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Dating Violence Perpetration and Victimization among US Adolescents: Prevalence, Patterns, and Associations with Health Complaints and Substance Use

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Abstract

Purpose—This research identified conceptually cohesive latent classes of youth dating violence (DV) and examined associations between covariates and classes by gender.

Methods—A nationally representative sample of 2,203 tenth-grade students completed assessments of physical and verbal DV victimization and perpetration, depressive symptoms, health complaints, and substance use. A Factor Mixture Model was used to identify patterns of DV. Gender differences among classes were examined for depressive symptoms, health complaints, and substance use.

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Implications and Contributions: Uniquely, this study provides prevalence estimates of dating violence perpetration from a nationally representative sample. It extends previous research by examining the cooccurrence of perpetration and victimization and factors associated with different patterns of dating violence. These analyses provides insight regarding how best to address the issue among youth.

Results—Prevalence of DV victimization was 35% and perpetration was 31%. A three-class model fit adequately and provided conceptual cohesion: Class 1) non-involved (65%); Class 2) victims/perpetrators of verbal DV (30%); and Class 3) victims/perpetrators of verbal and physical DV (5%). Compared to Class 1 adolescents, those in Classes 2 and 3 were more likely to report depressive symptoms, psychological complaints, and alcohol use. Females in Classes 2 and 3 were also more likely to report physical complaints, cigarette use, and marijuana use. Among females involved in DV, those in Class 3 compared to Class 2 reported more depressive symptoms, physical and psychological complaints, and cigarette and marijuana use.

Conclusions—The three-class model distinguished involvement in verbal acts from involvement in verbal and physical acts. Adolescents involved in DV had similar probabilities of reporting perpetration and victimization suggesting violence within relationships may be mutual. Involvement in DV was associated with more health issues and concurrent problem behaviors. For females in particular, the increased involvement in DV was associated with other health indicators.

Keywords

Dating violence perpetration; dating violence victimization; physical and verbal dating violence; factor mixture model

Violence perpetrated in the context of adolescent romantic relationships is common[1-3] and merits interest given its potential impact on multiple health outcomes[4,5], and on the development of expectations for the conduct of adult intimate relationships[6]. However, only recently has dating violence (DV) among adolescents been recognized as an important public health issue[3].

Prevalence estimates of reported DV victimization from studies using nationally representative samples differ widely. In the 2005 National Survey of Adolescents, an estimated 1.6% of youth ages 12-17 experienced DV using stringent definitions of physical and sexual assault[7]. Two surveys measuring physical DV victimization in nationally representative samples, National Survey of Child and Adolescent Victimization (ages 12-17) and the Youth Risk Behavior Surveillance (high school students), report 64% and 9.8% of respondents, respectively, were victimized[8,9]. Using a measure that included verbal and physical victimization, 32% of youth in opposite-sex relationships reported DV victimization in the National Longitudinal Study of Adolescent Heath (Add Health)[10]. The wide range of estimates for prevalence are attributed to differences in the definition and type of violence assessed (i.e., physical, psychological and/or sexual), sample characteristics, measurement timeframe, and study methods[1,3]. Nonetheless, it is evident that DV victimization affects a substantial number of youth.

Fewer studies examine perpetration among adolescents[11], and none were identified in nationally representative samples. Estimates of perpetration vary widely across studies[2,11,12] for similar reasons as those given for the wide variability of victimization estimates. Foshee and Matthew cite studies with estimates ranging from 14% – 81% for psychological and 11% – 41% for physical violence perpetration [11]. Other reviews cite a more restricted range for perpetration of physical violence, 26% to 46%, suggesting self-reported DV perpetration is common[2,12].

Using latent class analysis to examine victimization among girls, Foster and colleagues identified 3 classes, those uninvolved, those experiencing verbal violence, and those experiencing both verbal and physical violence[13]. Our study extends this work by examining DV victimization and perpetration simultaneously, including males, and using factor mixture models (FMM), a hybrid of factor analysis and latent class analysis[14]. Although FMM has not been previously used to examine DV, one advantage is that it

models population heterogeneity and the underlying constructs simultaneously[14]. This technique is particularly useful where there may be differences in the frequency of engaging in or severity of certain behaviors across latent classes[15]. In relation to DV, the model identifies groups based on patterns of behavior and explores the extent of DV involvement within and across those groups. Relevant covariates of DV are explored to distinguish among the classes, including gender, race, depression, health complaints, and substance use[16,17].

Gender differences in DV

Research findings regarding associations of DV with gender are inconsistent across studies. When broad definitions of DV are used, higher rates are often found among boys compared to girls[18]. When type of victimization is considered, girls are more often victims of combined verbal and physical abuse whereas males are more likely to experience only verbal abuse[19]. Females more frequently report experiencing more severe forms of physical and sexual violence[7,10,20]. Findings regarding perpetration and gender are similar. Several studies suggest that females perpetrate DV more often than or at the same rate as males[11], whereas others suggest that more males perpetrate severe forms at all ages[1,3].

Racial differences in DV

The evidence regarding the effects of minority status on involvement in DV is also mixed[1,3]. Severe DV victimization was found to be similar across all racial groups[7]. One study found that being African American was a risk factor for verbal victimization but not both verbal and physical victimization[13]. Regarding DV perpetration, African Americans and Hispanics perpetrate more frequently than Whites; Asians perpetrate least frequently[21].

However, when types of DV are considered, African Americans were more likely to perpetrate physical dating violence[20], whereas no racial differences were found for psychological or sexual perpetration[21].

Depressive symptoms and health complaints

Depressive symptoms have consistently been associated with DV[1,3,22]. In longitudinal research, victimization was associated with later depressive symptoms, typically dysthymic mood, sleep disturbance, hopelessness, and anxiety[4,5]. Associations have been found between perpetration and depressive symptoms among girls[23], but less consistently among boys[24].

The association between DV and health complaints, such as headache and stomachache, has not previously been examined in adolescents. Health complaints have been associated with poor friendship quality [25], experiences of bullying[26],and school stress[27]. Furthermore, relations have been found between the experience of intimate partner violence and increased psychological and physical symptoms among adult women[28]. Thus, a positive association is plausible between the experience of DV and report of health complaints.

Substance use

Substance use is identified as a precursor and a consequence of DV[2], although specific findings vary by gender, substance, and type of DV. Using Add Health data, Roberts and colleagues[22] report that DV victimization was associated with increased illicit substance use one year later for female but not male adolescents. Another study using Add Health data

found the effects of victimization during high school on substance use 5-years later varied by type of violence and gender. Among females, psychological victimization was predictive of heavy episodic drinking; physical (with or without psychological) victimization was predictive of smoking. Among males, psychological victimization was predictive of marijuana use; no other associations were found[5]. Examining substance use as a consequence of DV, Ackard and colleagues found that for females, victimization in high school predicted later cigarette and marijuana use[4].

Study Significance

The first aim of the study is to examine prevalence of involvement in DV in a nationally representative sample of US adolescents. A second aim is to examine patterns of DV across reported roles (victims and perpetrators) and types (verbal and physical) of behaviors. Given the frequency with which adolescents report both victimization and perpetration, we expect to find a pattern that reflects involvement in both. Furthermore, we expect patterns that distinguish among types and/or number of types of aggression. Finally, we examine differences in patterns of DV by race and explore gender differences in covariates of the different classes, including depressive symptoms, health complaints, and substance use.

Methods

A nationally representative sample of 2524 10^{th} grade students from 80 schools (public and private; 69% student response rate) was assessed during the 2009-2010 school year as part of the NEXT Generation Health Study. Required classes in 10^{th} grade were selected randomly within schools. Research staff administered paper and pencil surveys; absent students had the opportunity to mail-in their survey or complete it online. African-American youth were oversampled to provide better population estimates and an adequate sample to examine racial/ethnic differences. Parents provided written consent and family demographics. This study was approved by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development Institutional Review Board. Students not having a romantic relationship in the last 12 months were directed to skip the DV questions. The 2203 students who reported on their experience with DV comprise the analytic sample. Chi-Square analyses revealed that, compared to those not completing the DV items, a significantly ($p<.05$) greater proportion of those who completed the DV items had parents with lower education, were of minority status, and reported ever smoking (last 30-days), drinking (last 30-days) and using marijuana (last 12-months).

Measures

Dating Violence

The revised Conflict Tactics Scale[29] was used to assess involvement in DV in the last 12 months. Five items assessing victimization asked youth if his/her boyfriend/girlfriend did any of the following: 1) call him/her names or insult him/her, 2) swear at him/her, 3) threaten, 4) push or shove him/her, and 5) throw something that could hurt him/her. To assess perpetration, respondents were asked about exhibiting these same five behaviors in relationships. Students who answered “yes” were compared to those who answered “no” or “don't know” (Cronbach's *alpha* =.87 for 10 items).

Depressive Symptoms

Depressive symptoms were assessed using the 6-item Modified Depression Scale[30] which queried youth on their feelings of sadness, irritability and hopelessness, ability to pay attention at school, and changes in sleep and eating over the last 30 days. Youth responded on a scale where 1= never and 5 = always (Cronbach's *alpha*=.82).

Health complaints

Frequency of eight health complaints over the last six months was assessed using the checklist from the Heath Behaviors in School-Aged Children survey (HBSC)[31]. Physical complaints included headache, stomachache, backache, and feeling dizzy; psychological complaints included feeling low, bad temper, nervousness, and difficulty sleeping. Youth responded on a scale of 1-5 with 1= rarely or never and 5=about every day (Cronbach's *alphas* physical complaints =.70, psychological complaints = .72).

Substance Use

Students reported the number of occasions on which they used tobacco and alcohol over the last 30 days, and marijuana in the last 12 months. Response categories ranged from “never” to “forty times or more”. To address the skewed distributions, responses were dichotomized to “ever” versus “never” used each substance.

Demographic information

Youth reported gender, race, and ethnicity. Race and ethnicity were categorized as White, African American, Hispanic and Other (Asian, Native American, Pacific Islander). Parents reported their own education level; the higher of mother or father education was used and categorized as 1= high school graduation or less, 2= some college and 3=college graduate or more.

Statistical Analysis

We calculate descriptive statistics for the overall sample and separately by gender. Because results from exploratory and confirmatory factor analyses suggested a single dimensionality for the 10 victimization and perpetration items, factor mixture models (FMM) were used to describe the patterns of involvement in DV. FMM is a hybrid model which combines common factor analysis and latent class analysis[14]. It includes a categorical latent variable to identify distinct classes in the population, and a continuous latent variable to describe the continuum that exists within each latent class. The factor in this study represents the extent of involvement in DV. Factor loadings were set invariant across class.

To select the appropriate number of classes with maximized model fit, a series of FMMs were fit to the data. The most parsimonious 1-class FMM was examined first; successive models with two to four classes were then estimated. Models were compared on statistical fit indices and conceptual considerations. First, model selection was based on the Akaike Information Criterion (AIC)[32], Bayesian Information Criterion (BIC)[33] and sample size adjusted BIC (ABIC)[34], identifying the model with lowest indices or where the indices begin to level off[35] . Second, adequate classification quality was evaluated, indicated by entropy and average class probability (ACP) values near one. Third, solutions with extremely small classes were considered unstable and thus avoided. Last, the practical interpretability of the classes was considered in comparing models with similarly adequate fit statistics.

After the appropriate number of classes was chosen, gender, race/ethnicity and parent education were added to examine demographic differences in the latent classes. The model is analogous to a multinomial logistical regression and odds ratios were estimated to indicate the influence of the covariates on probability of class membership relative to a reference class. Male gender, White race and higher parent education were used as referents. The models were then run separately by gender to examine if the class structure would be replicated within each gender. Depressive symptoms, health complaints, and substance use were included as distal auxiliary variables, analogous to covariates, and compared by gender

across latent classes through pairwise contrasts. All analyses were conducted with Mplus Version 6.2 (Muthén and Muthén, Los Angeles, CA), adjusting for the complex sampling design.

Results

Descriptive Statistics

Most respondents were White (57%) and female (53%), with a mean age of 16.2 (Table 1). The prevalence of any victimization and any perpetration in the overall sample was 35% and 31% respectively. Twenty-four percent of students reported verbal but no physical victimization, and 11% reported physical victimization. Similarly, 21% reported verbal but no physical perpetration, and 9% reported some physical perpetration. The means for depressive symptoms, physical, and psychological complaints were 2.37, 2.14, and 2.32, respectively. Approximately 20% of students reported tobacco use (30-day), 38% alcohol use (30-day), and 28% marijuana use (12-month).

Factor Mixture Models (FMMs)

The models with two, three, and four classes all resulted in high classification qualities (all entropy and ACP values greater than .80), indicating reliable classification (Table 2). The AIC, BIC, and ABIC values decreased with increasing number of classes, with a sharp decrease from the one-class model to the three-class model, and then leveled off. Compared to the three-class model, the four-class solution did not distinguish an additional interpretable class and added an extremely small class. Thus, the three-class solution was the most appropriate based on model fit statistics and theoretical implications. This model resulted in three meaningful classes: 1) non-involved (65.0%), 2) victimization and perpetration of verbal-only behaviors (29.8%), and 3) victimization and perpetration of both physical and verbal behaviors (5.2%; see Figure 1). These three latent classes were significantly different in extent of involvement in DV, as indicated in latent factor means of 0 (reference for Class 1,), 3.80 (Class 2) and 6.10 (Class 3). Youth were assigned to Class 1 (Non-involved), Class 2 (Verbal), or Class 3 (Verbal/Physical) as determined by their posterior probability. When models were conducted separately by gender, the three-class models were replicated (Table 2) and the pattern of involvement in DV was consistent across for both (data not shown).

Associations of Class Membership with Demographics

Demographic variables were included as covariates (Table 3). Compared to their proportion of Class 1, females were disproportionately represented in Class 2. African American adolescents were overrepresented in Class 3 relative to their proportions in Class 1. When examined by gender, the only significant association between race and DV found was that African American males were overrepresented in Classes 2 and 3. Parent education was unrelated to class membership.

Associations of Class Membership with Other Covariates by Gender

Males in Classes 2 and 3 reported significantly more depressive symptoms and psychological complaints than those in Class 1. Furthermore, males in Class 2 reported more marijuana use than those in Class 3. Among females, all three classes differed on depressive symptoms, psychological complaints, tobacco use, and marijuana use, such that females in Class 1 reported the least and those in Class 3 reported the most symptoms and use. Females in Classes 2 and 3 reported more physical complaints and alcohol use than those in Class 1 (See Figure 2).

Discussion

Thirty-five percent of youth reported victimization and 31% of youth reported perpetration of verbal and/or physical DV in the last year; thus, youth report committing DV at similar rates as they are victimized. The prevalence of DV victimization found in this sample is similar to that reported for heterosexual youth in Add Health[10]. This is the first nationally representative study to present prevalence of perpetration, and the rate found is within the range of those reported in previous studies[2,11]. Verbal DV was more commonly reported than physical DV for both victimization and perpetration. The small number of violent acts assessed and yes/no response options may have limited the reporting of DV. Nonetheless, findings indicate that DV affects a substantial number of youth even when only physical DV is considered.

Using FMM, we found that DV as measured by the Conflict Tactics Scale represents a singular construct or latent factor that includes both perpetration and victimization, in which youth engage to varying degrees. We identified three meaningful patterns of DV behaviors: 1) those non-involved, 2) those likely to report only verbal behaviors, such as name calling and swearing, and 3) those likely to report physical behaviors, such as pushing and throwing things, in addition to verbal behaviors. The structure of the item probabilities suggests that youth commit behaviors at the same level they experience them, although whether they are both victim and perpetrator within the same relationship cannot be determined. Aggressive acts within intimate relationships may reflect dyadic characteristics and a context of increasing escalation in which it is difficult to clearly distinguish perpetrators and victims[11]. Intervention efforts should acknowledge that participants in DV may be both victim and perpetrator. Furthermore, whether or not the aggression is reciprocal, DV occurs within relationships and needs to be addressed in that context. As such, and perhaps unique to DV, it may be useful to frame questions about the risk for and consequences of aggression within romantic relationships, rather than addressing victimization and perpetration separately.

The class structure found in these data replicate those previously reported using the Conflict Tactics Scale to assess victimization[13]. Our measures cannot differentiate severity of any individual behaviors. However, the three classes differed significantly on the latent DV score: youth in the physical and verbal DV class demonstrated a greater probability of reporting victimization and perpetration for all behaviors. Taken together, these findings suggest youth reporting both verbal and physical aggression engage in more verbal aggression than those reporting verbal aggression only. Thus, interventions that target youth experiencing physical DV should also target appropriate communication and conflict resolution within a relationship.

Similar to previous research, the analysis of the associations of class membership with demographic characteristics revealed that being African American was associated with physical and verbal DV behaviors[11,17], however in the gender stratified analysis this finding was limited to boys. Being female was associated with verbal behaviors, but not with verbal and physical behaviors, suggesting that although females report more involvement in DV, this difference may reflect more involvement with verbal aggression. This finding is similar to that reported in previous research using similarly broad DV measures that found females are more likely to perpetrate [3,20] and be victims of DV[16,17]. However, it is inconsistent with research indicating females are more often victims of physical DV[10,20,21]. Because victimization and perpetration were examined simultaneously, it is not possible to make direct comparisons with previous research. Perhaps more interesting are the gender differences in the patterns of associations found in the analyses of health complaints and substance use. Among girls, differences found

between those in the verbal only and those in the verbal and physical classes indicated more risk for those in the latter class. It is plausible that increased engagement in DV has different consequences for females than males and these findings merit further investigation.

Our results validate previous findings that involvement in DV was associated with greater depressive symptoms for girls and boys[1,3]. The results were consistent across reports of depressive symptoms over a 30-day timeframe and reports of psychological complaints over a 6-month period. This study extends previous literature by also examining physical complaints. Girls involved in DV were more likely to report physical complaints compared to those not involved. The lack of an association for boys may reflect the low rate at which boys reported physical symptoms. These findings compliment previous research showing that students who reported being bullied were more likely to report psychological and physical health complaints[26]. Research has also indicated an association between increased school stress and health complaints[36,37]. It is plausible that the pathway between symptoms and DV is through the physical effects of stress[37].

Consistent with previous research, positive associations were found between DV and substance use, with some variation by gender for individual substances. DV may be associated with greater risk taking in general or may share common causal determinants[38] with substance use. It also may be that substance use creates contextual vulnerability[1]; that is, the disinhibiting effects of alcohol or other substances may create a situation where adolescents exert less self-control and communication is poorer, thereby increasing the likelihood of DV[3]. Further understanding the interrelations of substance use and DV requires continued research using longitudinal designs. Although there is evidence that DV and substance use are associated over time[4,5,22], no clear temporal pattern has yet emerged. There may be a reciprocal effect, whereby DV and substance use maintain each other over time, regardless of which occurred first[39].

This study has several limitations to consider in interpreting the results. First, we have only the adolescent report regarding behaviors within their relationships. DV is a characteristic of the relationship, and therefore would be better understood by assessing both partners. However, the current design does not allow for the examination of the reciprocal nature of DV within particular relationships. Second, our measure of DV was limited in the range of behaviors assessed, and does not include sexual or more extreme violent interactions. Finally, this study used a cross sectional design which limits the interpretation of the findings. Although several longitudinal studies have been conducted[4,5,22] that examine predictors of victimization and perpetration separately, continued longitudinal research assessing predictors of concomitant victimization and perpetration will further elucidate the temporal ordering of DV and covariates.

Nonetheless, this study contributes substantially to our understanding of adolescent DV. First, no other study was identified that reported on perpetration based on a large nationally representative sample. This study uses an innovative analysis that allows for the simultaneous examination of perpetration and victimization. Understanding adolescent DV is important given its potential impact on development of expectations for adult romantic relationships and its demonstrated associations with poorer health outcomes among adolescents. The differences found between those engaged in verbal DV and those engaged in both physical and verbal DV suggests targeted interventions for each group may be merited. Because many youth involved in DV do so as both perpetrators and victims, intervention efforts may be more effective if perpetration and victimization are addressed in the context of couples.

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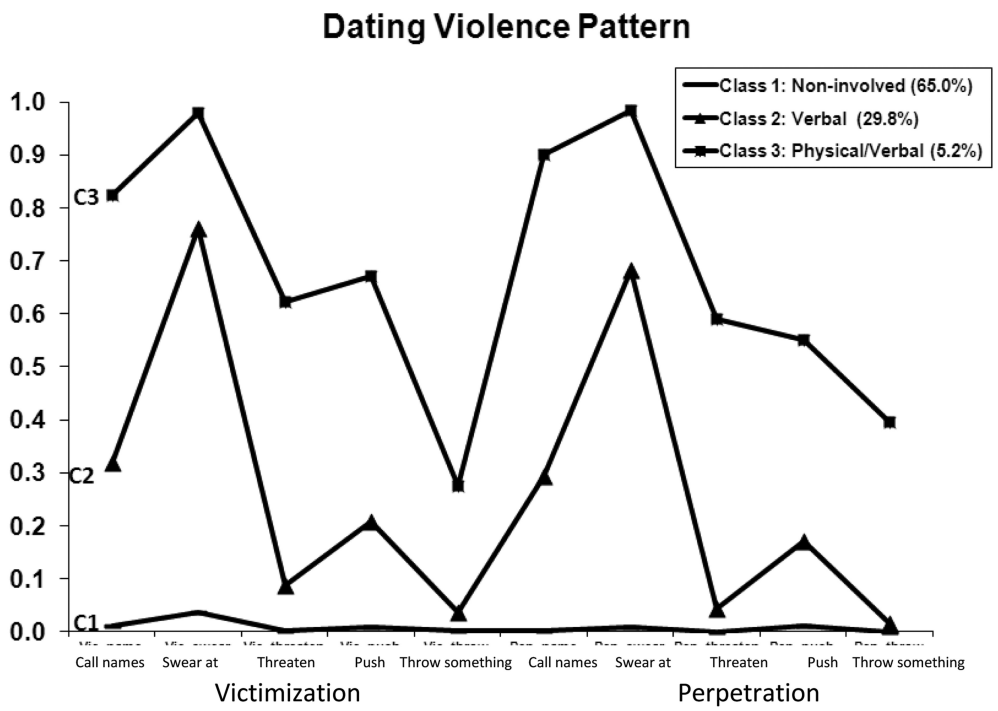
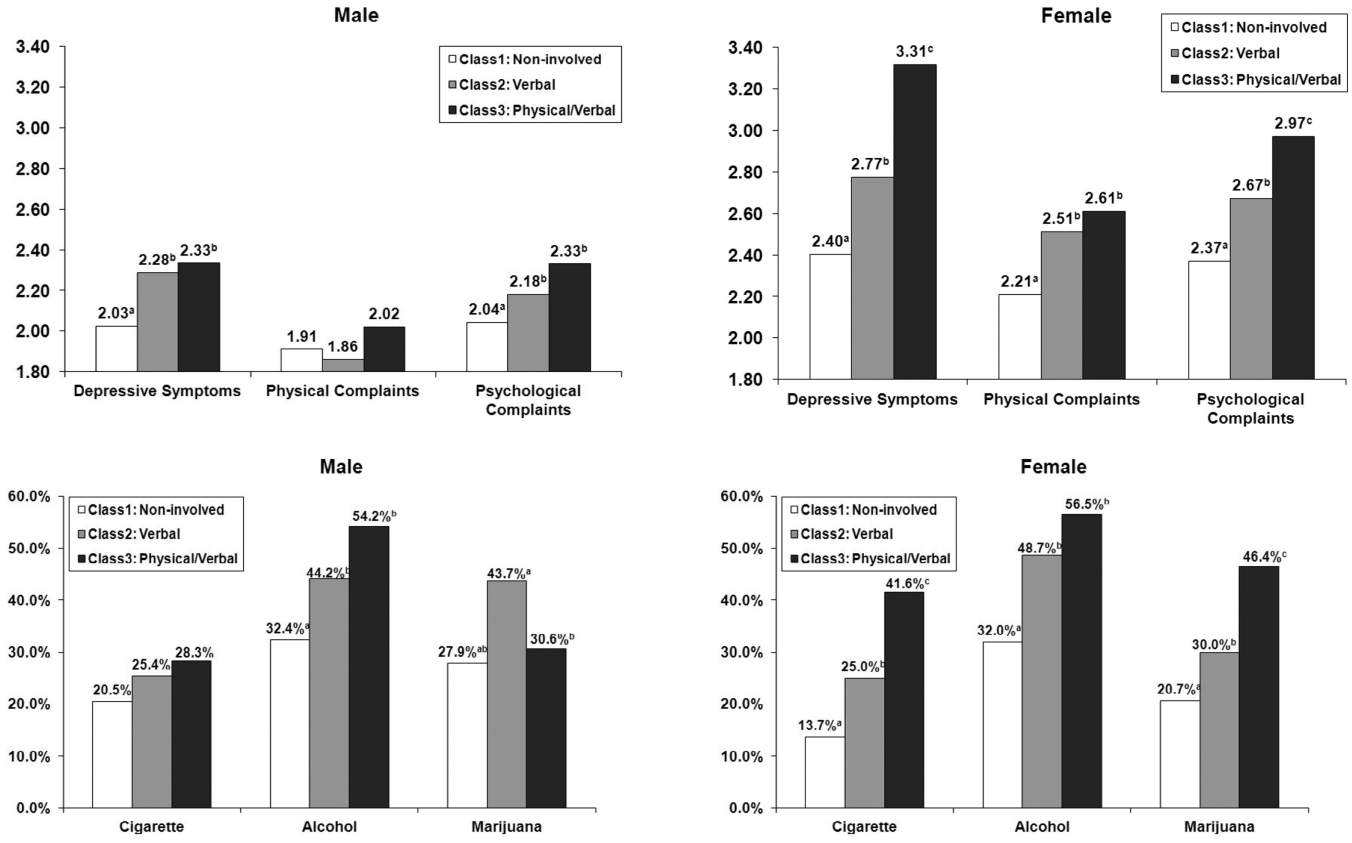


Note. Latent means were significantly different across latent class, which was 0 for the non-involved class (set as reference), 3.80 for the Verbal class and 6.10 for the Physical/Verbal class. Graphs for models separately by gender demonstrated the same pattern (not shown).

Figure 1.
Item Probabilities for the 3-Class FMM



Note. Latent classes with different superscripts are significantly different.

Figure 2.
Associations between Class Membership and Distal Outcomes (Depression, Health Complaints, and Substance Use

Table 1

Sample Characteristics (n = 2203)

Demographic	Total		Males		Females	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error
Age	16.19	.03	16.25	.04	16.15	.03
Race/Ethnicity	**N**	**Weighted %**	**N**	**Weighted %**	**N**	**Weighted %**
White	939	56.5	435	61.3	503	52.5
African American	441	18.5	162	13.6	279	22.5
Hispanic	706	20.2	330	19.8	373	20.4
Other	105	4.9	44	5.4	61	4.5
Parent Education						
High school or less	833	34.9	353	33.2	480	36.2
Some college	547	27.5	236	25.3	311	29.3
College degree or more	677	37.7	320	41.6	357	34.5
Dating Violence**						
Victim (yes to any)	713	34.8	287	27.2	425	40.3
Victim – Verbal	445	24.2	147	16.5	297	30.5
Victim – Physical	268	10.7	140	11.7	128	9.8
Perpetrated (yes to any)	651	30.5	204	19.3	446	39.7
Perpetrated - Verbal	434	21.4	138	13.0	295	28.2
Perpetrated - Physical	217	9.1	66	6.3	151	11.4
Covariates						
Health Complaints	**Mean**	**Standard Error**	**Mean**	**Standard Error**	**Mean**	**Standard Error**
Depressive Symptoms	2.37	.03	2.11	.04	2.59	.04
Physical Complaints	2.14	.07	1.89	.07	2.34	.07
Psychological Complaints	2.32	.06	2.08	.07	2.52	.06
Substance Use	**N**	**Weighted %**	**N**	**Weighted %**	**N**	**Weighted %**
Tobacco (30 day report)	331	20.2	141	21.4	187	19.1
Alcohol (30 day report)	703	37.6	287	35.7	413	39.0

Substance Use	N	Weighted %	N	Weighted %	N	Weighted %
Marijuana (12 month report)	534	28.1	250	31.3	281	25.4

** Dating Violence: Verbal included name calling, insulting, disrespect, and swearing, and none of the physical items; Physical include any threatening violence, pushing and shoving, throwing things at you

Table 2

Model Fit Statistics for the Factor Mixed Models with 1-4 Classes

All (N = 2203)	**1-Class Model**	**2-Class Model**	**3-Class Model**	**4-Class Model**
Akaike (AIC)	13937.9	10797.5	10348.4	10281.5
Bayesian (BIC)	14046.2	10917.1	10479.4	10424.0
Sample-Size Adjusted BIC	13985.8	10850.4	10406.3	10344.5
Entropy	--	0.895	0.877	0.850
Range of ACPs	--	0.971-0.977	0.886-0.955	0.837-0.966

Male (n = 974)	**1-Class Model**	**2-Class Model**	**3-Class Model**	**4-Class Model**
Akaike (AIC)	5222.7	3881.5	3726.8	3682.0
Bayesian (BIC)	5315.4	3984.1	3839.1	3804.0
Sample-Size Adjusted BIC	5255.1	3917.4	3766.0	3724.6
Entropy	--	0.920	0.906	0.907
Range of ACPs[a]	--	0.971-0.985	0.929-0.964	0.901-0.977

Female (n = 1225)	**1-Class Model**	**2-Class Model**	**3-Class Model**	**4-Class Model**
Akaike (AIC)	8550.9	6809.3	6493.1	6461.5
Bayesian (BIC)	8648.0	6916.7	6610.6	6589.3
Sample-Size Adjusted BIC	8587.7	6850.0	6537.6	6509.9
Entropy	--	0.876	0.866	0.837
Range of ACPs	--	0.965-0.976	0.923-0.947	0.841-0.964

Note. ACPs = Average Classification Probabilities. The AIC, BIC and sample-size adjusted BIC are information criteria, with lower value indicating better fit. The relative entropy and ACPs are indicators of adequate classification quality, with values near one indicating high certainty and reliability in the classification.

Table 3

Results of Facture Mixture Model with Demographic Variables as Covariates

Demographics	Total				Males				Females			
	Verbal		Physical/Verbal		Verbal		Physical/Verbal		Verbal		Physical/Verbal	
	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI	OR	95%CI
Variable (Referent)												
Sex (Male)												
Female	**2.27**	**1.71-3.02**	1.80	0.87-3.73	--	--	--	--	--	--	--	--
Race/Ethnicity (Caucasian)												
African American	1.68	0.95-2.96	**2.04**	**1.05-3.98**	**2.89**	**1.46-5.72**	**3.25**	**1.23-8.60**	1.24	0.66-2.35	1.55	0.60-3.99
Hispanic	1.25	0.75-2.09	0.92	0.37-2.30	1.53	0.80-2.92	1.20	0.18-7.79	1.08	0.50-2.33	0.83	0.22-3.18
Other	1.24	0.57-2.68	**0.06**	**0.01-0.52**	1.31	0.25-6.95	0.15	0.01-1.67	1.24	0.43-3.57	0[a]	--
Parent Education (College degree or more)												
High school or less	1.28	0.81-2.04	1.31	0.50-3.43	1.01	0.53-1.91	0.56	0.11-2.92	1.62	0.96-2.74	2.22	0.60-8.24
Some college	0.85	0.52-1.41	1.54	0.72-3.27	0.60	0.25-1.42	0.94	0.25-3.53	1.07	0.66-1.73	2.46	0.91-6.67

Note.

[a]Due to empty cell, this parameter was fixed to zero. The latent class of non-involved as set as reference group. Bold indicates significant associations.