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Abstract

Saint-Eloi Cadely et al. (2017) found longitudinal patterns for the perpetration of both psychological and physical intimate partner violence (IPV), including actively and minimally aggressive patterns. The current study builds on these findings by examining four theory-derived variables (interparental aggression, social-information processing (SIP) biases, relationship insecurities (preoccupied and fearful), and discontinuity in relationship partner over time) as predictors of membership within these patterns using multinomial logistic regression. The analysis sample consisted of 484 participants who were romantically involved at least once during the 8 waves of data collection from the ages of 18-25. In predicting psychological IPV, more SIP biases, higher levels of a preoccupied insecurity, and less discontinuity in relationship partners over time differentiated the actively aggressive patterns from the minimally aggressive pattern. Additionally, two actively aggressive patterns of psychological IPV differed in terms of SIP biases and discontinuity in romantic partners. Specifically, more SIP biases and less discontinuity in romantic partnerships distinguished the extensively aggressive pattern from the pattern that mainly consisted of minor types of aggression. In predicting physical IPV, the aggressive pattern differed from the non-aggressive pattern in terms of more interparental aggression, more SIP biases and more relationship insecurities. The findings that developmental patterns of IPV can be predicted by social and psychological factors may aid both developmental theory and practice.

Keywords: discontinuity in relationship partner, interparental aggression, intimate partner violence (IPV), social-information processing (SIP) biases, person-centered research, relationship insecurities

Predicting Patterns of Intimate Partner Violence Perpetration from Late Adolescence to Young Adulthood

Prior research has documented that the perpetration of intimate partner violence (IPV) arises and changes over time in patterned ways. However, some studies found the perpetration of IPV over time to be relatively stable (Capaldi, Shortt, & Crosby, 2003; Fritz & Slep, 2009; O’Leary & Slep, 2003), whereas others noted a decreasing pattern (Fritz & O’Leary, 2004; Kim, Laurent, Capaldi, & Feingold, 2008; Nocentini, Menesini, & Pastorelli, 2010; Wolfe et al., 2003). Yet other studies have shown IPV to increase across time (Orpinas, Hsieh, Song, Holland, & Nahapetyan, 2013; Orpinas, Nahapetyan, Song, McNicholas, & Reeves, 2012; Swartout, Cook, & White, 2012). Even a curvilinear pattern in the perpetration of IPV over time has been reported (Foshee et al., 2009). These pattern discrepancies across studies suggest that change in IPV may not be described with a single prototype across a population, but rather as an assortment of patterns. Recently, Saint-Eloi Cadely et al. (2017) tested this hypothesis among a sample of adolescents as they were transitioning from late adolescence (age 18) to young adulthood (age 25) using a person-centered methodology known as latent class analysis. One of the many benefits of a person-centered methodology is that it allows for the clustering of individuals into patterns or “classes” that maximize within-class similarity and between-class differences on defining factors (Swartout, Swartout, & White, 2011). Through this approach, Saint-Eloi Cadely et al. (2017) obtained three classes or patterns for the perpetration of psychological IPV (Little-to-None, Minor/Increasing, and Extensive/Increasing) and two classes for the perpetration of physical IPV (Little-to-None and Extensive). For both psychological and physical IPV, the Little-to-None class consisted of individuals reporting no (or practically no) use of IPV over time. For psychological IPV, individuals in the Minor/Increasing class tended to use the minor

types of psychological IPV and used more of them over time. Individuals within the Extensive/Increasing class used more types of IPV behaviors, both minor and severe, than the other classes, and their use of these behaviors increased over time. For physical IPV, the Extensive class was characterized by the use of multiple types of physical IPV over time.

The classes of psychological and physical IPV described by Saint-Eloi Cadely et al (2017) were differentiated from one another in terms of the types of IPV behaviors reported (i.e., relatively minor versus more severe), the variation in these reports across time (i.e., increase versus stability over time), and in terms of extensiveness (i.e., little-to-none, increasing, and extensive). These patterns added to the person-centered literature of IPV (e.g., Orpinas et al., 2012, 2013; Swartout et al., 2012) by demonstrating that varying patterns of IPV begin to emerge among adolescents and extend into young adulthood. The present study pushed beyond the variables that define the classes to examine whether class membership could be predicted on the basis of independent theoretically relevant variables. Investigating these research questions can potentially lead to a better understanding of what drives the use of IPV and the pattern of that use over time.

In keeping with this analytic goal, the current investigation treated the class memberships derived by Saint-Eloi Cadely et al. (2017) as categorical dependent variables, one for each type of IPV (three categories for psychological IPV and two for physical IPV), and sought to differentiate the categories of each dependent variable using the following four theory-based explanatory variables: (a) interparental aggression (social-learning theory) (Fite, Bates, Holtzworth-Munroe, Dodge, Nay, & Pettit, 2008; Hare, Miga, & Allen, 2009), (b) social-information processing biases (social-information processing) (Fite et al., 2008; Lansford et al., 2006), (c) preoccupied and fearful forms of relationship insecurities (attachment theory) (Grych

& Kinsfogel, 2010; Henderson, Bartholomew, Trinke, & Kwong, 2005), and (d) discontinuity in relationship partner (systems theory) (Capaldi et al., 2003; Fritz & Slep, 2009). The four theories from which these variables derive have contributed to current understanding of the occurrence of IPV, but it is rare for variables derived from different theoretical traditions to be included in an explanatory analysis. Nuances observed by this study in the prediction of class memberships may enhance understanding of IPV by identifying the factors that increase risk for distinctive classifications of IPV while controlling for the concurrent effects of the other theory-derived factors.

Interparental Aggression

Social-learning theory (Bandura, 1978, 2001) states that aggression is learned through modeling the behaviors of significant others (e.g., parents, peers) and/or through modeling the behavior observed from other significant influences (e.g., media). The modeling of IPV after exposure from parents/parental figures is well-supported by previous studies. For instance, exposure to interparental aggression (i.e., parents expressing aggressive behaviors toward one another) during childhood or adolescence may provide a negative model of relationship maintenance and self-regulation and can lead to the belief that aggression is an acceptable way of dealing with conflicts (Lichter & McCloskey, 2004). Previous longitudinal studies have shown higher IPV in the romantic relationships of late adolescents and young adults when interparental aggression was witnessed as a toddler (Fite et al., 2008) or in early adolescence (Hare et al., 2009). Research also suggests that interparental aggression distinguishes a continuous pattern of IPV victimization from a low stable pattern among college women (Swartout et al., 2012). Thus, maternal reports of interparental aggression were assessed as a proxy for intergenerational

transmission of aggression. Our question was whether interparental aggression differentiated the observed classes of psychological and physical IPV perpetration.

Social-Information Processing (SIP) Biases

The social-information processing (SIP) model focuses on individuals' perceptions of social situations and the role of interpretations, meaning constructions, and cognitive biases on aggressive behaviors (Crick & Dodge, 1994; Dodge, 1986). This social-cognitive model consists of six cognitive processes: (a) encoding: being mindful of social cues in social situations, (b) representation: interpreting social cues, (c) goal clarification: striving for goals regarding what they hope to gain from the situation, (d) response search process: generating responses to social situations, (e) response evaluation process: selecting a response deemed appropriate to the situation, and (f) enactment: enacting the chosen response. The literature suggests that biases in any of these processes can lead to the enactment of aggressive behaviors (Crick & Dodge, 1994).

According to the SIP model, when individuals are faced with an ambiguous situation, they look for information or social cues to help them make sense of it (encoding). Social cues can be internal (e.g., feelings of anxiety from being in a new situation or feelings stemming from negative past experiences in similar situations) or external (e.g., social context of the event). The cues that individuals attend to affect the interpretations made about the situation (representation). Individuals who emphasize negative social cues (e.g., negative past experiences in similar situations) are more likely to be biased toward hostile attributions (interpreting the intention of the other as a provocation) in ambiguous situations (Crick & Dodge, 1994). Interpretations of social situations are likely to influence how individuals wish for the situation to end (goal clarification). SIP theory proposes two classes of goals: interpersonal and instrumental. Interpersonal goals focus on building positive relationships whereas instrumental goals are more

oriented towards personal outcomes. Biases in the representation process (i.e., hostile attributions) are linked to a bias favoring instrumental rather than interpersonal goals (Crick & Dodge, 1994). Individuals also choose a way to respond to the situation (response search process), and this choice can be biased by their interpretation of the situation or the goal they have for it. The generation of aggressive responses in an ambiguous social situation would reflect a bias in the response search process. As the response search is underway, an evaluation process (response evaluation process) compares the alternatives with their expected effects on the situation. Positive evaluations of aggressive behaviors in ambiguous social situations indicate a bias in the response evaluation process. All these concurrent social-cognitive processes contribute to the ultimate chosen response (enactment) (Crick & Dodge, 1994).

Biases in interpretations of social cues (i.e., hostile attributions) have been tied to the perpetration of IPV in marital relationships (Clements & Holtzworth-Munroe, 2008; Holtzworth-Munroe & Hutchinson, 1993; Holtzworth-Munroe, Rehman, & Herron, 2000; Holtzworth-Munroe & Smutzler, 1996), and biases in representation, response search, and response evaluation during adolescence have been tied to the use of IPV in young adulthood (Fite et al., 2008). Therefore, the present study examined whether biases in these processes differentiated patterns of psychological and physical IPV.

Relationship Insecurities

Perceptions and behaviors within romantic relationships are also influenced by individuals' attachment-based relationship insecurities (Bartholomew, 1990). Such insecurities may reflect anxious feelings linked to a fear of abandonment and/or feelings of distrust or discomfort with closeness in romantic relationships. These orientations to close relationships represent empirical dimensions where anxiousness maps to a dimension of anxiety whereas

distrust and discomfort map to a dimension of avoidance. More anxious individuals tend to be dependent on or enmeshed with their romantic partners. More avoidant individuals tend to value their independence and may view closeness with their romantic partner as a threat to their autonomy (Bartholomew; Bartholomew & Horowitz, 1991; Brennan, Clark, & Shaver, 1998). Bartholomew (1990; Bartholomew & Horowitz, 1991) conceptualized these two dimensions as orthogonal and identified four types of relationship insecurities: secure (low on both dimensions), preoccupied (high on anxiety, low on avoidance), dismissive (low on anxiety, high on avoidance) and fearful (high on both dimensions). The present study focused on two of these insecurities: preoccupied and fearful.

A preoccupied insecurity is identified with uncertainty about one's self-worth and, in the context of a close relationship, a needy, anxious, and overly-dependent preoccupation with the relationship and relationship partner. A fearful insecurity combines this anxiety with a confusing inability to trust the relationship partner, resulting in a tendency to avoid intimacy due to fear of rejection and distrust of the partner (Bartholomew, 1990; Bartholomew & Horowitz, 1991).

The present study focuses on these two types of romantic attachment because the IPV literature indicates that individuals with anxious attachments may perpetrate IPV as a means to maintain closeness with their partner and/or to avoid potential abandonment by their partner (Roberts & Noelle, 1998). A fearful insecurity adds a lack of trust to the relationship scenario, and IPV may be seen as a way to avoid being hurt by a partner. This rationale is supported by previous studies indicating that high scores on the anxious dimension or endorsement of a preoccupied insecurity contributes to the use of IPV among adolescents (Grych & Kinsfogel, 2010; Miga, Hare, & Allen, 2010; Saint-Eloi Cadely, Kerpelman, & Pittman, 2018) and young adults (Henderson et al., 2005; Sandberg, Suess, & Heaton, 2010; Yarkovsky & Fritz, 2014).

Similar results were also shown for the fearful insecurity among a sample of predominately married men (Dutton, Saunders, Starzomski, & Bartholomew, 1994). Dutton et al. (1994) also found higher scores of fearful insecurity were related to higher scores of symptoms related to IPV perpetration ranging from anger, trauma, jealousy, and borderline personality disorder. Based on these findings, it was argued that endorsement of a fearful insecurity can promote IPV through these symptoms. Here, both relationship insecurities were tested as predictors of different classes of IPV perpetration over the transition from late adolescence to young adulthood.

Discontinuity in Relationship Partner

In the developmental transition from adolescence to young adulthood, it is likely that individuals will change relationship partners one or more times (Carver, Joyner, & Udry, 2003). According to systems theory, change in the elements of a system influences relationship contexts which in turn can affect the behaviors within the relationship system (Whitchurch & Constantine, 1993). More specifically, change from one relationship partner to another may promote change in behaviors as individuals adapt to a new relationship context. Violence within a continuing relationship can become a stable or increasing pattern over time (Giles-Sims, 1983). Other studies confirm that IPV patterns persist or escalate when adolescents and young adults remain in the same romantic relationships (Capaldi et al., 2003; Fritz & Slep, 2009; O'Leary & Slep, 2003). The present study examined whether discontinuity in romantic partnerships predicted membership in different classes of IPV perpetration as adolescents become young adults.

All of these theory-based constructs were expected to distinguish the actively aggressive classes (Extensive for physical IPV; Extensive/Increasing, and Minor/Increasing for psychological IPV) from the minimally aggressive classes (Little-to-None for both forms of

IPV). Specifically, greater exposure to interparental aggression in adolescence, more SIP biases, higher levels of relationship insecurities, and less discontinuity (greater stability) in romantic partnerships were expected to predict membership in the actively aggressive classes when compared to the minimally aggressive classes. Furthermore, we explored whether these constructs differentiated the two actively aggressive classes of psychological IPV (Extensive/Increasing and Minor/Increasing) from each other. The importance of this investigation was to better understand the previously identified aggressive patterns emerging in close romantic relationships at the transition from adolescence to young adulthood.

The following demographics were chosen as control variables given their relations with reports of IPV: gender, race, and socioeconomic status (SES). Although we acknowledge that “the most common perpetrators of violence against women are male intimate partners or ex-partners” (World Health Organization, 2012), many studies have shown that perpetration rates of IPV are similar, or at times slightly higher for females compared to males (see Archer, 2000 for a meta-analysis review; see Straus, 2009 for a literature review). IPV data collected from community samples and via self-report support the notion of a gender symmetry in the perpetration of such behaviors, whereas data from courts, police, hospital reports, and shelters show that IPV perpetration rates are higher for males relative to females (Johnson, 1995, 2006). Research also finds rates of IPV perpetration are higher among minorities (Caetano, Field, Ramisetty-Mikler, & McGrath, 2005) and low SES couples (Aldarondo & Sugarman, 1996; O’Keefe, 1998). Therefore, it was important to include these demographics as control variables in the present study.

Method

Participants and Procedure

Participants were part of the longitudinal Child Development Project (CDP). The primary aim of the CDP was to understand risk factors influencing children's developmental outcomes, including their transition to adulthood (Lansford et al., 2006; Pettit, Lansford, Malone, Dodge, & Bates, 2010). Data collection took place in Knoxville and Nashville, Tennessee, and in Bloomington, Indiana and began when participants were five years old (first wave collected in 1987) and continued annually for 24 years. Recruitment involved a two-step process. First, public schools that best represented the demographic diversity of the relevant city were selected, and then, children from each school were randomly selected to take part in the CDP. Roughly 85% of children were recruited during the schools' regular kindergarten registration periods, whereas 15% were recruited at the beginning of the school year to represent late-enrolling families. This procedure resulted in a sample of 585 participants that was representative of the three cities at the time of initial data collection.

IPV data collection began when participants were 18 years old (during the year 2000) and continued annually until they reached the age of 25. Only participants who were in a romantic relationship for at least one wave between the ages of 18-25 were included in the analysis. Imposing this condition resulted in an analysis sample of 484 participants (82.7% of the original sample). These participants were in relationships and provided IPV data for an average of 4.57 out of the eight waves ($SD = 2.18$). At each time point, only participants who reported a relationship duration of two months or more provided IPV data. At age 18, 44.3% of participants were romantically involved (dating, married, or cohabiting), and this percentage increased to 64.9% by the age of 25.

The analysis sample had slightly more females (51.9%), and was predominantly European-Americans (82.2%). Approximately 16.3% of participants were African-Americans,

and 1.4% identified as Other. At the beginning of the CDP, 62.2% of participants' biological parents were married to each other and 0.6% were cohabiting. The Hollingshead (1975) four-factor index based on parents' occupations and education levels collected at the first wave of the CDP revealed that families ranged in socioeconomic status from lower to middle class (range: 1-5; $M = 3.35$; $SD = 1.18$). Over 87% of participants' mothers and 75% of fathers had a high school education or more. Among the participants themselves, 69.4% completed high school by age 19, and 66.1% had education beyond high school by age 24. The analysis sample was compared with the excluded sample, and the only difference found on the variables of interest to this study was that males were over-represented in the excluded sample ($\chi^2(1) = 16.43$, $p < .001$). Specifically, 70.3% of the cases reporting no dating or romantic relationship experience were males.

Measures

IPV Classes. IPV classes for psychological and physical aggression were identified in a prior study conducted by Saint-Eloi Cadely et al. (2017) through latent class analysis. Individuals were classified into classes of psychological and physical IPV based on IPV data collected from the ages of 18-25. Individuals reported each year on the use versus non-use of psychological and physical IPV behaviors in their romantic relationships. Therefore, IPV classes reflected patterns in the usage of psychological and physical IPV over time. Details pertaining to the assessment of IPV utilized in the classification are available in Saint-Eloi Cadely et al. (2017).

Two actively aggressive classes (Minor/Increasing and Extensive/Increasing) and one minimally aggressive class (Little-to-None) were shown for psychological IPV. These patterns were created based on reports of the following behaviors: insulting, destroying belongings, yelling, threatening, stomping away from an argument, put downs, and spitefulness. Participants

within the Little-to-None class ($n = 110$; 22.7%) used few, if any, psychologically aggressive behaviors across waves. Participants within the Minor/Increasing class ($n = 255$; 52.7%) used minor types of psychological aggression (i.e., insulting, yelling, stomping away from an argument, and spitefulness) and expressed more of these behaviors over time. Lastly, participants within the Extensive/Increasing class ($n = 119$; 24.6%) used both minor and severe types of psychological aggression (i.e., destroying belongings, threatening, and put downs) and used more of these behaviors across waves.

For physical IPV, an active stable aggressive pattern (Extensive) and a minimally aggressive stable pattern (Little-to-None) were shown based on reports of the following behaviors: throwing something at one's partner, twisting an arm or hair, pushing, hitting, grabbing, slapping, kicking, and slamming one's partner against a wall. The majority of the sample were classified in the Little-to-None class ($n = 400$; 82.6%) as they reported very little-to-no perpetration of physical IPV across waves. The Extensive class ($n = 84$; 17.4%) persistently engaged in many types of physical aggression across waves. For psychological and physical IPV, class membership was a categorical dependent variable.

Interparental aggression. Participants' mothers reported via semi-structured interviews the frequency with which various types of aggression occurred between themselves and their spouse/partner during the previous year when participants were 16 years old. Seven items selected from the *Conflict Tactics Scale* (CTS; Straus, 1979) assessing primarily minor types of psychological (e.g., "Yelled, insulted, or swore") and physical (e.g., "Pushed, grabbed, or shoved") interparental aggression were included. The full scale was not used in order to manage the burden of data collection for participants because the interviews collected many more variables than are reported in this study. The selected items were answered on a 7-point scale

ranging from 0 (*Never*) to 6 (*Almost every day*) ($\alpha = .77$) and were expected to differentiate aggressive and nonaggressive parents in regards to the presence and the frequency of the aggression. Scores were calculated as a composite mean where higher scores indicated more interparental aggression.

SIP biases. Although SIP biases were assessed at various time points during participants' childhood (kindergarten through third grade, and eighth and eleventh grades), we used only the last of these assessments (Grade 11, age 16) because it coincided with adolescence while still preceding the assessment of aggression. Twelve vignettes featuring an ambiguous social situation between an antagonist and a protagonist that could potentially lead to a conflict between two adolescents or between an adolescent and an adult were presented to participants who took the role of the protagonist in each vignette. For each vignette, participants answered questions assessing the presences of bias in four of the information processes central to the SIP model: representation, goal clarification, response search, and response evaluation.

Representation was assessed through a bias toward hostile attributions. For each of the 12 vignettes, participants answered two items regarding their interpretation of the antagonist's motivation ("How likely is it that the other person was being mean to you?") and their feelings about the situation ("How angry would you be if this happened?"). Both items were rated on a five-point scale in which higher scores indicated higher levels of hostile attributions ($\alpha = .85$). *Goal clarification* was assessed through one dichotomized question for each vignette asking participants how they would want each the situation to turn out. Participants chose between an interpersonal goal ("You'd want the other person to like you") versus an instrumental goal ("You'd want the other person to respect you) ($\alpha = .80$). This process was coded in terms of a bias towards an instrumental goal. *Response search* was assessed in terms of a bias toward

behaving aggressively. Participants chose either an aggressive (e.g., “Give the teacher a dirty look and go sharpen the pencil”) or a non-aggressive hypothetical response (e.g., “Say, is it alright if I sharpen my pencil?”) for each vignette ($\alpha = .75$). Finally, response evaluation measured a bias toward approval of aggression. It was assessed only for the first six vignettes and was tapped with four questions about the appropriateness and consequences of behaving aggressively given the scenario (e.g., “How good or bad do you think this is as a way to act?”). Items were rated on a five-point scale in which higher scores reflected more positive evaluations towards the aggressive response ($\alpha = .92$).

Although all SIP processes are to be regarded as discrete from one another, a bias in one process can influence biases in other processes (Lansford et al., 2006). Furthermore, the assessment of SIP as a constellation of biases is in line with “the public health literature to create an index of risk variables by counting risk factors to use as a predictor” (Lansford, Malone, Dodge, Pettit, & Bates, 2010, p. 596). Therefore, rather than using four separate SIP biases in our analysis, a single global SIP score was calculated using the four assessments described above according to the procedure developed by Lansford et al. (2010). The dichotomous items (goal clarification and response search) were summed so that higher scores reflected more SIP biases (i.e., more instrumental goals sought and more aggressive response alternatives selected). A composite mean was computed for the representation and response evaluation processes where higher scores indicated more SIP biases for each process. These four variables were then transformed into dichotomies such that participants who scored one standard deviation above the mean or greater for each variable were coded “1” and all others were coded “0.” The final SIP score was the sum of the four process dichotomies. Scores for this construct ranged from 0 to 4 with higher scores reflecting more SIP biases. All four SIP processes were significantly

correlated with each other and loaded on a single factor in a principal component analysis supporting the reliability and validity of the construct.

Relationship insecurities. Relationship insecurities were assessed when participants were 18 years old using items from the *Relationship Style Questionnaire* (RSQ; Griffin & Bartholomew, 1994). Participants were asked to think about their past and present romantic relationships and were to respond to questions based on how they generally feel about relationships. Four selected items assessed a fearful insecurity (e.g., “I find it difficult to depend on other people”) and two selected items made up the preoccupied insecurity (e.g., “I find that others are reluctant to get as close as I would like”). Again, items were selected from considerably larger scales to manage the data collection burden on participants. For each kind of insecurity, a composite score was computed by taking the average of the relevant items coded so that higher scores indicated more insecurity. Bartholomew (1990; Bartholomew & Horowitz, 1991) theorized that these dimensions of insecurity map meaningfully onto the attachment dimensions of anxiety (i.e., preoccupied) and avoidance (i.e., fearful). Therefore, the dimensions were assessed separately to align with the theory. Cronbach alpha was .77 for the fearful insecurity items, and the two preoccupied insecurity items were moderately and significantly correlated ($r = .43, p < .001$).

Discontinuity in relationship partner. At ages 19-25, participants who were involved in a romantic relationship were asked how long (in months) the relationship had lasted. For those reporting an active relationship, if the relationship lasted 12 months or more, that wave was coded as a year of relationship continuity, (coded as “0”). If the relationship was less than 12 months old, that wave was coded as a year of relationship discontinuity due to the new partner (coded as “1”). The sum of these codes yielded the number of partner changes across waves. The

theoretical range for this variable was 0 to 7, but the actual range was from 0 to 5. This number was then divided by the number of waves in which the participant was romantically involved, yielding a ratio reflecting the rate of partner change.

Control Variables. Gender, race, and SES were controlled. Gender was dummy coded: 0 (*Male*), 1 (*Female*). Race was dummy coded: 0 (*European-Americans*), 1 (*African-Americans & Other*). SES scores were coded on Hollingshead's (1975) 5-point scale where higher scores indicated higher SES. Table 1 presents means and standard deviations for all variables, including controls, as well as their intercorrelations.

Plan of Analysis

Two sets of multinomial logistic regression (MLR) analysis used the above described variables to predict class memberships (Asparouhov & Muthén, 2014). One set considered the three patterns of psychological IPV, and the other considered the two patterns of physical IPV. When fitting a MLR, one class is used as a reference group. Therefore, results indicate the probability that, given a predictor variable, participants belong in one focal class versus the reference group. A positive coefficient indicates that the predictor is more descriptive of the focal class relative to the reference group, and a negative coefficient indicates the opposite. MLR results also include an odds ratio for each predictor interpreted as the likelihood that participants would belong to the focal class compared to the reference group given a one-unit increase in that predictor variable. An odds ratio greater than one denotes a greater probability for participants to be classified in the focal pattern relative to the reference group. In contrast, an odds ratio less than one implies a greater probability for participants to be classified in the reference group.

For psychological IPV, with its three classes, in order to make all possible comparisons among the classes, two MLR analyses were fit each taking a different class as the reference

group. The first took the Little-to-None class as reference and the other took the Minor-Increasing class as reference. Given that physical IPV had only two classes, only one MLR analyses was fit and the Little-to-None class was the reference group. Models were estimated in MPLUS version 7 (Muthén & Muthén, 1998-2012). Models for psychological and physical IPV were fit to the data controlling for gender, race, and SES. Importantly, with the exception of the association between the two relationship insecurity variables, the set of explanatory variables were uncorrelated or minimally correlated with each other, suggesting that the predictors were truly independent variables (see Table 1). Because not all participants provided data at all eight waves, Full Information Maximum Likelihood (FIML) was used to account for missing data which allowed all participants who provided data for at least one wave to be included in the study (Muthén & Muthén, 1998-2012).

Results

Psychological IPV

Results of the MLR comparisons for psychological IPV classes are presented in Table 2. Note that the focal classes head the columns and the reference classes provide the rows of the Table. Contrary to expectations, interparental aggression did not predict class membership for any of the patterns. However, results showed that the Extensive/Increasing class differed from the Little-to-None class in five ways. Three of these pertained to the theoretical constructs (SIP biases, preoccupied insecurity, and discontinuity in relationship partner). Specifically, the Extensive/Increasing class had more SIP biases, higher levels of a preoccupied relationship insecurity, and lower discontinuity (greater continuity) of relationship partnership across time than did the Little-to-None class. Controlling for the other variables in the model, classification into the Extensive/Increasing class was 62% more likely for each additional SIP bias reported,

53% more likely given a unit increase in preoccupied insecurity (i.e., 0.96 *SD*), and 73% more likely given a unit decrease in relationship discontinuity. Recall that discontinuity was assessed as a ratio, so a unit change reflects the difference between participants with the same partner at every wave (discontinuity = 0) and those with a different partner at every wave (discontinuity = 1). The remaining two significant differences between the Extensive/Increasing class and the Little-to-None class reflected demographic differences (gender and SES). More females and participants with lower Hollingshead SES scores were grouped in the Extensive/Increasing class compared to the Little-to-None class. Females were more than twice as likely to be grouped in the Extensive/Increasing class compared to the Little-to-None class, and a unit drop in the SES score was associated with a 24% greater likelihood of being classified in the Extensive/Increasing class than the Little-to-None class.

The Minor/Increasing class differed in two ways from the Little-to-None class. One of these differences reflected a theoretical variable (preoccupied insecurity) and the other was based on a demographic characteristic (gender). Compared to the Little-to-None class, the Minor/Increasing class had higher scores on preoccupied insecurity. A unit increase in preoccupied insecurity (i.e., 0.96 *SD*) was related to a 42% greater chance of being classified in the Minor/Increasing class compared to the Little-to-None class. Females were 83% more likely to be classified in the Minor/Increasing class compared to the Little-to-None class.

Although the Extensive/Increasing class and the Minor/Increasing class both differed from the Little-to-None class in two common ways, it is important that these two actively aggressive classes also differed from each other in terms of two theoretical factors (SIP biases and discontinuity in relationship partner) and one demographic factor (SES). The Extensive/Increasing class was characterized by more SIP biases and by less relationship

discontinuity (greater continuity) than the Minor/Increasing class. Each additional SIP bias was associated with a 42% greater chance of being grouped in the Extensive/Increasing class compared to the Minor/Increasing class, and those with the same partner every wave were 65% more likely to be classified in the Extensive/Increasing class than the Minor/Increasing class. Finally, a unit decrease in SES scores (i.e., 0.85 *SD*) was associated with a 23% greater likelihood of being classified in the Extensive/Increasing class than the Minor/Increasing class.

Physical IPV

Results of the MLR comparisons of physical IPV classes are presented in Table 3. With only two classes to compare, only one analysis using the Little-to-None class as a reference group was needed. Members of the Extensive class differed from those in the Little-to-None class in seven ways, four of which were based on theory derived variables (interparental aggression, SIP biases, fearful insecurity, and preoccupied insecurity) and three of which reflected demographic factors (gender, race, and SES). Compared to the Little-to-None class, the Extensive class had marginally higher scores on interparental aggression, significantly more SIP biases, and higher scores on both fearful (significant) and preoccupied (marginal) relationship insecurities. Classification in the Extensive class was associated with a 51% greater chance for a unit increase in interparental aggression (i.e., 0.64 *SD*), a 61% greater chance for each additional SIP bias reported, a 40% greater likelihood for a unit increase in fearful insecurity (i.e., 0.94 *SD*), and a 32% greater probability for a unit increase in preoccupied insecurity (i.e., 0.96 *SD*). Demographic differences between the classes revealed that females were 91% more likely to be grouped in the Extensive class than the Little-to-None class; minorities were twice as likely to be grouped in the Extensive class compared to the Little-to-None class; and a unit decrease in the

Hollingshead SES score (i.e., 0.85 *SD*) was associated with a 25% greater chance of being categorized in the Extensive class compared to the Little-to-None class.

Supplemental analyses were conducted to examine gender differences in class memberships. Because MPLUS does not allow for multi-group analyses to be conducted for multinomial logistic regression (MLR) models, a series of MLR models were fit separately for a subsample of males only, and again for the female subsample. These analyses showed that for psychological and physical IPV, SIP biases predicted class membership in the Extensive class relative to the other classes for males only. Additionally, for physical aggression, the fearful relationship insecurity distinguished the Extensive class from the Little-to-None class only for males. Whereas the preoccupied relationship insecurity predicted class membership in both the Extensive and Minor/Increasing classes compared to the Little-to-None class only for females for both psychological and physical IPV. Because these analyses were conducted separately for males and females, they do not reveal whether males and females differ significantly from each other (just whether each group differ significantly from zero). Therefore, these findings are not interpreted further but suggest that an investigation of gender differences is warranted in future research.

Discussion

Previous studies hinted at the possibility of diversity in the expression of IPV over time across a sample/population (Capaldi et al., 2003; Foshee et al., 2009; Fritz & O'Leary, 2004; Fritz & Slep, 2009; Kim et al., 2008; Nocentini et al., 2010; O'Leary & Slep, 2003; Orpinas et al., 2012, 2013; Swartout et al., 2012). Saint-Eloi Cadely et al. (2017) explored this diversity with a person-centered approach and identified multiple patterns of IPV across an eight-year period from ages 18-25. This approach classified individuals into different subgroups by

minimizing differences within groups and maximizing differences between them (Swartout et al., 2011). The current study then took the three classes of psychological IPV (Little-to-None, Minor/Increasing, and Extensive/Increasing) and the two classes of physical IPV (Little-to-None and Extensive) and used theoretically meaningful constructs derived from previous research to distinguish the classes from one another. The analyses revealed two important distinctions. First, actively aggressive patterns differed from effectively non-aggressive patterns, and second, when multiple actively aggressive patterns existed, they were distinguished from each other.

Importantly, all theoretical constructs of the present study contributed in at least one way to distinguishing the extensive IPV patterns (psychological: Extensive/Increasing; physical: Extensive) from the Little-to-None IPV classes. Not only are these findings consistent with the literature, but they also show that these constructs can be useful to understand continuity and/or escalation in IPV from adolescence to young adulthood. For instance, findings of the present study support the notion that intergenerational transmission of aggression during adolescence may contribute to an extensive and relatively stable pattern of physical IPV that extends from adolescence to young adulthood (Swartout et al., 2012). Similarly, cognitive biases appear to contribute to an escalation and steadiness in IPV over time (Clements & Holtzworth-Munroe, 2008; Holtzworth-Munroe & Hutchinson, 1993; Holtzworth-Munroe & Smutzler, 1996; Holtzworth-Munroe et al., 2000). In addition, continuity in relationship partner seems to provide a relationship context that allows for the emergence and escalation of extensive psychological IPV (Capaldi et al., 2003; Fritz & Slep, 2009; Giles-Sims, 1983). Furthermore, relationship insecurities contributed to membership in all aggressive classes of IPV when compared to the Little-to-None classes, which is consistent with prior research (Grych & Kinsfogel, 2010; Henderson et al., 2005; Miga et al., 2010; Sandberg et al., 2010; Yarkovsky & Fritz, 2014) and

suggests an important shared factor in minor and extensive IPV perpetration. Lastly, factors that predicted membership in the Extensive class of physical IPV also predicted membership in the Extensive/Increasing class of psychological IPV. This parallelism comports with the literature documenting the concurrence of both physical and psychological IPV (Bookwala, Frieze, Smith, & Ryan, 1992; Cano, Avery-Leaf, Cascardi, & O'Leary, 1998; Hamby & Sugarman, 1999; O'Leary & Slep, 2003).

Beyond demonstrating how these findings map onto existing literature, one of the most important contributions of the present study is the comparison between the two aggressive classes of psychological IPV. These findings can only be observed when the analysis strategy recognizes distinct classes of IPV. The two actively aggressive classes of psychological IPV were quite different from one another. Compared to the Extensive/Increasing class (increasing usage of minor and severe types of psychological IPV), members of the Minor/Increasing class (increasing usage of predominately minor types of psychological IPV) had fewer SIP biases and less consistency (more discontinuity) in romantic partnerships. These findings suggest that different classes of IPV, which reflect distinguishable patterns of aggressive behaviors, may have distinctive origins and may be sustained by different mechanisms. Yet, these two actively aggressive classes have similarities as well, including relationship insecurities and their gender and racial/ethnic composition. If multiple classes of actively aggressive individuals exist, the way we think about the origins and processes of IPV may be challenged and a view of IPV as a less unitary phenomenon that may be more sample specific may be promoted, thus supporting the utility of more person-centered research to understand the diversity of IPV.

Counter to our expectations, interparental aggression played a smaller role in this study than expected. Although it marginally differentiated the Extensive class from the Little-to-None

class for physical IPV in ways consistent with previous research, it did not differentiate the classes of psychological IPV. The IPV literature through the lens of social-learning theory is robust and would suggest that aggression witnessed as a youth would be a contributor to the perpetration of psychological and physical IPV in adulthood (e.g., Choice, Lamke, & Pittman, 1995; Fite et al., 2008; Hare et al., 2009; Swartout et al., 2012).

It is interesting that SIP biases did not differentiate the Minor/Increasing class from the Little-to-None class of psychological IPV. Perhaps this was because several of the assessed behaviors (insulting, yelling, and stomping out of the room or house) may be regarded as normative within romantic relationships (Follingstad & Rogers, 2013). Cognitive biases would not predict normative social behavior. It is relevant that SIP biases differentiated the Extensive/Increasing class from the Minor/Increasing class, since the prediction was that individuals whose cognitive biases make them feel confronted in an ambiguous social situation tend to believe that IPV is a more appropriate response.

This study incorporated variables representing multiple distinctive theoretical traditions that have been linked to IPV (e.g., Capaldi et al., 2003; Fite et al., 2008; Miga et al., 2010) but that have not typically been studied together. These variables were either minimally correlated or uncorrelated in the present study, even with our moderately large sample, suggesting they are truly independent from each other and may offer greater insight when combined in predicting IPV or identifying IPV patterns over time.

The demographic factors included as control variables in the present study successfully distinguished classes of both psychological and physical IPV. Consistent with the self-report literature (Archer, 2000; Straus, 2009), more females compared to males were classified in the aggressive patterns of psychological (Minor/Increasing and Extensive/Increasing) and physical

IPV (Extensive) in comparison to the Little-to-None class for both forms of IPV. Given that females tend to perpetrate less severe types of IPV (see Archer 2002 for a meta-analysis review), these findings should not be surprising due to the over-representation of such behaviors in the identified patterns of this study. Similarly, ethnicity and SES made contributions to the literature by distinguishing the more aggressive classes (Extensive and Extensive/Increasing) from the less aggressive (Minor/Increasing) and minimally aggressive classes (Little-to-None) for psychological and physical IPV. These findings not only coincide with the literature (Aldarondo & Sugarman, 1996; Caetano et al., 2005; O'Keefe, 1998), but also suggest that demographic differences in the perpetration of IPV continue as adolescents become young adults. Together, our findings for both theoretically derived variables and demographic attributes demonstrate that diverse characteristics and experiences were linked with distinctly patterned outcomes within our community-based sample. Future studies should benefit from considering population/sample variability in experiences of IPV.

Our findings have implications for interventions addressing IPV among youths. The identification of multiple classes of IPV along with evidence that each class of actively aggressive IPV has a distinctive set of more or less salient predictors suggests potential strategies for intervention. Where social information processing biases are salient, cognitive therapies may help individuals reframe their perceptions of the social behavior of others and their own responses to it. In addition, where system-linked factors appear to support the emergence or continuation of aggression, system-level interventions may be indicated to identify and interrupt aggressive behavior patterns. In the current study, the Minor/Increasing and the Little-to-None classes differed on only one explanatory variable: preoccupied relationship insecurity. Of course, any intervention would need to address the offending behavior, but if the models that distinguish

the classes in this study are valid, the similarity between the Minor/Increasing and Little-to-None classes suggests that corrective interventions targeting anxious, needy relationship insecurity with members of the Minor/Increasing class could be effective. Further research using person-centered methods along with prediction studies may begin to identify the variety of classes in the population beyond the current sample. Current findings also begin to give shape to factors that can be used to identify members of those classes.

Limitations

Several limitations are important to consider. First, although the sample represented the communities from which they were recruited, its middle-class and predominantly white composition limits the generalizability of the findings. Additionally, the types of IPV assessed by this study were mainly minor. Future use of more diverse samples and a wider range of aggressive behaviors should enhance the generalizability of findings and might reveal more classes of IPV.

Other measurement limitations arose in order to manage the burden of data collection. For instance, interparental aggression, a two person phenomenon, was assessed through only mother self-reports of mostly minor types of IPV. Furthermore, there was no direct assessment of whether the focal adolescent witnessed the interparental aggression, which is important to the social-learning of behavior (Bandura, 1978; 2001) and to adolescent acceptance of IPV as an effective conflict strategy (e.g., Bookwala et al., 1992; Foo & Margolin, 1995; Litcher & McCloskey, 2004). Perhaps, in future studies the inclusion of attitudes pertaining to the acceptability of IPV along with reports of having witnessed minor and severe forms of interparental aggression in future studies may lead to a better understanding of patterns in the

perpetration of IPV and an understanding of the role of social-learning on the emergence of IPV patterns from adolescence to young adulthood.

The assessments of relationship insecurities used fewer items than the published instruments from which the items were derived. Our results were consistent with theory, but the theoretical range of the assessed variables may not be fully represented in the model. Furthermore, since a dismissive insecurity (high avoidance, low anxiety) is linked to the emergence of IPV (Grych & Kinsfogel, 2010; Miga et al., 2010; Saint-Eloi Cadely et al., 2018) a more complete assessment of relationship insecurity could be beneficial.

Finally, interparental aggression, SIP biases, and relationship insecurities were assessed as time invariant variables. Each was assessed prior to the collection of any IPV data, but only once during adolescence. It is possible that change or stability in these constructs over time would contribute more or differently to the prediction of longitudinal patterns of IPV than a time invariant measure. Cognitive biases begin to emerge well before adolescence (Fite et al., 2008) as do patterns of relationship insecurity (Hare et al., 2009; Miga et al., 2010), and both of these constructs may vary dynamically across the transition to adulthood (Bartholomew, 1990; Pettit et al., 2010). Understanding change/stability in these factors may have important implications for social behaviors.

Despite these limitations, this analysis covers an eight-year time-span throughout the developmental period of late adolescence to young adulthood. It predicts IPV class membership using variables that address four important theories for understanding IPV. Findings of the present study build on recent research by indicating that the four assessed theoretical perspectives can do more than predict the perpetration of IPV during adolescence or young adulthood, but can also explain membership in classes of IPV characterized by both

extensiveness (i.e., little-to-none, increasing, and extensive) and severity of aggressive behaviors reported in close relationships as adolescents become young adults.

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Table 1. *Correlations and descriptive statistics of predictors of intimate partner violence (N = 484).*

Variable	1	2	3	4	5	6	7	8
1. Interparental aggression	-							
2. SIP biases	-.03	-						
3. Fearful insecurity	.03	.14*	-					
4. Preoccupied insecurity	.07	.09	.52***	-				
5. Ratio of change in romantic partner/Number of waves reported	-.04	-.05	.08	.01	-			
6. Gender	-.03	-.22***	.08	.03	-.10*	-		
7. Race	.00	.10	-.03	.07	-.05	.03	-	
8. SES	-.13*	-.14**	.06	-.04	.18***	-.06	-.39***	-
<i>M</i>	.69	.63	2.23	2.07	.27	.52	.18	3.35
<i>SD</i>	.64	.93	.94	.96	.30	.50	.38	1.18

Note. Gender (0 = Male, 1 = Female). Race (0 = European-Americans, 1 = African-Americans & Other). * $p < .05$, *** $p < .001$.

Table 2. *Multinomial logistic regression models comparing classes for psychological aggression (N = 484).*

	Minor/Increasing class (n = 255)				Extensive/Increasing class (n = 119)			
	B	(S.E)	β	Odds Ratio	B	(S.E)	β	Odds Ratio
Reference Group:								
<u>Little-to-None class (n = 110)</u>								
Interparental Aggression	-.09	(.22)	-.10	.92	-.10	(.27)	-.06	.90
SIP biases	.14	(.15)	.24	1.15	.49	(.17)	.43**	1.62
Fearful insecurity	.06	(.16)	.11	1.06	.26	(.19)	.23	1.29
Preoccupied insecurity	.35	(.16)	.65**	1.42	.43	(.19)	.39*	1.53
Discontinuity in relationship partner	-.27	(.38)	-.15	.77	-1.33	(.51)	-.38**	.27
Sex	.60	(.25)	.58**	1.83	.76	(.30)	.37**	2.14
Race	.18	(.35)	.13	1.20	-.04	(.42)	-.02	.96
SES	-.01	(.12)	-.03	.99	-.28	(.14)	-.31*	.76
Reference Group:								
<u>Minor/Increasing class (n = 255)</u>								
Interparental Aggression					-.02	(.24)	-.02	.98
SIP biases					.35	(.15)	.50*	1.42
Fearful insecurity					.19	(.16)	.28	1.21
Preoccupied insecurity					.07	(.15)	.11	1.08
Discontinuity in relationship partner					-1.06	(.43)	-.49**	.35
Sex					.16	(.25)	.12	1.17
Race					-.22	(.33)	-.13	.80
SES					-.26	(.11)	-.48**	.77

Note. The empty block at the bottom of the first column would consist of redundant findings, therefore this column was left blank. Analyses controlled for gender, race, and SES. ~ $p < .10$, * $p < .05$, ** $p < .01$.

Table 3. *Multinomial logistic regression models comparing classes for physical aggression (N = 484).*

	Extensive class (<i>n</i> = 84)			
	B	(S.E)	β	Odds Ratio
Reference Group:				
<u>Little-to-None class (<i>n</i> = 400)</u>				
Interparental Aggression	.41	(.25)	.26 [~]	1.51
SIP biases	.48	(.16)	.43 ^{**}	1.61
Fearful insecurity	.33	(.16)	.30 [*]	1.40
Preoccupied insecurity	.28	(.16)	.26 [~]	1.32
Discontinuity in relationship partner	-.37	(.47)	-.11	.69
Sex	.65	(.29)	.31 [*]	1.91
Race	.69	(.33)	.26 [*]	2.00
SES	-.29	(.13)	-.33 [*]	.75

Note. Analyses controlled for gender, race, and SES. [~] $p < .10$, ^{*} $p < .05$, ^{**} $p < .01$