinal Study of Adolescent Health

CHAPTER 1

INTRODUCTION

Teen dating violence (TDV), the physical, sexual or psychological violence that occurs within the context of heterosexual or same-sex dating relationships, is a substantial public health problem in the United States. In 2009, 9.3% of adolescent females and 10.3% of adolescent males reported physical victimization by a boyfriend or girlfriend in the past 12 months (Centers for Disease Control, 2010), and a nationally representative sample of US boys and girls report lifetime psychological violence victimization rates of 28% and 29%, respectively (Halpern, Oslak, Young, Martin, & Kupper, 2001). As distinct from the gendered pattern of adult intimate partner violence (IPV) (Tjaden & Thoennes, 1998), the burden of TDV victimization falls more equally on both males and females (Foshee, 1996); however, females may experience more severe physical violence (e.g., being hit, kicked or thrown down on the floor) than males, and are more likely to report sexual violence victimization (Coker, McKeown, Sanderson, Davis, Valois, & Huebner, 2000; Foshee, 1996).

A number of cross-sectional studies suggest that TDV victimization in both males and females is associated with adverse outcomes, including increased sexual risk behaviors, such as condom nonuse and multiple partners (e.g., Howard & Wang, 2003; Silverman, Raj, Mucci, & Hathaway, 2001; Valois, Oeltmann, Waller, & Hussey, 1999); suicidal behaviors (e.g., Ackard & Neumark-Sztainer, 2002; Banyard & Cross, 2008; Coker et al., 2000; Olshen, McVeigh, Wunsch-Hitzig, & Rickert, 2007); unhealthy weight control methods (e.g., Ackard & Neumark-Sztainer, 2002; Silverman et al., 2001); adverse mental health outcomes, such as anxiety, post-traumatic stress, and depression (e.g., Banyard & Cross, 2008; Callahan, Tolman, & Saunders, 2003; Roberts & Klein, 2003); substance use (e.g., Roberts & Klein, 2003;

Schad, Szwedo, Antonishak, Hare, & Allen, 2008; Silverman et al., 2001); pregnancy outcomes (e.g., Kreiter & Krowchuk, 1999; Roberts, Auinger, & Klein, 2005; Silverman et al., 2001); poor educational outcomes (Banyard & Cross, 2008); and injuries (Foshee, 1996). While these studies provide evidence that TDV victimization may be associated with adverse outcomes, the cross-sectional nature of their design precludes an assessment of temporality of effects (i.e., whether these behaviors are a cause or consequence of TDV victimization).

However, not all work investigating consequences of TDV victimization is cross-sectional in nature; to date, three longitudinal studies have also investigated outcomes of victimization. Using a sample of 1,516 adolescents from Minnesota, Ackard, Eisenberg and Neumark-Sztainer (2007) investigated outcomes related to physical and sexual TDV 5 years post-victimization. Primary outcome measures included unhealthy weight control behaviors, substance use, suicidal behaviors, body dissatisfaction, depressed mood and low self-esteem. Ackard et al. (2007) also assessed the association of TDV victimization with a composite risk index; individuals were considered high risk if they reported three or more risk behaviors. In this sample, victimization was related to depressive symptomology, smoking, marijuana use, and higher scores on the composite risk index in females, and to smoking in males. There were also borderline associations between TDV and suicide attempts in females, and between TDV and binge eating and TDV and suicidal ideation in males. While low power in the male sub-sample may have precluded the detection of significant differences in sex-stratified analyses (Ackard et al., 2007), this study provides evidence that TDV victimization is associated with future adverse outcomes in both males and females, even when controlling for prior levels of dependent variables.

Two other studies have used data from the National Longitudinal Study of Adolescent Health (Add Health) to investigate outcomes of victimization. Teitelman,

Ratcliffe, Dichter and Sullivan (2008) explored associations between psychological and physical TDV victimization and future IPV and HIV risk in 2,058 sexually active women, using the public-use Add Health data set. When controlling for past HIV risk (condom nonuse), TDV victimization was not found to be associated with HIV risk 5 years later; however, young women who had experienced TDV were at greater risk for adult IPV victimization.

Roberts, Klein and Fisher (2003) also used the public-use Add Health dataset to assess if experiencing physical or psychological victimization during a 1-year period was associated with changes in levels of risk behaviors during that same period. The sample for this study consisted of the 4,443 males and females who participated in Waves 1 and 2 of Add Health, and primary outcome measures included substance use (tobacco, alcohol and marijuana), antisocial behaviors, suicidal behaviors, violent behaviors (e.g., getting in a physical fight) and depression. For females, victimization was associated with increased suicidal behaviors, antisocial behaviors and substance use, while for both males and females, victimization was associated with increased depressive symptomology. TDV victimization was not related to violent behaviors in either males or females.

Together, these studies demonstrate that TDV victimization is likely associated with adverse consequences in both males and females. However, the longitudinal studies that have been conducted have several limitations. For example, Roberts et al. (2003) and Teitelman et al. (2008) both used the public use version of the Add Health dataset, which contains less than half of the total Add Health sample; although this data is still nationally representative, assessment of less prevalent outcomes may have been limited due to low power in sub-samples. Teitelman et al. (2008) also restricted their study to females only, and looked at only two outcomes. While Roberts et al. (2003) included both males and females and looked at a broader range of outcomes,

this study is limited by the short-term follow-up period (1 year). Finally, though the Ackard et al. (2007) study addresses some of these issues (i.e., including males and females, a long-term follow-up period (5 years), and a wide range of outcomes), this study is limited by the small sample size in the male sub-sample, which precluded a thorough investigation of outcomes for these victims. To address these limitations, additional longitudinal studies are needed that 1) include a broad range of outcomes; 2) are nationally representative; 3) include a large sample size; 4) assess outcomes for both males and females; and 5) include a long-term follow-up period. Further, while adverse consequences of psychological victimization are documented for adult men and women (Coker et al., 2002) and female adolescents (Roberts et al., 2005), no literature investigates outcomes for adolescent males who have experienced psychological TDV. Thus, studies are also needed that look at the effects of physical and psychological victimization separately.

The present study will investigate a broad range of adverse outcomes related to physical and psychological TDV 5 years after victimization using the restricted-use Add Health dataset, in order to clarify outcomes for adolescent males and females, and provide information that leads to more comprehensive prevention programs and services. Based on previous work, we hypothesize that physical and psychological victimization will be associated with a number of adverse outcomes in both males and females.

CHAPTER 2

METHODS

Data

The present study is a secondary analysis of the restricted-use Add Health dataset. Add Health was designed to study determinants of health and risk behaviors in a nationally representative sample of US adolescents. In 1994, participants for Add Health were selected from 80 high schools and 52 feeder middle schools with unequal probability of selection. Schools were stratified with respect to region of country, urbanicity, school size, school type and ethnicity. Using structured, in-home interviews, data were collected from the longitudinal sample at four waves. At Wave 1 (1994-1995), adolescents in grades 7-12 participated in an in-home interview (n with sampling weights=18,924). Approximately 14,000 of these adolescents were re-interviewed in 1996 at Wave 2. Participants were again interviewed in 2001-2002 (Wave 3; n with sampling weights=10,828) and in 2007-2008 (Wave 4; n with sampling weights=9,421).

Sample

The analytic sample was restricted to male and female adolescents who participated in the in-home interviews at Waves 1, 2 and 3. Participants were included if they 1) had been in a heterosexual dating or sexual relationship between the Wave 1 and 2 interviews (n=7,210); 2) were 18 years of age or younger at the Wave 2 interview (n=6,638); 3) reported that they had answered Wave 2 questions honestly (n=6,289); and 4) had complete data on all control variables and covariates (n=5,681). Complete case analysis resulted in the exclusion of less than 10% of the eligible sample.

Measures¹

Teen Dating Violence (TDV) Victimization

At Wave 2, participants were asked to identify up to three romantic and three sexual relationships occurring since the Wave 1 interview (approximately 18 months). Participants were then asked about violence victimization experienced in each identified relationship using audio computer assisted self interview (A-CASI).² Dating violence was measured using five items derived from the revised Conflict Tactics Scale (CTS2) (Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Participants were asked if a partner had ever 1) called them names, insulted them or treated them disrespectfully in front of others; 2) sworn at them; 3) threatened them with violence; 4) pushed or shoved them; or 5) thrown something at them that could hurt. For the present analyses, a dichotomous variable was created, indicating whether participants endorsed any of the five victimization items in any of their romantic or sexual relationships.

Based on the results of a prior latent class analysis (Foster, Hagan, & Brooks-Gunn, 2004), two TDV sub-groups were also created: a sub-group reporting psychological victimization only (item(s) 1, 2 or 3) and a sub-group reporting both physical and psychological victimization (item(s) 1, 2 or 3 and item(s) 4 or 5). In all cases, the comparison group was comprised of adolescents reporting having dating partners but no dating violence at Wave 2.

Control Variables

Age. Age in years at Wave 2, a continuous variable, was used in the present analyses.

¹ A detailed list of measures is presented in Appendix A.

² All measures except age, race/ethnicity, gender, socio-economic status, depression, self-esteem and extreme weight control were assessed using A-CASI.

Gender. Wave 2 self-reported gender was used in the present analyses.

Race/ethnicity. Using self-reported Wave 1 race and ethnicity data, four mutually exclusive racial/ethnic categories were created: non-Hispanic White, non-Hispanic Black, Hispanic and non-Hispanic other. Non-Hispanic adolescents reporting more than one race were assigned to the non-Hispanic other category.

Pubertal status. Pubertal status at Wave 2 was included due to its potential importance as a risk factor for dating violence victimization, beyond the effect of chronological age (Foster et al., 2004). Males and females were asked to rate themselves on three indicators of physical maturity, on items similar to those found in the Pubertal Development Scale (Petersen, Crockett, Richards, & Boxer, 1988). Males were asked about underarm hair growth, facial hair thickness and voice depth, and females were asked about breast development, body curviness and age at first menses.

Pubertal status scores were developed in a similar manner to Foster et al. (2004). For females, a menses duration measure was created by subtracting age at Wave 2 from age at first menses, resulting in an item with a range of 0 years to more than 5 years. To create the pubertal status scale, each item (three for males and three for females) was first standardized to mean 0 and standard deviation 1, in order to allow assessment of pubertal status as deviations from the mean. The three standardized items for each gender were then averaged to create the pubertal status score. Higher scores indicate more advanced pubertal status. Cronbach's alpha was 0.63 for the male pubertal development scale, and 0.53 for the female pubertal development scale.

Socioeconomic status. Parental education was used as proxy for socioeconomic status. At Wave 1, participants reported on the education level of their resident mother and father. For these analyses, six education categories were created (less than 8th grade, some high school, high school graduate, some college, college graduate and post-

college), and the highest education level for either the residential mother or residential father was used as the SES indicator for that participant.

Covariates

Child maltreatment. Child maltreatment was measured retrospectively at Wave 3. Items assessing child maltreatment in Add Health are similar to those in the Parent-Child Conflict Tactics Scale (Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). Participants were asked about neglect (“by the time you started sixth grade, how often had your parents or other adult care-givers not taken care of your basic needs, such as keeping you clean or providing food or clothing?”), physical abuse (“how often had your parents or other adult care-givers slapped, hit, or kicked you?”) and sexual abuse (“how often had one of your parents or other adult care-givers touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?”). Each item was measured on a 6-point scale, ranging from never to more than 10 times. A dichotomous variable was created, indicating whether participants reported any form of abuse or neglect.

Forced sex. At Waves 1 and 2, female participants were asked if they had been forced to have sexual intercourse against their will by any person (i.e., not only dating partners). A dichotomous variable was created, reflecting endorsement of forced sex at either wave. This covariate was only used in gender-stratified analyses.

Wave 3 Outcome Variables

Depression. The Centers for Epidemiological Studies—Depression Scale (CES-D) is a 20-item measure commonly used to assess depression (Radloff, 1977). At Waves 2 and 3, nine items from the CES-D were included, asking if participants had experienced particular feelings in the past 7 days (e.g., “You were bothered by things that don’t usually bother you,” “You felt depressed”). The nine items included in Add Health represent the four subscales of the CES-D (Crockett, Randall, Shen, Russell, &

Driscoll, 2005). Items were scored using a 4-point Likert-type scale (ranging from never (0) to most of the time (3)), and depression scores were created by summing responses across all nine items. Higher scores indicate more depressive symptomology; scores range from 0-27. Cronbach's alpha for the depression scale was 0.79 at Wave 2 and 0.80 at Wave 3.

Self-esteem. At Waves 2 and 3, self-esteem was assessed using four items from Rosenberg's self-esteem scale (Rosenberg, 1965). Participants were asked if they have a lot of good qualities, have a lot to be proud of, like themselves as they are, and feel like they are doing everything just about right. Each item was scored on a 5-point Likert-type scale (ranging from strongly agree (0) to strongly disagree (4)), and self-esteem scores were created by summing responses across the four items. For the present analyses, items were reverse coded, so that higher scores indicate higher self-esteem; scores range from 0-16. Cronbach's alpha for the self-esteem scale was 0.80 at Wave 2 and 0.78 at Wave 3.

Antisocial behaviors. Seven items from the Self-Reported Delinquency scale (Elliott, Ageton, & Huizinga, 1985) were used to assess antisocial behaviors at Waves 2 and 3. Participants were asked to self-report the frequency of their delinquent behaviors over the past 12 months; example items include deliberately damaging property that didn't belong to them and stealing items worth more or less than \$50. Responses were measured on a 4-point Likert-type scale, ranging from never (0) to 5 or more times (3). Antisocial behavior scores were created by summing responses across all seven items. Higher scores indicate a greater frequency of antisocial behaviors; scores range from 0-21. Cronbach's alpha for the antisocial behaviors scale was 0.73 at Wave 2 and 0.65 at Wave 3.

Sexual risk. A composite sexual risk index was created for this sample, based on prior sexual risk indices created using Add Health data (Henrich, Brookmeyer, Shrier, &

Shahar, 2005; Lehrer, Shrier, Gortmaker, & Buka, 2006). Five risk behaviors were included in the scale: condom nonuse at last sex, birth control nonuse at last sex, ≥ 3 sexual partners within the past 12 months, any STI diagnosis in the past 12 months, and any sex trading in the past 12 months. Each item was dichotomized, and then summed to create an overall score. For all risk behaviors, 0 represented low risk, and 1 represented high risk. Scores range from 0-5, with higher scores indicating higher risk.

Extreme weight control. At Waves 2 and 3, participants were asked to report on five behaviors used in the past 7 days in order to lose weight or keep from gaining weight. In order to not include potentially healthy behaviors (i.e., dieting, exercising) in our assessment of adverse outcomes related to victimization, the present study only included the three more extreme items: self-induced vomiting, taking diet pills or taking laxatives. A dichotomous variable was created, indicating if participants reported any of the extreme weight control items.

Suicidal ideation/attempt. Suicidal ideation was assessed by asking participants if they had seriously thought about committing suicide in the past 12 months. Participants endorsing this item were then asked how many times they had actually attempted suicide in the past 12 months. The attempt question was dichotomized, to indicate if a participant reported any suicide attempts in the past 12 months.

Substance use. Participants were asked to report on smoking behavior in the past 30 days. This variable was dichotomized, indicating if a participant reported any smoking behavior (i.e., smoking on one or more days). Participants reporting no smoking behavior in the past 30 days, or reporting that they had never smoked, were considered non-smokers.

To assess heavy episodic drinking behavior in the past 12 months, participants were asked how many times they had drank 5 or more drinks in a row in the past year. Response options ranged from none to every day or almost every day. Participants

reporting that they engaged in heavy episodic drinking behavior at least two to three times a month for each of the preceding 12 months were considered heavy episodic drinkers.

For the present analyses, illicit substance use was divided into two categories: marijuana use in the past 12 months and other drug use in the past 12 months. The other drug category was comprised of cocaine use (including powder, freebase or crack cocaine), injection drug use, and general illicit drug use (including LSD, PCP, ecstasy, mushrooms, speed, ice, heroin or prescription drugs used without a doctor's permission). Participants reporting any form of other drug use were considered other drug users.

Intimate partner violence victimization (IPV). At Wave 3, participants were asked to report on violence victimization occurring in romantic and sexual relationships in the past 12 months. Eligible relationships included recent sexual relationships (occurring since summer 1995), most important relationships, and relationships chosen for the Couples sample.³

Wave 3 IPV items were derived from the CTS2 (Straus et al., 1996). Participants were asked if, in the past 12 months, a partner had 1) threatened them with violence, pushed or shoved them, or thrown something at them that could hurt or 2) slapped, hit or kicked them. Responses were measured on a 7-point Likert-type scale, ranging from never to more than 20 times. A dichotomous variable was created, indicating whether participants endorsed either IPV item for any assessed relationship at Wave 3.

³ The Couples sample was designed to gather information on married, cohabitating and dating partners, and collected information from half of original respondents.

Statistical Analysis

Descriptive statistics were first calculated for the entire sample (n=5,681).

Bivariate associations between experiencing TDV at Wave 2 and all other variables were then explored. Significance of these associations was tested using t-tests for continuous variables (age, depression, self-esteem, antisocial behaviors and sexual risk taking), and χ^2 tests of association for categorical variables (gender, race/ethnicity, pubertal status, socioeconomic status, child maltreatment, extreme weight control, suicidal ideation/attempts, substance use and IPV victimization). Linear and logistic autoregression models were then created for each Wave 3 outcome variable, as appropriate, in order to investigate the association of TDV victimization at Wave 2 with adverse outcomes at Wave 3. Autoregression models control for the level of the dependent variable at the prior wave (e.g., in a model predicting depression at Wave 3, depression at Wave 2 is included as a covariate). Potential interactions of TDV by gender were also considered in each model. Effect sizes in models using multivariate linear regression were assessed using Cohen's f^2 (Cohen, 1988). This measure assesses the percentage of variance explained with and without a certain predictor (or set of predictors) in the model; $f^2 = .02$ is considered a small effect size, $f^2 = .15$ is considered a medium effect size, and $f^2 = .35$ is considered a large effect size (Cohen, 1988). In the present analyses, Cohen's f^2 represents the proportion of variance explained by TDV victimization in a given model.

In addition to models investigating the association between any TDV victimization at Wave 2 and Wave 3 outcomes, models were also created to investigate the association of specific sub-types of TDV (1) psychological victimization only and 2) both physical and psychological victimization) with each Wave 3 outcome. For sub-group analyses, we again investigated potential interactions of TDV by gender, and also performed gender-stratified analyses, in order to assess

differential effects for males and females. All models controlled for relevant covariates.

All analyses were performed in R v.2.11.1. Because of design effects in the Add Health dataset (Chantala & Tabor, 1995), the Survey package was used to calculate all descriptive statistics, bivariate associations and regression models. The Survey package accounts for complex survey design characteristics in its computations, allowing for nationally representative results with unbiased estimates. All results were evaluated at $p < .05$. This study was reviewed by the Cornell University Institutional Review Board and deemed exempt.

CHAPTER THREE

RESULTS

Missingness Assessment

For the current analyses, results are presented for the sample with complete data on all covariates; this resulted in the deletion of 608 individuals (9.7% of all eligible cases). In order to assess the impact of this decision, all analyses (descriptive, bivariate and regression) were run on three subsets: a subset using pairwise deletion ($n=6,289$), the subset using listwise deletion ($n=5,681$), and a subset using a random sample of the complete cases ($n=4,000$). In all cases, the results from these three subsets were very similar, indicating that the deletion of these individuals likely did not bias the results in any substantial way. Because of this, results are presented for the listwise deleted sample only ($n=5,681$).

In order to further explore missingness, individuals with any missing data on covariates were compared to individuals with no missing data. At Wave 2, individuals with missing data reported higher depression scores and lower self-esteem scores. They were also more likely to report a suicide attempt, but less likely to report marijuana use. At Wave 3, individuals with missing data were less likely to report heavy episodic drinking. Individuals with missing data were also younger, had lower socioeconomic status, and reported less advanced pubertal status than individuals with no missing data. There were no differences between missing and non-missing individuals on gender, race, maltreatment or dating violence group.

Sample Characteristics

The mean age of this sample was 16.0 years at Wave 2, and 21.4 years at Wave 3 (Table 1). The majority of the sample was White, non-Hispanic (Table 1). Fewer

than 11% of adolescents reported a parental education level of less than high school (Table 1). Other demographics are reported in Table 1.

Table 1. *Sociodemographics (n=5681)*

	Percentage[†]
Wave 2 age, mean (SD)	16.0 (0.10)
Wave 3 age, mean (SD)	21.4 (0.10)
Sex	
Male	47.7 (n=2519)
Female	52.3 (n=3162)
Race	
White, non-Hispanic	69.3 (n=3195)
Black, non-Hispanic	13.5 (n=1074)
Hispanic	10.8 (n=864)
Other	6.4 (n=548)
Parental education	
8 th grade or less	2.7 (n=190)
Some high school	7.9 (n=447)
High school graduate	30.5 (n=1639)
Some post-secondary	22.8 (n=1236)
College graduate	24.5 (n=1426)
Post-college	11.6 (n=743)
Child maltreatment	
Yes	33.1 (n=1906)
No	66.9 (n=3775)
Puberty	
2 SD above mean	1.6 (n=86)
1 SD above mean	14.8 (n=851)
Within +/- 1 SD of mean	71.8 (n=4095)
1 SD below mean	10.7 (n=584)
2 SD below mean	1.1 (n=65)
Wave 2 TDV victimization	
Psychological only	19.8 (n=1143)
Physical only	2.4 (n=128)
Physical and psychological	8.6 (n=483)
None	69.2 (n=3927)

[†]Unless otherwise noted. Percentages and means are weighted, number of subjects is unweighted.

Approximately 30.8% of adolescents in this sample reported dating violence victimization at Wave 2 (Table 1). Compared to non-victims, victims of TDV were older, and were more likely to have parents with lower education levels, have experienced child maltreatment, and be of more advanced pubertal status (Table 2).

They were also more likely to be non-White (Table 2). There was no significant difference in victim status by gender (Table 2).

Table 2. *Sociodemographics by Victim Status (n=5681)*

	Percentage[†]	
	<i>Victim</i>	<i>Non-Victim</i>
Wave 2 age, mean (SD)*	16.2 (0.09)	15.9 (0.10)
Wave 3 age, mean (SD)*	21.7 (0.10)	21.4 (0.10)
Sex		
Male	47.0 (n=808)	48.0 (n=1711)
Female	52.3 (n=946)	52.0 (n=2216)
Race⁺		
White, non-Hispanic	66.1 (n=968)	70.7 (n=2227)
Black, non-Hispanic	15.2 (n=341)	12.8 (n=733)
Hispanic	11.3 (n=262)	10.6 (n=602)
Other	7.5 (n=183)	6.0 (n=365)
Parental Education[^]		
8 th grade or less	2.0 (n=51)	3.0 (n=139)
Some high school	9.7 (n=154)	7.1 (n=293)
High school graduate	32.3 (n=553)	29.7 (n=1086)
Some post-secondary	23.6 (n=384)	22.5 (n=852)
College graduate	22.2 (n=406)	25.5 (n=1020)
Post-college	10.3 (n=206)	12.2 (n=537)
Child Maltreatment*		
Yes	40.2 (n=688)	29.9 (n=1218)
No	59.8 (n=1066)	70.1 (n=2709)
Puberty*		
2 SD above mean	2.6 (n=39)	1.1 (n=47)
1 SD above mean	16.7 (n=303)	14.0 (n=548)
Within +/- 1 SD of mean	70.0 (n=1234)	72.6 (n=2861)
1 SD below mean	9.6 (n=160)	11.2 (n=424)
2 SD below mean	3.1 (n=18)	1.1 (n=47)

[†]Unless otherwise noted. Percentages and means are weighted, number of subjects is unweighted.

*p < .001; [^]p < .01; ⁺p < .05

Relationships between Adverse Outcomes and TDV

At Wave 2, adolescents experiencing TDV victimization reported greater depressive symptomology, lower self-esteem, more antisocial behaviors, more suicidal ideation and attempts, greater rates of substance use, and greater sexual risk taking than non-victims (Table 3). At Wave 3, those who identified as TDV victims at Wave 2 also disproportionately reported these same adverse outcomes; compared to non-

victims, victims reported more depressive symptomology, lower self-esteem, more antisocial behaviors, more suicidal ideation and attempts, greater rates of substance use and increased IPV victimization (Table 3). An association also existed between dating violence at Wave 2 and extreme weight control behaviors at Wave 3 (Table 3). No association was found between TDV victimization at Wave 2 and extreme weight control behaviors at Wave 2, between TDV victimization at Wave 2 and sexual risk taking at Wave 3, or between TDV victimization at Wave 2 and heavy episodic drinking at Wave 3 (Table 3).

Table 3. *Bivariate Associations with Wave 3 Outcomes (n=5681)*

	Percentage[†]	
	<i>Victims</i>	<i>Non-Victims</i>
Depression, mean (SD)		
Wave 2*	7.2 (0.15)	5.2 (0.09)
Wave 3*	5.2 (0.17)	4.1 (0.09)
Self-esteem, mean (SD)		
Wave 2*	12.1 (0.09)	12.8 (0.06)
Wave 3*	12.6 (0.08)	13.0 (0.05)
Antisocial behaviors, mean (SD)		
Wave 2*	1.8 (0.09)	0.9 (0.05)
Wave 3*	0.9 (0.07)	0.6 (0.04)
Sexual risk taking, mean (SD)[‡]		
Wave 2 [^]	2.6 (0.05)	2.4 (0.05)
Wave 3	1.4 (0.03)	1.3 (0.03)
Extreme weight control		
Wave 2	1.9 (n=35)	1.2 (n=55)
Wave 3 ⁺	5.0 (n=98)	3.4 (n=140)
Suicidal ideation		
Wave 2*	20.1 (n=317)	10.3 (n=387)
Wave 3*	9.6 (n=149)	5.1 (n=183)
Suicide attempt		
Wave 2*	6.8 (n=113)	3.2 (n=117)
Wave 3 ⁺	2.8 (n=42)	1.5 (n=50)
Smoking		
Wave 2*	54.7 (n=872)	38.0 (n=1330)
Wave 3*	48.1 (n=789)	38.8 (n=1332)
Heavy episodic drinking		
Wave 2*	21.0 (n=365)	13.9 (n=487)
Wave 3	30.4 (n=484)	27.2 (n=905)
Marijuana use		
Wave 2*	47.7 (n=802)	26.2 (n=1022)

Table 3 (Continued)

Wave 3*	44.6 (n=739)	36.8 (n=1303)
Other drug use		
Wave 2*	15.1 (n=243)	5.7 (n=220)
Wave 3*	19.6 (n=311)	14.2 (n=481)
Partner violence victimization		
Wave 2	n/a	n/a
Wave 3*	42.6 (n=629)	24.2 (n=818)

[†]Unless otherwise noted. Percentages and means are weighted, number of subjects is unweighted.

[‡]Results are for the subset of participants that were sexually active at Waves 2 and 3.

*p < .001; ^p < .01; +p < .05

When accounting for covariates in regression analyses,⁴ TDV victimization at Wave 2 was associated with greater depressive symptomology ($\beta = 0.40$, 95% Confidence Interval (CI), 0.08-0.72; p = .01) and increased antisocial behaviors ($\beta = 0.19$, 95% CI, 0.06-0.31; p = .006) at Wave 3 (Table 4). The association with antisocial behaviors was also moderated by gender; the relationship between TDV victimization at Wave 2 and antisocial behaviors at Wave 3 was stronger for male victims, when compared to female victims and male and female non-victims ($\beta = -0.33$, 95% CI, -0.08- -0.58; p = .01) (Figure 1). Cohen's f^2 was 0.002 for depressive symptomology and 0.003 for antisocial behaviors, indicating small effect sizes.

Victimization at Wave 2 was also associated with higher odds of suicidal ideation (Adjusted Odds Ratio (aOR) = 1.76, 95% CI, 1.27-2.45; p = .001), other drug use (aOR = 1.33, 95% CI, 1.09-1.62; p = .006), heavy episodic drinking (aOR = 1.22, 95% CI, 1.02-1.45; p = .03) and IPV victimization (aOR = 2.26, 95% CI, 1.92-2.66; p < .001) at Wave 3 (Table 4). In this sample, victimization was not associated with lower self-esteem, increased sexual risk taking, or increased odds of extreme weight control, suicide attempts, smoking, or marijuana use at Wave 3 (Table 4).

⁴ A summary of results from regression analyses is found in Appendices B and C.

Table 4. Regression Analyses Predicting Outcomes at Wave 3 for Adolescents Reporting Any TDV Victimization at Wave 2 (n=5681)

	Coefficient (β (95% CI))	p-value
Depression	0.40 (0.08-0.72)	.01
Self-esteem	-0.14 (-0.30-0.01)	.07
Antisocial behaviors [†]	0.19 (0.06-0.31)	.006
Sexual risk taking [‡]	0.01 (-0.17-0.19)	> .500
	Coefficient (aOR (95% CI))	p-value
Extreme weight control	1.35 (0.93-1.97)	.12
Suicidal ideation	1.76 (1.27-2.45)	.001
Suicide attempt	1.73 (0.98-3.07)	.06
Smoking	1.13 (0.96-1.34)	.14
Heavy episodic drinking	1.22 (1.02-1.45)	.03
Marijuana use	1.17 (1.00-1.37)	.06
Other drug use	1.33 (1.09-1.62)	.006
Partner violence victimization	2.26 (1.92-2.66)	< .001

Boldfaced values indicate significance at p < .05. aOR=adjusted odds ratio. CI=confidence interval.

All analyses control for race, age, socioeconomic status, child maltreatment, pubertal status and gender. Each analysis also controls for the dependent variable at Wave 2 (e.g., in the regression for depression, depression at Wave 2 was included as a covariate).

[†]Significant gender interaction at p < .05.

[‡]Results are for the subset of participants that were sexually active at Waves 2 and 3.

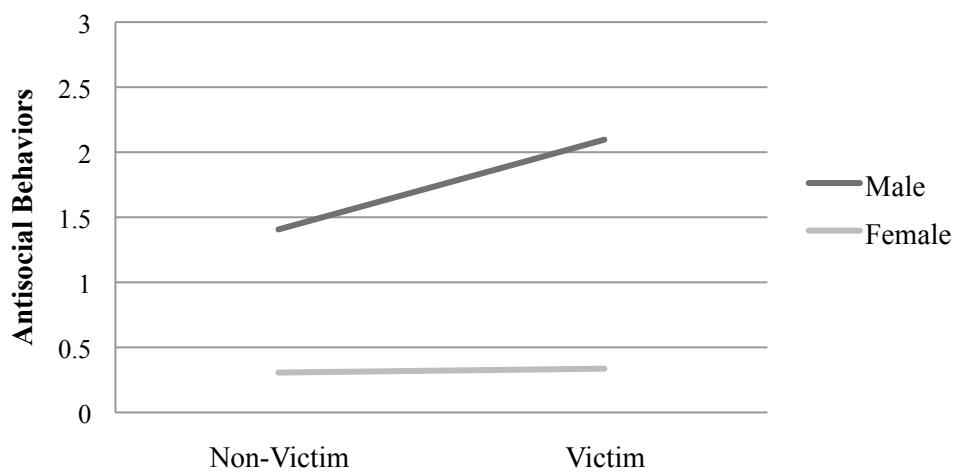


Figure 1. *Gender Differences in the Association of any Teen Dating Violence Victimization and Antisocial Behaviors*

Sub-group Analyses

Associations between outcomes and specific sub-types of TDV victimization were also explored. In the psychological victimization sub-group (i.e., adolescents reporting psychological victimization only versus adolescents reporting no dating violence), victimization was associated with increased antisocial behaviors at Wave 3 ($\beta = 0.17$, 95% CI, 0.05-0.29; $p = .008$) (Table 5). The association between Wave 3 antisocial behaviors and psychological victimization was again moderated by gender, with a stronger relationship between victimization and antisocial behaviors in male victims ($\beta = -0.29$, 95% CI, -0.54- -0.03; $p = .03$) (Figure 2). Cohen's f^2 for antisocial behaviors was 0.002, indicating a small effect size.

Psychological victimization at Wave 2 was also associated with increased odds of suicidal ideation (aOR = 1.71, 95% CI, 1.20-2.43; $p = .004$), heavy episodic drinking (aOR = 1.33, 95% CI, 1.08-1.64; $p = .008$), marijuana use (aOR = 1.23, 95% CI, 1.02-1.47; $p = .03$), other drug use (aOR = 1.38, 95% CI, 1.07-1.78; $p = .02$) and IPV victimization (aOR = 1.97, 95% CI, 1.60-2.42; $p < .001$) at Wave 3 (Table 5). There was also a borderline association between psychological victimization at Wave 2 and extreme weight control behaviors at Wave 3 (aOR=1.48, 95% CI, 1.00-2.20; $p = .05$) (Table 5).

Table 5. *Regression Analyses Predicting Outcomes at Wave 3 for Adolescents Reporting Psychological Victimization at Wave 2 (n=5070)*

	<i>Coefficient (β (95% CI))</i>	<i>p-value</i>
Depression	0.27 (-0.04-0.58)	.09
Self-esteem	-0.16 (-0.35-0.03)	.10
Antisocial behaviors [†]	0.17 (0.05-0.29)	.008
Sexual risk taking [‡]	0.05 (-0.16-0.27)	> .500
	<i>Coefficient (aOR (95% CI))</i>	<i>p-value</i>
Extreme weight control	1.48 (1.00-2.20)	.05
Suicidal ideation	1.71 (1.20-2.43)	.004
Suicide attempt	1.85 (0.96-3.59)	.07
Smoking	1.08 (0.88-1.33)	.46
Heavy episodic drinking	1.33 (1.08-1.64)	.008
Marijuana use	1.23 (1.02-1.47)	.03
Other drug use	1.38 (1.07-1.78)	.02
Partner violence victimization	1.97 (1.60-2.42)	< .001

Boldfaced values indicate significance at $p < .05$. aOR=adjusted odds ratio. CI=confidence interval.

All analyses control for race, age, socioeconomic status, child maltreatment, pubertal status and gender. Each analyses also controls for the dependent variable at Wave 2 (e.g., in the regression for depression, depression at Wave 2 was included as a covariate).

[†]Significant gender interaction at $p < .05$.

[‡]Results are for the subset of participants that were sexually active at Waves 2 and 3.

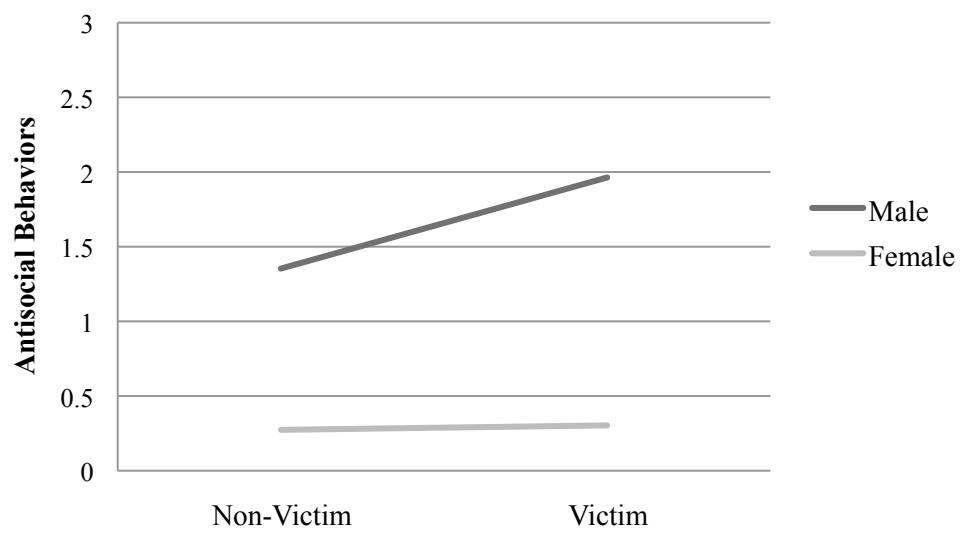


Figure 2. *Gender Differences in the Association of Psychological Teen Dating Violence Victimization and Antisocial Behaviors*

When analyses were stratified by gender, the experience of Wave 2 psychological victimization was only associated with increased Wave 3 antisocial behaviors in males ($\beta = 0.33$, 95% CI, 0.12-0.54; $p = .003$) (Table 6); Cohen's f^2 for antisocial behaviors was 0.005. Compared to male non-victims, male psychological aggression victims were also more likely to experience increased odds of suicidal ideation (aOR = 1.90, 95% CI, 1.13-3.20; $p = .02$), marijuana use (aOR = 1.34, 95% CI, 1.03-1.74; $p = .03$) and IPV victimization (aOR = 2.08, 95% CI, 1.53-2.84; $p < .001$) at Wave 3 (Table 6). In the female sub-sample, psychological aggression victims were more likely to experience increased odds of Wave 3 heavy episodic drinking (aOR = 1.44, 95% CI, 1.03-2.01; $p = .04$) and IPV victimization (aOR = 1.87, 95% CI, 1.44-2.43; $p < .001$) when compared to non-victims (Table 6).

Table 6. Regression Analyses Predicting Outcomes at Wave 3 for Adolescents Reporting Psychological Victimization at Wave 2, stratified by gender

	Male (n=2254)	Female (n=2816)		
	<i>Coefficient (β (95% CI))</i>	<i>p-value</i>	<i>Coefficient (β (95% CI))</i>	<i>p-value</i>
Depression	0.36 (-0.02-0.74)	.06	0.21 (-0.57-1.00)	.40
Self-esteem	-0.18 (-0.45-0.08)	.18	-0.15 (-0.42-0.13)	.30
Antisocial behaviors	0.33 (0.12-0.54)	.003	0.04 (-0.10-0.18)	> .500
Sexual risk taking [‡]	-0.07 (-0.37-0.23)	> .500	0.19 (-0.08-0.46)	.17
	<i>Coefficient (aOR (95% CI))</i>	<i>p-value</i>	<i>Coefficient (aOR (95% CI))</i>	<i>p-value</i>
Extreme weight control	1.63 (0.60-4.40)	.34	1.47 (0.93-2.33)	.10
Suicidal ideation	1.90 (1.13-3.20)	.02	1.61 (0.94-2.77)	.09
Suicide attempt	1.33 (0.41-4.35)	>.500	2.12 (0.93-4.86)	.08
Smoking	0.99 (0.72-1.36)	.96	1.16 (0.90-1.51)	.25
Heavy episodic drinking	1.24 (0.92-1.68)	.16	1.44 (1.03-2.01)	.04
Marijuana use	1.34 (1.03-1.74)	.03	1.11 (0.86-1.44)	.43
Other drug use	1.36 (0.93-1.98)	.12	1.40 (0.97-2.00)	.07
Partner violence victimization	2.08 (1.53-2.84)	< .001	1.87 (1.44-2.43)	< .001

Boldfaced values indicate significance at $p < .05$. aOR=adjusted odds ratio. CI=confidence interval.

All analyses control for race, age, socioeconomic status, child maltreatment, and pubertal status. Each analyses also controls for the dependent variable at Wave 2 (e.g., in the regression for depression, depression at Wave 2 was included as a covariate). Analyses for females also included forced sex as a covariate.

[‡]Results are for the subset of participants that were sexually active at Waves 2 and 3.

In the sub-group experiencing both psychological and physical victimization (i.e., adolescents reporting physical and psychological victimization versus adolescents reporting no dating violence), victimization at Wave 2 was associated with higher levels of depressive symptomology ($\beta = 0.91$, 95% CI, 0.32-1.50; $p = .003$), and increased odds of suicidal ideation ($aOR = 1.92$, 95% CI, 1.22-3.01; $p = .006$), smoking ($aOR = 1.29$, 95% CI, 1.02-1.64; $p = .04$) and IPV victimization ($aOR = 3.09$, 95% CI, 2.42-3.94; $p < .001$) at Wave 3 (Table 7). Cohen's f^2 for depressive symptomology was 0.006.

Table 7. Regression Analyses Predicting Outcomes at Wave 3 for Adolescents Reporting Physical and Psychological Victimization at Wave 2 (n=4410)

	<i>Coefficient (β (95% CI))</i>	<i>p-value</i>
Depression	0.91 (0.32-1.50)	.003
Self-esteem	-0.14 (-0.40-0.12)	.29
Antisocial behaviors	0.23 (-0.05-0.51)	.11
Sexual risk taking [‡]	-0.06 (-0.30-0.18)	> .500
	<i>Coefficient (aOR (95% CI))</i>	<i>p-value</i>
Extreme weight control	0.80 (0.39-1.62)	> .500
Suicidal ideation	1.92 (1.22-3.01)	.006
Suicide attempt	2.03 (0.83-4.99)	.12
Smoking	1.29 (1.02-1.64)	.04
Heavy episodic drinking	1.06 (0.77-1.46)	> .500
Marijuana use	1.09 (0.79-1.50)	> .500
Other drug use	1.10 (0.80-1.51)	> .500
Partner violence victimization	3.09 (2.42-3.94)	< .001

Boldfaced values indicate significance at $p < .05$. aOR=adjusted odds ratio. CI=confidence interval.

All analyses control for race, age, socioeconomic status, child maltreatment, pubertal status and gender. Each analyses also controls for the dependent variable at Wave 2 (e.g., in the regression for depression, depression at Wave 2 was included as a covariate).

[‡]Results are for the subset of participants that were sexually active at Waves 2 and 3.

When analyses for victims of physical and psychological aggression were stratified by gender, Wave 2 victimization in females was associated with greater depressive symptomology ($\beta = 0.90$, 95% CI, 0.12-1.67; $p = .03$), as well as increased odds of suicidal ideation ($aOR = 2.07$, 95% CI, 1.17-3.66; $p = .01$), smoking ($aOR =$

1.53, 95% CI, 1.13-2.06; $p = .006$) and IPV victimization ($aOR = 2.79$, 95% CI, 2.06-3.77; $p < .001$) at Wave 3 (Table 8).

Table 8. Regression Analyses Predicting Outcomes at Wave 3 for Adolescents Reporting Physical and Psychological Victimization at Wave 2, stratified by gender

	Male (n=1909)		Female (n=2501)	
	<i>Coefficient (β (95% CI))</i>	<i>p-value</i>	<i>Coefficient (β (95% CI))</i>	<i>p-value</i>
Depression	0.89 (0.01-1.76)	.05	0.90 (0.12-1.67)	.03
Self-esteem	-0.06 (-0.42-0.30)	.75	-0.18 (-0.50-0.13)	.26
Antisocial behaviors	0.54 (-0.05-1.14)	.08	0.03 (-0.17-0.22)	> .500
Sexual risk taking [‡]	0.006(-0.34-0.35)	> .500	-0.11 (-0.44-0.22)	> .500
	<i>Coefficient (aOR (95% CI))</i>	<i>p-value</i>	<i>Coefficient (aOR (95% CI))</i>	<i>p-value</i>
Extreme weight control [†]	n/a	n/a	0.95 (0.46-1.96)	> .500
Suicidal ideation	1.90 (0.96-3.74)	.07	2.07 (1.17-3.66)	.01
Suicide attempt [†]	n/a	n/a	1.87 (0.81-4.32)	.15
Smoking	1.04 (0.63-1.71)	> .500	1.53 (1.13-2.06)	.006
Heavy episodic drinking	1.13 (0.72-1.76)	> .500	0.98 (0.64-1.48)	> .500
Marijuana use	1.13 (0.72-1.79)	> .500	1.06 (0.70-1.60)	> .500
Other drug use	1.20 (0.74-1.92)	.46	0.98 (0.58-1.64)	> .500
Partner violence victimization	3.56 (2.34-5.42)	< .001	2.79 (2.06-3.77)	< .001

Boldfaced values indicate significance at $p < .05$. aOR=adjusted odds ratio. CI=confidence interval.

All analyses control for race, age, socioeconomic status, child maltreatment, and pubertal status. Each analyses also controls for the dependent variable at Wave 2 (e.g., in the regression for depression, depression at Wave 2 was included as a covariate). Analyses for females also included forced sex as a covariate.

[†]Cell count for male victims at Wave 3 too small to obtain a reliable estimate.

[‡]Results are for the subset of participants that were sexually active at Waves 2 and 3.

In males, Wave 2 physical and psychological victimization was only associated with increased Wave 3 IPV victimization ($aOR = 3.56$, 95% CI, 2.34-5.42; $p < .001$); however, there was also a borderline association between victimization at Wave 2 and depressive symptomology at Wave 3 ($\beta = 0.89$, 95% CI, 0.01-1.76; $p = .05$) (Table 8). Cohen's f^2 for depressive symptomology was 0.005 for females and 0.006 for males.

CHAPTER FOUR

DISCUSSION

The present study demonstrates that TDV victimization during adolescence is related to adverse outcomes in young adulthood. Five years after victimization, TDV victims were more likely to report depressive symptomology, heavy episodic drinking, other drug use, antisocial behaviors, suicidal ideation and IPV victimization than non-victims. When analyses were restricted by TDV sub-group, individuals experiencing psychological aggression only were more likely to report several types of substance use (heavy episodic drinking, marijuana use and other drug use), increased antisocial behaviors, increased suicidal ideation and increased IPV victimization when compared to non-victims. Psychological aggression victims were also somewhat more likely to report extreme weight control behaviors.

The relationship between victimization and antisocial behaviors was also strongly moderated by gender, both for TDV victimization overall, and in the subset of victims experiencing psychological aggression only; in both cases, the effect of victimization on antisocial behaviors was restricted to males. The subset of victims experiencing both physical and psychological aggression were more likely to report increased smoking, suicidal ideation, IPV victimization and depressive symptomology, when compared to non-victims. We did not find any associations between victimization and self-esteem, or between victimization and sexual risk behaviors in any set of analyses. Importantly, these results imply that psychological victimization alone may be as detrimental to future health outcomes as the experience of physical and psychological victimization combined; as prior studies of outcomes related to TDV victimization have not assessed the impact of psychological aggression alone, and as psychological aggression in teen dating relationships is in general an

understudied phenomenon, it is important that future studies in this field include a specific consideration of psychological aggression in their methodology.

We also found that the TDV victimization was related to adverse outcomes in both males and females. Further, it appears that for males, the experience of psychological aggression is most strongly related to adverse outcomes, while for females, the experience of both physical and psychological aggression may be most detrimental. Together with the results from the total sample, this suggests that certain outcomes may be more strongly related to certain sub-types of TDV, and that this relationship may differ by gender. For example, while both antisocial behaviors and depressive symptomology were related to victimization in the overall TDV group, when analyses were subsetted by type of victimization, antisocial behaviors were only related to victimization in the subset of victims experiencing psychological aggression, while depressive symptomology was only related to victimization in the subset of victims experiencing both psychological and physical aggression. Similarly, while suicidal ideation was related to TDV victimization in both males and females, for males, this relationship only existed in the subset experiencing psychological aggression, while for females, there was only an association in the subset experiencing both physical and psychological aggression. The relation of outcomes to specific sub-types of TDV victimization is an important consideration in future research.

Comparisons to Prior Work

The results from this study support past longitudinal work looking at outcomes of TDV victimization (Ackard et al., 2007; Roberts et al., 2003; Teitelman et al., 2008). Roberts et al. (2003) also used the Add Health sample, and looked at outcomes occurring within a year of victimization. Using this time frame, they found that TDV in females was associated with substance use, antisocial behaviors, and suicidal behaviors, while in both males and females, TDV was associated with depressive

symptomology. Following up with this sample approximately 5 years after victimization, we found that effects on substance use, depressive symptomology and suicidal behaviors persisted for females. For males, depression effects appeared slightly attenuated. In addition, borderline associations with substance use and suicidal behaviors emerged in the male sub-sample, but only for the subset of males experiencing psychological aggression only. This discrepancy may be because Roberts et al. (2003) used a TDV measure that included both physical and psychological victimization, a sub-type for which we also found no associations with substance use or suicidal behaviors in males.

The other primary difference between our findings and those of Roberts et al. (2003) relates to antisocial behaviors. In their study, antisocial behaviors were related to victimization in females, but not males, while in this study, antisocial behaviors were related to victimization in males, but not females. In our study, this association was also found to be strongly moderated by gender, with a significantly stronger effect for males. This difference may again be due to definitions of TDV used; in our study, victimization was only related to antisocial behaviors in the subset of males experiencing psychological aggression only, and not in the subset experiencing both physical and psychological aggression.

Our results also support findings from a sample of Minnesota youth (Ackard et al., 2007). In their sample, physical and sexual TDV victimization were related to substance use in males, and also had borderline associations with suicidal behaviors in the male sub-sample. In the female sub-sample, Ackard et al. (2007) found associations between victimization and substance use, victimization and depression, and a borderline association between victimization and suicidal behaviors. Similar to our study, Ackard et al. (2007) found no association between victimization and self-esteem in males or females, or between victimization and unhealthy weight control in

females. While there were some slight differences between findings in the Ackard et al. (2007) study and this study (e.g., Ackard et al. (2007) did not find an association between victimization and depression in males), this may again be due to differences in type of TDV assessed.

Finally, our findings in the female sub-sample compare to those from Teitelman et al. (2008). This is not surprising, as they also used Waves 2 and 3 of the Add Health dataset. However, our study extends the findings from this paper, by demonstrating that TDV victimization is also related to future IPV victimization in male TDV victims, regardless of type of TDV assessed. In addition, although we used a broader measure of sexual risk than Teitelman et al. (2008), we also found no association of this variable with prior TDV victimization in either males or females.

Together, these studies suggest that TDV victimization is related to long-term, adverse outcomes in both males and females, and that this relationship may differ by type of TDV experienced. However, as will be discussed below, measurement limitations in Add Health make it difficult to determine if differences in outcomes can be attributed to the sub-type of violence experienced. Further work is needed that includes more in-depth measurement of TDV in teens, in order to clarify these associations. Studies of this nature are especially important, as a better understanding of these relationships could provide important knowledge to secondary prevention initiatives.

Directionality Issues

Similar to Roberts et al. (2003), we found that individuals who experienced TDV victimization also disproportionately experienced adverse behaviors and conditions at the time of victimization. While our baseline measures of risk behaviors came from Wave 2 (and thus were assessed at the same time as victimization), in their study with Add Health data, Roberts et al. (2003) carefully assessed timing of

victimization, in order to better approximate baseline risk status. Looking only at participants who reported being victimized between Waves 1 and 2, Roberts et al. (2003) found that these individuals had higher risk scores on all outcomes at Wave 1 (i.e., before victimization occurred), and also had higher risk scores on outcomes at Wave 2 (i.e., after victimization occurred). This suggests that while individuals experiencing TDV may be more likely to experience adverse outcomes following victimization, they are also disproportionately at risk prior to victimization. Further, longitudinal studies assessing risk factors for TDV victimization suggest that several of the outcomes assessed in our study may also be risk factors, including low self-esteem (Foshee, Benefield, Ennett, Bauman, & Suchindran, 2004), substance use (Cleveland, Herrera, & Stuewig, 2003; Foshee et al., 2004; Raiford, Wingood, & DiClemente, 2007), depression (Cleveland et al., 2003; Foshee et al., 2004), sexual risk behaviors (Cleveland et al., 2003), and antisocial behaviors (Foster et al., 2004).

While not assessing TDV specifically, Kilpatrick, Acierno, Resnick, Saunders and Best (1997) sought to address issues of directionality in relation to adult interpersonal violence and substance use. Using a 3-wave national probability sample of adult women (the National Women's Study), they found that substance use at Wave 1 predicted subsequent physical or sexual assault. However, they also found that assaults occurring during the study period increased women's risk for substance use at Wave 3. From this, Kilpatrick et al. (1997) state that the substance abuse-assault relationship is reciprocal; it is plausible that a similar relationship exists for victims of TDV. Similarly, Ehrensaft, Moffitt and Caspi (2006) studied the relationship between IPV and psychiatric disorders in a representative New Zealand birth cohort. In this prospective sample, they found that psychiatric disorders (e.g., major depressive disorders, marijuana dependence, PTSD) increased the likelihood of involvement in an abusive relationship in both men and women, and that involvement in an abusive

relationship was also related to increased psychiatric disorders in women post-victimization. To clarify these relationships in adolescents, additional studies are needed that more thoroughly investigate life trajectories that increase risk for TDV victimization, as well as trajectories from victimization to subsequent adverse outcomes.

Stress and Coping: A Potential Pathway to Adverse Outcomes

A possible mechanism for explaining trajectories from TDV victimization to adverse outcomes may be via a stress and coping framework. While a number of individuals in our study experienced adverse outcomes, as in other studies examining outcomes related to adverse events (e.g., Werner, 1995), there were also individuals who did not experience adverse consequences following victimization. While there may be several reasons for this, one possibility is that individuals who do experience adverse outcomes 1) perceive victimization as a stressful event, and 2) use unhealthy coping mechanisms to deal with this stressor, leading to subsequent adverse outcomes. In their review of the literature on coping in adolescence, Compas, Connor-Smith, Saltzman, Thomsen and Wadsworth (2001) report that across multiple studies, relationships have been found between disengagement and emotion-focused coping and greater internalizing and externalizing behavior problems, and between engagement and problem-focused coping and more positive adjustment. As described in their review, problem- and emotion-focused coping refer to responses that involve acting on the source of stress (problem-focused), such as generating solutions to a problem or trying to change the situation causing the stress, versus those that focus on alleviating emotions that arise as a result of the stressor (emotion-focused), which could include avoidance of the source of stress, or expressing one's emotions to others. Engagement and disengagement are another way to conceptualize coping responses in adolescence, and provide a broader framework than the problem- vs.

emotion-focused classifications. Engagement coping involves responses that are oriented towards the source of stressor, whereas disengagement coping involves responses oriented away from the stressor (Compas et al., 2001). Further, engagement and disengagement coping can be a voluntary response to the stressor, or can represent involuntary or autonomic responses (Compas et al., 2001).

Using confirmatory factor analysis, Connor-Smith, Compas, Wadsworth, Thomsen and Saltzman (2000) demonstrated that voluntary engagement coping can be further sub-divided into primary control coping (i.e., coping which focuses on altering objective conditions) and secondary control coping (i.e., coping which focuses on adapting to the stressor). Items that comprised primary engagement coping in their analysis included problem solving, emotional expression and emotional regulation, while items that comprised secondary engagement coping included positive thinking, acceptance, and distraction (Connor-Smith et al., 2000). Neither disengagement coping nor involuntary coping responses (engagement or disengagement) were further divided into primary and secondary control responses. Items that comprised voluntary disengagement coping included denial, avoidance and wishful thinking; items related to involuntary engagement coping included intrusive thoughts and emotional arousal; and items related to involuntary disengagement coping included involuntary avoidance and emotional avoidance. When considering each of these coping styles and associations with behavioral outcomes, Connor-Smith et al. (2000) found that disengagement coping and involuntary coping were related to more externalizing and internalizing behavioral problems, while primary and secondary control coping styles were related to fewer problems.

Coping style is also related to specific outcomes of interest in this study. For example, in a sample of 918 inner-city youth, Siqueira, Diab, Bodian and Rolnitzky (2001) found that perceived stress and negative life events were related to current and

experimental marijuana use, and that, compared to those who had never used marijuana, current users and experimenters were much more likely to use negative coping styles (anger, avoidance), and much less likely to use positive coping styles (parental support). Similarly, in a sample of 140 Midwestern teens, Horwitz, Hill and King (2010) found that emotion-focused and avoidant coping styles were strongly predictive of depression and suicidal ideation.

In sum, it is important that future studies of outcomes of TDV consider coping style, as it may be that individuals most at risk for adverse outcomes are those that use disengagement or emotion-focused coping. In the case of substance use specifically, it is also important to examine this behavior as both an outcome, and as a form of coping (Horwitz et al., 2010; Johnson & Pandina, 2000). Finally, future work should also examine if social support buffers relationships between TDV victimization and adverse consequences, as this variable has previously been shown to be an important protective factor in the relationship between stress and negative outcomes, including several outcomes examined in this study (e.g., Cheng & Chan, 2007; Ge, Natsuaki, Neiderhiser, & Reiss, 2009; Meadows, Brown, & Elder, 2006).

Limitations

While the findings of this study indicate that TDV victimization is related to adverse outcomes in young adulthood, several limitations should be noted. Although our results suggest that specific sub-types of TDV victimization may be differentially related to adverse outcomes, the five measures of TDV in Add Health assess relatively mild forms of psychological and physical aggression, precluding a thorough evaluation of this finding. Add Health also did not include measures related to sexual violence victimization. Since females appear more likely to experience severe forms of TDV (Coker et al., 2000), including more comprehensive questions on TDV victimization may allow a more precise assessment of adverse outcomes in female

victims. Further, the limited number of items collected on each sub-type of violence (three for psychological aggression, two for physical aggression) also makes it difficult to form strong conclusions regarding relationships between outcomes and specific sub-types of violence. Add Health also did not assess perpetration of TDV, and so we were unable to assess differential impacts of being a victim only, versus impacts if an individual both experienced and perpetrated violence within the relationship.

In relation to psychological aggression measures specifically, recent qualitative data collected by these authors suggest that Add Health measures are not consistently considered harmful, but that the perception of harm is related to the specific context within which the violence occurs (e.g., severity, frequency). Since Add Health did not assess context, it is possible that people responding to these items did not perceive these events as harmful, which would attenuate findings. In the future, measures of psychological aggression should also include questions about the context under which the aggression occurred, and whether or not the recipient perceived the actions as harmful. Further, studies should consider the use of a personal interviewing approach when trying to assess effects related to victimization (as opposed to simple checklists, such as those used in Add Health), as these interviews allow for a more comprehensive assessment of the timing and context under which the event occurred (Coyne & Downey, 1991; Wethington, Brown, & Kessler, 1995).

Finally, the effect sizes for continuous outcomes were quite small; however, small effect sizes are frequently encountered in behavioral and psychology research, due to the large amount of measurement error that may exist in these data (Cohen, 1988). However, these small effect sizes also support the need for additional research that more clearly addresses issues of directionality and causality in relation to TDV victimization and outcomes.

Conclusions

In spite of these limitations, these findings have important implications for future research and practice, including the design of secondary prevention programs. Specifically, prevention programs should incorporate information on psychological aggression in dating relationships into their curricula, as findings from this study suggest that this form of victimization is as detrimental as physical TDV. These programs should also target both males and females, as both genders appear to experience adverse outcomes following victimization.

Additional studies are needed that further assess the impact of victimization on adverse outcomes, and how these outcomes may vary by sub-type of violence experienced. Studies are also needed that focus on trajectories into, and out of, violent relationships: the finding that victims of TDV are more likely to experience future IPV victimization is especially concerning, and deserves further attention. Because of the detrimental impact of TDV on health and risk behaviors, both primary and secondary prevention of TDV should be considered of utmost importance. Since teens are unlikely to seek help for TDV victimization (Ashley & Foshee, 2005), screening for TDV within the context of physician or school nurse visits is an important mechanism for assisting teens experiencing violence in their relationships. Further, if unhealthy coping styles are found to be related to adverse outcomes of TDV, this knowledge should be incorporated into secondary prevention programs. As the findings of this study demonstrate, opportunities to intervene after the occurrence of TDV are likely critically important to improving future health outcomes for victims.

APPENDIX A
DETAILED LIST OF MEASURES

Measure	Wave	Section Number and Title	Question Number(s)
Teen dating violence victimization	2	Section 24: Relationship Information	H2RI9, 11, 13, 15, 17
		Section 25: Non-Relationship Information	H2RX9, 11, 13, 15, 17 ⁵ & H2NR31, 33, 35, 37, 39
Age	2	Section A: Setup of CAPI Interview	CALCAGE2
Gender	2	Section A: Setup of CAPI Interview	BIO_SEX2
Race/ethnicity	1	Section 1: General Introduction	H1GI4 & 6A-E
Pubertal status	2	Section 31A: Male Physical Development	H2MP1-3
		Section 31B: Female Physical Development and Pregnancy History	H2FP1-4
Socioeconomic status	1	Section 14: Resident Mother	H1RM1
		Section 15: Resident Father	H1RF1
Child maltreatment	3	Section 29: Mistreatment by Adults	H3MA2-4
Forced sex (females only)	1	Section 24: Contraception	H1CO10
	2	Section 23: Contraception	H2CO12
Depression	2	Section 10: Feelings Scale	H2FS1, 3-7, 15-17
	3	Section 12: Social Psychology and Mental Health	H3SP5-13
Self-esteem	2	Section 18: Personality and Family	H2PF21, 23-25

⁵ RX questions indicate that questions from section 24 were asked of that individual, when questions from section 25 should have been asked.

	3	Section 12: Social Psychology and Mental Health	H3SP19-22
Antisocial behaviors	2	Section 28: Delinquency Scale	H2DS2, 7-11, 13
	3	Section 26: Delinquency and Violence	H3DS1-7
Sexual risk	2	Section 23: Contraception and Section 25: Non-Relationship History	H2CO7, H2CO8A-C, H2CO19A-G/ I-J, H2NR4, H2NR8
	3	Section 16: Sexual Experiences and Sexually Transmitted Diseases	H3SE4, 9, 10, 21A-F/H/L-M, 17-18
Extreme weight control	2	Section 3: General Health	H2GHC-E
	3	Section 9: General Health and Diet	H3GHD-F
Suicidal behaviors	2	Section 32: Suicide	H2SU1-2
	3	Section 28: Tobacco, Alcohol, Drugs, Self-Image	H3TO130-131
Substance use	2	Section 27: Tobacco, Alcohol, Drugs	H2TO5, 21, 44, 50, 58, 61
	3	Section 28: Tobacco, Alcohol, Drugs, Self-Image	H3TO7, 40, 109, 112, 118, 121
Adult intimate partner violence victimization	3	Section 19: Relationships in Detail	H3RD110, 112

Wave 1 documentation available from:

<http://www.cpc.unc.edu/projects/addhealth/codebooks/wave1>

Wave 2 documentation available from:

<http://www.cpc.unc.edu/projects/addhealth/codebooks/wave2>

Wave 3 documentation available from:

<http://www.cpc.unc.edu/projects/addhealth/codebooks/wave3>

APPENDIX B
SUMMARY OF RESULTS FROM TABLES 4, 5 AND 7

	<i>Any TDV victimization</i>	<i>Psychological victimization only sub-group</i>	<i>Physical and psychological victimization sub-group</i>
Depression	✓	✗	✓
Self-esteem	✗	✗	✗
Antisocial behaviors	✓	✓	✗
Sexual risk taking	✗	✗	✗
Extreme weight control	✗	✗	✗
Suicidal ideation	✓	✓	✓
Suicide attempt	✗	✗	✗
Smoking	✗	✗	✓
Heavy episodic drinking	✓	✓	✗
Marijuana use	✗	✓	✗
Other drug use	✓	✓	✗
Partner violence victimization	✓	✓	✓

✓ : association found

✗ : association not found

APPENDIX C
SUMMARY OF RESULTS FROM TABLES 6 AND 8

	<i>Psychological victimization only sub-group</i>		<i>Physical and psychological victimization sub-group</i>	
	Male	Female	Male	Female
Depression	✗	✗	✗	✓
Self-esteem	✗	✗	✗	✗
Antisocial behaviors	✓	✗	✗	✗
Sexual risk taking	✗	✗	✗	✗
Extreme weight control	✗	✗	n/a	✗
Suicidal ideation	✓	✗	✗	✓
Suicide attempt	✗	✗	n/a	✗
Smoking	✗	✗	✗	✓
Heavy episodic drinking	✗	✓	✗	✗
Marijuana use	✓	✗	✗	✗
Other drug use	✗	✗	✗	✗
Partner violence victimization	✓	✓	✓	✓

✓ : association found

✗ : association not found

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