

**The Development of Interpartner Aggression from Adolescence to Young Adulthood**

by

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## Abstract

The overall purpose of this dissertation was to advance our knowledge of change in interpartner aggression (IPA) as adolescents become young adults. This three-study dissertation examined patterns of change and the relationship between psychological and physical forms of IPA throughout the transitional period of late adolescence to young adulthood. The data used for all three studies came from the Child Development Project (Pettit, Lansford, Malone, Dodge, & Bates, 2010) and focused on the 484 participants of that longitudinal study who provided data on their romantic relationship between the ages of 18 and 25.

The first study examined multiple patterns of change in the perpetration of psychological and physical forms of IPA through latent class analysis. For both forms of aggression, a latent variable was calculated at each wave based on the occurrence versus non-occurrence of IPA behaviors in that particular year. Results indicated three trajectories of psychological and four trajectories of physical IPA. Specifically, for psychological aggression, the trajectories revealed: (a) one pattern where little or no aggression was expressed over time (Little-to-None Trajectory), (b) one pattern where participants increased in their perpetration of psychological aggression over time (Minor/Increasing Trajectory), and (c) one pattern where participants consistently expressed psychological aggression over time (Extensive Trajectory). These three patterns were also found for physical aggression along with a fourth pattern where a decrease in participants' perpetration of physical aggression was shown (Decreasing Trajectory). Comparisons were made

among the patterns by participants' demographics and the actual aggressive behaviors more commonly expressed within each trajectory. In general, minor forms of aggression were mostly reported among trajectories for psychological and physical aggression. Participants classified in the more aggressive trajectories (Extensive, Minor/Increasing, and Decreasing Trajectories) were more likely to be females, minorities from low SES households, had less education at the age of 24, and indicated a higher length of cohabitation.

Results of the first study allows for participants to be classified in their respective patterns and for pattern membership to be treated as a dependent variable. Therefore, the second study extended the findings from Study 1 by examining the following theory based variables as empirical predictors of these trajectories: (a) from social-learning/social-cognitive theory, interparental aggression, (b) from social-information processing (SIP), SIP biases, (c) from attachment theory, fearful and preoccupied attachment styles, and (d) from systems theory, discontinuity of relationship partner. Results indicated that interparental aggression predicted membership in the high stable pattern for physical aggression only. SIP biases predicted membership in the increasing and stable pattern for both psychological and physical aggression. The fearful and preoccupied attachment styles predicted membership in these same patterns for both forms of aggression, and membership in the Decreasing Trajectory for physical aggression was also predicted by the preoccupied attachment style. Lastly, discontinuity of relationship partner negatively predicted membership in the highly stable pattern for psychological aggression and in the increasing pattern for physical aggression.

The third study used SEM cross-lagged analysis to examine the longitudinal relationship between psychological and physical aggression modeled as latent variables at each wave. Results indicated a stronger prediction for early reports of psychological aggression to later reports of

physical aggression compared to early reports of physical aggression predicting later psychological aggression. These findings suggest that over time psychological aggression may escalate to physical aggression.

Findings from these studies provide developmental implications and improve our understanding of change in IPA from adolescence to young adulthood by identifying multiple patterns of change in these behaviors throughout this transitional period, by examining how different variables representative of different theories can influence these trajectories, and by providing support for the notion that psychological aggression may be a predecessor and contributor to later physical aggression.

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Seven years ago, I came to Auburn with nothing but a dream of getting a Ph.D. and becoming a professor. After many trials, tribulations, countless hours in the grad lab, and constant rewrites, I have finally earned the right to be called “Dr. Hans.” I consider this dissertation as a testament that dreams can become reality through dedication and perseverance. Of course, this was not exactly a “one man journey” as I wouldn’t have been able to have accomplished my goal without a strong support system.

I would like to dedicate this dissertation to my family. To my mother, thank you for being my strongest motivator and for never allowing me to give up myself. To my father, thank you as well for your support. Thanks are also extended to my committee members for their assistance as I was completing this project. To my major professor, Dr. Joe F. Pittman, thank you for your guidance, patience, honesty, and support throughout my graduate career. Dr. Jennifer L. Kerpelman, thank you for your investment in my professional progression. Dr. Gregory S. Pettit, thank you for believing in my vision and for allowing me to use your data to conduct this dissertation. Dr. Amy Rauer, thank you for your feedback and for challenging me to think deeper about my questions. Outside of my committee, special thanks must be given to Dr. Kristen Bub for consulting with me regularly as I was moving forward with my results. Lastly, thanks to my peers and faculty members who have come to my aid with words of encouragement when I needed them.

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## I. General Introduction

Prior to Makepeace (1981), little attention was given to the prevalence of interpartner aggression (IPA). IPA includes hurtful behaviors expressed or experienced by one's romantic partner. Through his work, Makepeace reported that approximately 21% of the college students he studied experienced psychological (demeaning forms of aggression) and/or physical aggression (involving potentially harmful physical contact and attack) within their relationships. Similar findings were obtained by Matthews (1984) who indicated that 23% of college students in his sample reported being victims of physical dating violence. More recent studies have shown that rates of IPA may begin during adolescence, although the prevalence of these behaviors have varied across studies based on the age/background of participants, the definition of psychological and physical IPA, and whether both forms of IPA were assessed. Among public high school females in Massachusetts, Silverman, Raj, Mucci, and Hathaway (2001) found that approximately 1 in 10 adolescents endured some form of physical abuse from a dating partner. According to the Centers for Disease Control and Prevention (CDC, 2012), 22% of girls and 15% of boys between the ages of 11 and 17 report some incident of psychological and/or physical form of IPA in their dating lives, with approximately 10% saying it happened within the previous 12 months. The statistics are even higher for psychological aggression. Between 50%-90% of adolescents and young adults in romantic relationships have perpetrated or been victimized with psychological abuse (Barnyard, Arnold, & Smith, 2000; Champion, Collins, Reyes, & Rivera, 2009; Ellis, Crooks, & Wolfe, 2009; Holt & Espelage, 2005; Jelz, Molidor, & Wright, 1996; Jouriles, Garrido, Rosenfield, & McDonald, 2009; Lawrence, Yoon, Langer, &

Ro, 2009). Furthermore, a study conducted by the Research Triangle Institute International (RTI International, 2012) showed that 37% of 7<sup>th</sup> graders within their sample experienced psychological aggression, whereas 15% of the sample experienced physical abuse from their dating partner.

Importantly, studies have shown that adolescents who are perpetrators or victims of IPA are likely to report similar experiences as young adults (Cui, Ueno, Gordon, & Fincham, 2013; Gomez, 2011; Halpern, Spriggs, Martin, & Kupper, 2009; Smith, White, & Holland, 2003; Spriggs, Halpern, & Martin, 2009). Although the reoccurrence of IPA is well-documented in the literature, patterns in the emergence of such behaviors over time are poorly understood. The purpose of the present dissertation was to understand these patterns in the perpetration of IPA from late adolescence to young adulthood. This was undertaken in the following three studies: (a) The first study was an extensive exploratory study that examined the possibility that IPA changes in different patterns for subsets of people over time, (b) the second study investigated theoretically driven variables as predictors of these multiple patterns, and (c) the third study explored the co-development of psychological and physical aggression throughout the transitional period of late adolescence to young adulthood with the central hypothesis that psychological aggression precedes and promotes the later development of physical aggression. Results from this project add to our knowledge of IPA from a longitudinal perspective.

## **Study 1**

Many studies found change in IPA during adolescence (Fritz & Slep, 2009; Nocentini, Mesenini, & Pastorelli, 2010; O'Leary & Slep, 2003; Orpinas, Nahapetyan, Song, McNicholas, & Reeves, 2012; Wolfe et al., 2003), young adulthood (Fritz & O'Leary, 2004; Kim, Laurent, Capaldi, & Feingold, 2008), and throughout the transitional period of adolescence to young

adulthood (Capaldi, Shortt, & Crosby, 2003; Swartout, Cook, & White, 2012; Swartout, Swartout, & White, 2011; Thompson, Swartout, & Koss, 2012). However, these studies are inconsistent in regards to how IPA changes across these periods. Specifically, some studies have shown a decrease (Fritz & O’Leary; Kim et al., 2008; Nocentini et al., 2010.; Wolfe et al., 2003), whereas others have shown a stable pattern of IPA over time (Capaldi et al.; Fritz & Slep; O’Leary & Slep). These inconsistencies suggest that one single trajectory may not be representative of all change in IPA across a sample or population. In other words, IPA may change in differing patterns over time. This has been investigated in recent studies that have shown various patterns of IPA over time (Orpinas et al., 2012; Swartout et al., 2011; Swartout et al., 2012; Thompson et al., 2012). However, these studies have not examined a multitude of change for different types of IPA simultaneously, nor have the types of aggression expressed within each trajectory been examined. The first study of this dissertation addresses this matter by suggesting that multiple distinct patterns or trajectories of psychological and physical IPA may emerge in subsets of individuals between the ages of 18-25. This study also describes these patterns in terms of their demographic attributes and the types of aggression (minor vs. severe) characteristics of these patterns.

## **Study 2**

Study 2 serves as an extension of Study 1 by examining what factors predict membership in the patterns identified. The following predictors were chosen because they are representative of respected theories that have been shown to be influential to the prevalence of IPA. The first predictor, interparental aggression (defined as having witnessed IPA perpetrated by one’s parents as children/adolescents) is representative of social-learning (social-cognitive) theory. This theory argues that aggression can be learned through intergenerational transmission as one observes

such behaviors enacted by one's parents/caregivers (Bandura, 1978, 2001; see Widom, 1989 for a review of the literature). The importance of interparental aggression to IPA among adolescents (Fite et al., 2008; Hare, Miga, & Allen, 2009; Jouriles et al., 2012; Malik, Sorenson, & Aneshensel, 1997; Wolf & Foshee, 2003) and adults (Choice, Lamke, & Pittman, 1995; O'Leary, Malone, & Tyree, 1994) is well documented.

Social-information processing (SIP) is another theoretical model applicable to understanding IPA. It emphasizes the understanding of meanings constructed by individuals during interactions with others. Past findings have indicated a linkage between hostile attributions (a type of SIP bias) and IPA among adolescents (Fite et al., 2008; Pettit, Lansford, Malone, Dodge, & Bates, 2010) and married couples (Clements & Holtzworth-Munroe, 2008; Copenhagen, 2000; Holtzworth-Munroe, Rehman, & Herron, 2000). This and other biases that represent inaccurate social information processing are examined as predictors of IPA patterns.

Thirdly, insecure attachment styles are examined as predictors of the identified IPA trajectories and serve as representatives of attachment theory. This theory suggests that individuals who are insecurely attached to their romantic partners (e.g., clingy, dependent, or avoidant) may use aggression when relationship needs or goals are unmet. Past studies show that men who are physically abusive toward their spouse are more likely to have an insecure romantic attachment style than nonviolent men (Babcock, Jacobson, Gottman, & Yerrington, 2000; Dutton, Saunders, Starzomski, & Bartholomew, 1994; Holtzworth-Munroe, Stuart, & Hutchinson, 1997).

Finally, discontinuity of relationship partner is tested as a predictor of IPA patterns as a representative of systems theory. According to systems theory, relationships signify a system. Changes in the membership of a system can influence the dynamics within that system

(Whitchurch & Constantine, 1993). In other words, partner changes offer an opportunity to create a new emergent pattern of interaction in the new relationship. Previous studies suggest more stability in IPA among adolescents and young adults who remained with the same partner over time (Capaldi et al., 2003; Fritz & Slep, 2009).

Study 2 examined whether predictors would differentiate between patterns where consistent usage of aggression was expressed versus patterns where little aggression was perpetrated. Based on theory and prior research, it was expected that these predictors would separate active patterns from inactive patterns of aggression. It was also investigated whether these predictors would distinguish active patterns of aggression from each other. With the exception of discontinuity of relationship partner, no specific hypotheses have been made regarding how these predictors would distinguish between active patterns of aggression due to lack of empirical and theoretical basis. However, it was expected that discontinuity of relationship partner would disassociate these active patterns from each other, given that change in IPA over time could be explained in part by discontinuity of relationship partner.

### **Study 3**

The purpose of Study 3 is to examine the relationship between psychological and physical aggression from late adolescence to young adulthood. It has been consistently shown in the literature that there is co-occurrence between psychological and physical aggression (Aldarondo, 1996; Bookwala, Frieze, Smith, & Ryan, 1992; Cano, Avery-Leaf, Cascardi, & O'Leary, 1998; Hamby & Sugarman, 1999; Stets, 1990; Toewns, McKenry, & Catlett, 2003). However, when assessed longitudinally, it has been suggested that psychological aggression may precede and promote later physical aggression (Murphy & O'Leary, 1989; O'Leary et al., 1994; O'Leary & Slep, 2003). In other words, physical aggression may be a progression from or

escalation of psychological aggression. This hypothesis has not been fully tested, nor has the relationship between both forms of aggression been examined across the developmental transition from adolescence to adulthood. Therefore, Study 3 tackles these questions.

## II. Study 1

### Typologies and Trajectories of Interpartner Aggression from Late Adolescence to Young Adulthood: A Latent Class Analysis Study

#### Abstract

Longitudinal studies do not agree how interpartner aggression emerges and changes from adolescence to adulthood. This may be because change in these behaviors may vary by individuals. Through latent class analysis, multiple patterns of change in the perpetration of interpartner aggression emerged during the transitional period from adolescence to young adulthood. Different patterns were also characterized by variations in types of aggression. A total of four patterns were expected respectively for psychological and physical aggression. Data from 484 participants collected annually from the ages of 18-25 were analyzed. Results indicated three patterns of change for psychological aggression (Little-to-None, Extensive, and Minor/Increasing), and four patterns of change for physical aggression (Little-to-None, Extensive, Minor/Increasing, and Decreasing). Patterns varied greatly in numbers of representatives, although they were more balanced in size for psychological aggression. In this community sample, minor forms of aggression were more common.

*Keywords:* adolescence, young adulthood, interpartner aggression, typologies, latent class analysis



## Typologies and Trajectories of Interpartner Aggression from Late Adolescence to Young Adulthood: A Latent Class Analysis Study

Research on the prevalence, causes, and consequences of interpartner aggression (IPA) reaches back over forty years. In his early work conceptualizing and assessing IPA, Straus (1979) considered IPA as a technique for conflict resolution, albeit a socially incompetent one. Other researchers and theorists include the more sinister motive of partner control or domination for at least some perpetrators (e.g., Johnson, 1995; 2006; Johnson & Ferraro, 2000). Whether IPA is the act of incompetent or scheming relationship partners, research findings indicate the hostile, hurtful behaviors that characterize these behaviors occur at surprisingly high rates among adolescents and young adults. The prevalence of such behaviors ranges between 50%-90% for psychological aggression (e.g., yelling, insulting, swearing, threatening to hurt, or destroying the belongings of one's romantic partner) (Barnyard, Arnold, & Smith, 2000; Champion, Collins, Reyes, & Rivera, 2009; Ellis, Crooks, & Wolfe, 2009; Holt & Espelage, 2005; Jelz, Molidor, & Wright, 1996; Jouriles, Garrido, Rosenfield, & McDonald, 2009; Lawrence, Yoon, Langer, & Ro, 2009; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) and from 10%-30% for physical aggression (e.g., grabbing, slapping, punching, choking, and/or kicking one's romantic partner) (Berger, Wildsmith, Manlove, & Steward-Streng, 2012; Centers for Disease Control and Prevention (CDC), 2012; Silverman, Raj, Mucci, & Hathaway, 2001; Straus et al., 1996).

Not only are the prevalence rates of IPA high among adolescents and young adults, but such behaviors persist for some individuals within this population over time (Cui, Ueno, Gordon, & Fincham, 2013; Gomez, 2011; Halpern, Spriggs, Martin, & Kupper, 2009; Smith, White, & Holland, 2003; Spriggs, Halpern, & Martin, 2009). However, studies disagree about the patterns underlying this persistence. Some studies show a stable pattern over time (Capaldi,

Shortt, & Crosby, 2003; Fritz & Slep, 2009; O’Leary & Slep, 2003), whereas others find a decrease in IPA (Goodnight et al., in preparation; Fritz & O’Leary, 2004; Kim, Laurent, Capaldi, & Feingold, 2008; Nocentini, Mesenini, & Pastorelli, 2010; Wolfe et al., 2003), and still others report an increasing trajectory (Orpinas, Nahapetyan, Song, McNicholas, & Reeves, 2012; Swartout, Cook, & White, 2012; Swartout, Swartout, & White, 2011a; Thompson, Swartout, & Koss, 2012). Most studies model single trajectories of IPA and therefore seek to describe patterns in the growth and change in IPA for entire samples or populations. Limited attention has been given to conceptualizing multiple trajectories of IPA (Orpinas et al., 2012; Swartout et al., 2011a; Swartout et al., 2012; Thompson et al., 2012) and these latter studies suggest that trajectories of IPA may change in different patterns for different subsets of samples or populations.

Also understudied in the IPA literature are the types of aggression expressed over time. Theories formulated around typologies of IPA emphasize motives and the context of the aggression rather than the aggressive behaviors themselves (Graham-Kevan & Archer, 2003; Holtzworth-Munroe & Stuart, 1994; Johnson, 1995; 2006; Johnson & Ferraro, 2000). Also, these theories focus on adults.

The purpose of the present study is two-fold. First, it adds to the literature on the longitudinal trajectories of IPA by exploring multiple patterns of perpetration of such behaviors across the transition of adolescence to young adulthood. Secondly, the present study attends to the forms of IPA expressed within trajectories. This is a descriptive study detailing the emergence of IPA in romantic relationships in the developmental period from adolescence to young adulthood.

## **IPA over Time**

Although many adolescents and young adults involved in romantic relationships experience psychological and physical aggression, the majority report few such behaviors (Orpinas et al., 2012; Swartout et al., 2011a; 2012; Thompson et al., 2012). This would suggest that *one trajectory of IPA can be expected to be low and stable* and this trajectory may represent a substantial fraction of study participants.

Many studies of IPA, however, show a stable longitudinal pattern of active IPA for at least a portion of their samples. O’Leary and Slep (2003) studied 206 high school students and found that reports of IPA remained stable over a three-month period. Similar results were shown by Fritz and Slep (2009) among 664 10<sup>th</sup> and 11<sup>th</sup> graders across a one-year interval and by Capaldi et al. (2003) across a two-year time-frame for 105 late adolescent couples. Although these studies were all longitudinal, each assessed IPA over brief intervals that were fully contained within the developmental period of adolescence. Furthermore, only two time points were observed in each study (Fritz & Slep is an exception). To truly test for behavior change, more than two time points are needed (Singer & Willett, 2003). The present study examines reports of IPA from adolescence to young adulthood across eight annual waves of data.

Like the above research on adolescents, adult studies also reveal stability of IPA. Aldarondo (1996) indicated among a sample of 772 married or cohabiting participants that roughly 33% of men were persistently abusive physically toward their partner throughout the three years and three data collections of his study. Using two waves of data from the National Youth Survey, Woffordt, Mihalic, and Menard (1994) showed that over 50% of males who reported physical abuse toward their partner at the first wave of their study reported some form of physical aggression at the second wave three years later. Furthermore, Lorber and O’Leary (2004) showed that approximately 41% of the 94 men ( $M = 25.29$  years old) in their sample who

reported physical aggression toward their wives at the start of their two year study continued to engage in such acts across all four waves. These findings suggest two things. First, there is considerable stability in IPA for many individuals. Second, the trend of stability in IPA is not characteristic of all individuals. In keeping with the first of these observations, *a stable actively abusive group across the transitional period of adolescence to young adulthood is expected.*

In keeping with the second observation, there is evidence of substantial change in rates of IPA over time. Foshee et al. (2009) among a sample of 973 adolescents found a non-linear pattern that began with an increase in IPA between the ages of 13-16, a peak at 16-17, and a decrease thereafter. Nocentini et al. (2010;  $N = 181$  adolescents 16-18 years old) and Wolfe et al. (2003;  $N = 191$  adolescents 14-16 years old), however, both reported linear decreases in IPA over time. This decreasing pattern was also found among young adults. For example, for 10-years (five waves of data: one month prior to marriage, six months, 18 months, 30 months, and 120 months after marriage), Fritz and O'Leary (2004) studied 203 women ( $M = 23.20$  years old at Wave 1) and found decreases in reports of both perpetration and victimization. Kim et al. (2008) had similar results in their 10-year study (five biennial waves) of 194 men aged 20-31, not all of whom engaged in IPA over time. Over the transition to adulthood, youth may develop more relationship skills and more strategies for dealing with conflict. Hence, for some individuals, rates of IPA may decrease with age and maturity. This logic coincides with past findings indicating that adolescents become less impulsive as they increase in age (Steinberg et al., 2008). *Therefore, a declining pattern of IPA among a subset of initially aggressive adolescents is expected as they transition to young adulthood.*

The studies reviewed in this section so far have estimated single trajectory models of change in IPA. The inconsistency in their findings, however, supports the conclusion that IPA

may change in different ways for different subgroups of people leading to multiple trajectories of change in a population. Consistent with this logic, a few recent studies have directly explored multiple patterns of IPA over time. For example, Swartout et al. (2012) examined young women's victimization from physical aggression. They found five trajectories in a cohort of 1,575 college women studied throughout their four years of college: (a) little-to-none (65.5%), (b) initially low with subsequent decreases (14.6%), (c) initially low with subsequent increases (14.1%), (d) initially high with subsequent declines (3%), and (e) persistently high (2.8%).

Similar studies of sexual aggression have identified multiple trajectories over time. Among a different sample of 1,580 college women, Swartout et al. (2011a) found four patterns of sexual victimization during their four years of college: (a) little-to-none (67.4%), (b) moderately increasing (12.4%), (c) decreasing (14.6%), and (d) initially high and increasing (5.5%). Thompson et al. (2012) found four patterns of sexual aggression perpetrated by a cohort of 795 undergraduate males across four years of college: (a) little-to-none (70.9%), (b) increasing (8.1%), (c) decreasing (12.4%), and (d) persistently high (8.6%). Although neither victimization nor sexual aggression will be addressed in the current study, these findings suggest a model for conceptualizing change in rates of IPA through multiple trajectories rather than a single trajectory.

Interestingly, only the studies modeling multiple trajectories of IPA report an increasing pattern of aggression (Swartout et al., 2011a; Swartout et al., 2012; Thompson et al., 2012). However, if patterns of IPA include only stable or decreasing rates, these behaviors should become increasingly rare even in early adulthood. This does not seem to be the case given study parameters estimated among adults (Choice, Lamke, & Pittman, 1995; Fritz & O'Leary, 2004; Murphy & O'Leary, 1989; O'Leary et al., 1989; O'Leary, Malone & Tyree, 1994; Schumacher

& Leonard, 2005). A pattern reflecting increases in IPA across the transition to adulthood could represent the processes of learning and reinforcement of IPA as it leads to desired relationship outcomes; a reasoning that overlaps with Bandura's (2001) social-cognitive theory and is consistent with the notion of IPA as a learned conflict tactic (Straus, 1979). Therefore, *an increasing trajectory of IPA across the transition from late adolescence to young adulthood is expected in the present study.*

### **Psychological vs. Physical**

These four general patterns of change are expected to characterize the increase, decline, or stability patterns of IPA over time for both psychological and physical aggression. Prior single trajectory studies suggest similar longitudinal patterns for both psychological and physical aggression, although they do not agree on their shape or direction. For instance, Fritz and Slep (2009) found that adolescent reports of both forms of IPA remained stable across a one-year interval. Wolfe et al. (2003) found a decrease in adolescent IPA with psychological and physical aggression decreasing at the same rate over time. Wolfe et al. and Fritz and Slep appear to agree that rates of psychological and physical aggression occur in parallel over time but they disagree on the pattern. Foshee et al. (2009) do not support parallelism between psychological and physical aggression. Rather, they report distinct patterns in the perpetration of psychological versus physical aggression with psychological aggression increasing steadily while physical aggression reveals a curvilinear trajectory whereby it first increases, then decreases. Clearly, studies of adolescents do not agree on the patterns of change in psychological and physical aggression over time.

Similar inconsistency is found in studies of young adults. Kim et al. (2008) indicated that men's use of psychological and physical aggression decreased over time but at different rates,

with psychological aggression decreasing more slowly than physical aggression. Fritz and O'Leary (2004) showed that women's reports of psychological aggression were stable across a 10-year interval, but their reports of physical aggression decreased.

Only one study specifically examined multiple trajectories of psychological aggression. Orpinas et al. (2012) studied 550 adolescents from the sixth through the 12<sup>th</sup> grade and found three trajectories: (a) persistently low, (b) increasing, and (c) persistently high. Although these findings are important to the current investigation, they are confined to the developmental period of adolescence. In the present study, multiple patterns of psychological and physical aggression are examined independently across the transition from adolescence to young adulthood.

### **The Present Study**

*To summarize, four general patterns in the perpetration of interpartner psychological and physical aggression are expected to emerge as adolescents' transition to young adulthood: a low stable pattern, a higher stable pattern, a decreasing pattern, and an increasing pattern.* In addition to understanding multiple trajectories of IPA from adolescence to young adulthood, the present study also examines variation in the specific behaviors that characterize each trajectory for both psychological and physical aggression. To date, studies have investigated multiple patterns of change in IPA using summed or mean aggression scores at each time point (Orpinas et al., 2012; Swartout et al., 2011a; Swartout et al., 2012; Thompson et al., 2012). This procedure ignores variation across trajectories in the types of IPA used in aggressive exchanges. By modelling IPA as a latent variable at each wave, the present study is able to identify different trajectory shapes, but also more subtle variations in the behaviors characterizing the trajectories over time. Specifically, trajectories will be described based on their shapes and the severity of the aggression being expressed within each pattern (recognizing that the range of severity is

largely at the low end of the continuum in the current sample). This contribution increases understanding not just of the occurrence of behaviors but also of the types of IPA expressed longitudinally.

Additionally, the trajectories will also be compared in terms of the demographic characteristics of their constituent members, specifically, gender, race, socioeconomic status (SES), as well as educational attainment and relationship status. Gender is important in IPA research. Although male aggression often leads to more dire consequences for partners (Archer, 2002), females report similar (Cano, Avery-Leaf, Cascardi, & O’Leary, 1998) or higher rates of IPA (Archer, 2000) and are more likely to engage in psychological aggression (Archer, 2004; Jelz et al., 1996). However, over time, females initially report higher rates of physical aggression than males, but later report lower levels of both psychological and physical aggression (Fritz & Slep, 2009; Nocentini et al., 2010).

Race is relevant because previous studies have shown minorities report higher prevalence and recurrence of IPA relative to European-Americans (Caetano, Field, Ramisetty-Mikler, & McGrath, 2005; Holt & Espelage, 2005). Similarly, low SES couples use more physical aggression (Aldarondo & Sugarman, 1996; O’Keefe, 1998). Given that SES is associated with lower educational attainment, differences among trajectories based on this factor are also expected. Finally, differences in relationship status (cohabiting/married) and years in that status are also examined. IPA is more likely to occur in committed than in casual relationships (Rhoades, Stanley, & Markman, 2012).

## **Method**

### **Participants and Procedure**



Data were drawn from a 24-year longitudinal study known as the Child Development Project (CDP). The CDP is aimed at understanding risk factors associated with children's health and social adjustment and how these factors can influence children's developmental outcomes including their transition to adulthood. Data were initially collected in Knoxville, Tennessee, Nashville, Tennessee, and Bloomington, Indiana. Participants who left these sites were followed across this 24-year period if possible.

At the beginning of the study, both children and parents were targeted for participation in the CDP. Approximately five to ten school districts within each city were identified. Families were invited to participate as they registered their children for kindergarten at the selected schools. Approximately 85% of participants were recruited in this manner. The remaining 15% were randomly selected at the beginning of the school year from those students who were not pre-registered in the summer before kindergarten.

Data were collected from two cohorts beginning in 1987 and 1988. Children were five years old at the beginning of data collection and have been followed annually to the age of 29. The original sample contained 585 participants. Approximately 91.6% of the original sample ( $n = 536$ ) were reached for data collection at the ages of 18-25, which is an exceptional retention rate for a long term study such as this.

IPA data were collected annually from participants who were in a dating/cohabiting/marital relationship during the reporting year from the ages of 18-25. The percentage of participants who were romantically involved increased from 44.3% at age 18 to 64.9% at 25. Rates of cohabitation/marriage ranged across waves from 5% at 18 to 43.8% at 25 (see Appendix A). For purposes of the present study, only participants who were romantically involved and

provided IPA data in at least one wave were included in the analysis. Participants provided IPA data for an average of five out of the eight waves ( $M = 4.80$ ;  $SD = 2.24$ ) (see Appendix B).

The analysis sample consists of 484 participants (82.7% of the original sample; 90.3% of the retained sample). This sample is not a nationally representative sample, but rather representative of the communities where the data were originally collected. Slightly over fifty percent were females (51.9%) and 82.2% were European-Americans. Other ethnicities included African-Americans (16.3%) and Hispanics, Asians, and Native Americans (totaling 1.4%). Information regarding SES and parents' education were collected at the beginning of the study. According to the Hollingshead SES scale (1979), the majority of participants came from middle-class families ( $M = \$40,003$ ;  $SD = 13.99$ ) (range: \$8,000 - \$66,000 in 1987 dollars). Approximately 87.3% of mothers and 75% of fathers had at least a high school education. Data on parents' marital status were collected periodically. Approximately 62.2% of participants' parents were married and 0.6% were cohabiting at the beginning of the study. By age 17, the percentages of parents who were married decreased to 55.2% and for cohabitation increased to 1.7%. Participants varied in their educational attainment. At the age of 19, 69.4% had graduated from high school, and by age 24, 66.1% had completed at least some post-high school education.

## Measures

**Demographics.** **Gender** was coded as follows: 0 (*Male*), 1 (*Female*). **Race** was dummy coded as follows: 0 (*European-Americans & Others*), 1 (*African-Americans*). **SES** was assessed at the beginning of the study as self-reported income and was recoded on a 5-point scale as follows: 1 = \$8,000-\$19,000, 2 = \$20,000-\$29,500, 3 = \$30,000-\$39,500, 4 = \$40,000-\$54,500, 5 = \$55,000-\$66,000 ( $M = 3.35$ ;  $SD = 1.18$ ). **Relationship Status** was assessed annually from ages 18-25. For the reporting year participants indicated whether they were single living alone,

cohabiting/single but living with a partner, married, separated living alone, or divorced living alone. From these responses, two dummy codes were created, one for cohabitation and one for marriage. These wave-based codes were then used to create several relationship status 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,  $M = 1.04$ ;  $SD = 1.79$ ). Finally, **Educational attainment** was assessed at age 24 and was coded on a 4-point scale (1 = *Did not graduate high school*, 2 = *Graduated high school*, 3 = *Some college*, 4 = *Graduated college*) ( $M = 2.87$ ;  $SD = 1.05$ ).

**IPA.** Although not ideal, IPA was measured in three different ways across the eight waves used in this study. Only perpetration items were used. At age 18, 11 items were selected from the *Revised Conflict Tactics Scale* (4 psychological aggression items and 7 physical aggression items) (CTS2; Straus et al., 1996). For ages 19-21, 5 items were selected from the original *Conflict Tactics Scale* (3 for psychological and 2 for physical aggression) (CTS; Straus, 1979). Finally, for ages 22-25, 15 items were selected from the CTS2 (7 for psychological and 8 for physical aggression) (see Appendix C for the exact wording of all items used at each wave). At ages 22-25, one of the psychological aggression items, “I put down my partner’s appearance or abilities,” came from the *Psychological Maltreatment of Women Inventory* (PMWI; Tolman, 1989). Items with zero variance were excluded from the analysis, which led to the exclusion of several of the more severe aggression behaviors (i.e., “I used a knife or gun on my partner”, “I choked my partner”, and “I beat up my partner”). Certain items across versions of the CTS assessed the same or similar behaviors with slightly different wording. For instance, hitting one’s partner was assessed for the CTS2 as: “I punched or hit my partner with something that could

hurt” and for the CTS as: “Hit or tried to hit your partner.” For analytic purposes, items with similar wording are treated as assessments of the same behavior (Pettit, Keiley, Laird, Bates, & Dodge, 2007).

Inconsistencies also existed in the scaling of the items across waves. IPA at ages 18 and 22-25 was assessed on a 7-point scale: 0 (*This has never happened*), 1 (*Once in the past year*), 2 (*Twice in the past year*), 4 (*3-5 times in the past year*), 8 (*6-10 times in the past year*), 15 (*11-20 times in the past year*), and 20 (*More than 20 times in the past year*). However, from ages 19-21, a different 7-point scale was used (0 = *Never*, 1 = *Less than once a month*, 2 = *Once a month*, 3 = *2-3 times a month*, 4 = *Once a week*, 5 = *2-3 times a week*, 6 = *Almost every day*). The first scale emphasizes precision at the lower range of the scale with 5 of the 7 categories reflecting rates of less than once a month. The second scale emphasizes precision at the higher end of the scale with 5 of the 7 categories reflecting rates of once a month or more. In order to create a shared scale and due to the skewness of the data (skewness range: 1.40 – 15.16;  $M = 6.93$ ), all items were dichotomized: 0 = *No aggression*, 1 = *Any aggression* (skewness range: 0.06 – 12.25;  $M = 2.86$ ).

### **Plan of Analysis**

Models of the present study were estimated in MPLUS version 6 (Muthén & Muthén, 1998-2010). Two latent class analyses (LCA) were conducted, one each for psychological and physical aggression. LCA is a type of person centered analysis that tests for variability between individuals and creates classes of individuals with similar reports based on the variables of interest (Swartout et al., 2011b). For each analysis, a separate latent variable was modeled at each wave indicated by the relevant items available at that wave. This analysis strategy allows each class to be characterized in two ways. One way is by subtle variations across classes in the aggressive behaviors most commonly reported. The second way is by the probability that

participants belong in a given trajectory relative to a comparison trajectory. For each measurement model, factor loadings for items that are the same (or similar) across waves were constrained to be equal so the factor would have the same meaning across waves (see Appendix D).

Generally, when estimating latent class models, a series of latent classes is fit one at a time, beginning with one latent class, then two, three, and so forth. Two sets of decision criteria are used in choosing which number of latent classes fit the data best. One criterion involves empirical comparisons of fit data. Each model is compared to the model with one less class (Swartout et al., 2011a; 2012; Thompson et al., 2012). Model fit is estimated based on the log likelihood ratio statistic (-2LL), the Bayesian Information Criterion (BIC), the Lo-Mendell-Rubin adjusted Likelihood Ratio Test (LRT), and the entropy. The -2LL “assumes a chi-square difference distribution” (Nylund, Asparouhov, & Muthén, 2007, p. 537), the BIC tests model fit based on the sample size and the number of parameters (Schwarz, 1978), the adjusted LRT assesses whether adding an additional class significantly contributes to the model (Nylund et al., 2007), 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). Empirically, better fit is indicated by a lower -2LL and BIC, a significant adjusted LRT, and relatively high entropy (Nagin, 1999, Nylund et al; Swartout et al; Thompson et al). Importantly, entropy generally decreases as more classes are added to a model (Celeux & Soromenho, 1996). Delta chi-square tests ( $\Delta\chi^2$ ) establish whether the -2LL significantly decreases as more classes are added. A second decision criterion is theoretical, so in the current case the final model chosen will reveal trajectories that suggest developmental processes rather than random or chaotic ones. Maximum

likelihood estimation and robust standard errors (i.e., Full Information Maximum Likelihood) are used to account for missing data across waves.

Logit values are generated for each latent variable in each latent class at each wave. These can be transformed to an odds ratio reflecting the likelihood of being classified into the indicated trajectory at the given wave compared to a comparison trajectory. Once the final model is chosen, each class is plotted based on the estimated odds ratio at each wave. Classes produced by LCA cannot be compared using multigroup analyses because LCA minimizes variance within classes. Hence trajectories are described and compared by calculating t-values whereby a mean difference in logit values is compared to the average of the standard errors of the two means being compared. A significant difference is indicated if the mean difference is greater than twice the calculated standard error.

## **Results**

### **Psychological Aggression**

For psychological aggression, a total of four classes were fit to the data. As each class was added to the model, the -2LL and the BIC decreased significantly. However the adjusted LRT was non-significant once four classes were fit to the data. This suggested that adding a fourth class did not contribute to the model. Furthermore, the entropy for the three-class model was somewhat higher compared to the four-class model (see Table 1). Finally, this model revealed three clear types of psychological aggression with interpretable trajectories. Therefore, the three-class model was chosen as the final model for psychological aggression. The three latent classes, the logit means and converted odds ratios at each wave per class are shown in Table 2. The comparison class for psychological aggression is Class 3. Presentation of the results will begin with this comparison class.

**Psychological Class 3: Little-to-None Trajectory.** Approximately 23% of participants ( $n = 110$ ) were classified in the Little-to-None Trajectory. The behaviors examined for psychological aggression included insulting, destroying belongings, yelling, threatening, stomping away from an argument, put downs, and spitefulness. Participants classified in this trajectory reported little or no such behavior. For instance, between 15%-29% of its members said they insulted their romantic partner across waves, 19%-32% yelled at their romantic partner, and 8%-20% stomped away from an argument. Still lower rates were shown for other psychological aggression. Specifically, put downs, threats, and destruction of belongings were all at 2% or less, and spitefulness was 5% or less across waves (see Appendix E). Overall, due to the continuously low rates of psychological aggression in Class 3, the descriptive name “Little-to-None Trajectory” was given.

**Psychological Class 2: Extensive Trajectory.** This trajectory consisted of approximately 24% of the sample ( $n = 119$ ). Participants who belonged in this trajectory used most forms of psychological aggression. Specifically, between 80%-97% insulted their partner across waves, 80%-95% yelled at their partner, 66%-88% engaged in stomping behaviors, 34%-47% used put downs, 40%-51% did something to spite their partner, 15%-31% threatened their partner, and 15%-29% destroyed their partner’s belongings (see Appendix E). Therefore, the trajectory shown for this class seems to reflect extensive, consistent use of psychological aggression.

Results indicated that the logit means of psychological aggression for the Extensive Trajectory at age 25 was significantly larger than its logit mean at age 18. However, compared to the Little-to-None Trajectory, the probability of participants being categorized in the Extensive

Trajectory was above 90% at each wave. This shows that the pattern for the Extensive Trajectory is stable over time and highly distinguishable from the Little-to-None Trajectory.

**Psychological Class 1: Minor/Increasing Trajectory.** Approximately 53% of the sample ( $n = 255$ ) were categorized in the Minor/Increasing Trajectory. The most common forms of aggression expressed within this trajectory were insulting, yelling, and stomping away from an argument. Across the eight waves an increasing trajectory was noted for several of these behaviors. From the first to the final wave, respectively, approximately 41%-81% of this class said they insulted their partner, 44%-76% yelled at their partner, and 25%-61% stomped away from an argument. Among the psychological aggression items, these three are some of the least severe (i.e., minor) expressions. Use of other forms of psychological aggression was much lower and in some cases almost negligible. Only 5% or less of the class ever engaged in threatening behaviors or destroying partner belongings. These rates at their maximum are less than half those of the Extensive Trajectory. Furthermore, 17% or less used put downs and less than a quarter ever claimed doing something to spite their romantic partner (see Appendix E). Based on these findings, this trajectory mostly reflects minor forms of psychological aggression that increase at later waves.

The odds ratio of .659 at age 18 indicates a 65.9% probability that participants classified in the Minor/Increasing Trajectory could be distinguished from the Little-to-None Trajectory at that age. By age 25 the likelihood that members of the Minor/Increasing Trajectory could be distinguished from the Little-to-None Trajectory was 96.5%. This is a significant increase. However, it should be noted that the pattern is not simple. From ages 18-20, the odds ratios were stable and not statistically different, then increased from ages 20-22, and resumed a largely stable



pattern from ages 22-25. Nevertheless, the overall pattern indicates that this trajectory became more distinguishable from the Little-to-None Trajectory across waves.

**Demographic comparisons between trajectories.** Results from chi-square analyses and analysis of variance (ANOVA) revealed demographic differences across trajectories. Chi-square analyses indicated that males were over-represented in the Little-to-None Trajectory,  $\chi^2(2) = 8.08, p < .05$ . In addition, participants with any cohabitation experience were over-represented in the Extensive Trajectory whereas those who never cohabited were over-represented in the Little-to-None Trajectory,  $\chi^2(2) = 6.74, p < .05$ . Furthermore, ANOVA results  $F(2, 481) = 4.06, p < .05$  and Bonferonni post-hoc tests indicated that the mean number of years cohabiting was significantly higher for the Extensive Trajectory compared to the Little-to-None Trajectory.

ANOVA results also indicated significant differences across trajectories by SES,  $F(2, 470) = 6.96, p < .001$ . Bonferonni post-hoc tests revealed that the mean SES for the Extensive Trajectory was significantly lower than the other trajectories. ANOVA results also showed significant differences by participants' educational attainment,  $F(2, 479) = 22.92, p < .001$ . Bonferonni post-hoc tests showed that educational attainment by age 25 was significantly lower in the Extensive Trajectory than the two other trajectories.

### **Physical Aggression**

For physical aggression, preliminary analysis revealed very large standard errors for the latent physical aggression construct at age 21 suggesting that data for this wave were suspect. Therefore, this wave was excluded from the analyses. This resulted in a slightly smaller sample size of 477. Although the adjusted LRT suggested that a two-class model could be sufficient (see Table 4), several criteria combined to support the selection of the four-class model. First, a series of  $\Delta\chi^2$  tests showed substantial improvement in model fit based on a criterion of 15.51 for eight

degrees of freedom as more classes were added. Second, the BIC also declined substantially as additional classes were added. Third, the five-class model was ruled out because it generated untrustworthy parameters with excessively large standard errors. Fourth, a higher entropy was found for the four-class model, relative to a three- and five-class models. Finally, the four-class model revealed interpretable patterns of change in physically aggressive behavior consistent with the literature and suggestive of developmental processes. Based on these findings, the four-class model was selected. Logit values and odds ratios for each class of physical aggression at each wave are given in Table 5 and again the comparison class was the least aggressive (Class 4).

**Physical Class 4: Little-to-None Trajectory.** The behaviors assessing physical aggression included throwing something at one's partner, twisting one's partner's arm or hair, pushing, hitting, grabbing, slapping, kicking, and slamming one's partner against a wall. Although the three classes for psychological aggression were similar in size, the four physical aggression classes were highly imbalanced. Approximately 71% of participants ( $n = 339$ ) were classified in the Little-to-None Trajectory. The highest rates of physically aggressive behaviors for this class were shown for grabbing and pushing, but the highest rate at any given wave for either of these behaviors was 4%. All other behaviors had maximum rates of 3% or less (see Appendix F). This class represents the low stable pattern expected for physical aggression.

**Physical Class 3: Extensive Trajectory.** The Extensive Trajectory for physical aggression included only 6% of the sample ( $n = 28$ ). Participants classified in this trajectory engaged in all forms of physical aggression, however, the most prevalent types of physical aggression were pushing, grabbing, throwing, twisting, hitting, and slapping. Across waves, partner focused aggression was reported by between 74%-92% for pushing, 64%-84% for grabbing, 30%-69% for throwing something, 27%-62% for twisting arms or hair, 24%-64% for

hitting, and 31%-58% for slapping. The least common forms of physical aggression for this class were kicking (16%-19%) and slamming (5%-30%) (see Appendix F). Their wide use of physically aggressive behaviors suggests this class includes “extensively” aggressive individuals whose use of aggression was consistently high across waves and represents the hypothesized high, stable trajectory for physical aggression. Finally, when the logit means were converted to odds ratios, probabilities of 98.8%-99.9% were found across waves suggesting that this Extensive Trajectory revealed a pattern of physical aggression that was highly distinguishable from the Little-to-None Trajectory.

**Physical Class 2: Minor/Increasing Trajectory.** Approximately 19% of participants ( $n = 89$ ) make up the Minor/Increasing Trajectory. The overall pattern of aggression in this class is for relatively low but increasing reports of less severe types of aggression. No form of aggression was reported by more than 44% of this class at any wave and most types of aggression were reported at percentages well below that. The types of aggression reported most (minimum to maximum) were pushing (12% to 44%) and grabbing (11% to 36%). Smaller percentages of this class said they threw things (3% to 20%), twisted arms or hair, (3% to 11%), hit (3% to 15%), or slapped (6% to 19%).

Importantly, the lowest reports of aggression were typically seen at wave 1 and later waves reveal higher reports with maximums at age 22 or later (see Appendix F). Within class comparisons indicate that the logit mean at age 25 is significantly larger than the logit mean at age 18, and the odds ratios, which were 77.9% at 18 were above 97% by 25. This indicates that the pattern of aggression for the Minor/Increasing Trajectory became more clearly distinct from the Little-to-None Trajectory across waves. This pattern is consistent with the expected

increasing trajectory of physical aggression but also indicates that for this sample, it is largely limited to less severe forms of aggression.

**Physical Class 1: Decreasing Trajectory.** The Decreasing Trajectory is another small subsample ( $n = 21$ ; 4%). This pattern initially involved high levels of all types of physical aggression. At age 18, between 58%-95% said they threw things at, twisted the hair or arms of, pushed, hit, grabbed, slapped, and/or kicked their partners. However, these behaviors decreased over time. Declines were in some cases dramatic. For pushing, percentages dropped from 95% at 18 to 38% at 25. For grabbing, the decline was from 90% to 32% for this same period. Other substantial declines were observed for throwing things (70%-20%), twisting (70%-9%), hitting (87%-7%), and slapping (76%-2%) (see Appendix F). The least common form of physical aggression for the Decreasing Trajectory was kicking (57%-4%). Furthermore, odds ratios for this trajectory were above .90 across all waves with the exception of age 22, where an odds ratio of .76 was shown. This suggests that across all waves, this trajectory was highly distinguishable from the Little-to-None Trajectory.

**Demographic comparisons between classes.** Results from chi-square analyses indicated that females were over-represented in the Decreasing and the Minor/Increasing Trajectories ( $\chi^2(3) = 9.65, p < .05$ ). Similarly, African-Americans were over-represented ( $\chi^2(3) = 28.02, p < .001$ ) in the Extensive, the Decreasing, and the Minor/Increasing Trajectories. Males and Whites/Others were over-represented in the Little-to-None Trajectory. Furthermore, participants who cohabited at least once throughout the study were substantially over-represented in the Extensive, Minor/Increasing, and the Decreasing Trajectories, whereas participants who never cohabited were over-represented in the Little-to-None Trajectory,  $\chi^2(3) = 13.58, p < .01$ . ANOVA analysis showed significant differences across classes based on the number of

cohabitation waves reported by participants,  $F(3, 473) = 5.06, p < .01$ . Bonferonni post-hoc tests indicated the Decreasing Trajectory had more waves of cohabitation compared to the Increasing and Little-to-None Trajectories (see Table 6). No significant differences emerged by participants' marital status.

ANOVA results and Bonferonni post-hoc tests also indicated significant differences across classes by SES,  $F(3, 462) = 5.83, p < .001$  and educational attainment,  $F(3, 472) = 10.45, p < .001$ . SES was significantly higher for the Little-to-None Trajectory relative to the Extensive and the Decreasing Trajectories, and educational attainment at age 24 was significantly higher in the Little-to-None Trajectory compared to all other classes (see Table 6).

**Comparisons across aggression classes.** In a final analysis, trajectory memberships for psychological and physical aggression were compared. Chi-square analyses revealed a strong association,  $\chi^2(6) = 141.37, p < .001$ . Specifically, participants who belonged in a given class of psychological aggression were over-represented in the comparable class of physical aggression. However, the majority of participants in the Little-to-None Trajectory for physical aggression (58.4%) actually were classified in the Minor/Increasing Trajectory for psychological aggression and over half of the Decreasing and Minor/Increasing Trajectories for physical aggression were classified in the Extensive Trajectory for psychological aggression (see Table 6).

## Discussion

The purpose of the present study was to examine and describe multiple patterns of change in IPA from adolescence to young adulthood. Most previous studies have estimated a single pattern of change in IPA but these studies do not agree on how such behaviors change over time (Capaldi et al., 2003; Fritz & O'Leary, 2004; Fritz & Slep, 2009; Kim et al., 2008; Nocentini et al., 2010; O'Leary & Slep, 2003; Wolfe et al., 2003). Furthermore, these studies have examined

rates of change in IPA within one developmental period (i.e., adolescence or adulthood). A few recent studies have investigated multiple patterns of change in IPA (Orpinas et al., 2012; Swartout et al., 2011a; 2012; Thompson et al., 2012) but these studies have not assessed multiple trajectories of psychological and physical aggression simultaneously, have summed across aggressive types of behavior, and hence have not recognized subtle differences in types/severity of aggression that are linked to specific trajectories. The following four trajectories were expected: a low stable trajectory, a high stable trajectory, a decreasing trajectory, and an increasing trajectory. In the end, three of these patterns were found for psychological aggression (Little-to-None, Extensive, and Minor/Increasing) and all four were found for physical aggression. Therefore, the findings largely supported expectations. Variation in the aggressive behaviors characterizing the psychological and physical aggression trajectories suggest these patterns differ in more than shape, but also in the types of behaviors expressed over time. More severe types of IPA were more common in the Extensive trajectories, whereas minor forms of IPA were more common across the other trajectories for both psychological and physical aggression.

Results indicated a low stable pattern for both psychological and physical aggression. This finding was expected because a substantial fraction of participants across empirical studies report no aggression in their relationships (Orpinas et al., 2012; Swartout et al., 2011a; 2012; Thompson et al., 2012). For physical aggression, the considerable majority of participants belonged in this group (71%), whereas only 23% of participants were categorized in this class for psychological aggression. Even for the Little-to-None trajectories, however, some participants engaged in low levels of primarily minor IPA. Perhaps not surprisingly, higher rates of psychological than physical aggression were seen. These findings coincide with previous studies

suggesting that psychological aggression is a more common form of relationship behavior (CDC, 2012; Holt & Espelage, 2005; Silverman et al., 2001). It may also be that psychological aggression is less costly and less risky in terms of negative outcomes for the perpetrator relative to engaging in physical aggression (Follingstad & Rogers, 2013).

Also, as expected, an active stable pattern labeled the Extensive Trajectory was shown for psychological and physical aggression. For psychological aggression, this pattern accounted for a quarter of the sample, but for physical aggression, this pattern accounted for only 6%. These rates are consistent with previous studies indicating that high stability in IPA is not representative of all individuals (Aldarondo, 1996; Lorber & O’Leary, 2004; Woffordt et al., 1994). This study shows that within a normative community sample, only a few individuals persist in the use of physical IPA over time. This suggests that for past community-based studies the empirical stability in physical IPA may be driven more by the low stable pattern than the high stable pattern (Capaldi et al., 2003; Fritz & Slep, 2009; O’Leary & Slep, 2003). A higher percentage of participants might be classified in an Extensive Trajectory should this study be replicated in a more at-risk sample. Nevertheless, current findings suggest that in a normative, community sample, an extensive stable pattern for both psychological and physical IPA, although relatively rare, is present at the transition from adolescence to young adulthood.

Importantly, the Extensive Trajectory involved a wider range of psychologically and physically aggressive behaviors than the others. Furthermore, 75% of the Extensive Trajectory for physical aggression was also in the Extensive Trajectory for psychological aggression, which means the Extensive Trajectory for physical aggression as an overall pattern appears to include the reliable co-occurrence of psychological aggression (Bookwala, Frieze, Smith, & Ryan, 1992;

Cano et al., 1998; Hamby & Sugarman, 1999; Murphy & O'Leary, 1989; O'Leary & Slep, 2003; O'Leary et al., 1994).

The expected increasing trajectory was also found for psychological (53%) and physical aggression (19%). An increasing pattern has been found in previous studies estimating multiple trajectories of IPA (Orpinas et al., 2012; Swartout et al., 2011a; 2012; Thompson et al., 2012). In the current study, this trajectory was called Minor/Increasing Trajectory because it appeared to start in adolescence with relatively minor forms of aggression reported by only a small fraction of the cases that ultimately are described by this class but over time more of these behaviors were expressed and by more class members. These increasing patterns may reflect a process whereby IPA is learned through the positive reinforcement of gaining desired outcomes in a relationship through the use of aggression (e.g., Bandura, 2001). Over time, as minor forms of IPA gain desired outcomes, other forms also may be employed. This class may be representative of Johnson's (1995; 2006; Johnson & Ferraro, 2000) situational couple violence. According to Johnson, situational couple violence generally arises from one or a series of arguments, mostly consists of minor aggression, and rarely leads to severe forms of aggression. Future studies will need to examine the motive behind the aggression in order to conclude that this group is an expression of situational couple violence.

Approximately 4% of participants reduced their use of physical aggression from adolescence into adulthood. This Decreasing Trajectory was characterized by extensive use of many types of physical aggression at age 18 but also dramatic declines for all types across waves. Studies show that impulsive behaviors decrease as adolescents increase in age (Steinberg et al., 2008), therefore, decreases in aggressiveness could occur as youth mature and become less impulsive. Alternatively, some initially aggressive youth may develop more relationship skills



and better conflict management skills as they gain relationship experience. Yet another alternative could be that those whose physical aggression decreases with time may have found its earlier use leading to undesirable outcomes. Although the Decreasing Trajectory was expected, it accounted for only a small fraction of the sample. This is somewhat surprising since it has been the defining pattern in some previous longitudinal studies on IPA among adolescents (Nocentini et al., 2010; Wolfe et al., 2003) and young adults (Fritz & O’Leary; Kim et al., 2008). Importantly, a decreasing pattern was not found for psychological aggression, perhaps because many of these behaviors are regarded as more normative in a context of relationship stress (e.g., insult, yell, and/or stomping away from an argument; Follingstad & Rogers, 2013). Behaviors that are regarded as less problematic may be less likely to decrease over time.

The finding of multiple trajectories of IPA from adolescence to young adulthood has implications for interventions targeting IPA among those making the transition to adulthood. Interventions may require different techniques attuned to the patterns of IPA relevant to the individual. For instance, individuals who tend to remain stable in their rates of perpetrating IPA may need more assistance from interventionists relative to individuals who decrease in their engagement of such behaviors, or individuals who are likely to increase in their reports of IPA over time. These findings also provide clinical implications by suggesting that clinicians may need to counsel individuals differently based on their pattern of IPA.

Although multiple trajectories of IPA emerged, it is important to note that in the current sample only minor forms of IPA were common enough to contribute to the analysis. This finding is in line with previous studies in community samples indicating that minor IPA occurs more frequently than severe IPA (Foshee et al., 2009; Katz, Kuffel, & Coblenz, 2002; Schnurr & Lohman, 2008). Some more severe aggressive behaviors were relevant to the decreasing and

extensive patterns, however. Therefore, trajectory shapes as well as the behaviors employed are important to the longitudinal study of IPA and there seems to be an association between severity and trajectory.

Another important finding was the strong covariation in trajectory memberships across psychological and physical aggression. The majority of participants who engaged in extensive physical aggression also perpetrated extensive psychological aggression. These results are in line with previous findings indicating a co-occurrence between psychological and physical aggression (Bookwala et al., 1992; Cano et al., 1998; Hamby & Sugarman, 1999; Murphy & O'Leary, 1989; O'Leary & Slep, 2003; O'Leary et al., 1994). Similarly, the other active patterns of physical aggression (Decreasing and Minor/Increasing Trajectories) were over-represented in the Extensive Trajectory for psychological aggression. In community samples, it seems that regardless of the pattern of active physical aggression, psychological aggression is prevalent (CDC, 2012; Holt & Espelage, 2005; Silverman et al., 2001). Also, the Little-to-None pattern for physical aggression was over-represented in the Minor/Increasing class for psychological aggression. These findings imply that psychological aggression may be a precursor to physical aggression.

Demographic differences consistent with previous studies were found. Specifically, females were over-represented in all active trajectories of both psychological and physical IPA, which coincides with previous studies suggesting that females are more aggressive than males (Archer, 2000; Jelz et al., 1996). However, female over-representation in the Minor/Increasing Trajectory for physical IPA, which is characterized by relatively minor aggression, is also consistent with research showing that females typically use less severe forms of physical aggression than males (Archer, 2002; Bookwala et al., 1992; Callahan, Tolman, & Saunders,

2003; Foo & Margolin, 1995; Foshee et al., 2009; Hamby & Sugarman, 1999). Furthermore, female over-representation in the Decreasing Trajectory for physical aggression is consistent with a greater tendency for females to become less aggressive over time (Nocentini et al., 2010; Wolfe et al., 2003).

Trajectories characterized by more extensive physical or psychological IPA over-represented African-Americans, lower SES and/or lower educational attainment. These findings mirror previous studies (Aldarondo & Sugarman, 1996; Caetano et al., 2005; Holt & Espelage, 2005; O'Keefe, 1998) and suggest that the Extensive Trajectories for psychological and physical IPA may include more vulnerable participants. However, the Decreasing Trajectory for physical IPA also over represented these more vulnerable traits. Perhaps at-risk individuals within this trajectory may find more effective ways of dealing with conflicts over time. Because both the Extensive and Decreasing pattern can both be identified with more vulnerable participants, the value in identifying multiple trajectories becomes evident. Different classes of behavior can emerge from similar individuals.

Lastly, cohabitation appears to be linked with IPA for this sample. Participants with any cohabiting experience were over represented in the Extensive Trajectory for psychological IPA and all active physical IPA trajectories. These finding coincide with Rhoades et al. (2012) that rates of IPA are higher among cohabiting couples compared to dating couples. However, it was the Decreasing Trajectory for physical aggression that had more years of cohabitation compared to all other classes. It has been argued that cohabiters may be less invested in their relationships and hence more likely to engage in IPA (Stafford et al., 2004; Stets, 1991), but perhaps longer cohabitation either selects more invested couples or increases their sense of investment leading to a reduction in IPA. Also important, participants who were married and/or cohabited for a

longer period of time were more likely to be categorized in the Extensive Trajectory for psychological IPA. If such behaviors are more normative (Follingstad & Rogers, 2013), individuals in longer term relationships may have more opportunities to engage in psychological aggression.

### **Limitations**

There are several limitations to the current analysis that need to be considered. An important one is that certain items used to assess IPA behaviors were not identical across waves. However, these items assessed the same or similar behaviors, just worded differently, and thus were constrained to equality across waves. In addition, two different response scales were used at different waves. Although the scale inconsistencies were resolved by dichotomizing all items, this solution created another issue. Behavioral indicators of IPA are qualitative (any vs. none) rather than continuous. The trajectories, therefore, reflect patterns based on the occurrence of aggressive behaviors rather than the amount. Greater aggressiveness is interpreted in terms of more types of IPA rather than more amounts of it. Nevertheless, a benefit of using the dichotomized data was that the very highly skewed data became considerably less skewed. Future research will be necessary to see how the trajectories described here appear if continuous data are used.

The fact that the majority of the items included in the analysis reflect minor forms of IPA might be considered another limitation. However, in the current community based sample the most severe forms of IPA available, “I used a knife or gun on my partner; I choked my partner; and I beat up my partner,” had no variance and had to be excluded from the analysis. Therefore, it is unlikely that the variety of highly aggressive behaviors assessed in the CTS and CTS2 would apply to the participants in this sample.

The sample is representative of the public school students in the three cities from which they were recruited, but it may not represent the general population. A similar study undertaken with a more diverse nationally representative sample or a more vulnerable sample (e.g., juvenile delinquents, inner city youths, low SES adolescents) could well reveal the same trajectories but with individuals distributed among the trajectories quite differently.

This study is also limited by the fact that the IPA assessments started at age 18. One psychological and two physical aggression trajectories already revealed extensive aggression at that age. Past studies have shown that adolescents may become involved in relationship aggression as early as age 12 (RTI International, 2012). To develop trajectories of IPA from their true points of initiation, it will be necessary to study adolescent aggression longitudinally beginning at a much earlier age.

### **Contributions**

The present study contributes to the literature by examining multiple rates of change in IPA from adolescence to young adulthood. The majority of previous studies focusing on change in IPA have estimated one trajectory over time (Capaldi et al., 2003; Fritz & O’Leary, 2004; Fritz & Slep, 2009; Kim et al., 2008; Nocentini et al., 2010; O’Leary & Slep, 2003; Wolfe et al., 2003) typically over a period of two years or less. The few recent studies that have investigated multiple rates of change in IPA have not examined nor compared patterns for both psychological and physical aggression nor have they examined the behaviors expressed within patterns (Orpinas et al., 2012; Swartout et al., 2011a; 2012; Thompson et al., 2012). These factors are important to understand as adolescents who engage in IPA are more likely to report similar behaviors as young adults (Cui et al., 2013; Gomez, 2011; Halpern et al., 2009; Smith et al.,

2003; Spriggs et al., 2009). The present study adds to the literature by increasing our understanding of the complexity of change in IPA over time.

Additionally, the present study's findings have implications for targeting interventions. A one-size intervention is unlikely to fit all if there are multiple patterns of IPA especially if those patterns emerge for different reasons. Also relevant to the differential targeting of interventions are the demographic differences between trajectories. Social address is important in understanding patterns of change in IPA.

In contrast to previous latent class studies on IPA where composite aggression variables masked the contributions of individual behaviors, the present study examined for each identified trajectory the relevance of specific aggressive behaviors. Not all behaviors were equally relevant across patterns. This suggests that trajectories are characterized by both the types of IPA being expressed and by the shape of the trajectory itself.

### **Future Directions**

The present study is a stepping stone in increasing our understanding of change in IPA from adolescence to young adulthood. Future studies will need to replicate the identified patterns in other more nationally representative community samples and in more vulnerable populations. It will also be critical to assess the motives behind the aggression in order to understand more clearly what drives adolescents to change or remain stable in their engagement of IPA as they become young adults. Understanding the driving forces of the aggression will allow for the examination of differences in the patterns of change in perpetration and victimization of IPA. This may also help clinicians and interventionists find effective ways to reach individuals based on their patterns of aggression over time. Additionally, future work should examine factors that distinguish these trajectories using theoretical perspectives present in the literature.

Table 1. *Fit statistics for psychological aggression classes (N = 484).*

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
<b>Three-Class</b>	<b>9901.392</b>	<b>10303.228</b>	<b>344.431 (<math>p &lt; .05</math>)</b>	<b>0.763</b>
Four-Class	9743.710	10201.185	154.898 ( $p = .43$ )	0.713

*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. *Logit values and odd ratios for psychological aggression at each wave per class (N = 484).*

	Class 1: Minor/Increasing Trajectory ( $n = 255$ )		Class 2: Extensive Trajectory ( $n = 119$ )		Class 3: Little-to-None Trajectory ( $n = 110$ )	
	Logit Means	Odds Ratios	Logit Means	Odds Ratios	Logit Means	Odds Ratios
Age 18	.660	.659	2.716 <sup>***</sup>	.937	0.000	.500
Age 19	.733	.675	3.268 <sup>***</sup>	.963	0.000	.500
Age 20	.627	.652	3.180 <sup>***</sup>	.960	0.000	.500
Age 21	1.501 <sup>~</sup>	.818	3.911 <sup>***</sup>	.980	0.000	.500
Age 22	2.923 <sup>***</sup>	.949	5.446 <sup>***</sup>	.996	0.000	.500
Age 23	3.210 <sup>***</sup>	.961	5.098 <sup>***</sup>	.994	0.000	.500
Age 24	3.266 <sup>***</sup>	.963	5.667 <sup>***</sup>	.997	0.000	.500
Age 25	3.316 <sup>***</sup>	.965	5.594 <sup>***</sup>	.996	0.000	.500

<sup>~</sup> $p < .10$ , <sup>\*\*\*</sup> $p < .001$

Table 3. Demographic differences across classes for psychological aggression ( $N = 484$ ).

	Class 1: Minor/Increasing Trajectory ( $n = 255$ )	Class 2: Extensive Trajectory ( $n = 119$ )	Class 3: Little-to-None Trajectory ( $n = 110$ )
<b>Cross-Tabulation Results</b>			
<b>Sex*</b>			
Male (48.1%)	45.1%	43.7%	60.0% <sup>o</sup>
Female (51.9%)	54.9%	56.3%	40.0% <sup>u</sup>
<b>Race</b>			
White/Other (83.7%)	83.9%	79.0%	88.2%
Black (16.3%)	16.1%	21.0%	11.8%
<b>Cohabitation*</b>			
No (50.2%)	51.0%	41.2% <sup>u</sup>	58.2% <sup>o</sup>
Yes (49.8%)	49.0%	58.8% <sup>o</sup>	41.8% <sup>u</sup>
<b>Married</b>			
No (66.3%)	64.7%	63.0%	73.6%
Yes (33.7%)	35.3%	37.0%	26.4%
<b>ANOVA Results</b>			
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
SES <sup>***</sup>	3.44 <sup>a</sup> (1.21)	3.01 <sup>b</sup> (1.12)	3.53 <sup>a</sup> (1.10)
Educational Attainment <sup>***</sup>	2.98 <sup>a</sup> (1.00)	2.34 <sup>b</sup> (1.03)	3.16 <sup>a</sup> (1.00)
Years of Cohab. <sup>*</sup>	1.04 <sup>ab</sup> (1.36)	1.34 <sup>a</sup> (1.67)	.82 <sup>b</sup> (1.22)
Years Married <sup>~</sup>	1.01 <sup>ab</sup> (1.70)	1.31 <sup>a</sup> (2.15)	.79 <sup>b</sup> (1.53)

*Note.* Percentages of the total sample are presented under cross-tabulation results. <sup>o</sup> (Over-represented), <sup>u</sup> (Under-represented). Means (standard deviations in parentheses) are reported for ANOVA results. Superscripts indicate significant differences between classes. Classes who share the same superscript were not significantly different from each other. Cohab. (Cohabitation); <sup>~</sup> $p < .10$ , <sup>\*</sup> $p < .05$ , <sup>\*\*\*</sup> $p < .001$ .



Table 4. *Fit statistics for physical aggression classes (N = 477).*

Model	-2LL	BIC	Adj. LRT	Entropy
One-Class	5657.098	5965.473	-	1.000
Two-Class	4595.780	4953.495	1049.969 ( $p < .01$ )	0.902
Three-Class	4383.310	4790.366	208.249 ( $p = .20$ )	0.813
<b>Four-Class</b>	<b>4272.186</b>	<b>4728.582</b>	<b>108.917 (<math>p = .21</math>)</b>	<b>0.827</b>
Five-Class	4179.884	4685.621	90.467 ( $p = .21$ )	0.794

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

Table 5. *Logit values and odd ratios for physical aggression at each wave per class (N = 477).*

	Class 1: Decreasing Trajectory ( $n = 21$ )		Class 2: Minor/Increasing Trajectory ( $n = 89$ )		Class 3: Extensive Trajectory ( $n = 28$ )		Class 4: Little-to-None Trajectory ( $n = 339$ )	
	Logit Means	Odds Ratios	Logit Means	Odds Ratios	Logit Means	Odds Ratios	Logit Means	Odds Ratios
Age 18	6.797 <sup>***</sup>	.999	1.257	.779	4.675 <sup>***</sup>	.991	0.000	.500
Age 19	5.773 <sup>***</sup>	.997	2.858 <sup>**</sup>	.946	4.504 <sup>***</sup>	.989	0.000	.500
Age 20	4.604 <sup>**</sup>	.990	3.777 <sup>*</sup>	.978	4.393 <sup>**</sup>	.988	0.000	.500
Age 22	1.177 <sup>**</sup>	.764	4.486 <sup>***</sup>	.989	6.022 <sup>***</sup>	.998	0.000	.500
Age 23	2.300	.901	3.536 <sup>***</sup>	.972	7.204 <sup>***</sup>	.999	0.000	.500
Age 24	5.765 <sup>***</sup>	.997	4.325 <sup>***</sup>	.987	7.261 <sup>***</sup>	.999	0.000	.500
Age 25	4.120 <sup>**</sup>	.984	3.521 <sup>***</sup>	.971	5.847 <sup>***</sup>	.997	0.000	.500

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 6. Demographic differences across classes for physical aggression (N = 477).

	Class 1: Decreasing Trajectory (n = 21)	Class 2: Minor/Increasing Trajectory (n = 89)	Class 3: Extensive Trajectory (n = 28)	Class 4: Little-to-None Trajectory (n = 339)
<b>Cross-Tabulation Results</b>				
<b>Sex *</b>				
Male (48.2%)	23.8% <sup>u</sup>	40.4% <sup>u</sup>	42.9%	52.2% <sup>o</sup>
Female (51.8%)	76.2% <sup>o</sup>	59.6% <sup>o</sup>	57.1%	47.8% <sup>u</sup>
<b>Race ***</b>				
White/Other (84.1%)	66.7%	71.9% <sup>u</sup>	67.9%	89.7% <sup>o</sup>
Black (15.9%)	33.3% <sup>o</sup>	28.1% <sup>o</sup>	32.1% <sup>o</sup>	10.3% <sup>u</sup>
<b>Cohabitation **</b>				
No (52.2%)	23.8% <sup>u</sup>	44.9%	39.3%	56.9% <sup>o</sup>
Yes (47.8%)	76.2% <sup>o</sup>	55.1% <sup>o</sup>	60.7% <sup>o</sup>	43.1% <sup>u</sup>
<b>Married</b>				
No (65.8%)	57.1%	64.0%	71.4%	66.4%
Yes (34.2%)	42.9%	36.0%	28.6%	33.6%
<b>Psych Classes ***</b>				
Minor/Increasing (52.6%)	38.1% (3.2%)	42.7% <sup>u</sup> (15.1%)	25.0% <sup>u</sup> (2.8%)	58.4% <sup>o</sup> (78.9%)
Extensive (24.3%)	57.1% <sup>o</sup> (10.3%)	53.9% <sup>o</sup> (41.4%)	75.0% <sup>o</sup> (18.1%)	10.3% <sup>u</sup> (30.2%)
Little-to-None (23.1%)	4.8% <sup>u</sup> (0.9%)	3.4% <sup>u</sup> (2.7%)	0.0% <sup>u</sup> (0.0%)	31.3% <sup>o</sup> (96.4%)
<b>ANOVA Results</b>				
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
SES <sup>***</sup>	2.76 <sup>a</sup> (1.22)	3.20 <sup>ab</sup> (1.32)	2.78 <sup>a</sup> (1.15)	3.48 <sup>b</sup> (1.12)
Educational Attainment <sup>***</sup>	2.38 <sup>a</sup> (1.07)	2.55 <sup>a</sup> (1.09)	2.25 <sup>a</sup> (1.08)	3.02 <sup>b</sup> (1.00)
Years of Cohab. <sup>**</sup>	1.95 <sup>a</sup> (1.60)	1.07 <sup>b</sup> (1.34)	1.11 <sup>ab</sup> (1.42)	.87 <sup>b</sup> (1.23)
Years Married	1.10 (1.64)	1.22 (1.91)	.61 (1.26)	.92 (1.54)

*Note.* Percentages of the total sample are presented under cross-tabulation results. <sup>o</sup> (Over-represented), <sup>u</sup> (Under-represented). Percentages in parentheses are row percents. Means (standard deviations in parentheses) are reported for ANOVA results. Superscripts indicate significant differences between classes. Classes who share the same superscript were not significantly different from each other. Cohab. (Cohabitation); \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

### III. Study 2

#### Predictors of Classes of Interpartner Aggression from Late Adolescence to Young Adulthood

##### Abstract

Saint-Eloi Cadely et al. (2015) found multiple patterns of change for psychological and physical forms of interpartner aggression. The current study examined the following theoretical and empirical predictors of these patterns: interparental aggression, social-information processing (SIP) biases, insecure attachment styles, and discontinuity of relationship partner over time. Participants were 484 individuals who provided data on interpartner aggression in at least one of eight annual waves of data collected for the ages of 18-25. Results revealed distinctive patterns of predictors for the several previously identified trajectories. Specifically, participants whose reports of psychological and physical aggression were higher and stable were more likely to have witnessed interparental aggression, have high levels of SIP biases, endorse an insecure attachment style, and, for psychological aggression only, report more stability in relationship partner. The increasing patterns of psychological and physical aggression were both predicted by SIP biases and the preoccupied attachment style. The increasing pattern of physical aggression was also predicted by the fearful attachment style and stability in relationship partner. Finally, the decreasing trajectory of physical aggression was predicted by the preoccupied attachment style and SIP biases.

*Keywords:* interpartner aggression, interparental aggression, social-information processing biases, insecure attachment styles, discontinuity of relationship partner

## Predictors of Classes of Interpartner Aggression from Late Adolescence to Young Adulthood

Recent studies on interpartner aggression (IPA) suggest that these behaviors may change in various patterns over time (Orpinas, Nahapetyan, Song, McNicholas, & Reeves, 2012; Swartout, Cook, & White, 2012; Swartout, Swartout, & White, 2011; Thompson, Swartout, & Koss, 2012). Through latent class analysis, Saint-Eloi Cadely et al. (2015) expanded on these findings by identifying multiple trajectories (that will also be referred to as patterns or classes) in the perpetration of psychological and physical forms of IPA from late adolescence to young adulthood.

Three trajectories (patterns or classes) were found for psychological IPA (Minor/Increasing, Extensive, and Little-to-None) based on reports of the following behaviors: insulting, destroying belongings, yelling, threatening, stomping away from an argument, put downs, and spitefulness. Participants within the Minor/Increasing pattern ( $n = 255$ ; 53% of the sample) used mostly minor forms of psychological IPA but increased in their use of these behaviors across waves. Participants within the Extensive pattern ( $n = 119$ ; 24%) consistently engaged in most forms of psychological IPA. Lastly, the Little-to-None pattern ( $n = 110$ ; 23%) involved the use of little, if any, psychological IPA across waves.

Four patterns were indicated for physical IPA (Decreasing, Extensive, Minor/Increasing, and Little-to-None) 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. Two patterns had small memberships. Approximately 4% of the sample ( $n = 21$ ) were classified in the Decreasing pattern, which initially had high levels of all forms of physical IPA, but decreased in these behaviors over time. The Extensive pattern was similarly small. Its members ( $n = 28$ ; 6%) persistently engaged in many forms of physical IPA across waves. Participants grouped in the larger Minor/Increasing pattern ( $n = 89$ ; 19%) tended

to use mostly minor forms of physical IPA, but they increased in these behaviors across waves. Finally, the majority of the sample ( $n = 339$ ; 71%) was characterized in the Little-to-None pattern and reported very little to no perpetration of physical IPA across waves.

The present study seeks to extend the findings of Saint-Eloi Cadely et al. (2015) by examining predictors of memberships in these patterns. Four variables representing theoretical perspectives that may explain adolescents' perceptions of close relationships are treated as predictors of the identified IPA trajectories. These four variables and their respective theories are: (a) interparental aggression (social-learning theory), (b) social-information processing biases (social-information processing theory), (c) insecure attachment styles (attachment theory), and (d) discontinuity of relationship partner (systems theory). Of particular interest is whether these variables predict membership in some trajectories better than other ones.

### **Interparental Aggression**

Social-learning (social-cognitive) theory (Bandura, 1978; 2001) states that human behavior is shaped by individuals' cognitive representations which are largely influenced through observational learning. Specifically, individuals enact behaviors that they observed leading to desirable outcomes for others. Witnessing these behavior-outcome linkages may lead to feeling favorable toward the behavior (Lichter & McCloskey, 2004) and increase the likelihood of repeating it in a similar situation (O'Keefe, 1998). The concept of observational learning has been essential to understanding IPA. The literature has shown that children and adolescents growing up in a home where parents used violence in their relationship are more likely to report similar behaviors in their own romantic relationships (Jouriles, Muelles, Rosenfield, McDonald, & Dodson, 2012; Malik, Sorenson, & Aneshensel, 1997; Wolf & Foshee,

2003). This intergenerational transmission is attributed to learning IPA through observing its use in the family of origin.

Prospective studies suggest that interparental aggression can have long-term consequences for romantic relationships. For instance, findings from Fite et al's. (2008) sample of 498 revealed that exposure as a toddler to interparental aggression increased the likelihood of IPA at ages 18-21. O'Leary, Malone, & Tyree (1994) studied 272 young adult couples and found that men who reported high levels of interparental aggression as children (assessed premaritally) were more likely to be physically aggressive to their spouse (assessed 30 months after marriage). Similarly, exposure to interparental aggression as an adolescent predicts IPA during adolescence and adulthood. Hare, Miga, & Allen (2009) found that 13 year old adolescents ( $N = 75$ ) who witnessed father-to-mother aggression were more likely to become perpetrators or victims of IPA at age 18. Choice, Lamke, & Pittman (1995) found men ( $N = 1,836$ ) who recalled from their adolescence that their parents were aggressive towards each other were more likely to engage in wife-battering. The present study therefore examines whether interparental aggression predicts membership in the latent classes of psychological and physical aggression.

### **Social-Information Processing (SIP) Biases**

Another social-cognitive model that has contributed to our understanding of IPA is social-information processing (SIP). SIP focuses on individuals' perceptions of social situations and the role of interpretation, meaning construction, and cognitive biases in aggressive behaviors (Crick & Dodge, 1994; Dodge, 1986). This model consists of five concurrent cognitive processes: (a) encoding: individuals are mindful of social cues in the social situation, (b) representation: individuals interpret the cues they perceived, (c) response search: individuals generate ways to respond to the situation, (d) response decision: individuals select a response to

the situation and (e) enactment: individuals enact the chosen response (Dodge). Cognitive biases can emerge with each of these processes and can promote the use of aggressive behavior in a social context. Recent studies have shown that SIP is a good predictor of IPA among adolescents and young adults. Fite et al. (2008) studied 498 adolescents who were aged 13-16 at the beginning of their study and found the SIP biases linked to response search and response decision predicted perpetration of IPA at ages 18-21. Pettit, Lansford, Malone, Dodge, and Bates (2010) using the same sample as the current study found that victims of IPA at age 18 reported more SIP biases (hostile interpretations of hypothetical scenarios) towards both peers and romantic partners at age 22.

Previous studies have shown that men who physically abuse their wives are more likely than non-violent men to make negative attributions in marital conflict situations (Copenhagen, 2000; Holtzworth-Munroe, Rehman, & Herron, 2000). Clements and Holtzworth-Munroe (2008) found the same relationship between hostile attributions and abusive behaviors for violent wives in 71 couples. Clearly, SIP is a useful model for understanding romantic aggression. Individuals with more of these social cognitive biases are more likely to be aggressive in their relationships over time. Therefore, SIP biases are examined as predictors of class membership in the present study.

### **Insecure Attachment Styles**

Attachment theory states that individuals develop internal working models of the self and others. Specifically, beginning in infancy, through day-to-day interactions with caregivers individuals may create a perception of themselves as being worthy of love and affection or not and may develop a sense of others as being available to address their needs or not. These perceptions of self and others are carried through development to adulthood and can influence

how individuals interact within relationships (Bowlby, 1989; Collins & Allard, 2001). In romantic relationships, individuals with a positive model of self feel worthy of love and are confident in developing intimacy with others, whereas individuals with a negative model of self may feel undeserving of love. Those with a positive model of others trust others to be responsive and caring toward them whereas those with a negative model of others may feel uncomfortable trusting a partner. In either case, the insecurity is expected to hinder intimacy.

Bartholomew (1990; Bartholomew & Horowitz, 1991), assesses security-insecurity on two continuous dimensions representing anxiety about relationships (model of self) and avoidance of closeness (model of others). The preoccupied attachment style is characterized by a negative view of the self but a positive view of others. These individuals are generally needy, anxious, and overly-dependent on their romantic partner. The dismissive attachment style is evident in individuals who have high regard for themselves but keep their romantic partners at a distance. Often these individuals are avoidant and distrusting of their partner. Lastly, the fearful attachment style is seen in individuals who perceive themselves and others in a negative light. These individuals are distant in their romantic relationships, and although they desire intimacy, they are uncomfortable acting on this desire out of fear of rejection. Romantic attachment styles develop with romantic relationship experience and are related to IPA among adolescents and young adults (Dutton et al., 1994; Miga et al., 2010). Assessments are available for the preoccupied and fearful attachment styles, hence they are our focus in this section.

Miga et al. (2010) studied 93 adolescents and found that having a preoccupied attachment style at the age of 14 was associated with perpetration of psychological and physical aggression at age 18. Babcock et al. (2000) found that married men ( $N = 36$ ) who were classified as preoccupied were more likely to resort to violence when their wives attempted to withdraw



during a conflict. These studies support a link between preoccupied attachment and aggression; however, research by Dutton et al. (1994) suggests the fearful attachment style may be an even greater risk factor. Among 160 married men, Dutton et al. showed that a fearful attachment style was associated with higher levels of anger, traumatic symptoms, jealousy, and borderline personality disorder than was a preoccupied attachment style. These attributes are related to romantic aggression (Bookwala, Frieze, Smith, & Ryan, 1992; Cano, Avery-Leaf, Cascardi, & O'Leary, 1998; Dutton et al.; Giordano et al., 2010).

Together, these findings support the conclusion that the fearful and preoccupied attachment styles are related to IPA. The preoccupied attachment style may promote IPA as a way to gain a partner's attention (Babcock et al., 2000). The fearful attachment style may promote IPA through the confusing mix of emotions that include desire for intimacy, feelings of unworthiness and the anger and jealousy that seem common to this style (Dutton et al., 1994). The present study investigates the associations of preoccupied and fearful attachment styles on the multiple patterns of psychological and physical aggression that emerge over time.

### **Discontinuity of Relationship Partner**

According to systems theory, relationships represent a system. A system according to this theory represents the type of interactions between two or more people. Changes in the elements of a system can influence relationship contexts, which in turn can affect the behaviors within relationships (Whitchurch & Constantine, 1993). In the developmental transition from adolescence to young adulthood, it is likely that individuals will change relationship partners from time to time, particularly since relationships in adolescence tend to be transient (Carver, Joyner, & Udry, 2003; Collins, 2003). As individuals change relationship partners, the context of the relationship changes, which may lead to change in behaviors as the individuals adapt to the

new relationship. Systems theory also suggests that violence within a romantic relationship can become a stabilized pattern. As partners stay in aggressive relationships a pattern of aggression emerges (Giles-Sims, 1983). However, this pattern depends at least in part on consistency in relationship partners. This notion has been supported in previous studies examining the linkages between discontinuity of dating partner and IPA. Fritz and Slep (2009) studied this phenomenon in a sample of 664 middle adolescents over the course of one year. They found that adolescents who remained with the same dating partner for that full year tended to report consistent levels of psychological IPA, whereas those who changed dating partners on average reported lower levels of such behaviors throughout the study. Capaldi, Shortt, & Crosby (2003) showed similar results with 105 late adolescents across a two-year interval. These findings suggest that continuity in relationship partner is related to continuity in the interpersonal behavior system of the relationship which sustains IPA over time, whereas change in relationship partner may create change in that behavior system which could in turn change the likelihood of aggression. In keeping with this research and logic, the present study examines the role of continuity and discontinuity of relationship partner as a predictor of class memberships of romantic aggression from late adolescence to young adulthood.

### **The Present Study**

In summary, the predictors interparental aggression, SIP biases, insecure attachment styles, and discontinuity of relationship partner are conceptualized as predictors of patterns of IPA. They are expected to predict class memberships in psychological (Minor/Increasing, Extensive, and Little-to-None) and physical (Decreasing, Minor/Increasing, Extensive, and Little-to-None) forms of IPA. Previous studies which have largely treated aggression as a unitary phenomenon would lead to the expectation that all of these variables will differentiate between

the two stable classes: Extensive and Little-to-None. However, since both changing patterns are also active patterns of IPA in spite of being relatively low at the beginning (Minor/Increasing) or at the end (Decreasing), all active patterns can be expected to be different in some ways from the Little-to-None Classes. At the same time, the two changing patterns may differ from the other active pattern in some ways and from both stable patterns in other ways. No specific hypotheses are made regarding how the active aggressive classes will differ from each other due to lack of theoretical and empirical foundations. However, based on prior research and theory suggesting that discontinuity of relationship partner may introduce a pattern of change in relationship aggression, it is expected that discontinuity in relationship partner will predict membership in the increasing and decreasing classes compared to either stable classes. Prior research also suggests the importance of controlling for gender (Archer, 2000; 2004; Cano, Avery-Leaf, Cascardi, & O'Leary, 1998), race (Caetano, Field, Ramisetty-Mikler, & McGrathm, 2005; Holt & Espelage, 2005), and socioeconomic status (SES) (Aldarondo & Sugarman, 1996; O'Keefe, 1998) in the analysis.

## **Method**

### **Participants and Procedure**

Participants were 585 individuals who participated in a 24-year longitudinal study known as the Child Development Project (CDP). The purpose of the CDP was to examine social development from childhood to adulthood. Data collection took place in Knoxville, Tennessee, Nashville, Tennessee, and Bloomington, Indiana. Participants who left these sites were followed across this 24-year period if possible.

Data collection began when participants were five years old and continued annually until the age of 29. Data were collected from two cohorts beginning in 1987 and 1988. Approximately

five to ten school districts within each city were targeted. Recruitment for the CDP began when parents were registering their children for the kindergarten of the selected schools. Roughly 85% of participants were recruited in this manner, whereas 15% of the sample was recruited at the beginning of the school year since they were not pre-registered in the summer before kindergarten. Approximately 91.6% of the original sample ( $n = 536$ ) were reached for data collection at the ages of 18-25, which is an excellent retention rate for a longitudinal study such as this.

IPA data were collected annually from participants who were in a dating/cohabiting/marital relationship during the reporting year from the ages of 18-25. Approximately 44.3% of participants were romantically involved at the age of 18, and this percentage increased to 64.9% at the age of 25; 5% were cohabiting/married at 18, compared to 43.8% at 25 (see Appendix A). Only participants who were romantically involved and provided IPA data for at least one wave were included in the analysis of the present study. On average, participants reported IPA data for five waves ( $M = 4.80$ ;  $SD = 2.24$ ) (see Appendix B). This exclusion resulted in an analysis sample of 484 participants (82.7% of the original sample; 90.3% of the retained sample). Around 52% of the analysis sample was female, 82.2% were European-American, 16.3% were African-American, and 1.4% identified as Other. At the beginning of the study, the Hollingshead SES scale (1979) indicated that the majority of participant family incomes were middle-class ( $M = \$40,003$ ;  $SD = 13.99$ ; range: \$8,000 - \$66,000 in 1987 dollars). Approximately 87% of participants' mothers and 75% of participants' fathers had a high school education or more. Data on parents' marital status were collected periodically and showed that 62.2% of participants' parents were married, and 0.6% were cohabiting at the beginning of the study. When participants were 17, 55.2% of parents were

married and 1.7% were cohabiting. Participants' educational attainment was assessed from the ages of 19-24, and showed that 69.4% had graduated high school by the age of 19, and 66.1% had an education beyond high school at the age of 24. It should be noted that the analysis sample is representative of the communities where the data were collected but is not nationally representative. The analysis sample was compared with the excluded sample and no differences were found on the variables of interest.

## **Measures**

**IPA classes.** In a prior study (Saint-Eloi Cadely et al., 2015), latent class analyses revealed multiple patterns of change for psychological and physical forms of IPA. Three trajectories were found for psychological aggression: (a) Minor/Increasing ( $n = 255$ ; perpetration of largely minor forms of psychological IPA increasing from age 18 to 25), (b) Extensive ( $n = 119$ ; consistent use of various forms of psychological IPA over time), and (c) Little-to-None ( $n = 110$ ; very little use of psychological IPA). Four trajectories were shown for physical aggression: (a) Decreasing ( $n = 21$ ; perpetration of various forms of physical IPA decreasing across waves), (b) Minor/Increasing ( $n = 89$ ; use of minor forms of physical IPA increasing across waves), (c) Extensive ( $n = 28$ ; consistent perpetration of many types of physical IPA), and (d) Little-to-None ( $n = 339$ ; very little physical IPA). Psychological and physical aggression were examined separately with class membership treated as the categorical dependent variables in the present study.

**Interparental aggression.** Participants' mothers reported on aggression occurring between herself and her spouse/partner via semi-structured interviews when participants were 16 years old. A composite score based on the mean of seven items derived from the CTS (Straus, 1979) was calculated. Five items assessed psychological forms of interparental aggression (e.g.,

“Yelled, insulted, or swore”) and the remaining two items assessed physical forms of interparental aggression (e.g., “Pushed, grabbed, or shoved”). Items were rated on a 7-point scale ranging from 0 (*Never*) to 6 (*Almost every day*) ( $\alpha = .77$ ). Higher scores indicated higher levels of aggression between parents.

**SIP biases.** SIP biases were evaluated for participants at the age of 16 (Lansford et al., 2006). Participants were presented with 12 vignettes featuring an ambiguous social situation between two adolescents or between an adolescent and an adult that could potentially lead to a conflict. Participants took the role of the protagonist in each vignette and answered questions pertaining to the information processing components central to the SIP model.

The first component, *goal clarification*, represents the attending and encoding phases of information processing and was assessed in terms of the interpersonal goals participants believed they would have if facing that situation. The goals could be instrumental (“You’d want the other person to respect you”) or interpersonal (“You’d want the other person to like you”). The theory suggests that participants who strive for more interpersonal goals may be less likely to make negative attributions and less likely to choose an aggressive response in the hopes of being liked (Crick & Dodge, 1994). Therefore, the score for goal clarification was calculated as the number of instrumental goals across the 12 vignettes. Higher scores indicated more SIP biases ( $\alpha = .80$ ).

The representation process was assessed through hostile attributions. For each of the 12 vignettes, participants answered two items regarding their interpretations of the antagonists’ motivations (“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?”). Answers to both questions were rated on a 5-point scale where higher scores indicated higher levels of interpreted meanness

and anger. A composite score was computed by taking the average of these 24 items and higher scores indicated more *hostile attribution bias* ( $\alpha = .85$ ).

The response search process was assessed in terms of a bias toward an aggressive response. Participants chose between a non-aggressive and an aggressive hypothetical response to each vignette. The *aggressive response bias* score was the number of aggressive responses chosen across the 12 vignettes. Higher scores indicated more aggressive response bias ( $\alpha = .75$ ).

The response evaluation process was assessed only for the first six vignettes. For each vignette, participants answered four questions about the appropriateness and consequences of behaving aggressively given the scenario (“How good or bad do you think this is a way to act?”, “Would the other girl/boy be mean to you next time?”, “How would you feel about yourself if you acted like this?”, “How much would other people like you if they saw you acting like this?”). Items were rated on a 5-point scale where higher scores indicated more positive evaluations towards the aggressive response. A *response evaluation bias* score was created as the average of all 24 items ( $\alpha = .92$ ).

**Insecure attachment styles.** Romantic attachment styles were assessed when participants were 18 years old using items from the *Relationship Styles Questionnaire* (RSQ; Griffin & Bartholomew, 1994). Only the fearful and preoccupied styles were used in the present study. Four selected items made up the fearful style (e.g., “I find it difficult to depend on other people”) and two selected items made up the preoccupied style (e.g., “I find that others are reluctant to get as close as I would like”). Items were rated on a 5-point scale ranging from *Not at all like me* to *Very much like me*. For each style, a composite score was computed by taking the average of the relevant items coded so that higher scores indicated more insecurity. Cronbach

alpha was .77 for the fearful style and a correlation of .43 was shown for both items assessing the preoccupied style.

**Discontinuity of relationship partner.** At ages 19-25, participants were asked whether they were involved in a romantic relationship, and if so, how long they had been romantically involved with that partner. A variable reflecting the number of partner changes across waves was calculated based on whether participants reported being romantically involved with the same partner for more than 12 months, meaning they were with the same partner as the year before (coded “0”) or less than 12 months, meaning they were involved with a new partner (coded “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 participants contributed to calculate a ratio reflecting the percentage of waves participants changed partners out of the number of waves contributed.

**Control Variables.** Gender, race, and SES were controlled in the present study. **Gender** was dummy coded: 0 (*Male*), 1 (*Female*). **Race** was dummy coded: 0 (*European-Americans & Others*), 1 (*African-Americans*). **SES** was assessed as self-reported income at the beginning of the CDP study (hence in 1987 dollars) and was recoded on a 5-point scale where higher scores indicated higher income (1 = \$8,000-\$19,000, 2 = \$20,000-\$29,500, 3 = \$30,000-\$39,500, 4 = \$40,000-\$54,500, 5 = \$55,000-\$66,000) ( $M = 3.35$ ;  $SD = 1.18$ ). (See Table 1 for correlations and descriptive statistics for all predictors and controls).

### **Plan of Analysis**

Two sets of multinomial logistic regression (MLR) analyses examined whether class memberships could be predicted by theoretically relevant variables. One set considered the three trajectories of psychological aggression and the other considered the four trajectories for physical



aggression. 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 class versus the reference group. MLR results also include an odds ratio for each predictor interpreted as the likelihood that participants would belong to a particular class compared to the reference group given a one-unit increase in that predictor variable. In each of the current analyses, multiple MLR analyses were fit so that all possible comparisons were made among the three psychological IPA and among the four physical IPA classes. Models were estimated in MPLUS version 6 (Muthén & Muthén, 1998-2010). Variables associated with each theoretical framework were examined in a separate model predicting IPA classes with controls in order to examine how each variable, as a representative of its respective theory, distinctly explains various patterns of change in psychological and physical forms of IPA.

## **Results**

### **Psychological Aggression**

Table 2 presents the results of the MLR for the comparison of psychological IPA classes. Although not shown in the table so as to save space, the coefficients were estimated controlling for gender, race, and SES (see Appendix G for coefficients of control variables).

**Interparental aggression.** Interparental aggression was not a significant predictor of class membership in any comparisons of psychological IPA classes.

**SIP biases.** Aggressive response bias significantly predicted membership in psychological IPA classes.

***Minor/Increasing Class compared to the Little-to-None Class.*** Participants with high levels of aggressive response bias were significantly more likely to be grouped in the Minor/Increasing Class than the Little-to-None Class. A unit increase in aggressive response bias

was associated with a 45% greater chance of being grouped in the Minor/Increasing Class compared to the Little-to-None Class.

*Extensive Class compared to the Little-to-None Class.* Higher aggressive response bias also significantly differentiated the Extensive Class from the Little-to-None Class. A unit increase in aggressive response bias was associated with a 92% greater chance of being classified in the Extensive Class compared to the Little-to-None Class.

*Extensive Class compared to the Minor/Increasing Class.* Lastly, higher aggressive response bias significantly distinguished the Extensive Class from the Minor/Increasing Class. A unit increase in aggressive response bias was associated with a 33% greater chance of being categorized in the Extensive Class compared to the Minor/Increasing Class.

**Insecure attachment styles.** The preoccupied attachment style significantly differentiated both the Minor/Increasing and Extensive classes from the Little-to-None Class.

*Minor/Increasing Class compared to the Little-to-None Class.* A unit increase in the preoccupied attachment style was associated with a 40% greater chance of being classified in the Minor/Increasing Class compared to the Little-to-None Class.

*Extensive Class compared to the Little-to-None Class.* A unit increase in the preoccupied attachment style was associated with a 51% greater chance of being classified in the Extensive Class compared to the Little-to-None Class. A marginally significant distinction between the Extensive and Little-to-None Classes indicated that a unit increase in the fearful attachment style was associated with a 34% greater chance of being grouped in the Extensive Class.

**Discontinuity of relationship partner.** As expected, more continuity in relationship partners predicted a greater likelihood of being classified in the Extensive Class compared to either the Little-to-None and the Minor/Increasing classes.

*Extensive Class compared to the Little-to-None Class.* Individuals who changed relationship partners at every wave compared to those who had the same partner at all waves were 70% less likely to be classified in the Extensive Class compared to the Little-to-None Class.

*Extensive Class compared to the Minor/Increasing Class.* Similarly, partner changes at every wave versus having one continuous partner was related to a 64% lower likelihood of being grouped in the Extensive Class compared to the Minor/Increasing Class.

In terms of psychological aggression, many distinctions were found between the Extensive Class and the Little-to-None Class. The Extensive Class reported more aggressive response biases, a more preoccupied attachment style, a marginally more fearful attachment style, and less discontinuity of relationship partner. The other active class, Minor/Increasing, was also different from the Little-to-None Class with a more preoccupied attachment style, and more aggressive response biases. Finally, the two active classes were also distinguished from each other. The Extensive Class had more aggressive response biases and less discontinuity of relationship partner than the Minor/Increasing Class.

### **Physical Aggression**

Table 3 presents the results of the MLR for the comparisons of physical IPA classes. Again, gender, race, and SES are controlled but their coefficients are not shown (see Appendix G for coefficients of control variables).

**Interparental aggression.** The Extensive Class differed from all three other physical IPA classes in terms of interparental aggression. A unit increase in interparental aggression increased the likelihood of being classified in the Extensive Class by more than a doubling compared to all other classes. No other pairs of classes differed in terms of this predictor.

**SIP biases.** Memberships in physical IPA classes were predicted by hostile attribution and response evaluation biases.

*Minor/Increasing Class compared to the Little-to-None Class.* Higher response evaluation bias distinguished the Minor/Increasing Class from the Little-to-None Class. A unit increase in response evaluation bias more than doubled the chance of being classified in the Minor/Increasing Class compared to the Little-to-None Class.

*Extensive Class compared to the Little-to-None Class.* High levels of hostile attribution bias significantly predicted membership in the Extensive Class compared to the Little-to-None Class. A unit increase in hostile attribution bias increased the likelihood of being grouped in the Extensive Class by a tenfold compared to the Little-to-None Class.

*Extensive Class compared to the Decreasing Class.* High levels of hostile attributions and low levels of response evaluation biases significantly differentiated the Extensive Class from the Decreasing Class. A unit increase in hostile attributions increased the likelihood of being categorized in the Extensive Class by nearly eightfold and a unit increase in response evaluation bias was associated with an 84% lower likelihood of being grouped in the Extensive Class compared to the Decreasing Class.

*Extensive Class compared to the Minor/Increasing Class.* High levels of hostile attributions and low levels of response evaluation biases also distinguished the Extensive Class from the Minor/Increasing Class. A unit increase in hostile attributions increased the likelihood

of being classified in the Extensive Class by more than a tenfold, and a unit increase in response evaluation bias was associated with an 84% lower likelihood of being classified in the Extensive Class compared to the Minor/Increasing Class.

**Insecure attachment styles.** Insecure attachment styles differentiated among the stable classes (Extensive versus Little-to-None) and among the active classes (Decreasing and Minor/Increasing) of physical IPA.

*Decreasing Class compared to the Little-to-None Class.* High levels of a preoccupied attachment style predicted membership in the Decreasing Class compared to the Little-to-None Class. A unit increase in the preoccupied attachment style was related to an 82% greater chance of being classified in the Decreasing Class compared to the Little-to-None Class.

*Extensive Class compared to the Little-to-None Class.* High levels of fearful attachment styles predicted membership in the Extensive Class relative to the Little-to-None Class. A unit increase in the fearful attachment style was associated with a 56% greater chance of being categorized in the Extensive Class. A similar, marginally significant result for the preoccupied attachment style was also found. A unit increase in preoccupied attachment was related to a 52% greater chance of being classified in the Extensive Class compared to the Little-to-None Class.

*Minor/Increasing Class compared to the Decreasing Class.* Both insecure attachment styles predicted membership in the Minor/Increasing Class compared to the Decreasing Class. A unit increase in the fearful attachment style was associated with a 63% greater chance of being classified in the Minor/Increasing Class, and a unit increase in the preoccupied attachment style reduced the chance of being categorized in the Minor/Increasing Class by 47% compared to the Decreasing Class.

*Extensive Class compared to the Decreasing Class.* High levels of a fearful attachment style predicted membership in the Extensive Class compared to the Decreasing Class. A unit increase in the fearful attachment style was associated with a two-fold increase in the likelihood of being grouped in the Extensive Class compared to the Decreasing Class.

*Extensive Class compared to the Minor/Increasing Class.* High levels of a preoccupied attachment style predicted membership in the Extensive Class compared to the Minor/Increasing Class. A unit increase in the preoccupied attachment style was associated with a 56% greater chance of being categorized in the Extensive Class compared to the Minor/Increasing Class.

**Discontinuity of relationship partner.** Results showed that continuity in relationship partner distinguished the Minor/Increasing Class from the two stable classes, Little-to-None and Extensive.

*Minor/Increasing Class compared to the Little-to-None Class.* Less change in romantic partner (i.e., greater continuity) predicted membership in the Minor/Increasing Class compared to the Little-to-None Class. Individuals with the same partner at every wave were 65% more likely than to those with a new partner at every wave to be categorized in the Minor/Increasing Class compared to the Little-to-None Class. Less discontinuity (more continuity) in partners predicted membership in the Minor/Increasing Class.

*Extensive Class compared to the Minor/Increasing Class.* Discontinuity of relationship partner marginally differentiated the Extensive Class from the Minor/Increasing Class. Individuals with a different partner at every wave were more than twice as likely to be classified in the Extensive Class as those with the same partner at every wave.

To summarize, the Extensive Class was distinguished by high levels of interparental aggression, high levels of hostile attributions bias, high levels of a preoccupied and fearful

attachment styles, and discontinuity of relationship partner. Specifically, high levels of these variables differentiated the Extensive Class from all other classes. The Decreasing Class was characterized by high levels of response evaluation bias and high levels of a preoccupied attachment style. High levels of response evaluation bias distinguished the Decreasing Class from the Extensive Class and high levels of a preoccupied attachment style contrasted the Decreasing Class from the Minor/Increasing and the Little-to-None classes. So in at least one way, the Decreasing Class was distinguished from each of the other classes. The Minor/Increasing Class was characterized by high response evaluation bias, more fearful attachment style, and less discontinuity of relationship partner. Response evaluation bias differentiated the Minor/Increasing Class from the Little-to-None and Extensive classes and high levels of a fearful attachment style distinguished the Minor/Increasing Class from the Decreasing Class. Also, more continuity in relationship partner differentiated the Minor/Increasing Class from the Extensive Class and the Little-to-None Class. Again, therefore, in at least one way, the Minor/Increasing Class was distinct from every other class. Lastly, the Little-to-None Class differed from the Extensive Class by lower levels of interparental aggression, lower levels of hostile attribution bias, and lower levels of the preoccupied and fearful attachment styles. This class was also distinguished from the Minor/Increasing Class by less response evaluation bias and was contrasted from the Decreasing Class by lower levels of a preoccupied attachment style.

Because it could be argued that the identified trajectories reflect variations in historical levels of problem behavior, the analysis was replicated controlling for problem behaviors assessed at age 16 using the *Child Behavior Checklist* (CBCL; Achenbach, 1991). It was reasoned that, if the results change substantially with problem behaviors controlled, then the pattern of findings reported above may over-estimate differences among the trajectories.

However, the results of the alternative analysis replicated the above patterns with three minor exceptions: one finding that was statistically significant without behavior problems in the analysis became marginally significant ( $p < .10$ ) and two marginally significant findings became non-significant. No meaningful pattern changes emerged, suggesting that problem behaviors is not a critical control variable for this analysis.

### **Discussion**

The purpose of this study was to examine a set of theoretically driven predictors that could differentiate between the three classes of psychological IPA and the four classes of physical IPA identified in a previous study (Saint-Eloi Cadely et al., 2015). These constructs derive from different theoretical traditions but they have in common a capacity to influence relationship contexts and cognition. For instance, social-learning theory offers interparental aggression as an explanation for IPA. This theory asserts that youth learn aggressive behaviors from observing interparental aggression and their apparent consequences and then use these behaviors later in romantic relationships when it seems to promote desired outcomes. SIP emphasizes aggressive, hostile interpretations made during an interpersonal exchange which can lead to interpersonal aggression. Attachment theory considers attachment styles, which focus on cognitive/affective representations of self and others, and how these representations can impact behaviors in romantic relationships. Finally, discontinuity of relationship partner captures an aspect of systems theory whereby changes of relationship partner affect the context in which relationship decisions and behaviors occur. Results indicated that all constructs made significant contributions to distinguishing trajectories of psychological or physical IPA or both. Importantly however, the effects varied across patterns.



To summarize, the actively aggressive classes (Extensive, Minor/Increasing, and Decreasing) were differentiated from the Little-to-None Class in ways expected based on theory and prior research. For instance, for psychological aggression, more SIP bias in aggressive responses distinguished the Extensive and Minor/Increasing classes from the Little-to-None Class. Both attachment styles distinguished the Extensive Class from the Little-to-None Class, and the preoccupied attachment style separated the Minor/Increasing Class from the Little-to-None Class. Furthermore, less discontinuity in relationship partner differentiated the Extensive Class from the Little-to-None Class.

For physical aggression, the theoretically derived predictors differentiated the Little-to-None Class from each active class in at least one way. The Extensive Class had more interparental aggression at age 16 than the Little-to-None Class. The Minor/Increasing Class reported more SIP bias in response evaluations and the Extensive Class reported more SIP bias in hostile attributions than the Little-to-None Class. The Extensive Class had higher preoccupied and fearful attachment styles and the Decreasing Class had higher preoccupied attachment style than the Little-to-None Class. Lastly, less discontinuity in relationship partner distinguished the Minor/Increasing Class from the Little-to-None Class.

Perhaps more important than the distinctions between the active and inactive IPA classes are the distinctions among the aggressive classes of psychological and physical IPA. For psychological IPA, the Extensive Class had more SIP bias in aggressive responses and less discontinuity in relationship partner than the Minor/Increasing Class. For physical IPA, the Extensive Class reported more interparental aggression, more SIP bias in hostile attributions, and less SIP bias in response evaluations than the Minor/Increasing and Decreasing classes. The Decreasing Class was distinct in that it had the highest scores on the fearful attachment style

across all classes. The Minor/Increasing class was distinct among the active IPA classes in that it had the lowest scores on the preoccupied attachment style. Discontinuity in relationship partner differentiated the Extensive and Minor/Increasing classes in ways that are consistent with systems theory. For psychological aggression, where the Little-to-None and the Extensive classes were roughly equal in size, the Minor/Increasing Class had more partner discontinuity in relationship partners than the Extensive Class. Low discontinuity (higher continuity) contributed to pattern stability for the Extensive Class. For physical aggression, all actively aggressive classes were small in numbers. Here the Minor/Increasing Class had less discontinuity than either stable class (Extensive and Little-to-None). Therefore, it appears that low discontinuity (more continuity) of dating partner may promote the escalation of physical aggression, even though it appears to promote the stability of psychological aggression.

Overall, these findings bring some significant theoretical implications to the literature. Findings of the present study suggest that the theories represented by the noted above predictors not only help explain the occurrence versus non-occurrence of IPA but also the emergence of different patterns of IPA from late adolescence to young adulthood. For example, consistent with previous studies (e.g., Choice et al., 1995; Fite et al., 2008; Hare et al., 2009; O'Leary et al., 1994) and Bandura's (1978; 2001) social-learning theory, interparental aggression assessed at age 16 distinguished between the active and inactive stable patterns, and also distinguished the active stable pattern from the changing patterns of physical IPA. Interparental aggression seems to contribute to developing a behavior pattern characterized by extensive use of physical aggression. Interestingly, however, in this sample the two unstable patterns of aggression seemed unaffected by interparental aggression.

SIP biases also assessed at age 16 distinguished the longitudinal patterns of psychological and physical IPA. For instance, findings of the present study add to the literature on the linkage between aggressive response bias and IPA (Fite et al., 2008). For psychological IPA, adolescents who increase (Minor/Increasing Class) or are stable in its use (Extensive Class) are likely to regard aggression as an acceptable response to socially ambiguous situations. For physical aggression, response evaluation bias was again an important predictor to the Minor/Increasing and the Decreasing classes compared to the Extensive Class. This suggests that for physical aggression, the two changing classes (Minor/Increasing and Decreasing) are characterized by a greater tendency to view aggression as a viable response to social ambiguity whereas the stable aggressive class (Extensive) is characterized by the use of hostile attributions. This finding builds on previous research (Clements & Holtzworth-Munroe, 2008; Copenhagen, 2000; Holtzworth-Munroe et al., 2000; Pettit et al., 2010) by suggesting that an extensive pattern of physical aggression in particular may be linked to a tendency to consistently make negative, hostile interpretations of their partner's actions over time.

Findings also suggest that both the preoccupied and fearful attachment styles, assessed at age 18, may contribute to stability in IPA from adolescence to young adulthood. Specifically, the stable Extensive Class reports greater insecurity in terms of both preoccupied and fearful styles than the Little-to-None Class for psychological and physical IPA. The findings for physical aggression are more complex. The Extensive Class had higher fearful attachment scores at 18 than the class that would ultimately decrease, and higher preoccupied attachment scores at 18 than the class that would ultimately increase. Extensive use of physical aggression may reflect a response to substantial insecurity that, in the present sample, is manifested in high insecurity scores for both attachment dimensions. Both forms of insecurity suggest a cry for intimacy but

also a likely lack of skills for gaining that desired intimacy (Bartholomew, 1990; Bartholomew & Horowitz, 1991). These findings are also consistent with previous studies indicating a linkage between insecure attachment styles and the perpetration of psychological and physical forms of IPA (Babcock et al.; Dutton et al., 1994; Miga et al., 2010) but also extend the literature by showing that these styles differentiated the Extensive Class relative to the others.

Interestingly, the Minor/Increasing Class for psychological aggression reported more endorsement of a preoccupied attachment style at age 18 relative to the low stable class, whereas this class for physical aggression was characterized by higher levels of a fearful attachment style at age 18 compared to the Decreasing Class. Previous studies have shown that both attachment styles are related to the perpetration of IPA (Babcock et al., 2000; Dutton et al., 1994; Miga et al., 2010). Findings of the present study build on these studies by suggesting that over-dependence to one's romantic partner in late adolescence may lead to an increase in minor forms of psychological IPA up to adulthood, and an orientation to fear rejection at age 18 can also resort to this same pattern for physical aggression throughout this transitional period. Future studies will need to examine whether an increase in IPA is also related to higher endorsements of an insecure attachment style over time in order to understand this pattern more fully. Also, the Decreasing Class when compared to the Minor/Increasing Class had higher scores on the preoccupied attachment style. Recall that members of the Decreasing Class were highly engaged in physical IPA at age 18 but largely abandoned that practice over the following years. Their preoccupied style may have predicted their initial status but may say less about their trajectory.

Finally, the findings of continuity of relationship partner indicate the influence of systems-linked variables on patterns of IPA. Specifically, for psychological aggression, the Little-to-None and the Minor/Increasing classes both had greater discontinuity in relationship

partner than the Extensive Class. These findings suggest that stability in relationship partner among adolescents/young adults actively using psychological IPA provides a relationship context that supports stability in aggressive behaviors across time, whereas discontinuity is linked either to lower expressions (Little-to-None) or to the changing, Minor/Increasing Class (Whitchurch & Constantine, 1993). These findings extend previous work (Capaldi et al., 2003; Fritz & Slep, 2009) by showing that stability in relationship partner can differentiate between stable and unstable patterns of psychological IPA over time.

For physical aggression, the pattern is less clear. It was expected for the Extensive Class to have the greatest continuity, but instead, the Minor/Increasing Class had more continuity in relationship partner than either the Extensive or the Little-to-None classes. For the small classes of actively aggressive individuals in this sample, apparently remaining with the same partner over time mattered more for the escalation of aggression than the stability of its use within the context of a stable relationship. This is consistent with Giles-Sims' (1983) argument suggesting that a partner who remains in a relationship after the first occurrence of violence may increase the likelihood of such behaviors to re-occur.

In summary, all predictors distinguished at least one pattern from its counterparts for psychological and physical aggression. These results indicate that relationship linked context and cognition play a role in the pattern of change in IPA that emerges throughout the transitional period of adolescence to young adulthood. This suggests that as adolescents become young adults, they carry with them perceptions of romantic relationships that may have been developed through observing their parents' use of aggression, misinterpreting social cues, cognitive/affective representations one holds for self and others, and through change in relationship partner. These perceptions in turn can influence aggressive behaviors within

romantic relationships initially and over time and can also predict multiple patterns of change in relationship aggression from adolescence to young adulthood.

### **Limitations**

The primary limitation of the present study is that it is a secondary dataset and decisions regarding what to collect and how to collect it were made prior to the initiation of this study and without this study in mind. Interparental aggression strongly over-represented minor aggression in its assessment and hence may not be as powerful a discriminator as might be expected. Also, interparental aggression data were collected only from participants' mothers and it is unknown whether the child's experience is accurately represented in the mother's accounts. Although significant findings were shown, more findings may have been indicated with a better assessment of this variable.

Few items were used to assess insecure attachment styles, which created weakness in their assessments. Furthermore, findings for discontinuity of relationship partner should be treated with caution. The analysis sample consists of participants who provided IPA data for at least one of the reported waves. For those who provided multiple waves, those waves may not have been in consecutive years so reporting involvement with the partner for over a year does not automatically refer to the same partner in non-consecutive waves. Also, very few participants were represented in three out of the four classes for physical aggression (Saint-Eloi Cadely et al., 2015). Although this is expected in a community sample, this limitation affects the power in the findings. Another limitation of the present study is its lack of sample diversity. Approximately 82% of the sample were European-Americans and the majority were from middle-class households. Therefore, future studies will need to replicate these findings on a more diverse and more vulnerable populations. Nevertheless, the dataset covers an eight year time-span throughout

the developmental period of late adolescence to young adulthood and includes variables that address four relevant theories that have been applied to the understanding of IPA. These factors make this dataset rich and useful for addressing the present study's research goals.

### **Contributions**

Contributions of the present study include the examination of the effects of interparental aggression, SIP biases, insecure attachment styles, and discontinuity of relationship partner on class memberships of psychological and physical IPA over time. By indicating that these variables distinguished between active and inactive patterns and between stable and changing patterns, the present study builds on previous findings by showing that participants who endorse these variables are more likely to be classified into specific patterns of IPA over time. These findings also have implications for interventions targeting youths in addressing IPA. By understanding how various factors are linked to patterns of change in IPA over time, these findings can be used to target preventive and corrective interventions for different classes of IPA. Furthermore, these findings add to our current knowledge on the influence of relationship context and cognition on change in IPA from adolescence to young adulthood. The ways in which these variables affect adolescents' perceptions of romantic relationships seem to be carried forward as youth become young adults.

### **Future Directions**

Although it is important to know that the development of insecure attachment styles at age 18 can influence multiple patterns of change in IPA over time, adolescents begin to construct their attachment style prior to age 18 (Hare et al., 2009; Miga et al., 2010). Therefore, it would be valuable to examine if the development of insecure attachment styles prior to age 18 matters to the trajectory of IPA taken throughout the transitional period of adolescence to young

adulthood. Similarly, since attachment styles continue throughout adulthood (Bowlby, 1989), future studies could examine whether later attachment styles predict trajectory membership later in adulthood. The same is also necessary for SIP given that the formation of cognitive biases may begin prior to age 16. Rather than treating these theoretically relevant predictors as time-invariant, it would be valuable to measure them as time-varying predictors to examine how changes throughout adolescence can relate to patterns of IPA over time.

Another interesting future direction would include intervening factors that affect the predictors of IPA classes. Would factors that affect changes in SIP biases affect IPA patterns in turn? Research has shown that adolescents and young adults who view engaging in aggressive behaviors within a relationship as acceptable are likely to perpetrate such behaviors in their own romantic relationships (Lichter & McCloskey, 2004). If interventions affect attitudes toward aggression, do they subsequently influence stability or changing patterns in IPA? Olsen, Parra, and Bennett (2010) theorize cognitive factors as a mediator between early influences (e.g., family and peer influences) and relationship violence. Understanding such intervening factors could build our understanding on the influence of relationship cognition on change in IPA from adolescence to young adulthood.



Table 1. *Correlations and descriptive statistics of predictors of interpartner aggression classes (N = 484).*

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Interparental Aggression	-										
2. Instrumental Goals	-.03	-									
3. Hostile Attributions	.03	.01	-								
4. Aggressive Response Bias	-.03	.11*	.48***	-							
5. Response Evaluation	.01	.08	.56***	.57***	-						
6. Fearful Attachment	.03	.17**	.22***	.11~	.09	-					
7. Preoccupied Attachment	.07	.04	.26***	.11*	.07	.52***	-				
8. Ratio of change in romantic partner/number of waves reported	-.04	-.04	.05	-.08	-.03	.09~	.02	-			
9. Sex	-.03	.01	-.26***	-.21***	-.25***	.08	.03	-.10*	-		
10. Race	.00	.13*	.03	.11*	.10~	-.01	.07	-.08~	.02	-	
11. SES	-.13*	.01	-.04	-.15**	-.18***	.06	-.04	.18***	-.06	-.41***	-
<i>M</i>	.69	7.58	2.16	.82	1.70	2.23	2.07	.27	.52	.16	3.35
<i>SD</i>	.64	3.03	.46	1.58	.45	.94	.96	.29	.50	.37	1.18

~ $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 2. *Multinomial logistic regression models comparing classes for psychological aggression.*

<b>Panel A. Interparental Aggression</b>				
Minor/Increasing Class ( <i>n</i> = 255) Compared to Little-to-None Class ( <i>n</i> = 110)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	-.07	.21	-.13	.94
Extensive Class ( <i>n</i> = 119) Compared to Little-to-None Class ( <i>n</i> = 110)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	-.09	.28	-.11	.91
Extensive Class ( <i>n</i> = 119) Compared to Minor/Increasing Class ( <i>n</i> = 255)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	-.03	.25	-.05	.98
<b>Panel B. Social Information Processing</b>				
Minor/Increasing Class ( <i>n</i> = 255) Compared to Little-to-None Class ( <i>n</i> = 110)				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	-.01	.05	-.03	.99
Hostile Attribution Bias	.36	.42	.21	1.43
Aggressive Response Bias	.37	.20	.74 <sup>***</sup>	1.45
Response Evaluation Bias	.26	.44	.15	1.30
Extensive Class ( <i>n</i> = 119) Compared to Little-to-None Class ( <i>n</i> = 110)				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	-.00	.06	-.00	1.00
Hostile Attribution Bias	.59	.49	.20	1.81
Aggressive Response Bias	.65	.21	.78 <sup>***</sup>	1.92
Response Evaluation Bias	.16	.52	.06	1.18
Extensive Class ( <i>n</i> = 119) Compared to Minor/Increasing Class ( <i>n</i> = 255)				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.01	.05	.04	1.01
Hostile Attribution Bias	.23	.38	.18	1.26
Aggressive Response Bias	.28	.11	.75 <sup>***</sup>	1.33
Response Evaluation Bias	-.10	.42	-.08	.91

Table 2 Continues.

Table 2 Continued.

<b>Panel C. Insecurity Attachment Styles</b>				
Minor/Increasing Class ( $n = 225$ ) Compared to Little-to-None Class ( $n = 110$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.08	.16	.14	1.08
Preoccupied Attachment	.34	.16	.66**	1.40
Extensive Class ( $n = 119$ ) Compared to Little-to-None Class ( $n = 110$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.30	.18	.34~	1.34
Preoccupied Attachment	.41	.18	.49**	1.51
Extensive Class ( $n = 119$ ) Compared to Minor/Increasing Class ( $n = 255$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.22	.15	.47	1.25
Preoccupied Attachment	.08	.15	.17	1.08
<b>Panel D. Discontinuity of Relationship Partner</b>				
Minor/Increasing Class ( $n = 255$ ) Compared to Little-to-None Class ( $n = 110$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-.18	.37	-.16	.84
Extensive Class ( $n = 119$ ) Compared to Little-to-None Class ( $n = 110$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-1.21	.49	-.53**	.30
Extensive Class ( $n = 119$ ) Compared to Minor/Increasing Class ( $n = 255$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-1.03	.43	-.64***	.36

~  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Table 3. *Multinomial logistic regression models comparing classes for physical aggression.*

<b>Panel A. Interparental Aggression</b>				
Decreasing Class ( <i>n</i> = 21) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	.14	.41	.10	1.15
Minor/Increasing Class ( <i>n</i> = 89) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	.13	.25	.16	1.13
Extensive Class ( <i>n</i> = 119) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	.86	.27	.64 <sup>***</sup>	2.36
Minor/Increasing Class ( <i>n</i> = 89) Compared to Decreasing Class ( <i>n</i> = 21)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	-.02	.47	-.02	.98
Extensive Class ( <i>n</i> = 28) Compared to Decreasing Class ( <i>n</i> = 21)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	.72	.45	.75 <sup>*</sup>	2.04
Extensive Class ( <i>n</i> = 28) Compared to Minor/Increasing Class ( <i>n</i> = 89)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	.73	.34	.84 <sup>***</sup>	2.08
<b>Panel B. Social Information Processing</b>				
Decreasing Class ( <i>n</i> = 21) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.02	.12	.06	1.02
Hostile Attribution Bias	.35	.68	.16	1.42
Aggressive Response Bias	-.10	.30	-.16	.91
Response Evaluation Bias	.75	.68	.34	2.13
Minor/Increasing Class ( <i>n</i> = 89) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.01	.05	.03	1.01
Hostile Attribution Bias	.04	.43	.03	1.05
Aggressive Response Bias	.06	.11	.14	1.06
Response Evaluation Bias	.78	.44	.52 <sup>*</sup>	2.18

Table 3 Continues.

Table 3 Continued.

Extensive Class ( <i>n</i> = 28) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.06	.11	.14	1.06
Hostile Attribution Bias	2.39	.82	.86***	10.89
Aggressive Response Bias	.18	.15	.23	1.20
Response Evaluation Bias	-1.06	.79	-.37	.35
Minor/Increasing Class ( <i>n</i> = 89) Compared to Decreasing Class ( <i>n</i> = 21)				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	-.01	.13	-.08	.99
Hostile Attribution Bias	-.31	.66	-.25	.74
Aggressive Response Bias	.16	.29	.45	1.17
Response Evaluation Bias	.02	.72	.02	1.02
Extensive Class ( <i>n</i> = 28) Compared to Decreasing Class ( <i>n</i> = 21)				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.04	.16	.11	1.04
Hostile Attribution Bias	2.04	.91	.92***	7.66
Aggressive Response Bias	.28	.30	.44	1.32
Response Evaluation Bias	-1.82	.92	-.80**	.16
Extensive Class ( <i>n</i> = 28) Compared to Minor/Increasing Class ( <i>n</i> = 89)				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.05	.12	.15	1.05
Hostile Attribution Bias	2.34	.78	1.06***	10.42
Aggressive Response Bias	.12	.14	.19	1.13
Response Evaluation Bias	-1.84	.79	-.81***	.16
<b>Panel C. Insecurity Attachment Styles</b>				
Decreasing Class ( <i>n</i> = 21) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	-.30	.30	-.27	.74
Preoccupied Attachment	.60	.31	.54**	1.82
Minor/Increasing Class ( <i>n</i> = 89) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.19	.18	.33	1.21
Preoccupied Attachment	-.03	.16	-.05	.97
Extensive Class ( <i>n</i> = 28) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.45	.18	.41*	1.56
Preoccupied Attachment	.42	.26	.39~	1.52

Table 3 Continues.

Table 3 Continued.

Minor/Increasing Class ( $n = 89$ ) Compared to Decreasing Class ( $n = 21$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.49	.33	.61*	1.63
Preoccupied Attachment	-.63	.33	-.80**	.53
Extensive Class ( $n = 28$ ) Compared to Decreasing Class ( $n = 21$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.75	.33	.93***	2.11
Preoccupied Attachment	-.19	.38	-.24	.83
Extensive Class ( $n = 28$ ) Compared to Minor/Increasing Class ( $n = 89$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.26	.23	.35	1.29
Preoccupied Attachment	.44	.28	.62*	1.56
<b>Panel D. Discontinuity of Relationship Partner</b>				
Decreasing Class ( $n = 21$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-.22	.65	-.07	.80
Minor/Increasing Class ( $n = 89$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-1.04	.43	-.51**	.35
Extensive Class ( $n = 28$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-.15	.69	-.07	.86
Minor/Increasing Class ( $n = 89$ ) Compared to Decreasing Class ( $n = 21$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-.82	.73	-.45	.44
Extensive Class ( $n = 28$ ) Compared to Decreasing Class ( $n = 21$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	.07	.92	.05	1.07
Extensive Class ( $n = 28$ ) Compared to Minor/Increasing Class ( $n = 89$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	.89	.76	.65~	2.43

~  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

#### IV. Study 3

### Psychological to Physical or Physical to Psychological? A Cross-Lag Analysis of Interpartner Aggression

#### Abstract

This study examined the relationship between psychological and physical aggression across five waves of data as adolescents transitioned to young adulthood. Although it was expected that early reports of both types of aggression would predict later reports of the other, it was hypothesized that psychological aggression would be a stronger predictor of later physical aggression across waves than vice versa. Interpartner aggression data collected from 462 participants at age 18 and ages 22-25 were used in the present study. Results of a cross-lagged SEM model indicated that early psychological aggression was indeed a stronger predictor of later physical aggression across waves. Results also showed stability for both forms of aggression over time. The implications of the findings are discussed.

*Keywords:* adolescence, young adulthood, psychological aggression, physical aggression, and cross-lag analysis

## Psychological to Physical or Physical to Psychological? A Cross-Lag Analysis of Interpartner Aggression

Research has long recognized that psychological aggression and physical aggression tend to co-occur (Bookwala, Frieze, Smith, & Ryan, 1992; Cano, Avery-Leaf, Cascardi, & O’Leary, 1998; Hamby & Sugarman, 1999; Stets, 1990; Toewns, McKenry, & Catlett, 2003). O’Leary and colleagues conducted an important series of longitudinal studies with samples of adolescents and young adults that suggested psychological aggression may lead to physical aggression over time (Murphy & O’Leary, 1989; O’Leary, Malone, & Tyree, 1994; O’Leary & Slep, 2003). The present study examined the relationship between these two forms of aggression more thoroughly during the transition from late adolescence to young adulthood. These associations as well as their developmental timing are important to consider since reports of interpartner aggression often begin during adolescence (Centers for Disease Control and Prevention (CDC), 2012; Silverman, Raj, Mucci, & Hathaway, 2001) and persist over time (Cui, Ueno, Gordon, & Fincham, 2013; Gomez, 2011; Halpern, Spriggs, Martin, & Kupper, 2009; Smith, White, & Holland, 2003; Spriggs, Halpern, & Martin, 2009).

Interpartner aggression is defined as hostile, abusive behaviors expressed toward one’s romantic partner. These behaviors can be expressed through psychological, physical, and sexual behaviors (however, sexual aggression was not assessed in the present study). Psychological aggression includes verbal and non-verbal behavior including insulting or criticizing one’s romantic partner, and intimidation, which may involve destroying a partner’s belongings and threatening to hurt him/her (Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Physical aggression includes behaviors that may physically harm one’s partner. Such behaviors can



include grabbing, pushing, slapping, punching, kicking, and/or using a knife or gun to hurt a partner (Straus et al; Foshee et al., 2009).

Several cross-sectional studies note that psychological aggression and physical aggression are related. For instance, two studies of high school students (Study 1:  $N = 280$ ; Study 2:  $N = 217$ ) by Cano et al. (1998) found moderate to strong relationships between adolescent reports of perpetrating psychological and physical aggression. Bookwala et al. (1992) indicated that psychological aggression was a significant predictor of physical aggression among a sample of 305 introductory psychology students. Hamby and Sugarman (1999) studied 374 undergraduates and found that, ignoring the severity of both forms of aggression, perpetration of psychological aggression was strongly related to perpetration of physical aggression. Results also showed that more severe forms of psychological aggression were related to more severe forms of physical aggression. Toewns et al. (2003) also revealed a strong relationship between psychological aggression and physical aggression for 80 divorced fathers. In a large representative sample of over 6,000 married individual, Stets (1990) showed that reports of perpetrating psychological aggression were related to reports of perpetrating physical aggression.

The relationship between psychological and physical aggression is also supported by other cross-sectional studies comparing physically aggressive and non-aggressive couples. For instance, in a study of 79 couples, Burman, John, and Margolin (1992) and Margolin, John, and Gleberman (1988) reported that husbands who were physically aggressive toward their spouses also were more likely to engage in psychological aggression. Lloyd (1996) studied 67 young adult couples and Rogers, Castleton, and Lloyd (1996) used a subsample of 25 from the 67 to examine interaction patterns during arguments. Lloyd found that physically aggressive couples expressed more psychological aggression than did nonaggressive couples. Rogers et al. showed

that partners who were physically aggressive were also more likely to control and dominate an argument. When comparing 10 physically abusive couples with 29 non-abusive couples, Sabourin (1995) also noted that abusive couples were more likely to be controlling during an argument than non-abusive couples. The concurrent relationship between psychological and physical aggression was also found by Aldarondo (1996) who collected physical and psychological aggression data from 772 married or cohabiting couples at three time points over a three-year period. Looking at each wave as a cross-sectional time-frame, men who physically abused their partner reported more psychological aggression than those who did not.

The above literature focuses on the associations between psychological and physical abuse in cross-sectional data. It is also important to document the continuity of the two forms of aggression over time. Cross-sectional retrospective studies (Cano et al., 1998) and longitudinal studies (Aldarondo, 1996; Fritz & Slep, 2009; Lorber & O'Leary, 2004; O'Leary & Slep, 2003; Woffordt, Mihalic, & Menard, 1994) reveal considerable stability in physical aggression over time among adolescents and young adults. Cano et al. indicated that for the nearly 500 adolescents who participated in their research, recollections of previous physical aggression were moderately to strongly related to current reports of such behaviors. For the O'Leary and Slep sample of 206 high school students, reports of physical aggression at Time 1 were strongly related to reports of the same behaviors three-months later. Fritz and Slep found for 664 middle adolescents that reports of physical aggression remained stable over a one-year interval. Among 772 couples, Aldarondo showed that approximately 33% of men who were physically abusive toward their partner during any year of the three year study were abusive in all three years. Similarly, Woffordt et al. found among the 107 married or cohabiting adult males in their sample that 51% reported physical aggression toward their partner at both data collections across a three-

year interval. Additionally, Lorber and O’Leary followed 94 men for over two years who reported being physically abusive to their spouse prior to marriage. Their results showed that over 40% of men reported physically abusing their wife at all four time points of the two year study.

Similar results are found for psychological aggression. Fritz and O’Leary (2004) found a stable pattern of psychological abuse among 203 young adult women across a 10-year interval. Similar stability in psychological aggression was revealed by Fritz and Slep (2009) for their sample of over 600 adolescents. Capaldi, Shortt, & Crosby (2003) reported the same pattern among 105 late adolescents across a two-year interval. Taken together, these two sets of findings suggest that both psychological aggression and physical aggression tend to remain stable over time.

The current study attempted to go beyond the documentation of stability in these forms of aggression. Some longitudinal studies suggest that earlier psychological aggression predicts later physical aggression, which may indicate that the latter is an escalation in relationship aggression. For instance, O’Leary and Slep (2003) showed among 206 high school students, that the incidence of psychological aggression at Time 1 was related to the incidence of physical aggression three-months later. These findings however did not control for levels of physical aggression at Time 1. Murphy and O’Leary (1989) studied 393 young adult couples and found that reports of psychological aggression, when assessed at premarriage and six months after marriage were related to reports of physical aggression 24 to 30 months after marriage. From this same sample, O’Leary et al. (1994) found that participants who reported perpetrating psychological aggression at 18 months of marriage were more likely to perpetrate physical

aggression at 30 months of marriage. These findings suggest that early psychological aggression may precede and escalate over time to physical aggression.

Because psychological aggression is less visible and may be perceived as less dangerous for the perpetrator (Follingstad & Rogers, 2013), it may be a more common initial conflict strategy for an individual with a limited repertoire. However, to determine whether psychological aggression is a true precursor of physical aggression, both directions must be tested simultaneously and compared in one structural equation model (SEM) while controlling for the known stabilities and concurrent associations between the two forms of aggression.

### **The Present Study**

The present study examined the relationship between psychological and physical aggression as adolescents transitioned to young adulthood. Although the literature suggests that adolescents who are involved in an aggressive relationship are likely to report similar experiences as young adults (Cui et al., 2013; Gomez, 2011; Halpern et al., 2009; Spriggs et al., 2009), the authors found no studies that examined the relationship between psychological and physical aggression throughout this transitional period. Given the relationship between both behaviors in adolescence and adulthood (Murphy & O’Leary, 1989; O’Leary et al., 1994; O’Leary & Slep, 2003), it was expected that both forms of aggression would be related over this time period. Cross-lag associations between psychological and physical aggression were examined over time *under the expectation that early forms of both types of aggression would predict subsequent forms of the other* (i.e., psychological and physical aggression at  $T_i$  would predict, respectively, physical and psychological aggression at  $T_{i+1}$ ). However, based on previous findings (Murphy & O’Leary; O’Leary et al; O’Leary & Slep) and under the assumption that psychological aggression is a precursor of physical aggression, *it was hypothesized that*

*psychological aggression would be a stronger predictor of physical aggression across waves than the alternative.* To consider the possibility that the associations between the two types of aggression may increase in strength over time, the cross-lag coefficients for each type of aggression were compared across waves. The model was fit controlling for the stabilities of each form of aggression, which were expected to be statistically significant and substantial (Aldarondo, 1996; Cano et al., 1998; Capaldi et al., 2003; Fritz & O’Leary, 2004; Fritz & Slep, 2009; Lorber & O’Leary, 2004; O’Leary & Slep, 2003; Woffordt et al., 1994) and were compared across waves in order to explore strength in these pathways over time. The model also controlled for the concurrent associations between both forms of aggression. Again, these associations were expected to be statistically significant (Bookwala et al., 1992; Cano et al.; Hamby & Sugarman, 1999; Stets, 1990; Toewns et al., 2003). Concurrent associations were also compared across waves in order to investigate potential growth/decline in the co-occurrence of psychological and physical aggression across waves. Lastly, stability patterns were compared to the cross-lag associations in order to examine whether stability in psychological and physical aggression is stronger than the progression from one type of aggression to another.

All analyses controlled for gender, race, and socioeconomic status (SES). These demographics are important control variables as previous studies suggest that reports of romantic aggression are similar or slightly higher for females relative to males (Archer, 2000; Richardson, 2005; Straus, 2009). Females also appear to use more psychological aggression than males (Archer, 2004; Jelz, Molidor, & Wright, 1996). Moreover, past findings have indicated that interpartner aggression is more prevalent among ethnic minorities and low SES couples (Aldarondo & Sugarman, 1996; Caetano, Field, Ramisetty-Mikler, & McGrath, 2005; Holt & Espelage, 2005; O’Keefe, 1998; Stets & Straus, 1989).

## Method

### Participants and Procedure

Participants were part of the Child Development Project (CDP); a 24-year longitudinal study which examined children's social development and adjustment into adulthood. Children were five years old at the beginning of data collection and were followed until the age of 29. Data were collected from two cohorts beginning in 1987 and 1988 and were initially collected in Knoxville, Tennessee, Nashville, Tennessee, and Bloomington, Indiana. If possible, participants who left these sites were followed across this 24-year period.

In the beginning of the CDP, families were invited to participate in the study. Approximately five to ten school districts within each city were targeted. Families were invited to participate as they were registering their children for the kindergarten of the selected schools. Around 85% of participants were recruited in this manner. The remaining 15% were randomly selected at the beginning of the school year from those students who were not pre-registered in the summer before kindergarten.

This resulted to a sample of 585 participants who varied in family structure and socioeconomic status (81% European-Americans). Approximately 91.6% of participants ( $n = 536$ ) provided data at ages 18-25, which is a remarkable retention rate for a long term longitudinal study. For current purposes, only participants who were romantically involved with a partner at the age of 18 and/or ages 22-25 were retained for analytic purposes (see Table 1 for the percentages of participants who were dating, cohabiting, or married at ages 18 and 22-25). Participants reported involvement in these relationships (and therefore provided interpartner aggression data) for an average of three out of five waves ( $M = 3.30$ ;  $SD = 1.38$ ). The analysis sample consisted of 462 participants (79.0% of the original sample; 86.2% of the retained

sample). The majority of the sample was female (52.6%) and European-American (82.9%). Approximately 15.8% of participants were African-American, and 1.3% of participants were identified as Other (Hispanic, Asian, and Native American). Roughly 61.2% of participants' mothers and 42.4% of fathers reported a high school education and/or some college. According to the Hollingshead SES scale (1979), the majority of participants belonged to middle-class families at the beginning of data collection (range: \$8,000 – \$66,000;  $M = \$39,991$ ;  $SD = 13.95$ ). Furthermore, 62.1% of participants' parents were married, 0.6% were cohabiting, and the remainder of the sample were single, divorced, or remarried at the beginning of the study. When participants were 17 years old, 55.8% of their parents were married, 1.7% were cohabiting, 13.6% were divorced, and the rest were single, separated, or widowed.

## Measures

**Interpartner aggression.** Interpartner aggression was assessed through selected items from the *Revised Conflict Tactics Scale* (CTS2; Straus et al., 1996). Eleven items were selected at age 18 (4 items assessed psychological aggression and 7 items assessed physical aggression) and 15 items were selected at ages 22-25 (7 items assessed psychological aggression and 8 items assessed physical aggression) (see Appendix C). One of the seven items assessing psychological aggression for the last four years was derived from the *Psychological Maltreatment of Women Inventory* (“I put down my partner’s appearance or abilities”) (PMWI; Tolman, 1989).

Items were originally assessed on a scale made up of seven categories (0 = *This has never happened*, 1 = *Once in the past year*, 2 = *Twice in the past year*, 4 = *3-5 times in the past year*, 8 = *6-10 times in the past year*, 15 = *11-20 times in the past year*, 20 = *More than 20 times in the past year*). This scale, however, produced severely skewed data that did not improve with data transformations (skewness range: 1.71 – 15.23;  $M = 7.44$ ). In order to improve the skewness of

the data, items were recoded to a 4-point scale as follows (0 = 0 (*Never*), 1 = 1 or 2 (*once or twice in the past year*), 2 = 4 or 8 (*three to 10 times in the past year*), and 3 = 15 or 20 (*eleven or more times in the last year*)). Although still seriously skewed (skewness range: .23 – 15.23;  $M = 4.27$ ), the recode produced a substantial improvement. Cronbach alphas averaged 0.77 across the five waves for psychological aggression (range: 0.72 – 0.81) and 0.81 for physical aggression (range: 0.69 – 0.91).

Although interpartner aggression data were also collected at ages 19-21, a smaller number of items were collected using a different version of the CTS (Straus, 1979) and a scale that could not be directly recoded into categories comparable to those used at the other waves. Therefore, waves for ages 19-21 were excluded from the present analysis.

**Control variables.** Both gender and race were treated as dummy coded variables (**Gender:** 0 = *Male*, 1 = *Female*; **Race:** 0 = *European-Americans/Others*, 1 = *African-Americans*). **SES** was recoded from a self-reported income score to a 5-point scale where higher scores indicated higher income (1 = \$8,000-\$19,000, 2 = \$20,000-\$29,500, 3 = \$30,000-\$39,500, 4 = \$40,000-\$54,500, 5 = \$55,000-\$66,000) ( $M = 3.35$ ;  $SD = 1.18$ ).

### **Plan of Analysis**

Analyses were conducted in MPLUS version 6 (Muthén & Muthén, 1998-2010). A measurement model was first fitted to the data. A latent variable for psychological and physical aggression was created at each time point indicated by the items assessing each form of aggression at each wave. Items that were the same at each time point had their loadings constrained to equality (see Table 2 for factor loadings of latent variables and Table 3 for correlations between latent variables across waves).



Next, cross-lag analysis was used to address the hypotheses of the present study. Cross-lag pathways of early psychological aggression predicting later physical aggression (e.g.,  $T_i$  psychological aggression predicting  $T_{i+1}$  physical aggression) and early physical aggression predicting later psychological aggression (e.g.,  $T_i$  physical aggression predicting  $T_{i+1}$  psychological aggression) were fitted to the model. The cross-lag model included wave-to-wave stabilities for psychological and physical aggression and the concurrent associations between psychological and physical aggression at each wave. The demographic controls gender, race, and SES, were modeled as predictors of psychological and physical aggression at age 18 (see Figure 1).

Full Information Maximum Likelihood (FIML) was used to account for missing data. Model fit was examined by the chi-square statistic ( $\chi^2$ ), the comparative fit index (CFI), the Tucker-Lewis Index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). According to Hooper, Coughlan, and Mullen (2008), the  $\chi^2$  statistic measures the amount of incongruity between the sample and the fitted covariance matrices. The CFI and TLI compare the  $\chi^2$  value of the model being tested with a null/independence model where all variables are uncorrelated. The RMSEA assesses the probability of the parameters of the model to fit the covariance matrix of the sample. Lastly, the SRMR indicates the “difference between the residuals of the sample covariance matrix and the hypothesized covariance model” (Hooper et al., p. 54).

## Results

Results indicated that the measurement model fit the data poorly ( $\chi^2 = 11403.54$ ,  $p < .001$ ;  $DF = 2417$ ;  $CFI = .42$ ;  $TLI = .41$ ;  $RMSEA = .09$ ,  $p < .001$ ;  $SRMR = .13$ ). There are several reasons for the poor fit of the measurement model. First, the skewness of the interpartner

aggression items led to a small variance in the latent variables of psychological and physical aggression, which damages fit. Secondly, loadings for certain items that were treated as indicators of the latent variables for psychological and physical aggression were smaller than .4, which suggests that the items were weak indicators of these latent variables (see Table 2). Nevertheless, these items were definitional and theoretically relevant indicators of these latent variables. For instance, although the item “destroying the belongings of one’s partner” was a weak indicator of psychological aggression because it was endorsed so infrequently, this item is a classic indicator of psychologically aggressive behavior (Straus et al., 1996). Modification indices were used to explore fit problems and suggested that many items could potentially cross-load on other latent variables whether assessed concurrently or at other waves. Of course, modeling such cross-loads would be illogical. In spite of the poor fit of the measurement model, the  $\chi^2/DF$  ratio for the present model was below 5 ( $11403.54/2417 = 4.72$ ) which is suggestive of an acceptable model fit (Wheaton, Muthén, & Summers, 1977). Recognizing the theoretical mandates of definition, the logical mandates of time, and the limitations imposed on the measurement model by low frequency, highly skewed items, we proceeded to the structural analysis.

A structural model with stability, concurrence, and cross-lag associations was fit to the data. To assess the fit of the structural model, we focused on changes in the fit statistics resulting from the addition of the structural model. Specifically, the  $\chi^2$  increased by 540 points and the degrees of freedom (DF) increased by 231 points ( $\chi^2 = 11944.17$ ,  $p < .001$ ; DF= 2648). This produces a  $\chi^2/DF$  ratio of 2.34 which is indicative of a reasonable fit. Also, the structural model accounted for only 4.5% of the final  $\chi^2$  value while 95.5% of it was accounted for by the

measurement model. These findings suggest that it was reasonable to proceed with this structural model.

Each pathway was compared via a series of delta chi-square tests ( $\Delta\chi^2$ ) to examine the strength of each relationship and to account for any potential growth/stability in the patterns over time (see Appendix H). Pathways that were shown to be equal were constrained to equality in the final model ( $\chi^2 = 11995.83, p < .001; DF = 2661$ ) ( $51.66/13 = 3.97$ ). Only the unstandardized coefficients (which are based on raw units) were set to equality, whereas the standardized coefficients (which are based on standard deviation units) were freely estimated (see Figure 1).

Results of the final model indicated that early reports of psychological aggression strongly and positively predicted later reports of these same behaviors across waves. Progression in the stability of psychological aggression across waves was tested through  $\Delta\chi^2$  tests. Interestingly,  $\Delta\chi^2$  tests demonstrated that the stability of psychological aggression was statistically the same from ages 22-25, offering no support for an escalation, but rather suggesting considerable steadiness in the usage of this behavior in early adulthood.

For physical aggression, the relationships between consecutive waves were significant and moderate. Pathways at each wave were compared via  $\Delta\chi^2$  tests to determine the strength in the stability of physical aggression over time. Results indicated that these stability pathways were statistically the same across all waves, again suggesting continuity in the use of physical aggression over time. In order to establish whether stability levels varied by the type of aggression, stability pathways for psychological and physical aggression were compared within each wave using  $\Delta\chi^2$  tests. The stability pathways for psychological aggression were significantly greater than those for physical aggression at each wave. These findings indicate that

although both forms of aggression tend to be stable across time, psychological aggression is more stable than physical aggression.

Stabilities for psychological and physical aggression were compared to their cross-lag associations to determine the relative strength of these pathways in comparison to each other. Results from  $\Delta\chi^2$  tests showed that stability pathways were stronger than the cross-lag associations in 13 of 16 comparisons. These findings mean that overall, stability coefficients exceed cross-lag associations for both forms of aggression over time.

Concurrent associations also were significant at each wave, signifying that reports of psychological aggression were reliably related to reports of physical aggression across waves. Coefficients of these associations were moderate. These associations were compared across waves to account for possible progression/de-escalation over time. Results from  $\Delta\chi^2$  tests indicated that the concurrent associations were statistically the same for ages 22, 23, and 24, but were larger at age 18 and smaller at age 25. Therefore, these findings suggest that concurrence between psychological and physical aggression may become smaller as adolescents move into early adulthood.

Finally, the central focus of this analysis was on the cross-lag associations across waves. First, pathways were compared across waves to test for a possible increase in the cross-lag associations over time. Results from  $\Delta\chi^2$  tests indicated that all four pathways of early psychological to later physical aggression were statistically the same, hence their unstandardized coefficients were set to equality. Furthermore, three out of four pathways of early physical predicting later psychological aggression were statistically the same, therefore, their unstandardized coefficients were also constrained to equality. Overall, results indicated that early reports of psychological aggression were consistent and substantial predictors of later physical

aggression at each wave. Likewise, early physical aggression also predicted later psychological aggression for three out of four waves. Although the unstandardized solutions for seven out of the eight cross-lag pathways were set to be equal, when examining the standardized coefficients, results indicated that early psychological aggression was a stronger predictor of later physical aggression across waves relative to the opposite direction of early physical aggression predicting later psychological aggression. This suggests that even though these pathways were the same when estimated in raw units, differences emerged when pathways are estimated in standard deviations (SDs). For instance, one SD increase in psychological aggression at age 18 was related to an increase of .18 of a SD in physical aggression at age 22, whereas one SD increase in physical aggression was related to an increase of .03 in psychological aggression for these time points. This indicates a six-fold difference in standard units in the relationship of early psychological to later physical aggression versus early physical to later psychological aggression from ages 18-22. From ages 23 to 24 and ages 24 to 25, similar comparisons in standard units suggest a four-fold to eleven-fold difference indicating that psychological aggression is a better predictor of later physical aggression. These findings support the central hypothesis of the present study that the relationship between early psychological and later physical aggression is stronger than the relationship between early physical and later psychological aggression across waves.

## **Discussion**

Findings from previous studies introduced the notion of psychological aggression preceding physical aggression (Murphy & O'Leary, 1989; O'Leary et al., 1994; O'Leary & Slep, 2003). Results from the present study allows researchers to make this claim with more confidence as the relationship between early psychological and later physical aggression was

compared to that of early physical and later psychological aggression in one cross-lagged SEM model. When examined in the context of standard units (standardized deviations), it becomes clear that the effects of early psychological to later physical aggression is stronger than the opposite direction. These findings suggest that physical aggression may be a progression or escalation from psychological aggression. Because of the nature of the sample, this study further supports the expectation that this escalation extends beyond adolescence and into young adulthood.

Results from the present study also push forward our understanding of the consistency of psychological and physical aggression over time. Stability in both forms of aggression has been shown separately for adolescence (Cano et al., 1998; Fritz & Slep, 2009; O’Leary & Slep, 2003) and adulthood (Aldarondo, 1996; Capaldi et al., 2003; Fritz & O’Leary, 2004; Lorber & O’Leary, 2004; Woffordt et al., 1994). The present study suggests these stability levels are also sustained across the transition from adolescence to young adulthood. However, stability in psychological aggression was greater than that of physical aggression, and, not surprisingly, both stabilities were greater than the cross-lag pathways. Lastly, in keeping with previous studies was the consistently significant concurrence of psychological and physical aggression across waves (Bookwala et al., 1992; Cano et al., 1998; Hamby & Sugarman, 1999; Stets, 1990; Toewns et al., 2003).

In the end, findings from the present study provide important implications for our understanding of interpartner aggression from adolescence to young adulthood. Most importantly, results support a stronger progression from psychological aggression to physical aggression compared to the alternate direction. It can now be argued with more certainty that psychological aggression precedes and may promote later physical aggression. Additionally,

both psychological and physical aggression appear to be stable from late adolescence to young adulthood.

### **Limitations**

Perhaps the most serious limitation of the present study was the poor model fit found for the measurement model. It is clear that a major contributor to the poor fit was the skewness of the data which can be expected for items assessing aggressive behaviors or other very low frequency items. Another problem again associated with their low frequency was the fact that some items were weak empirical indicators of the latent variables. Finally, the empirical covariation between psychological and physical aggression items both within and across waves led to a model in which illogical cross-loadings had a negative effect on fit. Fortunately, the negative fit was largely confined to the measurement model which, despite the poor fit, reflected appropriate definitions of the measured constructs and only logical loadings.

An additional limitation is the fact that fewer items were used to assess both psychological and physical aggression at age 18. This reduces confidence regarding the comparability of the coefficients from ages 18-22 with the coefficients at other waves. Also, over 82% of participants were European-Americans and the majority of participants were from middle-class households, which represent a lack of diversity in the sample. Although the present study's sample is representative of a community sample, it will be important to replicate this study on a more diverse, nationally representative, and more at-risk sample.

### **Contributions**

Contributions of the present study include the examination of psychological and physical aggression from adolescence to young adulthood. Past studies have examined this association within one developmental period (Bookwala et al., 1992; Cano et al., 1998; Hamby & Sugarman,

1999; Murphy & O’Leary, 1989; O’Leary et al., 1994; O’Leary & Slep, 2003; Stets, 1990; Toewns et al., 2003). The present study addresses the relationship between both forms of aggression from late adolescence to young adulthood. Additionally, the implementation of cross-lag methodology is a significant contribution to the literature of interpartner aggression. Through this analytical technique, the present study suggests that physical aggression may be a progression from psychological aggression, which supports a notion that has been proposed but not directly tested in the interpartner aggression literature (Murphy & O’Leary; O’Leary et al.; O’Leary & Slep).

### **Future Directions**

Because engagement in interpartner aggression may be more common among more vulnerable adolescents (e.g., low SES adolescents, inner city youths, juvenile delinquents) (Aldarondo & Sugarman, 1996; O’Keefe, 1998; Stets & Straus, 1989), it will be important to replicate the present study’s findings in such populations. The present study was conducted on a community sample, which would explain the low rates of these behaviors. Replicating this study with more at-risk youths could not only minimize some of the data problems encountered (e.g., reduce skewness), but also bring more significant implications to the literature of interpartner aggression by targeting populations who are more at-risk of engaging in such behaviors.

Importantly, future studies will need to consider the intentions behind the aggression and how those intentions influence the relationship between psychological and physical aggression. Johnson (1995, 2006) argued individuals’ motivations for aggression matter for the type of aggression observed. Poor conflict management skills may result in “situational couple violence” whereas a motive to dominate/control one’s romantic partner may result in more severe



psychological abuse and physical battering. The predictive value of psychological relative to physical IPA may not be the same across motives behind the aggression.

Future directions should also examine these associations beginning at an earlier age. Given that engagement in interpartner aggression may begin as early as middle school (RTI International, 2012), it would be important to see if the progression of psychological to physical aggression starts earlier in adolescence.

Lastly, it will be essential to examine factors that can potentially influence these cross-lag associations. For instance, are these associations more prevalent among adolescents who were physically/sexually abused or who witnessed high levels of interparental aggression? Also, do adolescents' attitudes towards the acceptability of interpartner aggression influence these cross-lag relationships? Understanding these questions will advance our understanding of the relationship between psychological and physical aggression over time.

Table 1. Percentages of participants who were dating, cohabiting, or married at age 18 and from ages 22-25 ( $N = 462$ ).

	Dating	Cohabiting	Married	Total
	$N$ (%)	$N$ (%)	$N$ (%)	$N$ (%)
Age 18	190 (41.1%)	16 (3.5%)	8 (1.7%)	214 (46.3%)
Age 22	153 (33.1%)	91 (19.7%)	64 (13.9%)	308 (66.7%)
Age 23	128 (27.7%)	103 (22.3%)	94 (20.3%)	325 (70.3%)
Age 24	120 (26.0%)	100 (21.6%)	111 (24.0%)	331 (71.6%)
Age 25	99 (21.4%)	83 (18.0%)	128 (27.7%)	310 (67.1%)

*Note.* Total consists of the number and percentages of participants who were romantically involved at each wave.

Table 2. *Factor loadings of latent variables for psychological and physical aggression at each time point. Items were constrained to equality across waves (N = 462).*

	Psychological Factor Loadings				
	Age 18	Age 22	Age 23	Age 24	Age 25
Yell	1.000	1.000	1.000	1.000	1.000
Destroy	.157	.157	.157	.157	.157
Threat	.235	.235	.235	.235	.235
Insult	.946	.946	.946	.946	.946
Stomp		.687	.687	.687	.687
Putdown		.349	.349	.349	.349
Spite		.348	.348	.348	.348
	Physical Factor Loadings				
	Age 18	Age 22	Age 23	Age 24	Age 25
Push	1.000	1.000	1.000	1.000	1.000
Throw	.618	.618	.618	.618	.618
Twist	.582	.582	.582	.582	.582
Hit	.581	.581	.581	.581	.581
Grab	.889	.889	.889	.889	.889
Slap	.673	.673	.673	.673	.673
Kick	.288	.288	.288	.288	.288
Slam		.226	.226	.226	.226

*Note.* Unstandardized coefficients are reported and items that were the same across waves were constrained to equality. All factor loadings were significant at the .001 level.

Table 3. Correlations between latent variables across waves. Standardized parameter estimates are reported ( $N = 462$ ).

	Psychological Latent Variables					Physical Aggression Latent Variables				
	PSYCH18	PSYCH22	PSYCH23	PSYCH24	PSYCH25	PHY18	PHY22	PHY23	PHY24	PHY25
PSYCH18	-									
PSYCH22	.44 <sup>***</sup>	-								
PSYCH23	.43 <sup>***</sup>	.72 <sup>***</sup>	-							
PSYCH24	.39 <sup>***</sup>	.60 <sup>***</sup>	.75 <sup>***</sup>	-						
PSYCH25	.32 <sup>***</sup>	.63 <sup>***</sup>	.60 <sup>***</sup>	.83 <sup>***</sup>	-					
PHY18	.68 <sup>***</sup>	.24 <sup>*</sup>	.16 <sup>*</sup>	.19 <sup>*</sup>	.14	-				
PHY22	.34 <sup>***</sup>	.71 <sup>***</sup>	.32 <sup>***</sup>	.32 <sup>***</sup>	.33 <sup>***</sup>	.36 <sup>***</sup>	-			
PHY23	.23 <sup>**</sup>	.37 <sup>***</sup>	.58 <sup>***</sup>	.33 <sup>***</sup>	.29 <sup>***</sup>	.20 <sup>*</sup>	.40 <sup>***</sup>	-		
PHY24	.39 <sup>***</sup>	.37 <sup>***</sup>	.44 <sup>***</sup>	.60 <sup>***</sup>	.36 <sup>***</sup>	.45 <sup>***</sup>	.47 <sup>***</sup>	.49 <sup>***</sup>	-	
PHY25	.30 <sup>**</sup>	.38 <sup>***</sup>	.45 <sup>***</sup>	.54 <sup>***</sup>	.61 <sup>***</sup>	.42 <sup>***</sup>	.51 <sup>***</sup>	.41 <sup>***</sup>	.52 <sup>***</sup>	-
<i>Variances</i>	.85	.68	.67	.76	.75	.24	.06	.19	.14	.05
<i>SD</i>	.92	.82	.82	.87	.87	.49	.24	.44	.37	.23

Note. PSYCH = Psychological Aggression; PHY = Physical Aggression. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

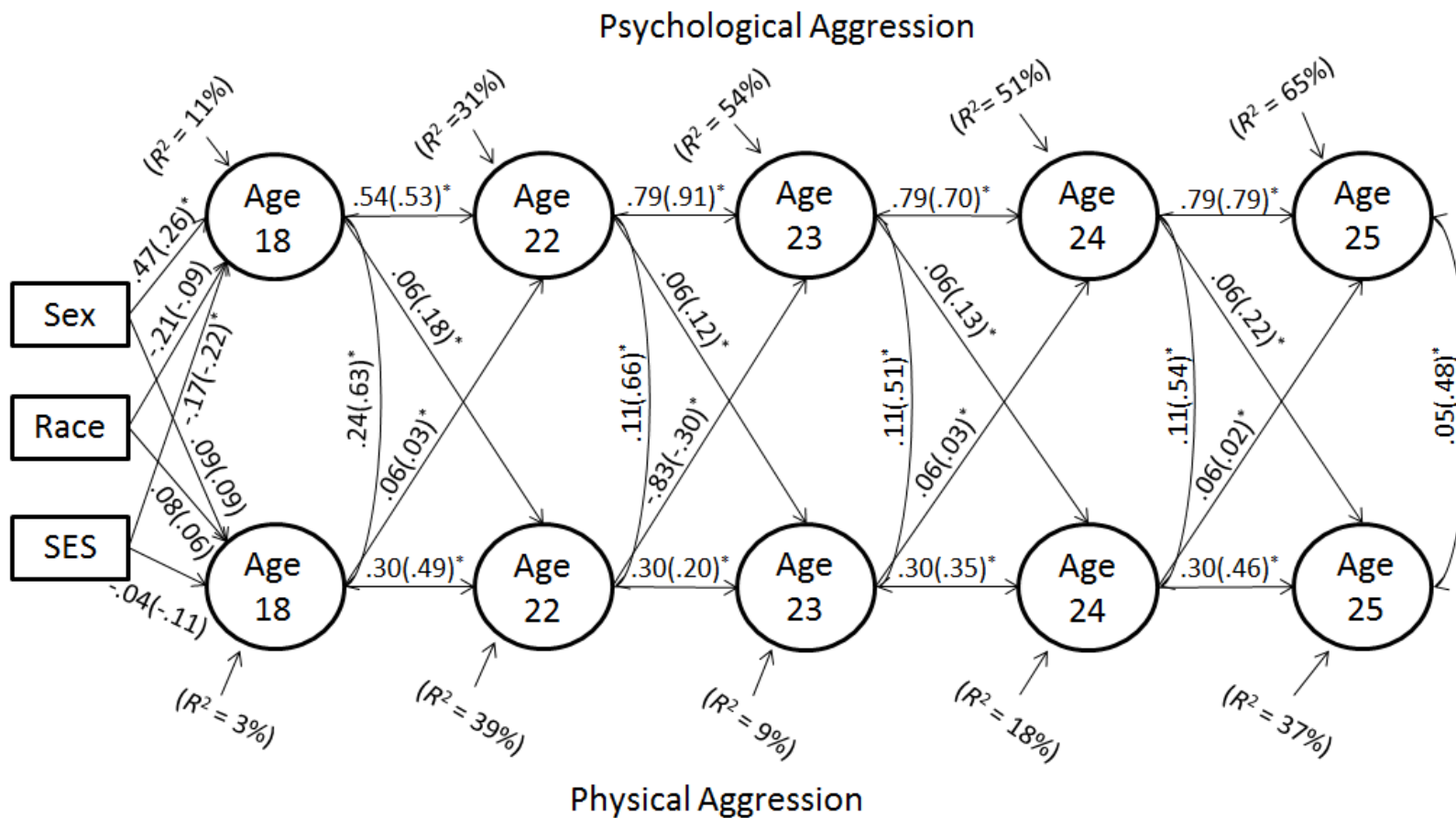


Figure 1. Cross-lag model of early psychological aggression predicting later physical aggression, and early physical aggression predicting later psychological aggression. Standardized coefficients are in parentheses ( $N = 462$ ). \* $p < .001$

## V. General Discussion

Ever since Makepeace's (1981) groundbreaking work on the prevalence of interpartner aggression (IPA) among college students, research on the rates of IPA among adolescents and young adults has exploded. Countless studies have shown high rates of IPA within this population. Although studies agree that the frequency of IPA continues throughout this transitional period (Cui, Ueno, Gordon, & Fincham, 2013; Gomez, 2011; Halpern, Spriggs, Martin, & Kupper, 2009; Smith, White, & Holland, 2003; Spriggs, Halpern, & Martin, 2009), there is no concurrence on the pattern of growth and change of these behaviors. Results from the present dissertation shed light to this question by identifying multiple trajectories of IPA, factors that can predict these trajectories, and also provides an understanding on the co-development of psychological and physical forms of IPA from adolescence to young adulthood.

In the first study, several distinct patterns of change in psychological and physical IPA were found through a person-centered approach known as latent class analysis. For both forms of aggression, one group of participants expressed very little IPA across waves (Little-to-None Class), one group of participants persistently engaged in IPA over time (Extensive Class), and one group of participants increased in their reports of mostly minor forms of IPA over time (Minor/Increasing Class). A fourth pattern was shown for physical aggression where a decrease in the expression of such behaviors occurred across waves (Decreasing Class). The aggressive classes for psychological and physical IPA (Extensive Class, Minor/Increasing Class, and Decreasing Class) were over represented by females, participants from ethnic minority

backgrounds, participants from low SES households, participants with low levels of education, and participants who cohabited at some point throughout the study.

Findings from Study 1 suggest that when examining change in IPA from adolescence to young adulthood, change in such behaviors must be thought of as a plurality of patterns rather than one average trajectory across a population as modeled in previous studies (Capaldi, Shortt, & Crosby, 2003; Foshee et al., 2009; Fritz & O’Leary, 2004; Fritz & Slep, 2009; Kim, Laurent, Capaldi, & Feingold, 2008; Nocentini, Mesenini, & Pastorelli, 2010; O’Leary & Slep, 2003). Differences were also shown based on the direction of the trajectory (stable, increasing, and decreasing) and in terms of the constellation of aggressive behaviors that appear to be characteristic of each pattern. Ways to move this study forward include investigating whether these patterns can be identified prior to late adolescence and whether they can be replicated in a more nationally representative sample in order to confirm their existence across the population. Conducting such studies will not only move forward our understanding of the multitude of change in IPA from adolescence to young adulthood, but will also provide implications for interventionists by suggesting that certain adolescents may need to be taught differently on the consequences of IPA based on their trajectory. For instance, adolescents who remain stable in their usage of IPA may need more assistance by interventionists to help them understand the consequences from engaging in such behaviors relative to adolescents who decrease in their reports of such behaviors over time. Although no specific techniques to reach such individuals are suggested, findings from Study 1 can be used as a transition for future studies to examine what techniques will be more effective to target certain individuals based on their trajectory.

Although findings from Study 1 are significant contributions to the literature, one major limitation is the inconsistency in the assessment of IPA across waves. Therefore, more studies

are needed to examine multiplicity in change of IPA with assessments that represent the highest standards of measurement. An important question is whether the patterns found in this study are replicated when the assessment is based on rates of such behaviors rather than the occurrence versus non-occurrence of the behaviors.

After these patterns were identified, I examined how they were distinguished from each other. Through multinomial logistic regression, Study 2 tested four predictors that stem from different theoretical traditions that have been used to explain the prevalence of IPA among adolescents and young adults: (a) interparental aggression (social-learning/social-cognitive theory), (b) social-information processing (SIP) biases (social-information processing theory), (c) insecure attachment styles (preoccupied and fearful; attachment theory), and (d) discontinuity of relationship partner (systems theory). To encapsulate the findings, all predictors distinguished the aggressive classes (Extensive, Minor/Increasing, and Decreasing) from the Little-to-None classes for psychological and physical aggression. The predictors also differentiated the stable classes (Extensive and Little-to-None) from the unstable classes (Minor/Increasing and Decreasing) and distinguished the aggressive classes from each other. Findings from Study 2 suggest that each class is distinctive from all other classes in at least one way based on the relevant but small number of predictors used. These findings also imply that characteristics developed earlier in life matter not just for engagement in IPA but for the pattern of engagement throughout this transitional period. Theoretical implications of Study 2 also include that the represented theories in addition to explaining the prevalence of IPA within adolescence and young adulthood can also build our understanding of change in IPA from adolescence to young adulthood.



For instance, interparental aggression was shown to predict membership in the Extensive Class for physical aggression, suggesting that it may be difficult for adolescents to unlearn the behaviors that they may have adopted as acceptable conflict strategies as they become young adults and gain more romantic experiences. This finding also suggests that social-learning theory can be used to explain the consistency of physical IPA as adolescents' transition to young adulthood.

SIP biases predicted membership in the Extensive and in the Minor/Increasing classes for psychological and physical aggression, signifying that individuals who begin to make negative attributions in adolescence when in ambiguous relationship situations are likely to continue this habit in young adulthood, which may lead to a continuation of IPA. This finding also implies that the SIP model is useful for understanding multiple patterns of change in IPA from adolescence to young adulthood.

A similar argument can be made regarding the insecure attachment styles, given that both styles were shown to predict membership in the high stable (Extensive Class) and increasing patterns (Minor/Increasing Class) for psychological and physical aggression. This indicates that relationship insecurity is related to persistence in IPA over time. However, the preoccupied attachment style also predicted membership in the Decreasing Class for physical aggression. This finding however speaks more to the effect this style may have on the starting point of this class rather than the pattern itself. Overall, these findings build on the current literature between the linkage of attachment styles and IPA by suggesting that some attachment styles may be better predictors of certain IPA trajectories. It can be assumed from these results that the attachment orientation developed during adolescence may influence their pattern of change in IPA over time. Future studies will need to examine SIP biases and insecure attachment styles as time-

varying predictors to confirm whether and how these characteristics covary with IPA from adolescence to young adulthood. Although SIP biases and attachment styles are thought of as relatively stable characteristics, these factors can change over time and can have potential implications for the ongoing expression of IPA based on experience in successful or unsuccessful close relationships during adolescence and young adulthood.

Lastly, discontinuity of relationship partner was treated as a predictor to the identified patterns of IPA. Specifically, more stability in relationship partner predicted constancy in psychological IPA, and contributed to an increase in physical IPA over time. Although these findings may appear to conflict with each other, they both coincide with systems theory by suggesting that less change in a system is likely to predict less change in a behavior within that system (Giles-Sims, 1983; Whitchurch & Constantine, 1993). If one regards relationships as a system, these findings suggest that remaining with the same partner is related to consistency and/or escalation of IPA over time.

Overall, findings from Study 2 suggest that perceptions of adolescent romantic relationships developed through various ways may be carried forward into young adulthood and influence change in IPA throughout this transitional period. However, future studies will need to examine other predictors and theoretical perspectives that have been shown to be influential to the prevalence of IPA. For instance, research suggests that harsh discipline towards adolescents is linked to reports of IPA among this age group (Chase, Treboux, & O'Leary, 2002; Jouriles, Mueller, Rosenfield, McDonald, & Dodson, 2012; Pfieger & Vazsonyi, 2006). It may be possible that this variable may also explain patterns of change in such behaviors over time.

The third study of this dissertation also investigated change in IPA over time by examining through cross-lag analysis the relationship between psychological and physical

aggression from adolescence to young adulthood. In conjunction with past findings (Murphy & O'Leary, 1989; O'Leary, Malone, & Tyree, 1994; O'Leary & Slep, 2003), it was expected that early reports of psychological aggression would more strongly predict later reports of physical aggression compared to the opposite direction. Results from Study 3 supported this hypothesis which confirms previous claims of psychological aggression preceding physical aggression within relationships over time (Murphy & O'Leary; O'Leary et al.; O'Leary & Slep). This finding also further supports this claim by documenting its continuity from adolescence into young adulthood. Therefore, when thinking about the nature of change in IPA over time, researchers must also consider the relationship between psychological and physical aggression. Findings from Study 3 also suggest that interventionists addressing IPA among adolescents should intervene when psychological aggression first begins rather than waiting for the emergence of physical aggression. However, these were examined only through self-reports. In order to move these findings forward, future studies will need to examine whether self-reports of psychological IPA predict subsequent partner reports of physical IPA and vice versa.

Moreover, all three studies of this dissertation focused on the perpetration of IPA. Therefore, it will be essential to examine potential differences of these results based on reports of victimization of IPA. Consideration of the motives behind the aggression may also be useful in moving the results of this dissertation forward. Patterns may vary for individuals who perpetrate aggression due to lack of anger management skills versus individuals who engage in IPA as a means to control one's partner (Johnson, 1995; 2006). Lastly, since the findings of this dissertation focused on a community sample in which the types of aggression reported were largely low in severity, it will be important to examine if the findings of the three studies replicate in a more nationally representative sample, and separately, in more vulnerable

populations (e.g., low SES adolescents, ethnic minority adolescents) where IPA, and more severe IPA, is more common. In any event, the present dissertation makes important contributions to the literature on change in IPA from adolescence to young adulthood and can be used as a segue for new research questions to be considered.

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## APPENDIX A

*Percentages of participants who were dating, cohabiting, or married from ages 18-25 (N = 484).*

	Dating	Cohabiting	Married	Total
	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>
Age 18	190 (39.3%)	16 (3.3%)	8 (1.7%)	214 (44.3%)
Age 19	188 (38.8%)	31 (6.4%)	25 (5.2%)	244 (50.4%)
Age 20	185 (38.2%)	36 (7.4%)	29 (6.0%)	250 (51.6%)
Age 21	177 (36.6%)	52 (10.7%)	41 (8.5%)	270 (55.8%)
Age 22	154 (31.8%)	92 (19.0%)	65 (13.4%)	311 (64.2%)
Age 23	128 (26.4%)	104 (21.5%)	94 (19.4%)	326 (67.3%)
Age 24	122 (25.2%)	100 (20.7%)	111 (22.9%)	333 (68.8%)
Age 25	102 (21.1%)	84 (17.4%)	128 (26.4%)	314 (64.9%)

*Note.* Total consists of the number and percentages of participants who were romantically involved at each wave.

## APPENDIX B

*Number of participants who reported interpartner aggression data from ages 18-25 (N = 484).*

	Missing	Non-Missing
	N (%)	N (%)
Age 18	244 (50.4%)	240 (49.6%)
Age 19	230 (47.5%)	254 (52.5%)
Age 20	223 (46.1%)	261 (53.9%)
Age 21	209 (43.2%)	275 (56.8%)
Age 22	172 (35.5%)	312 (64.5%)
Age 23	157 (32.4%)	327 (67.6%)
Age 24	149 (30.8%)	335 (69.2%)
Age 25	166 (34.3%)	318 (65.7%)

## APPENDIX C

*Items assessing psychological and physical aggression across all eight waves.*

Age 18		
Item Number	Subscale	Item
3	Psychological	I insulted or swore at my boyfriend/girlfriend.
5	Physical	I threw something at my boyfriend/girlfriend that could hurt.
7	Physical	I twisted my boyfriend/girlfriend's arm or hair.
11	Physical	I pushed or shoved my boyfriend/girlfriend.
13	Physical	I punched or hit my boyfriend/girlfriend with something that could hurt.
15	Psychological	I destroyed something belonging to my boyfriend/girlfriend.
17	Psychological	I shouted or yelled at my boyfriend/girlfriend.
21	Physical	I grabbed my boyfriend/girlfriend.
23	Physical	I slapped my boyfriend/girlfriend.
27	Psychological	I threatened to hit or throw something at my boyfriend/girlfriend.
29	Physical	I kicked my boyfriend/girlfriend.
Ages 19-21		
Item Number	Subscale	Item
6	Psychological	Yelled, insulted, or swore at your husband/wife.
8	Psychological	Stomped out of the room or house.
10	Psychological	Threatened to throw something at your husband/wife.
12	Physical	Pushed, grabbed, or shoved at your husband/wife.
14	Physical	Hit or tried to hit your husband/wife.

Appendix C (continues).



## Appendix C (continued).

Ages 22-25

Item Number	Subscale	Item
1	Psychological	I insulted or swore at my partner.
3	Physical	I threw something at my partner that could hurt.
5	Physical	I twisted my partner's arm or hair.
9	Physical	I pushed or shoved my partner.
15	Psychological	I put down my partner's appearance or abilities.
17	Physical	I punched my partner or hit my partner with something that could hurt.
19	Psychological	I destroyed something belonging to my partner.
23	Psychological	I shouted or yelled at my partner.
25	Physical	I slammed my partner against a wall.
29	Physical	I grabbed my partner.
31	Psychological	I stomped out of the room or house or yard during a disagreement.
33	Physical	I slapped my partner.
39	Psychological	I did something to spite my partner.
41	Psychological	I threatened to hit or throw something at my partner.
45	Physical	I kicked my partner.

APPENDIX D

*Factor loadings of latent variables for psychological and physical aggression at each time point across models.*

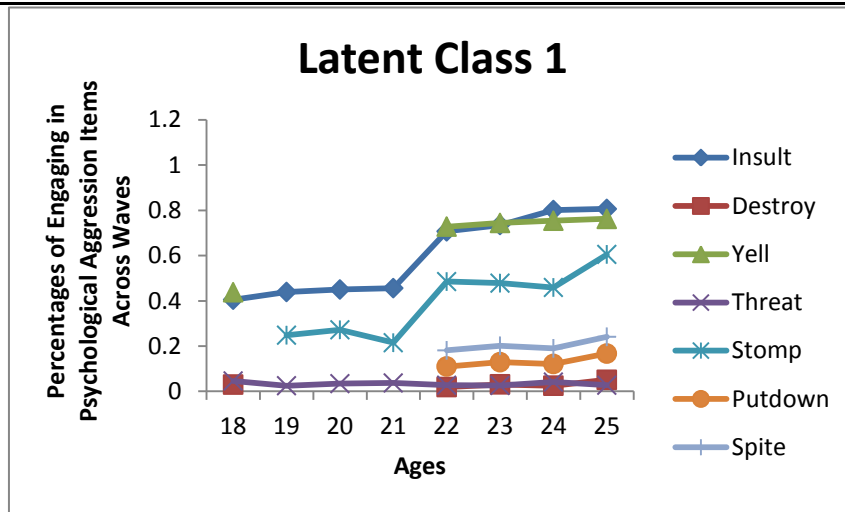
	Psychological Aggression (N = 484)							Physical Aggression (N = 477)							
	Threat	Destroy	Yell	Insult	Stomp	Putdown	Spite	Hit	Throw	Twist	Push	Grab	Slap	Kick	Slam
Age 18	1.000	.888	.789	.862				1.000	.793	.763	.880	.781	.694	.898	
Age 19	1.000			.862	.691			1.000			.880				
Age 20	1.000			.862	.691			1.000			.880				
Age 21	1.000			.862	.691										
Age 22	1.000	.888	.789	.862	.691	.655	.525	1.000	.793	.763	.880	.781	.694	.898	.690
Age 23	1.000	.888	.789	.862	.691	.655	.525	1.000	.793	.763	.880	.781	.694	.898	.690
Age 24	1.000	.888	.789	.862	.691	.655	.525	1.000	.793	.763	.880	.781	.694	.898	.690
Age 25	1.000	.888	.789	.862	.691	.655	.525	1.000	.793	.763	.880	.781	.694	.898	.690

*Note.* For physical aggression, age 21 was excluded from the model. All factor loadings were significant at the .001 level.

APPENDIX E

Percentages and plots of engagement in psychological aggression items across waves (N = 484).

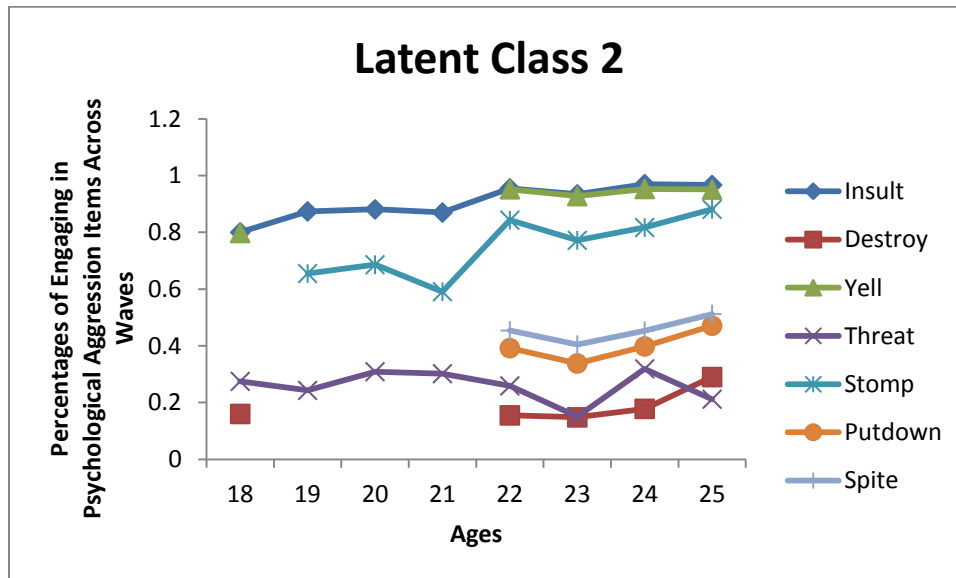
Latent Class 1: Minor/Increasing Trajectory							
	Insult	Destroy	Yell	Threat	Stomp	Putdown	Spite
18	.405	.030	.438	.046			
19	.439			.025	.248		
20	.450			.034	.272		
21	.456			.037	.215		
22	.707	.019	.728	.027	.485	.110	.181
23	.735	.031	.744	.026	.478	.129	.201
24	.801	.025	.754	.041	.459	.121	.190
25	.806	.051	.762	.027	.605	.167	.241



Appendix E (continues).

Appendix E (continued).

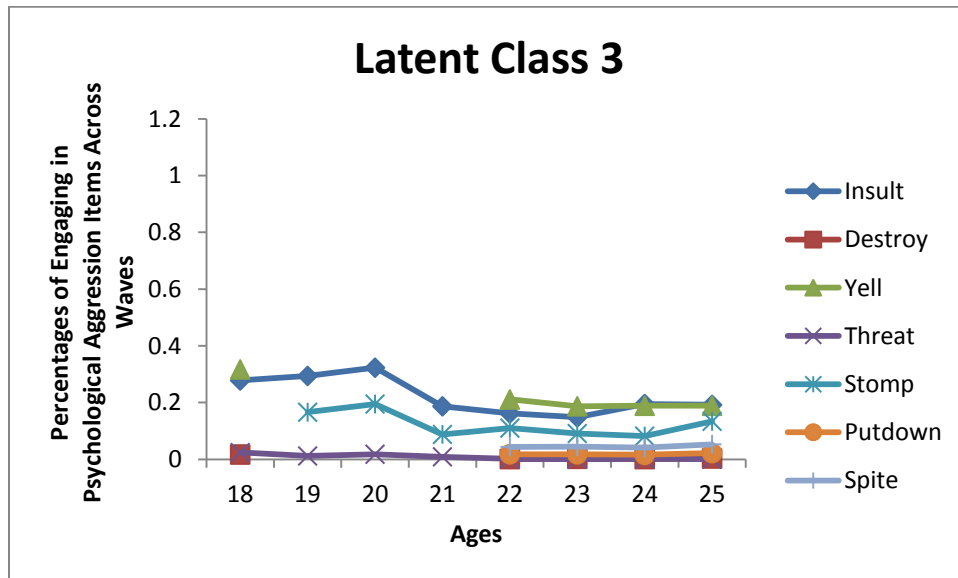
Latent Class 2: Extensive Trajectory							
	Insult	Destroy	Yell	Threat	Stomp	Putdown	Spite
18	.800	.160	.798	.275			
19	.874			.243	.655		
20	.881			.309	.686		
21	.870			.302	.591		
22	.955	.155	.952	.259	.843	.392	.454
23	.934	.148	.928	.151	.772	.338	.404
24	.970	.178	.953	.319	.817	.398	.453
25	.967	.290	.951	.212	.881	.471	.512



Appendix E (continues).

Appendix E (continued).

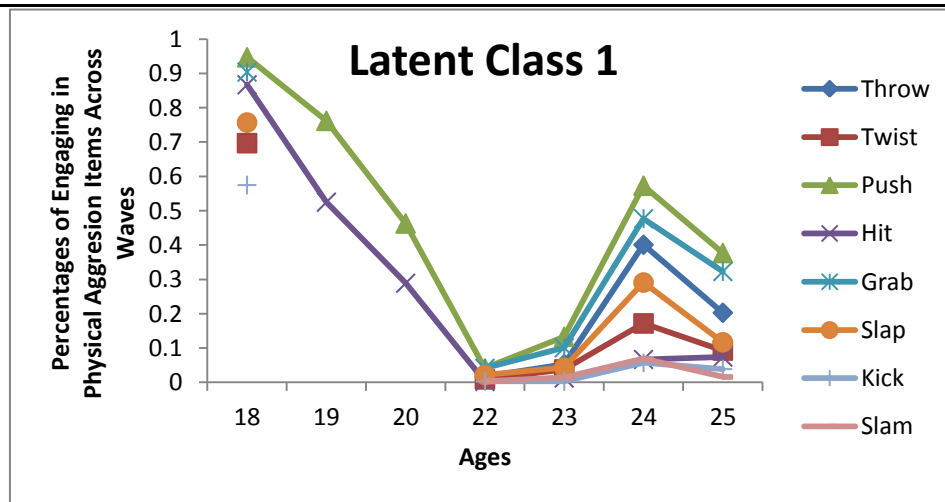
Latent Class 3: Little-to-None Trajectory							
	Insult	Destroy	Yell	Threat	Stomp	Putdown	Spite
18	.278	.017	.317	.024			
19	.294			.012	.166		
20	.323			.018	.195		
21	.187			.009	.088		
22	.162	.001	.211	.002	.110	.018	.044
23	.148	.002	.187	.001	.091	.018	.045
24	.195	.001	.189	.002	.082	.016	.041
25	.192	.003	.189	.001	.134	.022	.053



APPENDIX F

Percentages and plots of engagement in physical aggression items across waves (N = 477).

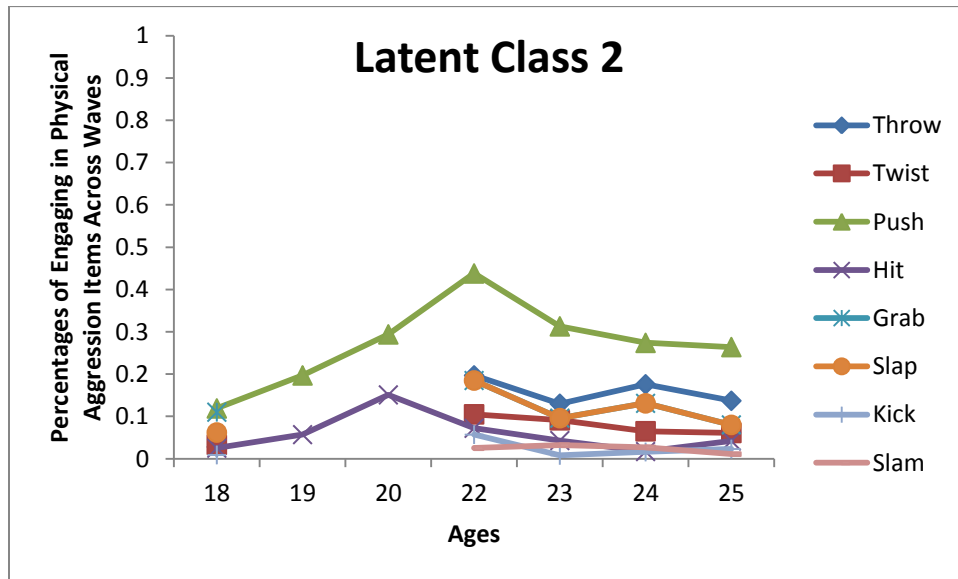
Latent Class 1: Decreasing Trajectory								
	Throw	Twist	Push	Hit	Grab	Slap	Kick	Slam
18	.700	.697	.947	.867	.904	.757	.575	
19			.762	.525				
20			.463	.289				
22	.017	.009	.041	.003	.041	.022	.003	.003
23	.053	.038	.133	.013	.101	.043	.003	.014
24	.401	.172	.573	.067	.477	.291	.057	.069
25	.203	.093	.377	.074	.323	.117	.039	.016



Appendix F (continues).

Appendix F (continued).

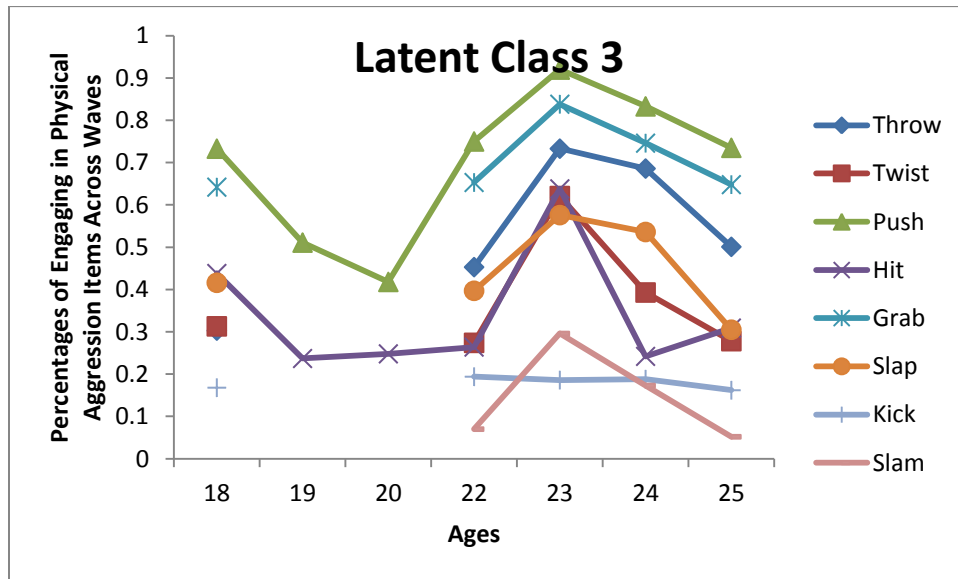
Latent Class 2: Minor/Increasing Trajectory								
	Throw	Twist	Push	Hit	Grab	Slap	Kick	Slam
18	.028	.033	.119	.025	.110	.062	.009	
19			.197	.057				
20			.294	.151				
22	.197	.105	.438	.072	.361	.185	.057	.025
23	.130	.091	.313	.043	.227	.096	.008	.032
24	.176	.065	.274	.017	.228	.131	.016	.027
25	.137	.061	.264	.042	.230	.080	.023	.011



Appendix F (continues).

Appendix F (continued).

Latent Class 3: Extensive Trajectory								
	Throw	Twist	Push	Hit	Grab	Slap	Kick	Slam
18	.303	.313	.733	.438	.642	.416	.168	
19			.511	.237				
20			.418	.248				
22	.453	.274	.750	.264	.653	.397	.194	.070
23	.733	.621	.920	.638	.838	.576	.186	.296
24	.686	.393	.833	.242	.746	.536	.188	.173
25	.501	.278	.735	.309	.648	.305	.162	.052



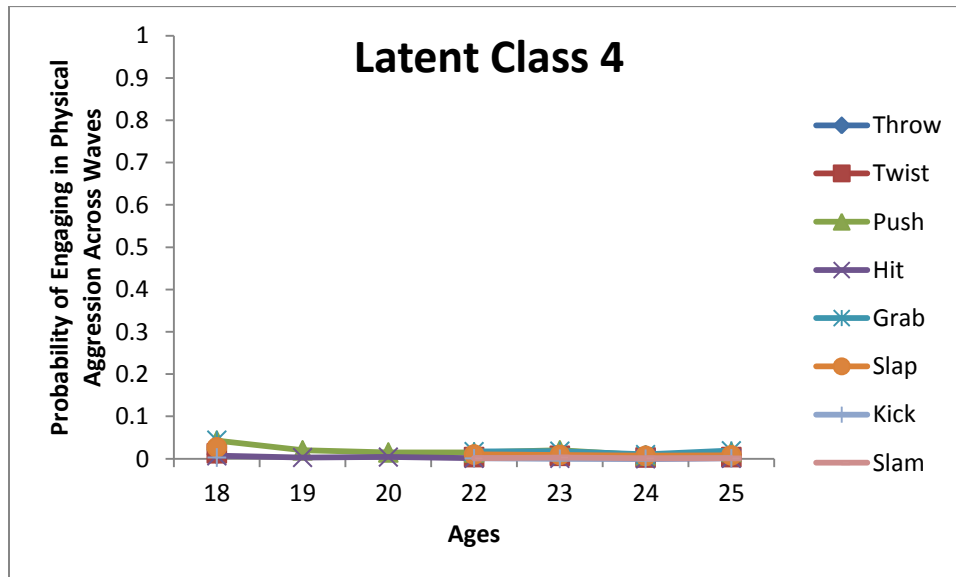
Appendix F (continues).



Appendix F (continued).

Latent Class 4: Little-to-None Trajectory

	Throw	Twist	Push	Hit	Grab	Slap	Kick	Slam
18	.011	.013	.043	.007	.044	.027	.003	
19			.020	.003				
20			.015	.004				
22	.007	.004	.015	.001	.017	.010	.001	.001
23	.009	.007	.020	.001	.018	.009	.000	.003
24	.007	.003	.008	.000	.010	.007	.000	.001
25	.010	.004	.016	.001	.019	.008	.001	.001



APPENDIX G

Table 1. *Multinomial logistic regression models comparing classes for psychological aggression.*

<b>Panel A. Interparental Aggression</b>				
Minor/Increasing Class ( <i>n</i> = 255) Compared to Little-to-None Class ( <i>n</i> = 110)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	-.07	.21	-.13	.94
Sex	.59	.23	.89***	1.81
Race	.30	.37	.34	1.35
SES	-.03	.11	-.12	.97
Extensive Class ( <i>n</i> = 119) Compared to Little-to-None Class ( <i>n</i> = 110)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	-.09	.28	-.11	.91
Sex	.62	.27	.55**	1.85
Race	.23	.42	.15	1.26
SES	-.35	.13	-.74***	.71
Minor/Increasing Class ( <i>n</i> = 255) Compared to Extensive Class ( <i>n</i> = 119)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	-.03	.25	-.05	.98
Sex	.02	.23	.03	1.02
Race	-.07	.32	-.08	.93
SES	-.31	.11	-1.03***	.73
<b>Panel B. Social Information Processing</b>				
Minor/Increasing Class ( <i>n</i> = 255) Compared to Little-to-None Class ( <i>n</i> = 110)				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	-.01	.05	-.03	.99
Hostile Attribution Bias	.36	.42	.21	1.43
Aggressive Response Bias	.37	.20	.74***	1.45
Response Evaluation Bias	.26	.44	.15	1.30
Sex	.92	.27	.58**	2.50
Race	.25	.41	.12	1.28
SES	.04	.11	.05	1.04

Table 1 Continued.

Extensive Class ( $n = 119$ ) Compared to Little-to-None Class ( $n = 110$ )				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	-.00	.06	-.00	1.00
Hostile Attribution Bias	.59	.49	.20	1.81
Aggressive Response Bias	.65	.21	.78***	1.92
Response Evaluation Bias	.16	.52	.06	1.18
Sex	1.24	.33	.47***	3.44
Race	.09	.50	.03	1.10
SES	-.23	.14	-.20~	.80
Extensive Class ( $n = 119$ ) Compared to Minor/Increasing Class ( $n = 255$ )				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.01	.05	.04	1.01
Hostile Attribution Bias	.23	.38	.18	1.26
Aggressive Response Bias	.28	.11	.75***	1.33
Response Evaluation Bias	-.10	.42	-.08	.91
Sex	.32	.25	.27	1.37
Race	-.15	.36	-.10	.86
SES	-.26	.11	-.52**	.77
<b>Panel C. Insecurity Attachment Styles</b>				
Minor/Increasing Class ( $n = 225$ ) Compared to Little-to-None Class ( $n = 110$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.08	.16	.14	1.08
Preoccupied Attachment	.34	.16	.66**	1.40
Sex	.58	.23	.58**	1.78
Race	.21	.37	.16	1.23
SES	-.04	.11	-.09	.96
Extensive Class ( $n = 119$ ) Compared to Little-to-None Class ( $n = 110$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.30	.18	.34~	1.34
Preoccupied Attachment	.41	.18	.49**	1.51
Sex	.58	.28	.35*	1.78
Race	.13	.43	.06	1.14
SES	-.36	.13	-.52***	.70

Table 1 Continues.

Table 1 Continued.

Extensive Class ( $n = 119$ ) Compared to Minor/Increasing Class ( $n = 255$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.22	.15	.47	1.25
Preoccupied Attachment	.08	.15	.17	1.08
Sex	.00	.23	.00	1.00
Race	-.08	.33	-.06	.93
SES	-.32	.10	-.87***	.73

**Panel D. Discontinuity of Relationship Partner**

Minor/Increasing Class ( $n = 255$ ) Compared to Little-to-None Class ( $n = 110$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-.18	.37	-.16	.84
Sex	.58	.23	.88***	1.79
Race	.30	.38	.34	1.35
SES	-.02	.11	-.07	.98

Extensive Class ( $n = 119$ ) Compared to Little-to-None Class ( $n = 110$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-1.21	.49	-.53**	.30
Sex	.58	.27	.43*	1.78
Race	.24	.42	.13	1.27
SES	-.29	.13	-.52**	.75

Extensive Class ( $n = 119$ ) Compared to Minor/Increasing Class ( $n = 255$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-1.03	.43	-.64***	.36
Sex	-.01	.23	-.01	.99
Race	-.06	.32	-.05	.94
SES	-.28	.10	-.68***	.76

~  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Table 2. *Multinomial logistic regression models comparing trajectories for physical aggression.*

<b>Panel A. Interparental Aggression</b>				
Decreasing Class ( <i>n</i> = 21) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	.14	.41	.10	1.15
Sex	1.23	.54	.66***	3.43
Race	1.06	.65	.42~	2.89
SES	-.33	.23	-.41	.72
Minor/Increasing Class ( <i>n</i> = 89) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	.13	.25	.16	1.13
Sex	.48	.25	.45*	1.61
Race	1.18	.31	.83***	3.26
SES	-.03	.11	-.07	.97
Extensive Class ( <i>n</i> = 119) Compared to Little-to-None Class ( <i>n</i> = 339)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	.86	.27	.64***	2.36
Sex	.41	.42	.23	1.50
Race	1.08	.54	.45*	2.94
SES	-.25	.18	-.34	.78
Minor/Increasing Class ( <i>n</i> = 89) Compared to Decreasing Class ( <i>n</i> = 21)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	-.02	.47	-.02	.98
Sex	-.76	.56	-.73*	.47
Race	.12	.67	.09	1.13
SES	.29	.25	.67	1.34
Extensive Class ( <i>n</i> = 28) Compared to Decreasing Class ( <i>n</i> = 21)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	.72	.45	.75*	2.04
Sex	-.83	.65	-.66~	.44
Race	.02	.80	.01	1.02
SES	.07	.28	.14	1.08
Extensive Class ( <i>n</i> = 28) Compared to Minor/Increasing Class ( <i>n</i> = 89)				
	B	(SE)	$\beta$	Odds Ratio
Interparental Aggression	.73	.34	.84***	2.08
Sex	-.07	.45	-.06	.93
Race	-.10	.56	-.07	.90
SES	-.22	.20	-.46	.80

Table 2 Continues.

Table 2 Continued.

<b>Panel B. Social Information Processing</b>				
Decreasing Class ( $n = 21$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.02	.12	.06	1.02
Hostile Attribution Bias	.35	.68	.16	1.42
Aggressive Response Bias	-.10	.30	-.16	.91
Response Evaluation Bias	.75	.68	.34	2.13
Sex	1.41	.53	.71***	4.10
Race	1.02	.77	.38	2.78
SES	-.31	.24	-.36	.74
Minor/Increasing Class ( $n = 89$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.01	.05	.03	1.01
Hostile Attribution Bias	.04	.43	.03	1.05
Aggressive Response Bias	.06	.11	.14	1.06
Response Evaluation Bias	.78	.44	.52**	2.18
Sex	.71	.27	.53**	2.03
Race	1.16	.34	.63***	3.17
SES	.01	.12	.02	1.01
Extensive Class ( $n = 28$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.06	.11	.14	1.06
Hostile Attribution Bias	2.39	.82	.86***	10.89
Aggressive Response Bias	.18	.15	.23	1.20
Response Evaluation Bias	-1.06	.79	-.37	.35
Sex	.83	.46	.33~	2.28
Race	.97	.57	.28~	2.64
SES	-.38	.21	-.36*	.68
Minor/Increasing Class ( $n = 89$ ) Compared to Decreasing Class ( $n = 21$ )				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	-.01	.13	-.08	.99
Hostile Attribution Bias	-.31	.66	-.25	.74
Aggressive Response Bias	.16	.29	.45	1.17
Response Evaluation Bias	.02	.72	.02	1.02
Sex	-.70	.55	-.64	.50
Race	.13	.79	.09	1.14
SES	.32	.25	.68	1.38

Table 2 Continues.

Table 2 Continued.

Extensive Class ( $n = 28$ ) Compared to Decreasing Class ( $n = 21$ )				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.04	.16	.11	1.04
Hostile Attribution Bias	2.04	.91	.92 <sup>***</sup>	7.66
Aggressive Response Bias	.28	.30	.44	1.32
Response Evaluation Bias	-1.82	.92	-.80 <sup>**</sup>	.16
Sex	-.59	.65	-.29	.56
Race	-.05	.90	-.02	.95
SES	-.08	.31	-.09	.92
Extensive Class ( $n = 28$ ) Compared to Minor/Increasing Class ( $n = 89$ )				
	B	(SE)	$\beta$	Odds Ratio
Goal Clarification	.05	.12	.15	1.05
Hostile Attribution Bias	2.34	.78	1.06 <sup>***</sup>	10.42
Aggressive Response Bias	.12	.14	.19	1.13
Response Evaluation Bias	-1.84	.79	-.81 <sup>***</sup>	.16
Sex	.12	.48	.06	1.12
Race	-.18	.59	-.07	.83
SES	-.40	.23	-.47 <sup>*</sup>	.67
<b>Panel C. Insecurity Attachment Styles</b>				
Decreasing Class ( $n = 21$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	-.30	.30	-.27	.74
Preoccupied Attachment	.60	.31	.54 <sup>**</sup>	1.82
Sex	1.27	.57	.60 <sup>***</sup>	3.56
Race	.98	.67	.34 <sup>~</sup>	2.67
SES	-.32	.24	-.36	.73
Minor/Increasing Class ( $n = 89$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.19	.18	.33	1.21
Preoccupied Attachment	-.03	.16	-.05	.97
Sex	.44	.25	.41 <sup>~</sup>	1.55
Race	1.16	.31	.79 <sup>***</sup>	3.20
SES	-.05	.11	-.11	.95
Extensive Class ( $n = 28$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.45	.18	.41 <sup>*</sup>	1.56
Preoccupied Attachment	.42	.26	.39 <sup>~</sup>	1.52
Sex	.32	.42	.16	1.37
Race	.94	.54	.34 <sup>~</sup>	2.56
SES	-.38	.19	-.44 <sup>*</sup>	.68

Table 2 Continues.

Table 2 Continued.

Minor/Increasing Class ( $n = 89$ ) Compared to Decreasing Class ( $n = 21$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.49	.33	.61*	1.63
Preoccupied Attachment	-.63	.33	-.80**	.53
Sex	-.83	.59	-.55~	.44
Race	.18	.69	.09	1.20
SES	.27	.25	.43	1.31
Extensive Class ( $n = 28$ ) Compared to Decreasing Class ( $n = 21$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.75	.33	.93***	2.11
Preoccupied Attachment	-.19	.38	-.24	.83
Sex	-.96	.68	-.63*	.39
Race	-.04	.80	-.02	.96
SES	-.06	.29	-.10	.94
Extensive Class ( $n = 28$ ) Compared to Minor/Increasing Class ( $n = 89$ )				
	B	(SE)	$\beta$	Odds Ratio
Fearful Attachment	.26	.23	.35	1.29
Preoccupied Attachment	.44	.28	.62*	1.56
Sex	-.13	.46	-.09	.88
Race	-.22	.57	-.12	.80
SES	-.33	.20	-.57*	.72
<b>Panel D. Discontinuity of Relationship Partner</b>				
Decreasing Class ( $n = 21$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-.22	.65	-.07	.80
Sex	1.21	.54	.66***	3.37
Race	1.04	.65	.41~	2.82
SES	-.33	.23	-.42	.72
Minor/Increasing Class ( $n = 89$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-1.04	.43	-.51**	.35
Sex	.45	.25	.37*	1.57
Race	1.15	.32	.69***	3.16
SES	-.01	.11	-.03	.99
Extensive Class ( $n = 28$ ) Compared to Little-to-None Class ( $n = 339$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-.15	.69	-.07	.86
Sex	.34	.41	.25	1.40
Race	.97	.53	.53*	2.64
SES	-.33	.18	-.59*	.72



Table 2 Continued.

Minor/Increasing Class ( $n = 89$ ) Compared to Decreasing Class ( $n = 21$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	-.82	.73	-.45	.44
Sex	-.77	.57	-.70 <sup>~</sup>	.47
Race	.11	.67	.07	1.12
SES	.31	.24	.67	1.36
Extensive Class ( $n = 28$ ) Compared to Decreasing Class ( $n = 21$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	.07	.92	.05	1.07
Sex	-.88	.65	.99 <sup>***</sup>	.42
Race	-.07	.79	-.06	.93
SES	-.01	.28	-.01	1.00
Extensive Class ( $n = 28$ ) Compared to Minor/Increasing Class ( $n = 89$ )				
	B	(SE)	$\beta$	Odds Ratio
Discontinuity	.89	.76	.65 <sup>~</sup>	2.43
Sex	-.11	.44	-.14	.89
Race	-.18	.56	-.16	.84
SES	-.32	.20	-.92 <sup>**</sup>	.73

<sup>~</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

## APPENDIX H

*Comparing stability pathways of psychological aggression across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	Crit $\chi^2$
No constraints	11944.167	2648			
PSYCH18→PSYCH22 PSYCH22→PSYCH23	11953.280	2649	9.113	1	3.841
PSYCH18→PSYCH22 PSYCH23→PSYCH24	11950.973	2649	6.806	1	3.841
PSYCH18→PSYCH22 PSYCH24→PSYCH25	11952.688	2649	8.521	1	3.841
PSYCH22→PSYCH23 PSYCH23→PSYCH24	11945.253	2649	1.086	1	3.841
PSYCH22→PSYCH23 PSYCH24→PSYCH25	11944.956	2649	0.789	1	3.841
PSYCH23→PSYCH24 PSYCH24→PSYCH25	11944.274	2649	0.107	1	3.841

*Comparing stability pathways of physical aggression across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta$ df	Crit $\chi^2$
No constraints	11944.167	2648			
PHY18→PHY22 PHY22→PHY23	11947.099	2649	2.932	1	3.841
PHY18→PHY22 PHY23→PHY24	11947.555	2649	3.388	1	3.841
PHY18→PHY22 PHY24→PHY25	11944.342	2649	0.175	1	3.841
PHY22→PHY23 PHY23→PHY24	11945.216	2649	1.049	1	3.841
PHY22→PHY23 PHY24→PHY25	11946.698	2649	2.531	1	3.841
PHY23→PHY24 PHY24→PHY25	11946.634	2649	2.467	1	3.841

*Comparing stability pathways of psychological and physical aggression across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	Crit $\chi^2$
No constraints	11944.167	2648			
PSYCH18→PSYCH22 PHY18→PHY22	11949.322	2649	5.155	1	3.841
PSYCH22→PSYCH23 PHY22→PHY23	11946.593	2649	2.426	1	3.841
PSYCH23→PSYCH24 PHY23→PHY24	11966.481	2649	22.314	1	3.841
PSYCH24→PSYCH25 PHY24→PHY25	11996.034	2649	51.867	1	3.841

*Comparing cross-lag pathways of early psychological aggression predicting later physical aggression across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	Crit $\chi^2$
No constraints	11944.167	2648			
PSYCH18→PHY22 PSYCH22→PHY23	11944.719	2649	0.552	1	3.841
PSYCH18→PHY22 PSYCH23→PHY24	11945.824	2649	1.657	1	3.841
PSYCH18→PHY22 PSYCH24→PHY25	11946.408	2649	0.038	1	3.841
PSYCH22→PHY23 PSYCH23→PHY24	11944.175	2649	0.008	1	3.841
PSYCH22→PHY23 PSYCH24→PHY25	11944.171	2649	0.004	1	3.841
PSYCH23→PHY24 PSYCH24→PHY25	11944.169	2649	0.002	1	3.841

*Comparing cross-lag pathways of early physical aggression predicting later psychological aggression across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	Crit $\chi^2$
No constraints	11944.167	2648			
PHY18→PSYCH22 PHY22→PSYCH23	11949.534	2649	5.367	1	3.841
PHY18→PSYCH22 PHY23→PSYCH24	11944.214	2649	0.050	1	3.841
PHY18→PSYCH22 PHY24→PSYCH25	11944.812	2649	0.645	1	3.841
PHY22→PSYCH23 PHY23→PSYCH24	11950.184	2649	6.017	1	3.841
PHY22→PSYCH23 PHY24→PSYCH25	11948.600	2649	4.433	1	3.841
PHY23→PSYCH24 PHY24→PSYCH25	11944.645	2649	0.478	1	3.841

*Comparing cross-lag pathways of early psychological aggression predicting later physical aggression and early physical aggression predicting later psychological aggression across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	Crit $\chi^2$
No constraints	11944.167	2648			
PSYCH18→PHY22 PHY18→PSYCH22	11945.231	2649	1.064	1	3.841
PSYCH22→PHY23 PHY22→PSYCH23	11956.010	2649	11.843	1	3.841
PSYCH23→PHY24 PHY23→PSYCH24	11949.337	2649	5.170	1	3.841
PSYCH24→PHY25 PHY24→PSYCH25	11953.375	2649	9.208	1	3.841

*Comparing cross-lag pathways of early psychological aggression predicting later physical aggression to stability pathways of psychological aggression across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	Crit $\chi^2$
No constraints	11944.167	2648			
PSYCH18→PHY22					
PSYCH18→PSYCH22	11970.947	2649	26.780	1	3.841
PSYCH22→PHY23					
PSYCH22→PSYCH23	12034.886	2649	90.719	1	3.841
PSYCH23→PHY24					
PSYCH23→PSYCH24	12065.265	2649	121.098	1	3.841
PSYCH24→PHY25					
PSYCH24→PSYCH25	12076.333	2649	132.166	1	3.841



*Comparing cross-lag pathways of early psychological aggression predicting later physical aggression to stability pathways of physical aggression across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	Crit $\chi^2$
No constraints	11944.167	2648			
PSYCH18→PHY22 PHY18→PHY22	11946.569	2649	2.402	1	3.841
PSYCH22→PHY23 PHY22→PHY23	11947.106	2649	2.939	1	3.841
PSYCH23→PHY24 PHY23→PHY24	11951.039	2649	6.872	1	3.841
PSYCH24→PHY25 PHY24→PHY25	11946.747	2649	2.580	1	3.841

*Comparing cross-lag pathways of early physical aggression predicting later psychological aggression to stability pathways of psychological aggression across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	Crit $\chi^2$
No constraints	11944.167	2648			
PHY18→PSYCH22 PSYCH18→PSYCH22	11949.837	2649	5.670	1	3.841
PHY22→PSYCH23 PSYCH22→PSYCH23	11969.253	2649	25.086	1	3.841
PHY23→PSYCH24 PSYCH23→PSYCH24	11976.927	2649	32.760	1	3.841
PHY24→PSYCH25 PSYCH24→PSYCH25	11982.101	2649	37.934	1	3.841

*Comparing cross-lag pathways of early physical aggression predicting later psychological aggression to stability pathways of physical aggression across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	Crit $\chi^2$
No constraints	11944.167	2648			
PHY18→PSYCH22 PHY18→PHY22	11948.580	2649	4.413	1	3.841
PHY22→PSYCH23 PHY22→PHY23	11975.914	2649	31.747	1	3.841
PHY23→PSYCH24 PHY23→PHY24	11965.753	2649	21.586	1	3.841
PHY24→PSYCH25 PHY24→PHY25	11960.941	2649	16.774	1	3.841

*Comparing concurrent pathways across waves (N = 462).*

Parameters constrained to be equal	$\chi^2$	df	$\Delta\chi^2$	$\Delta df$	Crit $\chi^2$
No constraints	11944.167	2648			
PSYCH18 WITH PHY18 PSYCH22 WITH PHY22	11960.593	2649	16.426	1	3.841
PSYCH18 WITH PHY18 PSYCH23 WITH PHY23	11957.802	2649	13.635	1	3.841
PSYCH18 WITH PHY18 PSYCH24 WITH PHY24	11967.200	2649	23.033	1	3.841
PSYCH18 WITH PHY18 PSYCH25 WITH PHY25	11997.367	2649	53.200	1	3.841
PSYCH22 WITH PHY22 PSYCH23 WITH PHY23	11944.174	2649	0.007	1	3.841
PSYCH22 WITH PHY22 PSYCH24 WITH PHY24	11945.058	2649	0.891	1	3.841
PSYCH22 WITH PHY22 PSYCH25 WITH PHY25	11961.489	2649	17.322	1	3.841
PSYCH23 WITH PHY23 PSYCH24 WITH PHY24	11945.016	2649	0.849	1	3.841
PSYCH23 WITH PHY23 PSYCH25 WITH PHY25	11956.336	2649	12.169	1	3.841
PSYCH24 WITH PHY24 PSYCH25 WITH PHY25	11952.742	2649	8.575	1	3.841