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Patterns of Intimate Partner Violence in Mothers At-Risk for Child Maltreatment

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Abstract

Using three interviews spanning 3 years, we identified intimate partner violence (IPV) classes and determined how class membership changed over time amongst a sample of 217 mothers at-risk for child maltreatment that were enrolled in an early childhood home visitation evaluation study. Data on perpetration/victimization, IPV type (verbal, physical, and sexual abuse and injury) and severity were used to conduct latent class analyses at each time point. Latent transition analyses established the proportion of mothers who changed classes over time. A three-class solution (minimal, moderate, and high IPV) was indicated at each time point. All classes included mutual IPV. Partners used minor verbal abuse in the minimal class, minor and severe verbal abuse and minor physical abuse in the moderate class, and all IPV categories in the high class. At each transition, 40% or more moved *from* minimal to moderate or high IPV. This movement emphasizes the need to screen women frequently and develop interventions recognizing the dynamic nature of IPV.

Keywords

abuse; latent class; home visitation

Recent research supports that the longitudinal course of IPV is complex and that over time IPV may persist at similar levels, escalate, or de-escalate (Feld & Straus, 1989; O'Leary, Barling, Rosenbaum, Malone, & Tyree, 1989). IPV also may cease all-together, with some studies suggesting that one-quarter to one-half of violent men become non-violent within the first few years of marriage (Feld & Straus, 1989; O'Leary et al., 1989; Quigley & Leonard, 1996; Straus & Gelles, 1999). The probability of cessation may be associated with IPV severity or directionality. For example, Aldarano (1996) found that men who perpetrated

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minor IPV were more likely than men who perpetrated severe IPV to become non-violent. Field and Caetano (2005)) reported that IPV was more likely to cease if there was initially male-to-female as compared to female-to-male or mutual IPV.

Although the course of IPV is potentially associated with severity and directionality, researchers have not examined trajectories of *classes* of IPV over time. Specifically, in the past decade, empirical work suggests that that IPV is not a singular phenomenon, but rather that different “types” (or classes) of IPV exist (Kelly & Johnson, 2008). Emphasizing the importance of these classes, Kelly & Johnson state that “among some social scientists, it is no longer considered scientifically or ethically acceptable to speak of domestic violence without specifying the type of partner violence to which one refers” (p. 477).

Perhaps the best-known classes were proposed by Johnson (2006) who suggested that IPV should be divided into situational couple violence involving low severity, mutual violence; intimate terrorism involving severe, generally male-perpetrated violence motivated by control; violent resistance involving IPV to resist a partner’s violence; and mutual violent control involving both partners using severe IPV for control. Delineation of classes of IPV may have ramifications for identification, treatment and policy (Kelly & Johnson, 2008). For example, optimal treatment for a partner in Johnson’s intimate terrorism class likely differs from one in a situational couple violence class (Kelly & Johnson, 2008).

Two other groups also have proposed classes of IPV victimization. Carbone-Lopez, Kruttschnitt, and MacMillan (2006) used latent class analyses to establish the following classes of IPV *victimization* for men (based on female-to-male violence) and women (based on male-to-female violence): no IPV, interpersonal conflict violence (low levels of minor physical violence), physical aggression (higher probability of physical violence, but acts without the use of force), and systematic abuse (frequent, intense violence including sexual violence and injury). Although the classes were the same for both sexes, Carbone-Lopez and colleagues found that women had higher prevalence of systematic abuse, physical aggression, and interpersonal conflict.

Dutton, Kaltman, Goodman, Weinfurt, and Vankos (2005) used cluster analysis to derive three patterns in physically violent relationships related to levels of women’s physical, emotional, and sexual abuse *victimization* (male-to-female violence)—moderate levels of physical violence and emotional abuse and low levels of sexual abuse (Pattern 1), high levels of physical violence and emotional abuse with low levels of sexual abuse (Pattern 2), and high levels of all three (Pattern 3). Women in the “Pattern 3” class were significantly more likely than women with the other two patterns to have post-traumatic stress disorder and depressive symptomatology (Dutton et al., 2005).

Despite growing research on IPV classes, additional exploration of classes that consider *both* victimization and perpetration is needed, particularly in high-risk samples that are the focus of intensive intervention efforts. Additionally, using IPV *classes* to examine trajectories operationalizes IPV as a multi-dimensional construct consisting of a constellation of behaviors, and allows for exploration of how class membership changes over time. Therefore, using longitudinal data, we sought to identify classes of IPV based on perpetration/victimization, IPV type (verbal, physical, and sexual abuse and abuse leading to injury), and IPV severity amongst a sample of mothers at-risk for child maltreatment who were enrolled in a randomized controlled trial to evaluate the effectiveness of early childhood home visitation. We also examined how membership in the identified classes varied over three maternal interviews spanning 3 years, hypothesizing that IPV would be a dynamic construct, with many women transitioning into and out of classes from year to year.

Method

Study Participants

The current study used data from the control sample of the Hawaii Healthy Start Program (HSP) early childhood home visitation evaluation. The HSP evaluation used an experimental design to determine the effectiveness of early childhood home visitation in preventing child maltreatment (Duggan et al., 1999, 2004, 2007). From November 1994 to December 1995, HSP staff identified post-partum women in participating hospitals on Oahu. Families were eligible to participate if they: (a) were English-speaking, (b) had not previously enrolled in HSP and were willing to enroll if assigned to the intervention, (c) were not involved with Child Protective Services, and if (d) the infant was at-risk for maltreatment.

Infants were identified as at-risk using a two-stage screening process. The HSP staff first screened newborn medical records to identify indicators of risk such as unmarried mother, unemployment, and inadequate prenatal care. If the medical record screen was positive or inconclusive, research staff administered the Kempe Family Stress Checklist to the infant's mother. The Kempe Family Stress Checklist measures child abuse risk factors including parental mental health problems and IPV (Kempe, 1976). Families scoring greater than 25 were considered at-risk (Kempe, 1976).

The original study and current analyses were approved by the authors' Institutional Review Board. The original study was approved by the Hawaii Department of Health and six recruitment hospitals.

Data Collection

Families were randomly allocated to an intervention group ($n = 373$) and to a main control group ($n = 270$). Mothers in both groups were interviewed by trained research staff at baseline. In addition, 41 families were randomized to a testing control group. By design, the outcome assessment schedule for this small testing control group was not the same as for participants in the intervention and main control groups; hence, these participants were excluded in the current analyses.

Follow-up interviews occurred annually when the child was 1 to 3 years old and annually when the child was 7 to 9 years old. During the interviews, research staff read validated measures to the women and recorded their response. A small number of measures, including the Revised Conflict Tactics Scale, were self-administered.

Inclusion Criteria

Previous research documents that the Hawaii Healthy Start early childhood home visitation intervention reduced IPV during the first 3 years of the child's life (Bair-Merritt et al., 2010). Because the purpose of this study was to examine IPV trajectories *without* the influence of an intervention, for all reported analyses only data from women randomized to the main control group were analyzed.

Additionally, although the larger study involved seven interviews, this study only uses data from three interviews: child ages 7, 8, and 9. This decision was made based on a change in IPV questions between earlier and later interviews. In early interviews, respondents were asked to answer IPV questions *only* if they had a current partner. When the child was 7, 8, and 9 years, participants were instructed to answer IPV questions *either* if they had a current partner *or* if they had a partner at any time in the past 12 months. To maintain consistency and avoid introducing bias due to changes in study design, we analyzed data from the

seventh year interview through the ninth year only. Mothers had to complete at least one of these interviews to be included in the current analyses.

Predictors of Latent Class Membership

During each interview, mothers reported their IPV victimization and/or perpetration over the past 12 months using the 78-item Revised Conflict Tactics Scale (CTS2). The CTS2 contains the following subscales: verbal abuse, physical assault, sexual abuse, and abuse leading to injury. Each subscale can be further segregated into minor and severe acts (Straus, 1979; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Four sexual abuse questions were omitted in the parent study; therefore, the sexual violence subscale was not divided into minor and severe acts. The remaining sexual abuse questions included the following: “I used force (like hitting, holding down, or using a weapon) to make my partner have sex,” “I insisted on sex when my partner did not want to (but did not use physical force),” and “I used threats to make my partner have sex.” Confirmatory factor analyses indicated that the proposed factor structure (Straus et al., 1996) was an appropriate fit to the underlying data for the sample (results available upon request to authors).

CTS2 response choices included never, once, twice, 3–5 times, 6–10 times, 11–20 times, and >20 times. For each item, reports of IPV acts were dichotomized as present (occurred 1 time) or absent. We then created the following 14 categories for each interview, with the woman considered “positive” for the category if any of the items in that category were reported (occurred 1 time): (1) minor verbal abuse victimization, (2) minor verbal abuse perpetration, (3) severe verbal abuse victimization, (4) severe verbal abuse perpetration, (5) minor physical abuse victimization, (6) minor physical abuse perpetration, (7) severe physical abuse victimization, (8) severe physical abuse perpetration, (9) sexual abuse victimization, (10) sexual abuse perpetration, (11) abuse victimization leading to minor injury, (12) abuse perpetration leading to minor injury, (13) abuse victimization leading to severe injury, and (14) abuse perpetration leading to severe injury. Women with no partner in the past 12 months were coded as no IPV. Information about whether women were responding about the same, or different, partner from year to year was not available.

Covariates

Covariates were selected based upon documented associations with IPV in prior studies (Coker, Smith, McKeown, & King, 2000; Vest, Catlin, Chen, & Brownson, 2002). Covariates included demographic data, previous IPV, maternal mental health and substance use. Socio-demographic information for the sample is presented in Table 1.

Baseline demographic data included: (a) age, (b) race/ethnicity, and (c) high school completion. To control for previous IPV, a summary score of all IPV acts was created at each time point for each woman (Straus et al., 1996).

The 5-item Mental Health Index-Short Form assessed anxiety and depressive symptoms in the past month at each interview (McHorney & Ware, 1995; Stewart, Hays, & Ware, 1988). Response choices are on a 6-point scale; responses were standardized to a scale of 0–100. A cutoff of less than 67 defined poor mental health (McHorney & Ware, 1995; Stewart et al., 1988).

Drug use was defined at each interview as self-report of any current drug use. Problem alcohol use was defined at each interview as self-report of current alcohol use along with two or more positive responses to the four CAGE questions, a validated screener for problem alcohol use (Mayfield, McLeod, & Hall, 1974). At a cutoff of two or more positive responses, the CAGE’s sensitivity ranges from 61–100% and specificity from 77–96% (Mayfield et al., 1974).

Statistical Analysis

Fifty-three (20%) mothers did not participate in any of the three interviews. These women were excluded, leaving a sample of 217. Comparing included and excluded women, there was a significant ($p < 0.05$) difference in racial background, with excluded women more likely to be Asian/Filipino and included women more likely to be White or Other. There were no differences in baseline maternal age, high school graduation, mental health, alcohol or drug use, or IPV. Missing data included occasional item-response missingness (4%) as well as missing interviews because the included mother was not located or was not the primary caregiver at the time of that specific interview (year 7: $n = 30$, 11%; year 8: $n = 26$, 10%; year 9: $n = 31$, 1%).

Missing data were determined to be missing at random (MAR), as the pattern of missingness could be predicted from other variables in the dataset (Schafer & Graham, 2002). Missing data were imputed with Bayesian based Markov-chain Monte-Carlo (MCMC) multiple imputation methods in SPSS 17.0 with 15 iterations. Multiple imputation is an effective way to deal with missing data that produces less bias and more accurate results than complete case analyses. Multiple imputation also accounts for the uncertainty of missing data, and provides valid estimates of variance (Schafer & Graham, 2002). All analyses therefore were conducted using imputed data.

Latent class analysis (LCA) and latent transition analysis (LTA) models were developed using MPlus (version 5.21; Muthen & Muthen, 2000). LCA addressed the first objective of classifying participants into IPV groups at each time point. In LCA, classes are akin to factors that emerge from a factor analysis model (McCutcheon, 1987). The major difference is that LCA is person-based, whereas factor analysis is variable-based (Cumsille, Darling, Flaherty, & Martinez, 2006). Results demonstrated the probability of mothers having membership in a class. Membership was predicted by the 14 dichotomous IPV categories, each of which was considered present if the mother reported occurrence of any CTS2 item within that category at least once in the past 12 months. Model fit was assessed using the Bayesian information criteria (BIC) statistic, the Lo-Mendell-Rubin likelihood ratio test (LMR-LRT), and entropy values (Jung & Wickrama, 2007).

We began with a two-class model at each time point and increased the number of classes until fit statistics indicated that the model was no longer statistically sound. LMR-LRT statistics were examined for nested models to determine if increasing numbers of classes were statistically appropriate. Resulting classes were examined to determine if they were theoretically meaningful. Consistent with acceptable practices for LCA modeling, final decisions on the number of classes were based on those that made theoretical sense even if a larger number of classes was statistically appropriate but did not add additional meaning (Marsh, Ludtke, Trautwein, & Morin, 2009).

After deciding on the appropriate number of classes at each time point, covariates were added. Time invariant covariates included maternal age and education. Race was not included because of its minimal impact on classes. Time varying covariates included maternal mental health, drug use, and previous IPV to account for prior levels of IPV in predicting current IPV class membership. Alcohol use was not included due to collinearity with drug use. Models were scrutinized for model fit and interpretability. Once LCA models were satisfactory, we proceeded to LTA models to examine how classes changed across time (Muthen & Muthen, 2000).

LTA models were first specified with only two time points and without covariates to determine if models converged and to assess model fit (Lanza & Collins, 2008). Covariates and the third time point were then added. Sensitivity analyses examined LCA and LTA

models with coding for no IPV including and excluding women with no partner in the past 12 months.

Results

IPV Classes

Starting with a two-class model, we compared models with increasing numbers of classes for each time point (see Table 2). A four-class solution was indicated statistically as the best fit for years 7 and 9, and a three-class solution was the best fit for year 8. We compared a three- versus four-class solution at each time point for theoretical meaning. The three-class solutions demonstrated a good fit to the underlying data for all years, were stable regardless of model modifications, and yielded classes that were theoretically meaningful. The fourth class did not provide additional information that was understandably different from another class in that model. Thus, we used a three-class solution for all analyses.

The three classes (minimal, moderate, and high IPV) were named to reflect the probabilities of the 14 IPV categories. The following proportions of women were categorized into the minimal, moderate, and high IPV classes respectively: year 7—55%, 29%, 16%; year 8—39%, 48%, 13%; and year 9—56%, 30%, 14%.

For the three classes at each time point, Table 3 provide the probabilities of participants reporting the occurrence of one or more acts within each of the 14 IPV categories. In all three years, there was an ordinal relationship between classes such that, for example, the moderate group was characterized by higher probabilities of each IPV category than the minimal group, and the high group by higher probabilities of each IPV category than the moderate group. Across years, in the minimal IPV class, probabilities were close to zero for all categories except minor verbal abuse. In the moderate IPV class, minor verbal IPV was ubiquitous and severe verbal and minor physical abuse occurred with fairly equivalent probabilities of perpetration and victimization. On average, women in the moderate group were somewhat more likely than their partners to perpetrate severe verbal abuse (0.30 versus 0.17). In the high IPV class, the probabilities of all categories of IPV except severe verbal abuse approached 1.00.

Transition of Classes

The transition model examined the matrices for years 7 to 8, and 8 to 9. The model had a good statistical fit to the data (BIC = 6991.455; entropy = 0.95). Class structures and defining characteristics remained the same as in the LCA analyses at separate time points.

Within each row of the transition matrices (Table 4), probabilities represent how participants in a given class remain in that class or move to another class at the next time point. During each transition, women commonly moved between classes. For example, from years 7 to 8, 54% of women in the minimal class remained in the minimal class, while 41% moved from the minimal IPV class into the moderate class and 5% moved to the high IPV class. Sensitivity analyses for coding of no IPV including and excluding women with no partner in the past 12 months showed no substantive differences for either LCA or LTA models (results available from authors).

Discussion

Differentiating between IPV typologies/classes has the potential to benefit both screening and intervention (Kelly & Johnson, 2008). As distinct IPV classes emerge that are consistent across populations, screening tools can be developed to accurately delineate class

membership. This ultimately may result in the development of effective intervention plans that are customized to the different characteristics of each class (Kelly & Johnson, 2008).

In the current study, mothers at-risk for child maltreatment were interviewed about IPV at three points over 3 years. At each interview, three stable classes of IPV (minimal, moderate, and high IPV) were found. These three classes appear to be similar to the three classes of Carbone-Lopez et al. (2006)—no IPV, interpersonal conflict violence, and systematic abuse, respectively. Our moderate class is similar to Dutton et al.'s description (2005) of moderate levels of physical and emotional abuse with low sexual abuse; our high class is similar to their description of high levels of all three types of abuse. However, in contrast to both Carbone-Lopez (2006) and Dutton (2005), our classes considered women's victimization as well as their use of IPV. Our moderate class also may correspond to Johnson's (2006) situational couple violence class, which is characterized by low levels of mutual IPV, and our high class may correspond either to his intimate terrorism and violent resistance classes, or to his mutual violent control class. Completely delineating how closely our classes resemble those of Johnson (2006), however, would require additional information about partners' motivations for IPV, including self-defense and coercive control.

Between when the child was 7 and 8 years old, most women in the moderate class remained in that class. The following year, the majority of women in the moderate IPV class moved to the minimal IPV class. This pattern has a number of possible explanations. First, IPV typically wanes as women get older; one year, however, may not be sufficient to account for this pattern. Second, for intact couples, the IPV that was occurring in the moderate class may reflect acute conflict that was able to be resolved over the 2 years. Finally, the findings may relate to idiosyncrasies of interpreting LCA. In all 3 years, there was an ordinal relationship between classes such that the high group was characterized by higher probabilities of each IPV category than the moderate group, and the moderate group had higher probabilities than the minimal group. However, when the child was 8 years old, the probabilities of occurrence of each IPV category were generally lower compared to when the child was 7 or 9. Thus, subtle differences in class composition may be responsible for some of the transition patterns.

When children were 8 and 9 years old, over half of women in the high IPV class moved to classes with lower levels of IPV. This general movement over time to lower levels of IPV amongst this high-risk sample is encouraging. Much less hopeful, however, is the finding that at each transition, over 40% of women in the minimal class moved *into* the moderate or high IPV class. These women then were experiencing increased violence within a relationship, and therefore were at increased risk for the negative health impact of IPV. Although these women were more likely to move into the moderate than the high class, the rates of transition out of minimal IPV are particularly salient because the study sample was a population commonly targeted by preventive interventions—mothers at-risk for child maltreatment.

Early childhood home visitation is a promising intervention for hastening the reduction of IPV in these families (Bair-Merritt et al., 2010). Establishing how and when to address IPV as a part of home visitation has increasingly been recognized as a critical element in optimizing this strategy's effectiveness. Specifically, the Family Violence Prevention Fund called for home visiting programs to "integrate IPV identification... into home visitation service delivery; [and] connect mothers who experience... IPV with community-based resources" (Family Violence Prevention Fund, 2010 p. 3).

Despite the increasing emphasis on incorporation of IPV screening into home visiting programs, translating these recommendations to effective screening and intervention may be

difficult. Home visitors describe their discomfort and lack of training with regard to IPV (Duggan et al., 2004; Tandon, Parillo, Jenkins, & Duggan, 2005). Literature suggests that home visitors often fail to recognize IPV, and when IPV is disclosed, do not routinely refer to community-based services (Duggan et al., 2004; Tandon et al., 2005). In 2010, the Federal government passed, as part of health care reform, America's Healthy Future Act S. 1796 (Pew Center on the States, 2010). This act provides \$1.5 billion over five years to finance early childhood home visitation programs. Funded programs must measure and provide evidence that the home visiting program reduces IPV/crime (Pew Center on the States, 2010). Effective implementation of IPV screening and intervention within home visitation programs, however, requires significant forethought and care. To most effectively identify and reduce IPV, our results suggest that programs must understand that IPV is not a static construct, and that women must be screened periodically. Additionally, the IPV interventions should consider the fluidity with which women enter and leave violent relationships.

Several important limitations should be noted. IPV data were gathered using women's self-reports of their own and their partner's IPV; self-report measures are subject to recall and social desirability biases. Societal views about IPV may have been different when the data were collected (1994–2005) as compared to the present. Also, we believe that identifying these classes, and the transitions between classes, is an important first step for understanding the trajectory of IPV in this population of women. Identifying reasons underlying the transitions is beyond the scope of the current analyses, but is an important future direction. For example, using the current data, we were not able to tell whether women were in the same, or different, relationships at each time point. Therefore, movement amongst classes could represent a change in relationship status, or a change in levels of violence within a constant relationship; this needs to be explored in ensuing studies. Finally, our results may not be generalizable to lower risk populations, or to populations with different socio-demographics.

Despite these limitations, this is the first study to our knowledge to conduct LTA to examine trajectories of classes of IPV. Our ordinal minimal, moderate, and high IPV classes all were characterized by mutual IPV, with escalating probabilities of the occurrence of each category of IPV with movement from minimal to moderate and moderate to high. Although each class did include mutual IPV, the motivations for men's and women's use of IPV (such as self-defense) were not available. Future research examining such motivations would add depth to our understanding of these classes. Membership in classes fluctuated over time, emphasizing the importance of screening regularly for IPV and of developing interventions that recognize the dynamic nature of violent relationships. Future research should investigate whether the use of IPV to gain coercive control differs by IPV class, and should elucidate why women transitioned from one class of IPV to another.

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Table 1**Maternal Socio-demographic Characteristics^a**

Characteristics	<i>N</i> (%) unless otherwise specified (<i>n</i> =217)
Age in years, mean (standard deviation [SD])	31.0 (5.9)
Primary race	
Native Hawaiian or Pacific Islander	70 (32)
Asian or Filipino	53 (24)
Caucasian	32 (15)
No primary ethnicity or other	62 (29)
High school graduate	158 (73)
Current problem alcohol use ^b	23 (11)
Current drug abuse ^c	18 (8)
Poor mental health ^d	51 (24)
IPV acts in past year, median (SD) ^e	14 (61.3)

^a All demographics are measured when the child was 7 years of age except race that was assessed only at the baseline interview;

^b Measured by self-report of current alcohol use and 2 positive responses to the four CAGE questions

^c Measured by any self-report of current illicit drug use;

^d Measured using the 5-item Mental Health Index, a cutoff of <67 defined poor mental health reported;

^e Measured using the Revised Conflict Tactics Scale, based on total number of acts of verbal, physical, and sexual IPV reported

Table 2

Fit Statistics for Latent Class Analyses across Time Points

Model	<i>N</i>	BIC	LMR-LRT	Entropy
Year 7				
2-class	217	2308.859	$p < .001$	0.97
3-class	217	2033.674	$p < .001$	0.96
4-class	217	2002.175	$p < .05$	0.94
5-class	217	2044.416	$p = .27$	0.95
Year 8				
2-class	217	2208.440	$p < .001$	0.98
3-class	217	2019.918	$p < .001$	0.95
4-class	217	1958.256	$p = .72$	0.97
Year 9				
2-class	217	1807.563	$p < .001$	0.99
3-class	217	1640.206	$p < .001$	0.96
4-class	217	1605.685	$p < .001$	0.96
5-class	217	1663.072	$p = .74$	0.97

^a“Years” refer to child age

Table 3

Item-Response Probabilities for Latent Classes of Intimate Partner Violence (IPV)

Class (<i>n^d</i>)	Type of IPV	Probabilities of IPV Type			
		Y ^{7d}	Y ^{8e}	Y ^{9f}	Average
Minimal IPV	Minor Verbal (P ^h)	0.27	0.12	0.16	0.18
	Minor Verbal (V ^c)	0.25	0.00	0.11	0.12
	Severe Verbal (P)	0.04	0.00	0.00	0.01
	Severe Verbal (V)	0.02	0.00	0.02	0.01
	Minor Physical (P)	0.07	0.00	0.00	0.02
	Minor Physical (V)	0.05	0.00	0.00	0.02
	Severe Physical (P)	0.02	0.00	0.00	0.01
	Severe Physical (V)	0.00	0.00	0.00	0.00
	Sex (P)	0.00	0.00	0.00	0.00
	Sex (V)	0.02	0.00	0.00	0.01
Moderate IPV	Minor Injury (P)	0.00	0.00	0.00	0.00
	Minor Injury (V)	0.00	0.02	0.00	0.01
	Severe Injury (P)	0.00	0.00	0.00	0.00
	Severe Injury (V)	0.00	0.00	0.00	0.00
	Minor Verbal (P)	1.00	0.82	0.79	0.87
	Minor Verbal (V)	0.98	0.77	0.74	0.83
	Severe Verbal (P)	0.47	0.16	0.27	0.30
	Severe Verbal (V)	0.25	0.07	0.18	0.17
	Minor Physical (P)	0.33	0.10	0.26	0.23
	Minor Physical (V)	0.28	0.09	0.26	0.21
Y7: (<i>n</i> = 63)	Severe Physical (P)	0.03	0.03	0.03	0.03
	Severe Physical (V)	0.03	0.03	0.03	0.03
	Sex (P)	0.03	0.03	0.03	0.03
	Sex (V)	0.03	0.03	0.03	0.03
	Minor Injury (P)	0.03	0.03	0.03	0.03
	Minor Injury (V)	0.03	0.03	0.03	0.03
	Y8: (<i>n</i> = 105)				
Y9: (<i>n</i> = 65)					

Class (n^d)	Type of IPV	Probabilities of IPV Type			
		Y7 ^d	Y8 ^e	Y9 ^f	Average
	Severe Injury (P)	0.03	0.03	0.03	0.03
	Severe Injury (V)	0.03	0.03	0.03	0.03
High IPV	Minor Verbal (P)	1.00	1.00	1.00	1.00
Y7: ($n = 35$)	Minor Verbal (V)	1.00	0.93	1.00	0.98
Y8: ($n = 28$)	Severe Verbal (P)	0.91	0.32	0.90	0.71
Y9: ($n = 30$)	Severe Verbal (V)	0.17	0.29	1.00	0.49
	Minor Physical (P)	1.00	0.86	1.00	0.95
	Minor Physical (V)	0.97	0.61	0.95	0.84
	Severe Physical (P)	0.95	0.95	0.95	0.95
	Severe Physical (V)	0.95	0.95	0.95	0.95
	Sex (P)	0.95	0.95	0.95	0.95
	Sex (V)	0.95	0.95	0.95	0.95
	Minor Injury (P)	0.95	0.95	0.95	0.95
	Minor Injury (V)	0.95	0.95	0.95	0.95
	Severe Injury (P)	0.95	0.95	0.95	0.95
	Severe Injury (V)	0.95	0.95	0.95	0.95

^aTotal $n = 217$ women each year;

^bP=mother's IPV perpetration;

^cV=mother's IPV victimization;

^dY7 = child age 7 years;

^eY8 = child age 8 years;

^fY9 = child age 9 years

Table 4

Latent Transition Probabilities for Latent Transition Analysis Models

	Y8^b Minimal IPV	Y8 Moderate IPV	Y8 High IPV
Y7 ^a Minimal IPV	0.54	0.41	0.05
Y7 Moderate IPV	0.17	0.68	0.15
Y7 High IPV	0.24	0.38	0.38
	Y9^c Minimal IPV	Y9 Moderate IPV	Y9 High IPV
Y8 Minimal IPV	0.57	0.35	0.08
Y8 Moderate IPV	0.62	0.29	0.09
Y8 High IPV	0.18	0.32	0.50

^aY7 = child age 7 years;^bY8 = child age 8 years;^cY9 = child age 9 years;

light gray shading indicates transition to less IPV; middle gray stable rates of moderate/high IPV; dark gray transition to increasingly severe IPV