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For more analysis details including missing data and probabilities for engaging in psychological and physical IPV at each wave, see: <https://works.bepress.com/hans-saint-eloicadely/>.

Abstract

Researchers do not agree on how intimate partner violence (IPV) emerges and changes from adolescence to young adulthood. This may be because change in these behaviors varies across individuals. The present study uses a longitudinal, person-centered approach to examine whether there are multiple classes or patterns of change in the perpetration of IPV during the transitional period from adolescence (age 18) to young adulthood (age 25) using data collected annually from a community sample of 484 participants. Latent class analysis was the analytic approach used. Results revealed three patterns for psychological IPV (Little-to-None, Minor/Increasing, and Extensive/Increasing) and two patterns for physical IPV (Little-to-None and Extensive). Patterns varied greatly in number of representatives, although they were more balanced in size for psychological than physical IPV. Variations in IPV behaviors were also revealed across classes, although as expected in a community sample, minor forms of IPV were more common than severe forms. Additionally, classes differed in demographic and relationship status variables. These findings suggest that IPV may occur in multiple distinct patterns as opposed to one average pattern across a population. This suggests that interventions for IPV may need to be geared to differences in patterns in order to enhance their efficacy.

Keywords: adolescence, classes, intimate partner violence, latent class analysis, patterns, young adulthood

Classes of Intimate Partner Violence from Late Adolescence to Young Adulthood

The high prevalence of intimate partner violence (IPV) among adolescents and young adults is well-documented. Up to 90% of this population have perpetrated psychological IPV (e.g., insulting or destroying partner's belongings) (Jouriles, Garrido, Rosenfield, & McDonald, 2009; Lawrence, Yoon, Langer, & Ro, 2009), whereas percentages range between 9%-30% for physical IPV (e.g., grabbing or kicking one's partner) (Berger, Wildsmith, Manlove, & Steward-Streng, 2012; Centers for Disease Control and Prevention (CDC), 2014). Additionally, once initiated, perpetration of IPV appears to persist as adolescents become young adults (Cui, Ueno, Gordon, & Fincham, 2013; Gomez, 2011). However, some studies suggest this behavior is stable across time (Capaldi, Shortt, & Crosby, 2003; Fritz & Slep, 2009; O'Leary & Slep, 2003), while others show a decreasing pattern (Fritz & O'Leary, 2004; Kim, Laurent, Capaldi, & Feingold, 2008; Nocentini, Mesenini, & Pastorelli, 2010; Wolfe et al., 2003), and others have either indicated an increasing pattern (Orpinas, Hsieh, Song, Holland, & Nahapetyan, 2013; Orpinas, Nahapetyan, Song, McNicholas, & Reeves, 2012; Swartout, Cook, & White, 2012), or a curvilinear trajectory (Foshee et al., 2009). The purpose of this study is to consider the possibility that the inconsistency in these findings is due to sample differences in the representation of naturally occurring subtypes of IPV. If so, understanding persistence or change in IPV may require modelling multiple patterns of IPV within study samples.

The majority of studies that have examined IPV over time have used a variable-centered approach that assumes one average pattern is representative of this phenomenon in the population. For this study, a person-centered approach, which focuses on sample heterogeneity is used. This method classifies participants into distinct subgroups that minimize within-group variance yielding pockets of similarity within the larger sample. Rather than developing one

average sample-wide pattern, a person-centered approach allows for the identification and examination of a variety of patterns across the population (Swartout, Swartout, & White, 2011).

The notion of variety in patterns of IPV is supported by recent person-centered studies (Orpinas et al., 2012; 2013; Swartout et al., 2012). But, these studies are limited to adolescents (Orpinas et al.; $M = 14.8$ years old) or college students (Swartout et al.). Given the variable-centered based literature suggesting that IPV initiated in adolescence persists into early adulthood (Cui et al., 2013; Gomez, 2011), it seems important to take a person-centered approach to the emergence of IPV across this transition. This is when involvement in romantic relationships increases (Carver, Joyner, & Udry, 2003) and the opportunity for IPV in the romantic context presents itself (Cui et al.; Gomez). The behaviors associated with IPV are varied and can be organized into psychological (e.g., yelling), physical (e.g., hitting) and sexual (e.g., unwanted intercourse) IPV (Straus, Hamby, Boney-McCoy, & Sugarman, 1996). The current study focuses on the perpetration of psychological and physical IPV because they form the basis of the longitudinal literature upon which we draw and to which we seek to contribute.

Another advantage of a person-centered analysis is that it permits the clusters of cases that are similar to one another to be described both in terms of the factors that go into the classification analysis and in terms of independent descriptive or explanatory variables (Swartout et al., 2011). For this study, the identified patterns are compared in terms of their characteristic IPV behaviors across time and in terms of basic demographic variables that are related to the perpetration of IPV: gender (Archer, 2000; Cano, Avery-Leaf, Cascardi, & O'Leary, 1998; Ellis, Crooks, & Wolfe, 2009), socioeconomic status (SES) and educational attainment (Aldarondo & Sugarman, 1996; O'Keefe, 1998), and relationship status (Rhoades, Stanley, & Markman, 2012). With the exception of Orpinas et al. (2013), the examination of demographic attributes across

patterns of IPV remains largely understudied. The indication of demographic trends across patterns may develop new understanding on varieties of IPV across the transition of adolescence to young adulthood and may have implications for interventions.

Thus far, we have developed the argument that the inconsistency of findings from longitudinal studies of IPV may be due in part to the existence of naturally occurring patterns in the development of IPV that are represented in research samples. A person-centered analysis strategy will help identify these patterns. The following will be a discussion of the patterns expected in the present study. A stable active pattern of perpetration for both psychological and physical IPV has been found across studies. For instance, O'Leary and Slep (2003) found for high school students that reports of perpetrating physical IPV remained stable over a three-month period. Similar stability was shown for psychological and physical IPV by Fritz and Slep (2009) among middle adolescents across a one-year interval and by Capaldi et al. (2003) among late adolescent couples across a two-year interval. Although these studies were all longitudinal, they assessed IPV over relatively brief intervals fully contained within the developmental period of adolescence. Furthermore, only two time points were observed in two of these studies. In order to be more confident about the shape of a pattern, more than two time points are necessary (Singer & Willett, 2003). The present study examines IPV perpetration from adolescents (initially age 18) as they mature into young adulthood (age 25) across eight annual waves of data collection. Importantly, variable-centered based research on adult samples also supports the conclusion that the perpetration of physical IPV is stable over time (Aldarondo, 1996; Lorber & O'Leary, 2004; Woffordt, Mihalic, & Menard, 1994). In keeping with these trends of stability in adolescence and adulthood, *a stable aggressive group is expected across the period of adolescence to young adulthood in the present study.*

However, this stable trend does not characterize all individuals in any study. For instance, Aldarondo (1996) showed that only 33% of men were physically abusive toward their partner at all three annual waves of his study. Using two waves of data from the National Youth Survey, Woffordt et al. (1994) showed that 51% of males who were physically abusive toward their partner at the first wave reported such behaviors at the second wave three years later. Lastly, Lorber and O'Leary (2004) showed that only 41% of the 94 men in their sample who reported physical aggression toward their wives at the start of their two-year study remained aggressive across all four waves. These findings support the conclusion that the stable aggressive pattern will characterize a relatively small fraction of a population or sample.

Any study of IPV documents that a large fraction of the study sample reports virtually no IPV behavior and in longitudinal studies, this would also represent a stable behavior pattern. Previous person-centered studies consistently identify a stable pattern of little-to-no IPV and this pattern tends to be characteristic for most participants (Orpinas et al., 2012; 2013; Swartout et al., 2012). Hence, *a stable minimally aggressive pattern is expected and it should represent a substantial fraction of study participants.*

In keeping with the observation of sample variability, there is reason to expect some inconsistency in the perpetration of IPV over time. Given the prevalence of psychological and physical IPV previously shown among adult samples (Choice, Lamke, & Pittman, 1995; Fritz & O'Leary, 2004; Schumacher & Leonard, 2005) and the existence of an increasing pattern shown in previous person-centered studies (Orpinas et al., 2012; 2013; Swartout et al., 2012), *an increasing pattern is expected for both forms of IPV across the transition from adolescence to young adulthood.* This pattern could reflect the processes of learning and reinforcement of IPV as it leads to desired relationship outcomes, a reasoning that is consistent with the notion of IPV

as a learned conflict tactic (Straus, 1979). Alternatively, this pattern could reflect increasing levels of relationship conflict over time which in turn could activate poorly regulated frustration and anger.

Some previous variable-centered studies have found an average decrease in the perpetration of IPV over time among adolescents (Nocentini et al., 2010; Wolfe et al., 2003) and young adults (Fritz & O'Leary, 2004; Kim et al., 2008). Foshee et al. (2009) found a non-linear pattern among adolescents that began with an increase in physical IPV perpetration between the ages of 13-16, a peak at 16-17, and a decrease thereafter. Nocentini et al. and Wolfe et al., however, both reported linear decreases in IPV perpetration over time. Nocentini et al. showed this pattern only for physical IPV, whereas Wolfe et al. found it for both psychological and physical IPV. Fritz and O'Leary indicated a decrease in women's perpetration of physical IPV against their spouse across a 10-year interval. Similar results were shown by Kim et al. in their 10-year study of young men. Emerging relationship experience and skills may help in dealing with conflicts as adolescents' transition to adulthood, or IPV may simply decrease with age and maturity. Indeed, adolescents become less impulsive as they age (Steinberg et al., 2008).

Therefore, a declining pattern of IPV among a subset of initially aggressive adolescents is expected over the transition of adolescence to young adulthood.

The Present Study

In summary, the present study aims to explain variety in the patterns of IPV perpetration across the transition of adolescence to young adulthood. Four general patterns are expected for both psychological and physical IPV: low stable, high stable, increasing, and decreasing. Given that psychological IPV is often viewed as a more normative aspect of romantic relationships (Follingstad & Rogers, 2013), more participants are expected to be classified in the

psychologically aggressive patterns than the physically aggressive patterns. These patterns will be described in terms of their particular IPV behaviors and the demographic and relationship status factors represented within each pattern. Findings of the present study may increase current understanding on change in IPV through the identification of multiple patterns of such behaviors and through the examination of the behaviors and demographics that constitute these patterns. This is a descriptive study with the potential to contribute to theory about change in the perpetration of IPV throughout the developmental period of adolescence to young adulthood.

Method

Participants and Procedure

Data for the present study came from the Child Development Project (CDP) (Pettit, Lansford, Malone, Dodge, & Bates, 2010). IPV data were collected annually from participants who were in a dating/cohabiting/marital relationship (hereafter referred to as romantic relationships) during the reporting year from the ages of 18-25. Only participants who were in a romantic relationship and provided IPV data for at least one wave were included yielding a retained sample of 82.7% ($n = 484$) of the original sample ($n = 585$). The percentage of participants in romantic relationships increased from 44.3% at age 18 to 64.9% at age 25.

Participants provided an average of four waves of data ($M = 4.57$; $SD = 2.18$). Although not nationally representative, this sample is representative of the communities from which the data were collected at the time the CDP was initiated. Slightly over half of participants were female (51.9%). Most were White (82.2%), but 16.3% were Black, and 1.4% were of other racial backgrounds. The sample was largely middle-class with a mean Hollingshead (1975) index score of 3.35 ($SD = 1.18$). Approximately 87% of mothers and 75% of fathers had at least a high school education. When the focal participants were five years old, 62% of their parents were

married, and 0.6% were cohabiting. By age 17, 55% of parents were married and 2% were cohabiting. Participants varied in educational attainment. At the age of 19, 69% had graduated from high school, and by age 24, 66% had completed some post-high school education. Although males were over-represented in the excluded sample ($\chi^2(1) = 16.43, p < .001$), no other significant differences were found between the analysis and the excluded samples.

Measures

IPV. Items from the *Revised Conflict Tactics Scale* (CTS2; Straus et al., 1996) were used at age 18 (4 for psychological and 7 for physical IPV) and at ages 22-25 (6 for psychological and 8 for physical IPV). Also, at ages 22-25, an additional item “I put down my partner’s appearance or abilities” came from the *Psychological Maltreatment of Women Inventory* (PMWI; Tolman, 1989). At ages 19-21, items from the *Conflict Tactics Scale* (CTS; Straus, 1979) were used (3 for psychological and 2 for physical IPV). These inconsistencies in assessment were not implemented with the current study in mind. Rather they were designed to limit participant research burden as data were collected annually to address other research goals. Our approach to the analysis, however, minimized the effects of these inconsistencies. We eliminated issues related to scaling differences by dichotomizing the IPV items (0 = *No aggression during reporting year*, 1 = *Any aggression in that period*). In addition, minor wording differences existing for a few items across versions of the CTS (e.g., CTS2: “I punched or hit my partner with something that could hurt”; CTS: “Hit or tried to hit your partner”), were treated as assessments of the same behavior (Pettit, Keiley, Laird, Bates, & Dodge, 2007).

The behaviors assessing psychological IPV included insulting, destroying belongings, yelling, threatening, stomping away from an argument, put downs, and spitefulness, whereas behaviors assessing physical IPV included throwing, twisting, pushing, hitting, grabbing,

slapping, kicking, and slamming against a wall. Three behaviors with zero variance for at least one wave were excluded from the analysis (*i.e.*, use of a knife or gun, choking, and beating up a romantic partner).

Demographics. For the demographic comparison of identified classes, **Gender** was coded 0 = *Male*, 1 = *Female*. **SES** was assessed with Hollingshead's (1975) four-factor index and coded based on his 5-point scale where higher scores indicated higher SES. **Relationship status** was assessed annually to create the following variables: **Ever cohabited** (0 = *no*, 1 = *yes*); **Ever married** (0 = *no*, 1 = *yes*); **Years cohabited** (*sum of wave-based cohabitation codes*, range 0 – 7, $M = 1.06$; $SD = 1.42$); and **Years married** (*sum of wave-based marriage codes*, range 0 – 8, $M = 1.04$; $SD = 1.79$). Lastly, **Educational attainment** was assessed at age 24 and was coded on a 4-point scale (1 = *Less than high school*, 2 = *Graduated high school*, 3 = *Some college*, 4 = *Graduated college*) ($M = 2.87$; $SD = 1.05$).

Plan of Analysis

A person-centered methodology known as latent class analysis (LCA) was used to test for variability in reports of IPV between individuals and between unknown latent classes of individuals with similar patterns of reports over time. An advantage of LCA (and other person-centered approaches) is that it is extremely useful when identifying different groups among highly skewed data, as is the case in the present study. The LCA reported here describes individuals based on the probability or likelihood that participants will engage in the behaviors in question. Participants with similar probabilities are categorized into classes or latent categories (Swartout et al., 2011). Because IPV was assessed at multiple waves over time, classes capture patterns in the probability that participants will perpetrate IPV across time points. These patterns may reflect stable, increasing, or decreasing patterns in the likelihood of expressing IPV over

time.

Two sets of LCA were conducted in MPLUS version 7 (Muthén & Muthén, 1998-2012), one each for the psychological and physical IPV repeated measures. For each analysis, a separate latent variable was modeled at each wave indicated by the items available at that wave. As is typical for longitudinal analyses with latent variables, factor loadings of items that were the same (or similar) across waves were constrained to equality (Garber, Keiley, & Martin, 2002). This procedure maximizes the continuity of meaning of the latent constructs across time (Pettit et al., 2007).

LCA proceeds as a series of models fit to the data beginning with one latent class and adding a class at each iteration until optimal fit data are reached. Each model is compared to the model with one less class. Model fit is estimated based on the log likelihood ratio statistic (-2LL) (Nylund, Asparouhov, & Muthén, 2007), the Bayesian Information Criterion (BIC) (Schwarz, 1978), the Lo-Mendell Rubin adjusted Likelihood Ratio Test (LRT) (Nylund et al.), and the entropy (Celeux & Soromenho, 1996; Clark & Muthén, 2009). The -2LL “assumes a chi-square difference distribution” (Nylund et al., p. 537), the BIC tests model fit based on the sample size and the number of parameters (Schwarz), the adjusted LRT assesses whether adding an additional class significantly contributes to the model (Nylund et al.), and the entropy reflects the assurance that the number of classes estimated from the model is a good representation of the data (Celeux & Soromenho, 1996). The following criteria are used to select the final model: (a) a significantly lower -2LL, (b) a lower BIC, (c) a significant adjusted LRT, and (d) a higher entropy.

Full Information Maximum Likelihood (FIML) is used to account for missing data across waves. This procedure allows for the inclusion of all participants with valid data provided at one

or more of the time points (Muthén & Muthén, 1998-2012). To utilize FIML, one must assume that missing data are missing at random. In the current case, missing data occurred because, for a variety of random reasons, participants either did not participate in a particular wave or they were not involved in a romantic relationship during the relevant period.

LCA calculates a mean factor score at each wave for each class. A factor score mean reflects the estimated probability that members of a class will perpetrate psychological or physical IPV at the given wave (at a particular age). Within a given wave, each factor score can be compared directly to the factor score of a reference class for which all factor score means have been set to zero. Therefore, a significant factor score mean at a given wave for a given class means that it is significantly different from the reference class at that wave. These analyses model patterns of change/consistency in the perpetration of IPV behaviors within a class across waves. To test whether apparent changes within classes represent significant change across time, and to test whether apparent differences in factor score means at the same time point for the two non-reference groups are significant when more than two classes emerge, t-values are calculated whereby the difference in factor score means is compared to the average standard errors of the means being compared. A significant difference is indicated if the mean difference is greater than twice the calculated standard error.

An additional advantage of LCA is that the patterns that emerge can be treated as categorical variables that can be predicted or described with other variables not included in their formation. In the present study, demographic attributes and relationship statuses characterized within each pattern were examined using chi-square analysis, independent sample t-tests, and analysis of variance (ANOVA) with Bonferroni tests (Clark & Muthén, 2009).

Results

Because not all participants were in romantic relationships at each wave of data collection, the fraction of the analysis sample that provided data at a given wave varied from 49% to 66%. FIML estimation procedures were used to account for missing data across waves. To confirm that equality constraints on factor loadings for similar IPV indicators were valid, the constrained and unconstrained models were compared. The constrained model fit the data better than the unconstrained model, supporting the validity of the constraints (Muthén & Muthén, 2003).

Psychological IPV

Up to four classes were fit to the data for psychological IPV. Although the lowest -2LL and BIC were shown for the four-class model, the adjusted LRT for this model was non-significant, suggesting that the four-class model was not significantly different from the three-class model. Additionally, the three-class model had a higher entropy than the two and four-class models. Therefore, the three-class model was chosen as the final model for psychological IPV (see Table 1, top panel). Classes for psychological IPV were labeled as follows: (a) Little-to-None (Comparison class), (b) Minor/Increasing, and (c) Extensive/Increasing. The estimated factor score means generated for participants across waves per class are plotted in Figure 1.

Psychological IPV: Little-to-None. The Little-to-None class refers to participants who indicated little probability of engaging in the assessed behaviors of psychological IPV across waves. Members of this class consistently revealed low likelihoods for these behaviors within a reporting year. Five percent or fewer reported any use of put-downs, spitefulness, personal threats, or destruction of property within a given wave. Indeed, the highest likelihoods were for the three most common forms of psychological aggression, with an 8%-20% chance of stomping away from an argument across waves, a 15%-29% chance of insulting the partner, and a 19%-

32% chance of yelling at a partner during any of the eight reporting years. This class of psychological IPV is the reference group for this analysis and the rarity of the relevant behaviors across waves warrants the label Little-to-None. This class was represented by 22.7% of the sample ($n = 110$).

Psychological IPV: Minor/Increasing. The Minor/Increasing class consists of participants whose likelihood of perpetrating psychological forms of IPV increased over time. Looking at the plot in Figure 1, the factor score means for this class were not significantly different from the Little-to-None class for ages 18-20, meaning that during these years the two classes could not be distinguished. Only after age 20 did the increasing pattern of psychological IPV become statistically distinguishable from the Little-to-None class. Furthermore, within-class comparisons showed that the factor score mean for age 25 was significantly larger than the factor score means for age 18, supporting the claim that this class represents the expected increasing pattern for psychological IPV. Importantly, however, the behaviors most descriptive of this class were the more minor forms of psychological IPV (insulting, yelling, stomping). Specifically, the likelihood for insulting one's partner increased from 41% to 81% across waves. Similar increases were seen for yelling (44% to 76%) and stomping away from an argument (25% to 61%). All other psychological IPV behaviors had very low likelihoods of 5% or less across waves. Therefore, this class was characterized by an increase in the perpetration of minor forms of psychological IPV in romantic relationships across the transition to adulthood and received the label Minor/Increasing. Approximately 52.7% of the sample ($n = 255$) were classified in this class.

Psychological IPV: Extensive/Increasing. The Extensive/Increasing class consisted of approximately 24.6% of the sample ($n = 119$) and was characterized by relatively high

likelihoods for the use of psychological IPV (see Figure 1). The Extensive/Increasing class was significantly distinguished from the Little-to-None class at every wave. In addition, within-class comparisons indicated that the factor score mean at age 25 was significantly larger than the factor score mean at age 18, supporting the conclusion that this extensive pattern was also an increasing one across the transition to adulthood. When analyses were re-run with the Minor/Increasing class as the comparison group (not shown), the results indicated that the Extensive/Increasing and Minor/Increasing classes were significantly different at all waves. Therefore, these two increasing classes appear to represent meaningfully distinct patterns. Unlike the Minor/Increasing pattern, participants within the Extensive/Increasing group tended to use most forms of psychological IPV. In addition to high likelihoods for insulting one's partner (80%-97%), yelling (80%-95%), and stomping away from an argument (66%-88%), they also had relatively high likelihoods for the use of put-downs (34%-47%), spitefulness (40%-51%), threats (15%-31%), and even for destruction of partner belongings (15%-24%).

Demographic comparisons between classes. Although demographic comparisons do not imply that demographic variables are causal contributors to class membership, they do suggest potentially important descriptive social address factors that characterize the classes. For example, Table 2 shows that there were more males in the Little-to-None class than females ($\chi^2(2) = 8.08, p < .05$). Cohabiters were over-represented in the Extensive/Increasing class, whereas those who never cohabited were over-represented in the Little-to-None class ($\chi^2(2) = 6.74, p < .05$). SES, educational attainment, years of cohabitation, and years of marriage were also related to class membership. Membership in the Extensive/Increasing class was associated with lower SES ($F(2, 470) = 6.96, p < .001$) and lower educational attainment ($F(2, 479) = 22.66, p < .001$). Compared to the Little-to-None class (but not the Minor/Increasing class), membership in

the Extensive/Increasing class was associated with more years of cohabitation ($F(2, 481) = 4.06, p < .05$) and marginally with more years of marriage ($F(2, 481) = 2.47, p = .09$).

Physical IPV

Up to three classes were fit to the data for physical IPV. The three-class model revealed the lowest -2LL and BIC, but the non-significant LRT suggested that the three-class model was not significantly different from the two-class model. Furthermore, higher entropy was shown for the two-class model compared to the three-class model. Thus, the two-class model for physical IPV was selected as the best fitting model (see Table 1, bottom panel). Classes for physical IPV were labeled as: (a) Little-to-None (Comparison class), and (b) Extensive. The estimated factor score means found for participants across waves per class are plotted in Figure 2.

Physical IPV: Little-to-None. Whereas the three classes of psychological IPV were somewhat balanced in size, the two physical IPV classes were highly imbalanced. Approximately 82.6% of participants ($n = 400$) were classified in the Little-to-None pattern. Participants classified in this pattern had a low probability of perpetrating physical IPV across all waves. Considering the specific behaviors, the likelihood of throwing, twisting, hitting, slapping, kicking or slamming one's partner was 4% or below at every wave of data collection. Even pushing and grabbing were reported by 9% or less across waves. This class represents the expected large stable pattern of minimal physical IPV.

Physical IPV: Extensive. Approximately 17.4% of the sample ($n = 84$) were classified in the Extensive class. Figure 2 presents the plot of factor score means for the Extensive class compared to the Little-to-None class. Seven of the eight means were significant, indicating that this pattern was highly differentiated from the Little-to-None class. The plot of factor score means for the Extensive class appears non-linear, but within-class comparisons showed that the

factor score mean at age 25 was not significantly different than the factor score mean at age 18. Thus, the Extensive class represents a statistically flat, stable pattern. Participants within this class had a much higher probability for engaging in the assessed physical IPV behaviors across waves compared to the Little-to-None class. The highest likelihood for perpetrating IPV across waves was found for pushing (32%-65%) and grabbing (37%-56%). For other forms of physical IPV, the likelihood was again considerably above that for the Little-to-None class. It was between 22%-45% for throwing, 14%-27% for twisting, 11%-38% for hitting, 21%-37% for slapping, and 6%-18% for kicking. The lowest likelihood for perpetrating physical IPV was shown for slamming (3%-11%). Taken together, these findings indicate the expected higher stable pattern of physical IPV across waves.

Demographic differences between classes. Descriptions of the two classes based on demographic characteristic are presented in Table 3. Females were marginally over-represented ($\chi^2(1) = 3.19, p = .07$) in the Extensive class. Cohabitation was linked to the Extensive class as a status ($\chi^2(1) = 7.19, p < .01$) and in terms of its duration ($t(482) = -2.60, p < .01$). SES ($t(471) = 4.71, p < .001$) and educational attainment ($t(480) = 4.76, p < .001$) were significantly lower for the Extensive class.

Comparisons across IPV classes. Table 3 also shows the cross-tabulation of class memberships for psychological and physical IPV. A chi-square test found the two sets of classes to be moderately associated ($\chi^2(2) = 112.60, p < .001; \phi_c = .48, p < .001$). Virtually everyone in the Little-to-None class for psychological IPV was in the Little-to-None class for physical IPV. Nearly half of the Extensive/Increasing class for psychological IPV was in the Extensive class for physical IPV. A look at how the Minor/Increasing class of psychological IPV perpetrators were distributed in the two physical IPV classes reveals that a large majority of them (90.2%)

were classified in the Little-to-None class for physical IPV.

Discussion

Findings of the present study suggest that the persistence of IPV should not be thought of as one unitary pattern across a population, but rather as a plurality of patterns and that each pattern may represent a subsample within a population. These findings suggest that the inconsistency in findings regarding change in IPV from previous variable-centered longitudinal studies may have been due to a diversity of unobserved patterns contained in their samples. In the current sample, two stable patterns, one minimal (Little-to-None) and substantial (Extensive) were shown for physical IPV, and a stable pattern of minimal aggression (Little-to-None) was also shown for psychological IPV. In addition, two increasing patterns were found for psychological IPV. Unlike previous person-centered studies identifying multiple distinct patterns of IPV among adolescents (Orpinas et al., 2012; 2013), the present findings suggest that these patterns emerging or existing in adolescence extend into adulthood. Also in contrast to previous person-centered studies, the present study not only examined the shape of IPV patterns over time, but also the behaviors represented within each pattern. This allowed for the investigation of which patterns were characterized by minor forms of IPV, and which were characterized by more diverse aggressive strategies.

Analogous to the variable-centered findings of cross-time, rank-order stability on IPV (Capaldi et al., 2003; Fritz & Slep, 2009; O'Leary & Slep, 2003), the present study found a stable pattern representing active use of physical IPV. This pattern characterized the behavior of 17% of the full sample. Importantly, this small class of extensive users of physical IPV is consistent with previous studies indicating that persistent and consistent use of IPV is limited to a fraction of adolescents and young adults (Berger et al., 2012; CDC, 2014).

Other stable patterns were also identified. Specifically, the large majority (83%) of participants were grouped in the low stable Little-to-None pattern for physical IPV, and 23% of the sample were classified in the Little-to-None pattern for psychological IPV. It seems clear that the pattern stability for physical IPV shown in previous studies (Capaldi et al., 2003; Fritz & Slep, 2009; O'Leary & Slep, 2003) is driven not only by the stability of the extensively aggressive group, but also by the stability of the minimally aggressive group. Already by age 18 and throughout the transition to early adulthood, the use and non-use of physical IPV appears set and stabilized. This did not seem to be the case for psychological IPV, however.

Aside from the relatively small Little-to-None class for psychological IPV, the two other patterns revealed increases in the use of psychological IPV in this community sample (Minor/Increasing and Extensive/Increasing). These patterns together incorporated more than 75% of the sample. The Minor/Increasing class was initially indistinguishable for the Little-to-None class and throughout the transition to adulthood, this class was mainly characterized by the increasing use of the more minor types of psychologically abusive behaviors. This pattern suggests the emergence of a learned pattern of behavior that arose after dating and romantic relationship experience increased. The other pattern was Extensive/Increasing and, not only was it distinguished from both other patterns of psychological IPV at each wave, it involved wider use of the full range of these behaviors. This pattern also suggests an on-going learning process whereby the reinforcement of gaining desired relationship outcomes results from the use of these behaviors (e.g., Straus, 1979), but this more Extensive/Increasing class may have emerged in other types of relationships and earlier than age 18. The plots for the Minor/Increasing and Extensive/Increasing classes leave open the question of what happens to these patterns after age 25. Both plots have the suggestion of an asymptote as age 25 is approached. However, future

studies will be needed to investigate whether these patterns continue to escalate, develop into stable patterns or even decline after age 25.

Combining the Minor/Increasing and the Extensive/Increasing classes for psychological IPV, it is clear that the substantial majority of the sample engages in this form of IPV. This is consistent with previous studies suggesting that the expression of psychological IPV is much more common than physical IPV (Foshee et al., 2009). Psychological IPV may be less costly to use (Follingstad & Rogers, 2013), and thus is used among more couples.

It is worth noting that the stable Little-to-None patterns found for psychological and physical IPV do not indicate the complete absence of IPV for every individual in the class. Instead, rare use of largely minor forms of aggression occurred by some. Therefore, rather than interpreting the label “Little-to-None” as none at all, this class may be representative of a relationship pattern in which psychological and physical aggression is only rarely if ever the solution to relationship problems.

For physical IPV, no increasing or decreasing patterns were found. It appears that in the present sample, patterns of physical IPV were established already prior to the age of 18, and perhaps prior to entry into romantic relationships. Assuming IPV emerges in the course of development, an increasing and/or decreasing pattern may be identified if the assessment of IPV begins prior to late adolescence and considers behavior in a wider range of relationships (e.g., peers, siblings). Also, because IPV items in the present study were dichotomized, the classes identified in this study represent patterns of use rather than rates of use. Future studies should replicate this analysis using rate-based data. That kind of research would add another dimension to the classification of IPV types.

Findings of the present study coincide with and build on the literature on the association

of certain demographic and relationship status factors with risk of engaging in IPV. In summary, these findings imply that participants with certain demographics may be more at-risk of persisting in IPV perpetration over time. Although one should not assume that these findings are representative of all individuals belonging to a certain demographic, they nevertheless stress the need for consideration of social address differences when considering multiplicity in IPV patterns over time.

Another important contribution of the present study is the concurrent investigation of psychological and physical IPV. Previous person-centered studies have limited their focus either to psychological (Orpinas et al., 2012) or physical IPV (Orpinas et al., 2013; Swartout et al., 2012). Studying them together in the same sample allows for parallelism in the perpetration of both forms of IPV to more clearly emerge. The fact that people in the Little-to-None class for psychological IPV were practically all in the same class for physical IPV from 18 to 25 is consistent with previous variable-centered studies (Fritz & Slep, 2009; Wolfe et al., 2003). In this way, current study demonstrates continuity across both forms of IPV by bridging the developmental period of adolescence into early adulthood.

In addition to continuity, the present findings also demonstrate that this correspondence between psychological and physical IPV is far from uniform. Not surprisingly, people who were in the Extensive class for physical IPV were also likely (69%) to be in the Extensive/Increasing class for psychological IPV, however, individuals classified in the Little-to-None class for physical IPV were found in all three classes of psychological IPV with only about a little over a quarter of them in the Little-to-None class. Extensive use of physical IPV is strongly suggestive of one's use of psychological aggression, but little-to-no use of physical aggression does not predict well to one's use of psychological aggression. In fact, for those in the Little-to-None

class of physical IPV, the most common class of psychological IPV was the Minor/Increasing type. These findings suggest the emergence of a specialized class of IPV that is exclusively psychological and not physical.

Mapping classifications from psychological to physical IPV is also informative. As already noted, those who tend not to use psychological IPV are very unlikely to employ physical IPV (less than 1%). For the more aggressive Minor/Increasing class of psychological IPV, about 10% use physical IPV, but in the most aggressive Extensive/Increasing class of psychological IPV, nearly half are in the Extensive class of physical IPV. Comparing the Extensive physical IPV class to progressively more psychologically aggressive classes reveals an increase in the use of physical IPV. There is theoretical and empirical evidence for progression from psychological to physical IPV (e.g., O'Leary & Slep, 2003), however, the present study suggests that this progression may not be as simple as one leading to the other. Future work in this area should consider both the variety of IPV patterns and correspondence of these patterns across psychological and physical IPV. It is not enough to note that psychological IPV occurs more regularly than physical IPV. It is more valuable to understand how different forms of IPV emerge individually and together across the transition to adulthood.

Limitations & Future Directions

Although this study covered an important developmental period and allowed for the investigation of multiplicity in IPV patterns across the transition from adolescence to adulthood, this study is not without limitations and these must be taken into consideration. First, there was inconsistency in the assessment of IPV across waves. The focus on IPV in adolescence and early adulthood was not the only focus of the CDP. However, the analysis strategy used to handle this matter is consistent with previous studies that analyzed data where different items were used to

assess the same behavior across waves (Pettit et al., 2007). Thus, the rescaling we did allowed the data to be useful despite wave-to-wave variations in our IPV questionnaires.

On one hand, the fact that data were collected from a community sample could be considered a limitation, since some of the expected patterns might be more likely to emerge in a higher risk sample. However, on the other hand, a community sample also represents a strength of the present study. Past researchers of IPV patterns limited their samples to college students (e.g., Swartout et al., 2012). Findings of the present study suggest that diverse patterns of IPV perpetration appear to occur even in low risk communities as adolescents become young adults. However, it would be valuable to replicate these findings in a more nationally representative sample and even in higher risk samples.

Many future directions for research can proceed from this study. In addition to replications studies, future studies should examine if these patterns emerge for victims of IPV. Although perpetration and victimization are highly correlated (e.g., Williams, Connolly, Pepler, Craig, & Laporte, 2008), the experiences and meaning of these behaviors may be different and thus deserve to be treated as distinct from each other (Johnson, 2006; Johnson & Ferraro, 2000). Future studies should also consider whether classes evolve over time or whether combinations of psychological and physical perpetration and victimization emerge and change with maturation. Important differences in emergent patterns may be found among individuals who only perpetrate IPV, who are only victimized, or who are both perpetrators and victims.

In addition to these several future directions, another important one arises from the fact that the set of classes identified through LCA can become a dependent variable and studies can be conducted to predict pattern membership. Such an investigation was initiated in the present study through the examination of demographic and relationship attributes as predictors of class

membership. These findings suggest that there is diversity not only in the patterns of IPV, but in the social address attributes of the classes as well. A follow-up study examining theory driven variables as predictors of class membership is under way. Lines of research such as this may lead to future research in which theoretical principles and models are found to be more relevant in certain classes of phenomena than in others.

In conclusion, the present study provides a deeper understanding on the persistence of IPV from adolescence into young adulthood (Cui et al., 2013; Gomez, 2011). Rather than thinking of this persistence as one average pattern across a population, findings of the present study imply that IPV may emerge in multiple patterns across the transition of adolescence to young adulthood, and each pattern may be represented by a subsample within a population. Furthermore, research using a person-centered approach in young adulthood could indicate whether and how patterns continue to evolve. The current study identified its patterns through the occurrence or nonoccurrence of specific IPV behaviors, but similar patterns would be expected with analyses of the rates of these behaviors. The present study also found that IPV patterns varied by demographic attributes and relationship status. Overall, these findings contribute to current understanding on the emergence of IPV from adolescence to young adulthood.

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Table 1. *Fit statistics for psychological and physical IPV classes (N = 484).*

| Psychological IPV | | | | |
|--------------------|-----------------|------------------|--|--------------|
| Model | -2LL | BIC | Adj. LRT | Entropy |
| One-Class | 11447.240 | 11737.798 | - | 1.000 |
| Two-Class | 10252.014 | 10598.211 | 1182.475 ($p < .01$) | 0.760 |
| Three-Class | 9901.392 | 10303.228 | 344.431 ($p < .05$) | 0.763 |
| Four-Class | 9743.710 | 10201.185 | 154.898 ($p = .43$) | 0.713 |
| Physical IPV | | | | |
| Model | -2LL | BIC | Adj. LRT | Entropy |
| One-Class | 5893.302 | 6214.770 | - | 1.000 |
| Two-Class | 4805.334 | 5182.442 | 1077.077 ($p = .06$) | 0.885 |
| Three-Class | 4575.286 | 5008.033 | 225.986 ($p = .16$) | 0.825 |

Note. -2LL= Loglikelihood statistic; BIC = Bayesian Information Criterion; Adj. LRT = Lo-Mendell-Rubin adjusted Likelihood Ratio Test. Bold-type indicates the selected model.

Table 2. Demographic differences across classes for psychological IPV ($N = 484$).

| | Little-to-None ($n = 110$; 22.7%) | Minor/Increasing ($n = 255$; 52.7%) | Extensive/Increasing ($n = 119$; 24.6%) |
|------------------------------|--|--|--|
| Cross-Tabulation | | | |
| Results | | | |
| Sex* | | | |
| Male (48.1%) ⁺ | 60.0% ^o | 45.1% | 43.7% |
| Female (51.9%) ⁺ | 40.0% ^u | 54.9% | 56.3% |
| Cohabitation* | | | |
| No (50.2%) ⁺ | 58.2% ^o | 51.0% | 41.2% ^u |
| Yes (49.8%) ⁺ | 41.8% ^u | 49.0% | 58.8% ^o |
| Married | | | |
| No (66.3%) ⁺ | 73.6% | 64.7% | 63.0% |
| Yes (33.7%) ⁺ | 26.4% | 35.3% | 37.0% |
| ANOVA Results | <i>M (SD)</i> | <i>M (SD)</i> | <i>M (SD)</i> |
| SES*** | 3.53 ^a (1.10) | 3.44 ^a (1.21) | 3.01 ^b (1.12) |
| Educational Attainment*** | 3.16 ^a (1.00) | 2.98 ^a (1.00) | 2.34 ^b (1.03) |
| Years of Cohab.* | .82 ^b (1.22) | 1.04 ^{ab} (1.36) | 1.34 ^a (1.67) |
| Years Married [~] | .79 ^b (1.53) | 1.01 ^{ab} (1.70) | 1.31 ^a (2.15) |

Note. ⁺Percentages of the total sample. ^o (Over-represented), ^u (Under-represented). Classes that share the same superscript in the ANOVA results are not different. Cohab. (Cohabitation); [~] $p < .10$, * $p < .05$, *** $p < .001$.

Table 3. *Demographic differences across classes for physical IPV (N = 484).*

| | Little-to-None (<i>n</i> = 400; 82.6%) | Extensive (<i>n</i> = 84; 17.4%) |
|---|--|---|
| Cross-Tabulation Results | | |
| Sex [~] | | |
| Male (48.1%) ⁺ | 50.0% | 39.3% ^u |
| Female (51.9%) ⁺ | 50.0% | 60.7% ^o |
| Cohabitation ^{**} | | |
| No (50.2%) ⁺ | 53.0% | 36.9% ^u |
| Yes (49.8%) ⁺ | 47.0% | 63.1% ^o |
| Married | | |
| No (66.3%) ⁺ | 66.3% | 66.7% |
| Yes (33.7%) ⁺ | 33.8% | 33.3% |
| Class Comparison Results | <i>n</i> (%) | <i>n</i> (%) |
| Psych Classes ^{***} | | |
| Little-to-None (<i>n</i> = 110; 22.7%) ⁺ | 109 (27.3%) ^o (99.1%) ^f | 1 (1.2%) ^u (0.9%) ^f |
| Minor/Increasing (<i>n</i> = 255; 52.7%) ⁺ | 230 (57.5%) ^o (90.2%) ^f | 25 (29.8%) ^u (9.8%) ^f |
| Extensive/Increasing (<i>n</i> = 119; 24.6%) ⁺ | 61 (15.3%) ^u (51.3%) ^f | 58 (69.0%) ^o (48.7%) ^f |
| T-Test Results | <i>M</i> (<i>SD</i>) | <i>M</i> (<i>SD</i>) |
| SES ^{***} | 3.47 (1.13) | 2.80 (1.25) |
| Educational Attainment ^{***} | 2.97 (1.01) | 2.38 (1.11) |
| Years of Cohabitation ^{**} | .99 (1.37) | 1.43 (1.60) |
| Years Married | 1.03 (1.77) | 1.05 (1.90) |

Note. ⁺Percentages of the total sample. ^o (Over-represented), ^u (Under-represented). ^fPsych class percentages in column of table in parentheses are row percents and add to 100%. [~]*p* < .10, ^{**}*p* < .01, ^{***}*p* < .001.

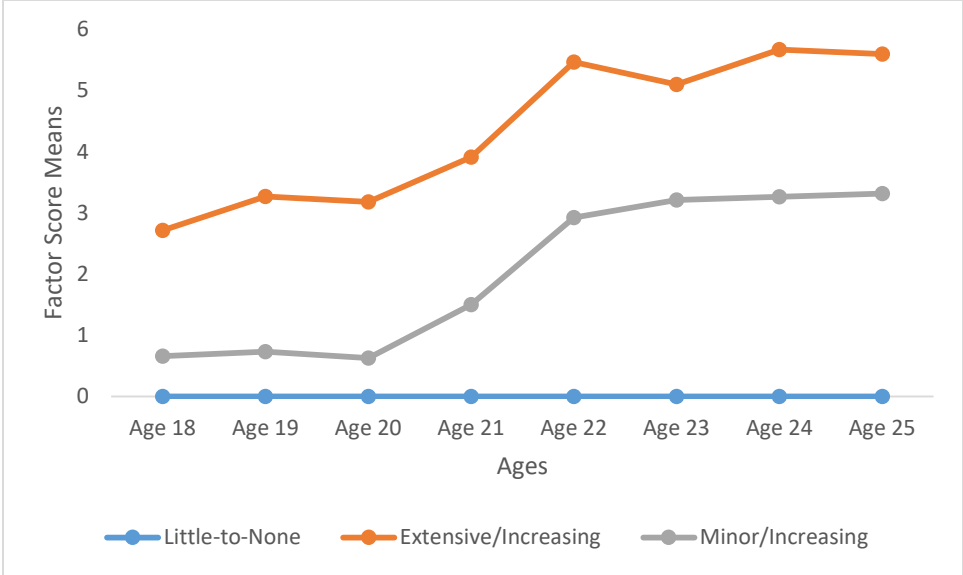


Figure 1. Plots of factor score means for classes of psychological IPV (N = 484).

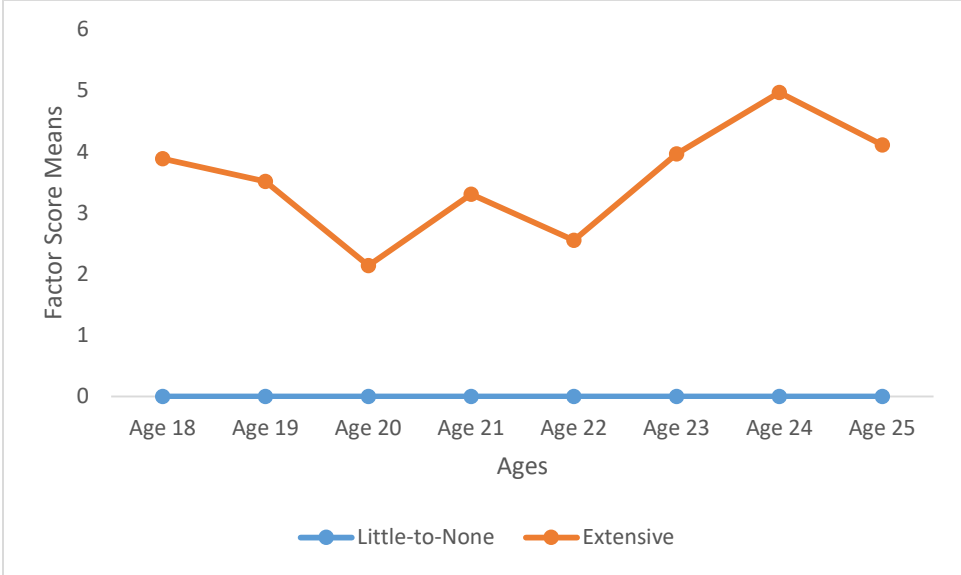


Figure 2. Plots of factor score means for classes of physical IPV (N = 484).