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Dispositional, Demographic, and Social Predictors of Trajectories of Intimate Partner Aggression in Early Adulthood

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Abstract

Objective—From a developmental systems perspective, the origins of maladjusted behavior are multifaceted, interdependent, and may differ at different points in development. Personality traits influence developmental outcomes, as do socialization environments, but the influence of personality depends on the socialization environment, and the influence of the socialization environment varies according to personality. The present study takes a developmental systems approach to investigate pathways through which dispositional traits in childhood might act in concert with peer and parental socialization contexts to predict trajectories of intimate partner aggression (IPA) during emerging adulthood.

Method—The study included 466 participants (49% male, 81% European American, 15% African American) from a longitudinal study of social development. Measures of demographics, temperament, personality, parent-child relations, romantic relationships, peer relationships, and IPA were administered between 5 and 23 years of age. The study used latent growth curve analysis to predict variations in trajectories of IPA during early adulthood.

Results—Numerous variables predicted risk for the perpetration of IPA, but different factors were associated at the end of adolescence (e.g., psychopathic traits) than with changes across early adulthood (e.g., friend antisociality). Males and individuals with a history of resistance to control temperament showed enhanced susceptibility to social risk factors, such as exposure to antisocial peers and poor parent-adolescent relations.

Conclusions—Consistent with a developmental systems perspective, multiple factors, including personality traits in early childhood and aspects of the social environment in adolescence predict trajectories of IPA during early adulthood through additive, mediated, and moderated pathways.

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Knowledge of these risk factors and for whom they are most influential could help inform efforts to prevent the emergence and persistence of IPA.

Keywords

Intimate Partner Violence; Dating Aggression; Temperament; Delinquent Peers; Early Adulthood

Recent estimates indicate that 1 in 3 women and 1 in 4 men in the United States have been victims of physical or sexual aggression by an intimate partner in their lifetime (Black et al., 2011). Victims of intimate partner aggression (IPA) are at increased risk for a multitude of negative long-term health outcomes, such as social maladjustment, depression, PTSD, and long term physical health problems (Bonomi et al., 2006; Campbell, 2002). Children exposed to IPA in the household are also at increased risk for serious emotional and behavioral problems (e.g., Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffe, 2003). Considering the high prevalence and widespread negative consequences of IPA, its prevention is of great importance to public health.

Researchers using data from cross-sectional and longitudinal studies have estimated the average trajectory of IPA perpetration across the lifespan. Researchers have found that IPA begins to decrease in early adulthood (Foshee et al., 2009; Kim, Laurent, Capaldi, & Feingold, 2008), with a recent longitudinal study finding a peak in IPA at age 20 (Johnson, Giordano, Manning, & Longmore, 2015). Considering the developmental course of IPA, early adulthood may be an optimal time to identify factors that differentiate individuals who will show declining trajectories in IPA perpetration from those who will show persistent or increasing trajectories.

Research taking a developmental systems perspective could help advance understanding of the emergence and maintenance of IPA perpetration during early adulthood, and in doing so, could inform prevention efforts. From a developmental systems perspective, variations in psychological and behavioral adaptations are understood to be the product of multiple, interdependent influences that unfold between the individual and their environment throughout development (Sameroff, 2000). For example, particular early appearing dispositional factors might be expected to contribute to IPA in the context of particular environments that follow from and amplify those dispositional factors. It is also possible that a particular dispositional factor could enhance susceptibility to particular environmental risk factors. However, if the hypothetical links between individual dispositions and the environment are disrupted, or if those same environments are experienced by individuals without those particular dispositions, aggressive behavior would be less likely to develop. To the extent that the effects of dispositions and environments on risk for IPA operate within such a system, selectively focusing on the influence of either traits or social environments, but not their interdependencies, would likely result in a fragmented account of how IPA develops.

Although the developmental systems approach has been applied to the study of general aggression and psychopathology for decades (Sameroff, 2000), only recently has its relevance to the study of IPA been fully articulated (Capaldi, Shortt, & Kim, 2005). In the present study we took a developmental systems approach to better understand risks for IPA

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in early adulthood. We investigated additive, mediated, and moderated effects of three kinds of risk/protective factors – dispositional, demographic, and social variables – on trajectories of IPA from ages 18–23.

Risk Factors for IPA Perpetration

Demographic, early-emerging dispositional characteristics, socialization experiences, and relationship variables all have shown associations with risk for IPA perpetration, although not with complete consistency. Cunradi, Caetano, and Schafer (2002) found that the variable of annual household income had the greatest relative association with IPA perpetration (over and above variables including education level, employment status, and alcohol-related problems), but other researchers (e.g., Aldarondo & Sugarman, 1996) did not find a significant association once other risk factors were statistically controlled. Mixed findings have also been reported for race and ethnicity. Caetano, Field, Ramisetty-Mikler, and McGrath (2005) found that African Americans and Hispanics were more likely than European Americans to initiate IPA, whereas Vest, Catlin, Chen, and Brownson (2002) found that race was no longer predictive of IPA after other risk factors were controlled.

Evidence for gender differences in IPA is also mixed (e.g., Dutton & Corvo, 2006). Several studies have found that sex does not predict IPA perpetration (Andrews, Foster, Capaldi & Hops, 2000; Ehrensaft et al., 2003). In contrast, Capaldi et al. (2012) concluded in their review of the research that women were slightly more likely than men to use violence against a partner. This conclusion was supported in part by a meta-analysis that found that women were more physically aggressive toward partners, but men were more likely to cause injury (Archer, 2000).

A variety of individual characteristics have also been found to predict risk for IPA perpetration. A history of general antisocial behavior in adolescence increases risk for perpetration of IPA in adulthood (Capaldi & Clark 1998; Capaldi, Dishion, Stoolmiller, & Yoerger, 2001; Kim et al., 2008), even after controlling for a wide range of other risk factors (Andrews et al., 2000). Impulsivity also has shown robust prospective associations with IPA perpetration, predicting perpetration in a nationally representative sample of heterosexual couples (Schafer, Caetano, & Cunradi, 2004) and in a sample or newlywed husbands and wives (Langer, Lawrence, & Barry, 2008). In addition, psychopathic traits, which include interpersonal (superficial charm), emotional (callousness), and behavioral features (antisocial behaviors), are also associated with elevated risk for IPA. Concurrent associations have been documented in a nonclinical sample of undergraduate university students (Coyne, Nelson, Graham-Kevan, Keister, & Grant, 2010), and in a community sample of cohabiting couples (Marshall & Holtworth-Munroe, 2010). Studies showing a prospective association between psychopathy and IPA are lacking, however.

Researchers have also found that individual characteristics specifically relating to intimate relationships predict IPA perpetration. Feelings of jealousy and dependency predicted IPA perpetration in a samples of adolescents (Giordano, Soto, Manning, & Longmore, 2010), adult women (Caldwell, Swan, Allen, Sullivan, & Snow, 2009), and adult men (Bornstein, 2006). To our knowledge, while many studies have included individual characteristics as

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predictors of risk for IPA, few studies have considered individual characteristics simultaneously with demographic and social predictors.

In addition to demographic and individual characteristics, several social variables are associated with risk for IPA perpetration. Affiliation with delinquent peers is a reliable social risk factor for future IPA perpetration (Capaldi et al., 2012). Miller, Gorman-Smith, Sullivan, Orpinas, and Simon (2009) and Pettit et al. (2006) found that friend delinquency predicted higher levels of dating aggression in late adolescence, even when controlling for parenting risk factors. Capaldi, Dishion, Stoolmiller, and Yoerger (2001) also found an association between males' delinquent friendships in middle adolescence and IPA in early adulthood.

Among those studying effects of parent-child relations, Banyard, Cross, and Modecki (2006) found that low levels of parental monitoring and low parental support in adolescence predicted IPA perpetration, Foshee and colleagues (2011) found that poor monitoring and family conflict predicted dating aggression, and Pettit et al. (2006) found that hostile and harsh parenting predicted dating aggression at age 18.

Not all studies have found evidence for parenting effects on IPA, however. Ehrensaft et al. (2003) found that lack of closeness to mother at ages 16–18 predicted IPA perpetration at age 24, but maternal inconsistency with rules and poor supervision did not. Adding to this mixed picture, Andrews et al. (2000) found that parent-adolescent conflict did not predict IPA perpetration, but family aversive communication in a problem-solving task did, for men only. In addition, lower levels of parent involvement and support did not predict dating aggression committed by boys during high school (Simons, Lin, & Gordon, 1998).

Relationship characteristics are also associated with IPA perpetration. Relationship length predicts persistence of IPA perpetration over time. Capaldi, Shortt, and Crosby (2003) found greater stability in IPA for those who stayed in the same relationship across assessments. In addition, Alexander, Moore, and Alexander (1991) found that relationship length predicted more verbal, but not physical, abuse, and Baker and Stith (2008) found that relationship length predicted women's reports of psychological aggression victimization. These findings suggest that relationship stability and duration should be considered when studying risk for IPA.

Incorporating Risk Factors into a Developmental Systems Framework

Most studies of IPA have emphasized either dispositional, demographic, or social-environmental variables, but not their interdependencies. Therefore, from a developmental systems perspective, several important questions regarding the development of IPA remain unanswered. First, although many different factors predict IPA perpetration, it is unclear to what extent these factors have additive, or nonredundant, effects, because risks often cluster together. While many studies have included control variables, few have considered individual, social, and demographic risk factors in the same analyses, or have controlled for relationship-specific factors, such as partnership changes and relationship duration.

Second, it is unclear to what degree risk factors that predict IPA at a single time point also distinguish individual differences in trajectories of perpetration, because most studies have

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examined either single assessments of IPA or have predicted IPA across multiple assessments without predicting its trajectory (e.g., Kim et al., 2008). It is possible that variables predicting perpetration at the end of adolescence would differ from those predicting perpetration in early adulthood, considering variability in patterns of antisocial behavior, and differences in their correlates, observed across this transition (Moffitt & Caspi, 2001).

Third, and perhaps most importantly, the pathways linking risk factors across different domains and development periods have not been adequately explored. In their recent review of the literature, Capaldi et al (2012) noted enormous progress in identifying risk factors for IPA, but relatively little progress in identifying moderated and mediated pathways linking risk factors to IPA. Nevertheless, the few studies having considered moderated and mediated relationships between risk factors have found support for these kinds of effects. For example, low socioeconomic status (SES), poor monitoring, and family conflict predicted IPA more strongly for boys than for girls (Foshee et al., 2011; Magdol, Moffitt, Caspi, & Sliva, 1998). In addition, race differences in IPA perpetration may be mediated by differences in SES. Vest, Catlin, Chen, and Brownson (2002) found that race no longer predicted IPA once income was controlled, suggesting that income might mediate race differences in IPA.

In addition to testing pathways involving gender and race, the present study also considers how impulsivity, in the form of temperamental resistance to control, could influence exposure and/or susceptibility to peer and parent-child risk factors for IPA. Impulsivity often involves hypersensitivity to reward and difficulty inhibiting prepotent behaviors (e.g., Martin & Potts, 2004), which could amplify the effects of exposure to deviant peers or parents who provide reinforcements for aggressive behavior and/or are observed receiving reinforcements for behaving aggressively.

Several studies from the conduct problems literature indicate the potential for impulsivity to moderate peer and parental influences. In the peer domain, Snyder et al. (2010) found that the reinforcement and modeling effects of deviant peers on later antisocial behavior were stronger for impulsive than for nonimpulsive children. In a complementary fashion, Goodnight, Bates, Newman, Dodge, and Pettit (2006) found that deviant peer affiliation predicted antisocial behavior measured more strongly for impulsive teens than for nonimpulsive teens.

Impulsivity also moderates effects of parenting on antisocial behavior. Above-average restrictive parenting in childhood was more strongly predictive of reduced antisocial behavior among temperamentally resistance to control (impulsive and unmanageable) children than among non-resistant children. (Bates, Pettit, Dodge, & Ridge, 1998). In a complementary fashion, parent-initiated efforts to combat children's behavior problems in late childhood were more effective for children with resistance to control temperaments (Goodnight, Bates, Pettit, & Dodge, 2008), and positive parental involvement was more strongly associated with reduced antisocial behavior among impulsive teens (Stice & Gonzales, 1998).

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In addition to moderating parental and peer influences, impulsivity predicts exposure to ineffective parenting and peer delinquency and increases risk for antisocial behavior in adolescence. Studies have found that temperamental negativity and oppositional behavior in childhood predicts reductions in positive parenting and increases in negative parenting (e.g., Ge et al., 1996; Kiff, Lengua, & Zalewski, 2011). In addition, impulsivity and oppositionality increase the likelihood of drifting into delinquent and aggressive peer groups (e.g., Chapple, 2005). Finally, impulsive children are at increased risk for exhibiting antisocial behaviors in adolescence (e.g. Olson, Schilling, & Bates, 1999). Thus, it is possible that peer and parenting variables and a pattern of antisocial behavior in adolescence provide pathways from early impulsivity to risk for IPA in early adulthood. Considering moderated and mediated pathways together, it is possible that temperamental resistance to control increases exposure to social risks for IPA while also increasing susceptibility to those influences.

The Current Study

We had two overarching goals in applying a development systems framework to the study of IPA perpetration. First, we sought to identify a set of nonredundant (i.e., additive) influences on trajectories IPA from a wide range of demographic, dispositional, and social-environmental variables. We included predictors from multiple domains and developmental periods and used a fully prospective design to minimize confounding of the direction and magnitude of associations between IPA and its correlates. We were interested in estimating the average trajectory of IPA in early adulthood in our sample while accounting for the effects of intimate partnership changes and variations in relationship duration, determining to what extent previously identified risk factors for IPA would be predictive when correlated risk factors were also considered, and distinguishing risk factors for IPA at the end of adolescence (age 18) from those that predicted subsequent changes in early adulthood (from age 18 to 23).

Second, we sought to identify possible interdependent effects of predictors from across different domains and developmental periods. Specifically, we tested the possibility that gender would moderate the influences of parent-teen relationship, antisocial peers, and SES, on IPA. In addition, we tested whether associations between resistance to control temperament in early childhood and elevated risk for IPA in early adulthood would be mediated by (1) negative parent-teen relations, (2) exposure to delinquent peers, and (3) antisocial behaviors in adolescence, and would moderate the effects of peer and parental influences by strengthening their associations with IPA. Finally, we tested whether elevated risk for IPA among African Americans might be mediated by lower levels of SES among this group. In conducting this study we hoped to identify non-redundant predictors of IPA in late adolescence and early adulthood and to uncover possible etiological mechanisms linking interdependent risk factors to IPA, as both kinds of information have the potential to inform prevention and treatment efforts.

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Method

Participants

Participants were from the Child Development Project (CDP; Dodge, Bates, & Pettit, 1990). CDP participant families were originally recruited from three cities (Nashville and Knoxville, TN, and Bloomington, IN) in 1987 and 1988. Data collection began the summer before the participants entered kindergarten (at around age 5), and follow-up collections were conducted annually. Data used for the current study were collected from parents and their offspring when offspring were between 5 and 23 years of age. The full CDP sample (N = 585) was representative of the SES of the populations at the respective sites. The Hollingshead index of SES at the outset of the study (M = 39.53, SD = 14.01) ranged from 8 to 66, indicating that the sample was predominantly middle class but included a broad range of socioeconomic backgrounds. The sample was 52% male, 81% European American, 17% African American, and 2% of other ethnicities. Of the 534 (91%) participants who completed assessments on at least one occasion between ages 18 and 23, 466 were in a relationship and completed an assessment of IPA on at least one occasion. Compared to those from the original sample who did not participate and/or did not report a relationship between ages 18 and 23, the subsample of 466 did not differ significantly in mother- or teacher-reported age 5 externalizing problems, age 5 family SES, or in ethnicity. However, relative to those who did not participate and/or were not in relationships between ages 18 and 23 (65% men), the subsample included fewer men (48.5% men; $\chi^2(1) = 11.04$, $p < .001$). The 466 participants from the subsample identified above were included in the analyses, and, in an effort to minimize the potentially biasing influence of missing data on the model parameters (Schafer & Graham, 2003), full information maximum likelihood estimation was used to maintain this sample size across analyses.

Measures

Dispositional/individual variables

Demographics: Child sex and ethnicity were reported during interviews with mothers at child age 5. Family SES at age 16 was computed with Hollingshead's (1975) four-factor index of social status, which is based on parental marital status, educational attainment, employment status, and occupational prestige. Mothers reported on their own and their spouse's (if present) level of education and type of work. Education level and occupational status of just one parent were used for single parent households.

Temperamental resistance to control: When children were 5 years of age, mothers completed the Retrospective Infant Characteristics Questionnaire (RICQ; Bates et al., 1998), a retrospective measure of infant temperament. Resistance to control was measured by four items reflecting early unmanageability and impulsivity as expressed in unresponsiveness to prohibitions and impulsiveness in explorations, with higher scores reflecting higher levels of unmanageability and impulsivity. Items were rated on a 7-point scale, and item scores were averaged together to create a resistance to control score. The resistance scale has shown cross-age continuity from 13 to 24 months of age in another sample (r = .55; Bates & Bayles, 1984) and has shown concurrent validity in terms of its association with externalizing behaviors (Bates et al., 1998). The RICQ has also shown reliability in the form

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of correlations between mothers' ratings of resistance to control in the second year of life and mothers' retrospective ratings at age 10 years (r = .34; Bates et al., 1998). Cronbach's alpha was .83.

Psychopathic traits: At age 16, youths completed the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), a 20-item self-report measure of psychopathic traits. Items on the APSD measure interpersonal (e.g., superficial charm, lack of empathy), emotional (e.g., shallow affect), and behavioral (e.g., reckless antisocial behaviors, impulsivity) dimensions of psychopathy. Participants responded using a 3-point scale (0= "not true at all" to 2= "definitely true"). Summed scores calculated for use in the current study had a Cronbach's alpha of .73.

Antisocial behavior: At age 16, youths completed the Youth Self-Report Form (Achenbach, 1991). The externalizing scale, which assesses a wide range of aggressive and delinquent behaviors, was used to measure youths' antisocial behavior. The externalizing scale of the Youth Self Report has shown high levels of reliability and validity (Achenbach, 1991). Cronbach's alpha for the externalizing scale was .89.

Fear of abandonment: At age 18, youths completed a measure of "fear of abandonment" (Holtzworth-Munroe, Meehan, Herron, Rehman, & Stuart, 2000) consisting of the sum of five items from the borderline and dependent personality scales of the Millon Clinical Multiaxial Inventory (MCMI-III, Choca & Van Denberg, 1997). Sample items include: "I'll do something desperate to prevent a person I love from abandoning me"; and "Being alone, without the help of someone close to depend on, really frightens me." Participants were instructed to consider all past and present relationships when responding to the items. Participants responded using a five-point scale, ranging from "not at all like me" to "very much like me." Cronbach's alpha was .82. Evidence for validity of this measure has been shown in the form of significant associations with the conceptually-related construct of low peer competence (Pettit et al., 2006).

Interpersonal jealousy: At age 18, youths completed a shortened, 7-item version of the Interpersonal Jealousy Scale (IJS; Mathes & Severa, 1981) to assess feelings of jealousy and possessiveness toward romantic partners (e.g., "I feel possessive toward my partner"). Participants were instructed to reflect on their current partners when responding to the items, or if they were not currently in a relationship, to reflect on past partners. Participants responded using a nine-point scale, ranging from "absolutely false/disagree completely," to "absolutely true/agree completely." A composite score was calculated by averaging scores on the 7 items. Cronbach's alpha was .84. Like the fear of abandonment scale, the IJS has shown evidence of validity in the form of associations with low peer competence (Pettit et al., 2006).

Social and environmental variables

Maternal warmth: At age 16, youths completed five items taken from the acceptance scale of the revised Child Report of Parent Behavior Inventory (CRPBI; Schaefer, 1965). These items concerning mothers' warmth and positive involvement were rated on a 1 (not like her)

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to 3 (a lot like her) scale. The acceptance scale of the CRPBI has been found to be reliable over one-and five-week periods (Margolies & Weintraub, 1977). Cronbach's alpha was .90.

Maternal monitoring: Monitoring items were included in mother interviews when youths were 16 years of age. Items were adapted from those used in previous studies of parental monitoring (Brown, Mounts, Lamborn, & Steinberg, 1993; Dishion, Patterson, Stoolmiller, & Skinner, 1991). Items, rated on a 1 (never) to 5 (always or almost always/ every day) scale, measured mothers' reported knowledge of their children's companions and whereabouts, difficulty in tracking their children's activities, likelihood that their children will go where forbidden, and frequency of communication with their children. The four monitoring items were averaged to create a composite monitoring scale. Cronbach's alpha was .65.

Parent-adolescent problem solving: Parent-adolescent problem solving was assessed with the Parent Adolescent Interaction Task (PAIT) Rating Scales at child age 16. The PAIT is based closely on the Iowa Family Interaction Rating Scales (Melby & Conger, 2001). The parent-adolescent (usually mother-adolescent) dyads were videotaped while they completed three interaction tasks, each lasting approximately 8 minutes. For the first task the mother and adolescent read and discussed their answers to questions printed on a set of cards covering a variety of topics. For example, the first card asked: "When do Mom and I spend time together? Was it an average week or did something different happen?" For the second task, dyads answered questions relating to areas of conflict previously reported by the mothers and adolescents. For the third task, the dyads role-played several hypothetical vignettes (e.g., resolving conflict about going on an overnight camping trip). The parent-child dyads were left alone in a room of their home to complete the tasks. The experimenter's interaction with participants was limited to setting up the camera and introducing, starting, and stopping each of the tasks.

Coders rated the video-taped interactions using scales from 1 (not at all characteristic) to 9 (mainly characteristic). The parent-child problem solving scale was a subjective rating of the overall effectiveness of the dyad's problem solving as observed across the three tasks. Raters considered the overall quality of communication and the degree to which effective and practical solutions were generated. Raters scored overall problem-solving after completing other, more specific ratings, such as "effective problem solving process" and "disruptive problem solving process," that were specific to the problem-solving portion of the parent-adolescent interaction. Interrater reliability was computed using 20% of the total cases. The intraclass correlation for the problem solving scale was .66 ($p < .01$).

Friend antisocial behavior: At age 16, participants reported on their friends' aggressive and delinquent behaviors, answering nine questions regarding the frequency with which their friends use drugs, steal, lie to parents, get in trouble at school, and get into fights. Responses were based on a five-point scale, ranging from never to very often. Responses were averaged to create a composite scale. Cronbach's alpha was .87. This scale has shown stability over a two-year period ($r = .54$; Goodnight et al., 2006)

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Relationship-oriented variables

Relationship information: Annually from ages 18–23, participants reported on aspects of their romantic relationships, including relationship length. Participants' reports of relationship length were used to create variables indexing the total number of months in the previous year the participant was in a relationship. Also, at ages 19–23, partnership stability was determined by examining whether names of partners were the same or different across waves. Rauer, Pettit, Lansford, Bates, and Dodge (2013) previously analyzed relationship length and partnership transitions data from the CDP, finding that variations in relationship duration and stability are associated with several variables in childhood and adolescence, including parent-teen relationship quality and friend support. Relationship stability and length were included as time varying covariates in the current study analyses.

Intimate partner aggression: Shortened versions of the Revised Conflict Tactics Scale (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996) were used to measure physical aggression and threat of physical aggression among participants in relationships during the previous year. Fifteen items regarding the perpetration or threat of aggression were administered at ages 18, 22, and 23, and nine items were administered at ages 19, 20, and 21. Item content and response options differed between the two versions. Because growth curve modeling requires equivalency of measurement over time, steps were taken to equate the item content and response scales across the two versions.

First, items with overlapping content were identified. Five items from the 15-item measure and 3 items from the 9-item measure were identified that assessed the same forms of physical aggression and threat of physical aggression. These items (shown in Table 1) were selected so that IPA variables with equivalent content could be created for each of the six years of assessment. Second, the 5 items selected from the 15-item measure were reduced to 3 variables to match the item frequency and content of the 3 items selected from the 9-item measure. One of the 5 items from 15-item measure was already equivalent in content to an item from the 9-item measure; therefore, it was not changed. However, the content included in the other 4 items selected from the 15-item measure matched content from 2 items in the 9-item measure. Therefore, these 4 items were combined to create 2 variables that matched the content to the 2 items from the 9-item version. Specifically, scores from the items "I pushed or shoved my boyfriend/girlfriend" and "I grabbed my boyfriend/girlfriend," from the 15-item measure were summed to create one matching variable, and scores from the items "I punched or hit my boyfriend/girlfriend with something that could hurt" and "I slapped my boyfriend/girlfriend" from the 15-item measured were summed to create the second matching variable. The completion of these steps resulted in having three variables with equivalent content from all six years in which IPA was assessed.

Next, differences in scale between the 3 matching items from the 9- and 15-item measures were addressed. Items from the 15-item measure were originally scaled such that 0 = "this 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." Items from the 9-item measure were originally scaled such that 0 = "never," 1 = "less than once a month," 2 = "about once a month," 3 =

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"2–3 times a month," 4 = "once a week," 5 = "2–3 times a week," and 6 = "almost every day." The following procedure was used to create an equivalent, 4-level scale from responses on the 15-item version and the 9-item version: Frequencies of zero on the 9-item and 15-item measures were scored as a "0" on the new scale; frequencies of "once, twice, 3–5, or 6–10 times in the past year" on the 15-item measure and responses of "less than once a month" on the 9-item measure were scored as a "1"; frequencies of "11–20 times in the past year" on the 15-item measure and responses of "about once a month" on the 9-item measure were scored as a "2"; and frequencies of "more than 20 times in the past year" on the 15-item measure and frequencies of "2–3 times a month" and above on the 9-item measure were scored as a "3." Responses on the 9-item scale of "2–3 times a month" or greater were given the same score of "3" because the 15-item measure did not differentiate beyond 20 or more times during the past year. The 3 rescaled items were then summed within each year to produce total annual IPA scores at ages 18 – 23 years. Cronbach's alpha for IPA scores were .82, .66, .80, .80, .65, and .83 from ages 18–23 years, respectively. The annual IPA scores served as outcome variables in the latent growth curve model.

Results

Descriptive and Bivariate Analyses

Descriptive statistics for continuous variables from all participants from the full CDP sample are reported in Table 2. Descriptive statistics regarding the subsample of participants who reported romantic relationships between ages 18 and 23 are reported in Table 3. Between 13% (age 21) and 23% (age 18) of the sample who were in relationships between age 18 and 23 reported perpetration of IPA. Bivariate correlations between non-categorical predictors are shown in Table 4. Bivariate correlations between non-categorical predictors and IPA from ages 18–23 are presented in Table 5. SES, parent-teen problem solving, and maternal monitoring were significantly negatively associated with IPA in at least one year, and temperamental resistance to control, antisocial behavior, psychopathic traits, fear of abandonment, interpersonal jealousy, friend antisocial behavior, family stress, and yearly relationship duration were significantly positively associated with IPA in at least one year. Maternal warmth was the only variable *not* significantly correlated with IPA at any age; therefore, it was excluded from subsequent analyses. T-tests were used to examine associations between categorical predictors and IPA. Females reported significantly greater levels of IPA perpetration than males at age 19 only, $t(200.97) = -2.21$, $p = .028$, and African Americans reported significantly greater levels of IPA perpetration than European Americans at age 20 only, $t(30.19) = -2.35$, $p = .025$. Participants reporting the same partners across two-year periods did not differ significantly from those who changed partners in their reported levels of IPA at any age.

Analyses Evaluating Invariance of IPA Assessments and Growth Processes

We planned to use the annual IPA scores as indicators for a single latent growth curve model (GCM) of IPA from ages 18–23 years. Before moving forward, however, we needed to confirm the success of the previously described transformation in creating equivalent assessments of IPA variables across the different ages. To do so, we conducted two analyses. The first analysis evaluated factorial invariance of the IPA items across all years of

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assessment. Factorial invariance was evaluated in terms of equivalence of intercepts and factor loadings for the three rescaled IPA items (i.e., hit, push/grab, threat) across assessments. A structural equation model was estimated in which six latent IPA factors were specified (one for each year), each having three indicators (hit, push/grab, threat). All factor loadings and intercepts of the indicators were constrained to be equal for common items across factors. Modification indices were then inspected for evidence of non-invariance. We found that 12 of 18 factor loadings and 18 of 18 intercepts were invariant across assessment. Notably, the non-invariant factor loadings were not patterned according to differences in assessments of IPA. That is, factor loadings were not consistently different between variables derived from the 9-item scale and those derived from the 15-item scale, which would suggest that the instances of non-invariance were not caused by pre-transformation differences in content and scale between the 9- and 15-item measures of IPA. After allowing non-invariant factor loadings to be estimated freely, model fit statistics were as follows: Satorra-Bentler scaled χ^2 (94, N = 466) = 179.178, p = .000, CFI = .90, RMSEA = .044. These results provide evidence for an adequate degree of invariance in measurement across the assessments.

The second analysis was conducted to confirm that the IPA variables derived from the 15-item and 9-item assessments were capturing the same growth process in the sample, and thus could be used to inform different time points in a single GCM of IPA from ages 18 to 23. This preliminary analysis involved simultaneously modeling two GCMs: one using the IPA variables from the age 18, 22, and 23 assessments (derived from the 15-item assessment), and the other using the IPA variables derived from the age 19, 20, and 21 assessments (derived from the 9-item assessment). If we found no statistically significant differences between the growth parameters estimated from the two GCMs, and if we found that the slopes from the two models and the intercepts from the two models were correlated, then we could conclude that the two models were capturing a common growth process and move forward with our plan to use all the IPA variables in a single GCM of IPA from ages 18 to 23. Mplus was used to test all latent GCMs. Robust standard errors were estimated to reduce bias due to nonnormal distribution of the IPA scores, and model fit was evaluated with the Satorra-Bentler scaled chi-square statistic, confirmatory fit index (CFI), and root mean square error of approximation (RMSEA).

As noted above, the model for this preliminary analysis was specified such that one GCM was estimated on the basis of the age 18, 22, and 23 IPA post-transformation variables, and a second GCM was estimated using the age 19, 20, and 21 IPA post-transformation variables. The two GCMs were specified such that the latent growth intercept for both models was set at age 18. Doing so allowed for a direct comparison of the intercepts and slopes from the two GCMs, as they both provided estimates of linear changes in IPA beginning at age 18. In order to test the invariance of the parameters from the two GCMs, the intercepts and variances of the two growth curve intercepts were constrained to be equal, as were the intercepts and variances of the two growth curve slopes. This model provided adequate fit to the data: Satorra-Bentler scaled χ^2 (12, N = 466) = 15.426, p = .219, CFI = .94, RMSEA = .025. After this model was estimated, the constraints on the intercepts and slopes of the two growth models were freed and the statistical significance of the resulting improvement in model fit was evaluated using a chi-square difference test. This test was nonsignificant,

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Satorra-Bentler scaled $\Delta \chi^2 = 1.67(4)$, $p = .80$, indicating that the slope and intercept estimates from the two GCMs did not provide significantly different characterizations of growth in IPA. In addition, the intercepts from the two GCMs from the constrained model were strongly correlated ($r = .64$), as were the slopes ($r = .71$), providing further evidence that the two models provided highly similar estimates of IPA trajectories (and individual variations in those trajectories) despite relying on variables derived from different assessments of IPA. These results provided us with confidence that we could move forward with testing a single GCM of IPA from ages 18–23.

Primary Analyses

The next step in carrying out our analyses was to characterize the form of the growth process in IPA from ages 18 to 23 for the sample using data from all assessments of IPA (18–23 years of age) in a single GCM. Annual relationship duration and same/different partner variables were included in this model as time-varying covariates, allowing for an estimate of the average trajectory of IPA net of any fluctuations owing to changes in average duration or stability in relationships across waves. Model fit values for a linear GCM were as follows: Satorra-Bentler scaled χ^2 (55, N = 466) = 54.524, $p = .493$, CFI = 1.00, RMSEA = .000. Nonlinear growth was then evaluated by adding a quadratic term to the model. No significant difference was found when comparing the fit of a model in which the mean of the quadratic term was freely estimated to the fit of a model in which the mean was fixed at a value of zero: Satorra-Bentler scaled $\Delta \chi^2 = 0.994$ (1), $p = .319$. Therefore, the quadratic term was excluded from all subsequent models. The estimated means of the intercept and slope from the linear growth model were .301, $p = .002$, and −.044, $p = .012$, respectively, indicating that the sample showed a significant annual decline in IPA from ages 18 and 23. The estimated variances of the intercept and slope were .909, $p = .003$, and .033, $p = .044$, respectively.

The effects of the various risk factors on the intercept (i.e., starting point at age 18) and slope (i.e., linear change from age 18 to 23) were considered next. However, before evaluating their effects, two composite variables were created. A parent-teen relations variable was created by computing the average of z-score standardized scores on the monitoring and problem solving scales. In addition, a jealousy/fear of abandonment (FOA) variable was made by computing the average of z-score standardized scores on the interpersonal jealousy and FOA scales. The composite variables were created in an effort to combine particular variables that were likely to reflect common or highly related constructs. The risk factors, included as predictors of the GCM intercept and slope (i.e., linear change from age 18 to 23), were added to the model in two steps. The first step involved adding resistance to control temperament, sex, and race. These predictors were evaluated before predictors from adolescence were added to the model to avoid disguising effects that might be mediated by predictors from adolescence. In the second step, adolescent predictors were added to the model (i.e., psychopathy, antisocial behavior, jealousy/FOA, friend antisocial behavior, SES, and parent-teen relations), as were several interaction terms. Resistance to control temperament was tested as a moderator of the effects of friend antisocial behavior and parent-teen relations on IPA, and gender was tested as a moderator of the effects of SES, friend antisocial behavior, and parent-teen relations on IPA. Moderation was tested by

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computing interaction terms between z-score standardized variables (for noncategorical variables) or, in the case of sex, a dummy-coded variable, to reduce multicollinearity and ease interpretation of any significant moderation effects.

Mediation was evaluated by testing indirect effects of temperamental resistance to control through the adolescent risk factors of antisocial behavior, friend antisocial behavior, and parent-teen relations; and of race through socioeconomic status. Mediated effects were tested using bootstrap resampling (Preacher & Hayes, 2008). This approach creates a distribution of the mediated (i.e., indirect) effect by repeatedly resampling with replacement from the data (1,000 times in our analyses). The confidence interval of the estimate is then inspected to determine statistical significance. The bootstrapping approach, in contrast with alternative approaches to testing mediation, does not assume that the estimate of the mediated effect is normally distributed, and therefore provides less biased tests of statistical significance (Preacher & Hayes, 2008).

The model including race, sex, and resistance to control temperament fit the data well: Satorra-Bentler scaled χ^2 (89, N = 466) = 107.49, p = .089, CFI = .901, RMSEA = .021. Female sex (β = .19) and African American ethnicity (β = .26) significantly additively predicted the intercept (i.e., starting point) of IPA at age 18, and resistance to control temperament had a trend level additive effect (β = .11, p = .06). In this model, resistance to control temperament was the only predictor (β = .12), apart from the intercept of the GCM (β = −.82), to significantly, additively predict the slope of IPA from age 18 to 23. Participants who were high in resistance to control in early childhood showed more gradual declines (or, possibly increases) in IPA during early adulthood as compared to participants who were low in resistance to control, who showed more dramatic declines in risk for IPA during this period. Unstandardized coefficients and their associated standard errors and p-values from this model are shown in Table 6.

The next model, which included all predictors from childhood and adolescence and tests of moderated and mediated effects, fit the data adequately: Satorra-Bentler scaled χ^2 (223, N = 466) = 284.92, p = .003, CFI = .915, RMSEA = .024. Female sex (β = .21), psychopathy (β = .30), jealousy/FOA (β = .30), SES (β = −.16) and African American ethnicity (β = .24) all had significant additive, main effect associations with the intercept of IPA. Resistance to control temperament (β = .12) and friend antisocial behavior (β = .28) had significant additive, main effect associations with the slope (i.e., change over time) of IPA from age 18 to 23, indicating that participants with a history of resistance to control temperament in early childhood or high levels of exposure to antisocial peers showed slower declines in IPA over time as compared to those without these characteristics. The intercept also had a significant effect on the slope (β = −.83), indicating that participants reporting high levels of IPA at age 18 showed larger declines in IPA than those reporting low levels IPA.

Only one test of mediation was statistically significant. The association between African American ethnicity and the intercept of IPA was mediated by SES (b = .137, 95% CI [.018, .318]). That is, differences in SES accounted for part of the difference in the intercept of IPA found between African American and European American participants. In contrast, despite finding statistically significant links from resistance to control temperament in early

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childhood to ASB (β = .11) and parent-child relations (β = −.12) in adolescence, associations between resistance to control and the slope of IPA were not found to be mediated by either variable. Unstandardized coefficients and confidence intervals from tests of mediation are shown in Table 8.

Several tests of moderated (i.e., interaction) effects were significant. When predicting the intercept of IPA, resistance to control temperament was found to moderate the effect of parenting (β = −.14). However, parent-teen relationship was not significantly associated with the intercept of IPA when simple slopes were calculated at 1 standard deviation above the mean in resistance to control (β = −.14) or for youths 1 standard deviation below the mean in resistance to control (β = .07). Rather, only at levels of resistance to control temperament exceeding 2.2 standard deviations above the mean was the inverse association between parent-teen relationship and the intercept of IPA statistically significant.

When predicting the slope, sex was found to moderate the effect of friend antisocial behavior (β = −.18), such that friend antisocial behavior was significantly associated with the slope of IPA for men (β = .45), but not for women (β = .09). In addition, resistance to control temperament was found to moderate the effect of friend antisocial behavior on the slope of IPA (β = .16), such that friend antisocial behavior was significantly associated with the slope of IPA for participants 1 SD above the mean in resistance to control in childhood (β = .40), but not for participants who were 1 SD below the mean in resistance to control (β = .13). Figures 1 and 2 show the model-implied moderating effects of sex and resistance to control temperament, respectively, on the effect of friend antisocial behavior on trajectories of IPA, net of the effects of all other predictors included in the model.

Finally, in regard to the effects of time-varying covariates, annual duration of time spent in a relationship (β = .06) was significantly and positively associated with annual reports of IPA, but same/different partner was not (β = −.02). Unstandardized coefficients, standard errors, and p-values for the model including all predictors are shown in Table 7.

Discussion

Recently much progress has been made in identifying risk factors for IPA perpetration. Much less is known, however, about how and for whom previously identified risk factors are linked to IPA. We took a developmental systems approach to investigate how risk factors across demographic, dispositional, and social-environmental domains work together through additive, mediated, and moderated processes to predict risk for IPA perpetration during early adulthood, a time when variations in long-term patterns of IPA are likely to appear. Although it was not possible to test a comprehensive developmental model of the origins of IPA perpetration, our hope was to identify a set of risk factors that independently increase risk for IPA, and to identify individual characteristics that influence exposure and susceptibility to social risk factors.

Our analyses revealed a complex set of associations between risk factors and IPA, with many findings replicating those from previous studies. IPA was found to be its highest level at age 18 and to decrease linearly thereafter, consistent with past research showing declines after

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adolescence (e.g., Foshee et al., 2009). Interestingly, the intercept and slope were strongly negatively correlated. We speculate that this association was due to a floor effect, in which participants' opportunity to show decreases in IPA was severely restricted by their starting point. Individuals who showed very little or no IPA (the majority of the sample) would not have an opportunity to show decreases over time, whereas those with moderate or high levels of IPA would. Several demographic characteristics, including female sex, low SES, and African American ethnicity, and several dispositional characteristics, including jealousy/FOA, were found to predict an elevated intercept of IPA at age 18, replicating findings from previous studies of IPA (e.g., Archer, 2000; Caetano et al., 2005; Giordano et al., 2010; Grann & Wedin, 2002; Gondolf & White, 2001). Notably, our findings indicate that these risk factors are additively associated with risk for IPA at age 18. In other words, their effects on IPA cannot be explained by their associations the other predictors included in our analyses. These findings do not, however, rule out the possibility that other unanalyzed confounders may explain these associations.

Our analyses also revealed a number of associations that have not been previously reported in the IPA literature. To our knowledge, our study is the first to find a prospective association between psychopathic traits and IPA in a community sample. Because we controlled for co-occurring antisocial behavior (and a wide range of other variables) in our analyses, this finding would suggests that other aspects of psychopathy, such as callous-unemotional traits, are responsible for this effect. Additionally, we are aware of no other studies formally testing and finding evidence that increased risk for IPA among African-Americans may result from disparities in access to socioeconomic resources, although results from other studies have hinted at the possibility (Vest et al., 2002).

We also found that resistance to control temperament and antisocial peers predict trajectories of IPA (the slope of the model) in early adulthood. Namely, resistance to control temperament and antisocial peers were inversely associated with the slope of IPA. Given that the mean slope was declining in the sample, these finding indicate that moderately elevated levels of resistant control temperament and antisocial peers are associated with a more gradual decline in risk for IPA in early adulthood, and very elevated levels of resistant to control temperament and antisocial peers are associated with flat trajectories or slight elevations in risk. Although Magdol et al. (1998) previously considered a broad measure of difficult temperament at age 3 in their prospective study of IPA in early adulthood, temperament was included as part of a multi-faceted "problem behavior" composite variable in their multivariate analyses. In addition, although many previous studies have reported associations between friend antisocial behavior and IPA (e.g., Gorman-Smith et al., 2009), we are unaware of any previous studies showing an association with *trajectories* of IPA in adulthood. This finding suggests that the effects of exposure to antisocial peers in adolescence may have a longer reach than previously estimated.

Our study is also unique in finding that males and individuals high in temperamental resistance to control are more responsive to antisocial peer influence on trajectories of IPA, and that youths high in resistance to control are also more susceptible to the effects of parenting on IPA at age 18. As illustrated by Figures 1 and 2, our findings suggest that males and individuals high in resistance to control are predicted to show flat rather than declining

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trajectories (for males) or growth in IPA (for those high in RTC) when exposed to highly antisocial peers. Findings of resistance to control-temperament acting as a moderator of peer and parent influences on IPA are consistent with evidence of enhanced susceptibility to peer and parental influences on general measures of antisocial behavior among impulsive children and adolescents (e.g., Stice & Gonzalez, 1998; Snyder et al., 2010). Capaldi et al. (2001), among others, have found that antisocial peers contribute to antisocial behavior by means of a deviancy training process that is driven by reinforcement learning. Specifically, peers have been found to shape future rates of antisocial behavior by selectively responding with positive affect to antisocial behaviors (Dishion, Spracklen, Andrews, & Patterson, 1996). Reinforcement learning also appears to help explain parenting effects on antisocial behavior. Snyder and Patterson (1995) found a strong correlation between rates of parental reinforcement for child aggressive behavior and rates of aggressive behavior exhibited by children on a future occasion. It is possible that an underlying hypersensitivity to reward could make temperamentally resistance to control children more susceptible to these reward-mediated socialization processes.

We have also suggested previously that temperamentally resistance to control youths may benefit more than other youths from higher levels of parental control, given their relative lack of self-control and their propensity to seek out high risk situations (Bates et al., 1998). In support of these possibilities, and consistent with the present results, we previously found that children with high levels of resistance to control temperament showed greater declines in their behavior problems following a parenting intervention featuring increased strictness and support as compared to youths who were comparatively low in resistance to control (Goodnight et al., 2008).

Several previously identified risk factors for IPA were not found to have statistically significant associations with IPA in our analyses. We did not find an association between antisocial behavior at age 16 and either the intercept or slope of IPA. However, the combination of significant bivariate correlations with IPA across multiple years and a null association with the intercept and slope of IPA in multivariate analyses suggests that antisocial behavior may be associated with IPA via mechanisms captured by other variables in the model. Indeed, antisocial behavior was correlated with several other predictors in the model that were predictive of IPA, such as resistance to control temperament, low SES, and psychopathic traits. Thus, it is possible that antisocial behavior and IPA are correlated in large part because they share common personality, demographic, and social-environmental precursors.

We also did not find a significant association between partnership changes and IPA. This may appear to be inconsistent with the findings of Shortt et al. (2012), who found greater stability in IPA for men who stayed in the same relationship over time. However, it should be noted that whereas Shortt et al. predicted stability of IPA in a high risk sample of men by examining correlations across assessments, the current study considered the effect of relationship changes on levels of IPA in a community-representative sample that included both men and women. Therefore, the findings are not directly comparable.

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It is notable that there was no overlap between variables predicting the intercept of IPA at age 18 and variables predicting changes in IPA from 18 to 23. There are several possible explanations for this pattern of findings. One possibility is that variables associated with the intercept, but not the slope, have a static influence on IPA. This form of influence is well-captured by how the intercept is specified in a latent growth curve model. The intercept represents a constant estimate of IPA carried over from year to year, while the slope represents an estimate of consistent annual change.

A second possibility relates to the tremendous development occurring between late adolescence and early adulthood. Research has demonstrated major reorganization of the brain during this time, resulting in an overall reduction in impulsivity. Also during this time, individuals are achieving new levels of independence, starting and completing college and/or entering the workforce, and transitioning from casual to more committed relationships marked by increased intimacy, cohabitation, engagement, and marriage (Meier & Allen, 2009). Given these dramatic changes, it would not be surprising if the causes of individual differences in IPA at work before this transition would be quite different from those that follow it.

Third, many youths who are engaging in aggression and delinquency and are at increased risk for IPA perpetration will show an adolescence-limited pattern of offending. This would mean that much of the population engaging in IPA in adolescence are quite different than the population engaging in IPA in adulthood, and that different risk factors predict IPA in these populations. For example, undercontrolled temperament in early childhood differentiates the life-course-persistent pattern of offending from the adolescence-limited one (Moffitt & Caspi, 2001).

Finally, a fourth possibility has to do with the fact that all predictors were added to the main model simultaneously. While in many ways this is a strength of the current study, it also means that effects are estimated net all other effects in the model. Any overlapping effects between variables are automatically eliminated, meaning that a variable with a bivariate, unadjusted association with IPA may not have a significant effect on IPA in multivariate analyses.

The findings of the present study provide support for an integrative, developmental systems account that conceptualizes IPA as the product of interdependencies between individual dispositions, contextual factors, and relationship characteristics (Capaldi, et al., 2005). Importantly, however, the current study suggests that not all putative risk factors are influential at all times, despite many variables showing bivariate correlations with IPA, and that the influences of some risk factors vary in predictable ways between individuals. Future research should continue to explore risks for IPA perpetration using a developmental, systemic framework, with a focus on distinguishing confounds from potentially causal influences and identifying etiological mechanisms linking risk factors across development.

The current findings have several implications for those involved in developing and/or implementing preventive interventions for IPA. First, they provide additional support for the increasingly popular notion that IPA perpetration results from a broad range of individual

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and social-ecological factors, and no single necessary or sufficient factor, and therefore prevention is most likely to be effective when targeting multiple risk factors. The findings also suggest that prevention efforts that aim to disrupt relations with antisocial peers and improve relations with parents may be particularly important for young men with an early history of temperamental resistance to control.

Furthermore, the results suggest that interventions for antisocial behavior not originally developed to specifically prevent IPA, such as Multisystemic Therapy (Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 2009) and Functional Family Therapy (Alexander & Robbins, 2011), may have promise for preventing IPA or reducing its occurrence. These approaches take a systems-perspective on treating antisocial behavior by improving parent-adolescent communication and problem solving and reducing time spent with delinquent peers. Although these treatments were designed to treat behavior problems in adolescence, by targeting risk factors that are associated with elevated risk for IPA, our findings suggest that they might also be useful in preventing IPA in early adulthood. In addition, MST in particular has been shown to reduce psychopathic traits in adolescence, which our results suggest could further reduce risk for IPA perpetration (Butler, Baruch, Hickey, and Fonagy, 2011). The implications of the present findings for enhancing and targeting interventions are speculative, however, considering the present studied risk for IPA, not the effects of intervention.

The current study had several limitations. First, although this study considered a wide range of risk factors from numerous domains, it was not exhaustive. For example, we did not include characteristics of partners or relationship functioning, both of which have been found to influence risk for IPA (Capaldi et al., 2012). Instead, we focused on more distal risk factors. Second, although accommodations were made, the current study used assessments of IPA that changed somewhat in scale and content over time and thus were not ideal for repeated-measures analysis. Nevertheless, our analyses indicated that the two forms of IPA assessment shared similar measurement properties and captured the same underlying growth process. Third, although the study benefitted from having repeated measures of IPA across a period of development in which there is likely to be great variability in trajectories of IPA, IPA was not assessed during middle adolescence, the period of time when IPA first develops for some perpetrators. Fourth, although the sample size of the current study was relatively large when compared to previous longitudinal analyses of IPA, it may not have been large enough to detect effects of small magnitude. Fifth, the results may not generalize to the most severe and chronic group of perpetrators, as the current sample was a community sample in which most perpetrators engaged in low levels of IPA. Moreover, the sample included in the multivariate analyses was comprised of a slightly smaller percentage of men (48.5%) than the original CDP sample (52% men), which could affect generalizability of the findings to the original, community-representative sample. Sixth, a large amount of IPA data were missing in our sample at various years. Although growth curve modeling accommodates partial missingness by modeling “around” missing data points, missingness that is nonrandom and associated with factors that affect risk for IPA perpetration has the potential to bias parameter estimation. We controlled for as many such variables as possible, but, it would still be important to be tentative in interpreting the results of the present study. Sixth, although the current study reduced confounding of risk factors for IPA, our findings cannot

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be interpreted as demonstrating causes of IPA. Nevertheless, our use of a prospective design, community sample, and broad range of risk factors make it an important contribution to the ongoing search for the causes of IPA perpetration. This search requires demonstration of a pattern of findings generated by studies with complementary methodological strengths and weaknesses, or offsetting threats to their validity. To our knowledge, no previous study has prospectively examined as broad of a set of risk factors while examining individual trajectories of IPA perpetration in a community sample.

In conclusion, the current study utilized a community-representative sample to examine a broad range of potential influences on IPA perpetration during early adulthood. Results suggest that factors from multiple developmental periods and domains are associated with IPA perpetration through additive, mediated, and moderated pathways. Finally, it appears that different risk factors contribute to IPA at the end of adolescence versus changes in IPA in early adulthood, suggesting that researchers and practitioners should consider influences from early development, late adolescence, and characteristics of intimate relationships when designing, implementing, and evaluating preventive interventions for IPA.

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References

Achenbach, TM. Manual for the Youth Self-Report and 1991 Profile. Burlington, VT: University of Vermont Department of Psychiatry; 1991.

Aldarondo E, Sugarman DB. Risk marker analysis of the cessation and persistence of wife assault. Journal of Consulting and Clinical Psychology. 1996; 64:1010–1019. [PubMed: 8916630]

Alexander, JF., Robbins, MS. Functional Family Therapy. In: Murrihy, CR.Kidman, DA., Ollendick, HT., editors. Clinical Handbook of Assessing and Treating Conduct Problems in Youth. New York, NY: Springer; 2011. p. 245-271.

Alexander PC, Moore S, Alexander ER III. What is transmitted in the intergenerational transmission of violence? Journal of Marriage and the Family. 1991; 53:657–667.

Andrews JA, Foster SL, Capaldi D, Hops H. Adolescent and family predictors of physical aggression, communication, and satisfaction in young adult couples: A prospective analysis. Journal of Consulting and Clinical Psychology. 2000; 68:195–208. [PubMed: 10780119]

Archer J. Sex differences in aggression between heterosexual partners: A meta-analytic review. Psychological Bulletin. 2000; 126:651–680. [PubMed: 10989615]

Baker CR, Stith SM. Factors predicting dating violence perpetration among male and female college students. Journal of aggression, maltreatment & trauma. 2008; 17:227–244.

Banyard VL, Cross C, Modecki KL. Interpersonal violence in adolescence. Journal of Interpersonal Violence. 2006; 21:1314–1332. [PubMed: 16940398]

Bates JE, Bayles K. Objective and subjective components in mothers' perceptions of their children from age 6 months to 3 years. Merrill-Palmer Quarterly. 1984; 30:111–130.

Bates JE, Pettit GS, Dodge KA, Ridge B. Interaction of temperamental resistance to control and restrictive parenting in the development of externalizing behavior. Developmental Psychology. 1998; 34:982–995. [PubMed: 9779744]

Bentler. On the fit of models to covariances and methodology to the Bulletin. Psychological Bulletin. 1992; 112:400–404. [PubMed: 1438635]

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Black, M., Basile, K., Breiding, M., Smith, S., Walters, M., Merrick, M., Stevens, M. The national intimate partner and sexual violence survey (NISVS): 2010 summary report. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention; 2011.

Bonomi AE, Thompson RS, Anderson M, Reid RJ, Carrell D, Dimer JA, Rivara FP. Intimate partner violence and women's physical, mental, and social functioning. American Journal of Preventive Medicine. 2006; 30:458–466. [PubMed: 16704938]

Bornstein RF. The complex relationship between dependency and domestic violence: Converging psychological factors and social forces. American Psychologist. 2006; 61:595. [PubMed: 16953747]

Bornstein RF. An interactionist perspective on interpersonal dependency. Current Directions in Psychological Science. 2011; 20:124.

Brown BB, Mounts N, Lamborn SD, Steinberg L. Parenting practices and peer group affiliation in adolescence. Child Development. 1993; 64:467–482. [PubMed: 8477629]

Butler S, Baruch G, Hickey N, Fonagy P. A randomized controlled trial of multisystemic therapy and a statutory therapeutic intervention for young offenders. Journal of the American Academy of Child and Adolescent Psychiatry. 2011; 50:1220–1235. [PubMed: 22115143]

Caetano R, Field CA, Ramisetty-Mikler S, McGrath C. The 5-year course of intimate partner violence among White, Black, and Hispanic couples in the United States. Journal of Interpersonal Violence. 2005; 20:1039–1057. [PubMed: 16051726]

Caetano R, Vaeth PAC, Ramisetty-Mikler S. Intimate partner violence victim and perpetrator characteristics among couples in the United States. Journal of Family Violence. 2008; 23:507–518.

Caldwell JE, Swan SC, Allen CT, Sullivan TP, Snow DL. Why I hit him: Women's reasons for intimate partner violence. Journal of Aggression, Maltreatment & Trauma. 2009; 18:672–697.

Campbell JC. Health consequences of intimate partner violence. The Lancet. 2002; 359:1331–1336.

Capaldi DM, Clark S. Prospective Family Predictors of Aggression Toward Female Partners for At-Risk Young Men. Developmental Psychology. 1998; 34:1175–1188. [PubMed: 9823503]

Capaldi DM, Dishion TJ, Stoolmiller M, Yoerger K. Aggression toward female partners by at-risk young men: The contribution of male adolescent friendships. Developmental Psychology. 2001; 37:61. [PubMed: 11206434]

Capaldi DM, Knoble NB, Shortt JW, Kim HK. A systematic review of risk factors for intimate partner violence. Partner abuse. 2012; 3:231. [PubMed: 22754606]

Capaldi DM, Shortt JW, Crosby L. Physical and psychological aggression in at-risk young couples: Stability and change in young adulthood. Merrill Palmer Quarterly. 2003; 49:1–27.

Capaldi, DM., Shortt, JW., Kim, HK. A life span developmental systems perspective on aggression toward a partner. In: Pinsof, WM., Lebow, JL., editors. Family psychology: The art of the science. New York: Oxford University Press; 2005. p. 141-167.

Chapple CL. Self-control, peer relations, and delinquency. Justice Quarterly. 2005; 22:89–106.

Choca, J., Van Denburg, E. Interpretive guide to the millon clinical multiaxial inventory. Washington, D.C: American Psychological Association; 1997.

Coyne SM, Nelson DA, Graham-Kevan N, Keister E, Grant DM. Mean on the screen: Psychopathy, relationship aggression, and aggression in the media. Personality and Individual Differences. 2010; 48:288–293.

Cunradi CB, Caetano R, Schafer J. Socioeconomic predictors of intimate partner violence among White, Black, and Hispanic couples in the United States. Journal of Family Violence. 2002; 17:377–389.

Dishion TJ, Patterson GR, Stoolmiller M, Skinner ML. Family, school, and behavioral antecedents to early adolescent involvement with antisocial peers. Developmental Psychology. 1991; 27:172.

Dishion TJ, Spracklen KM, Andrews DW, Patterson GR. Deviancy training in male adolescent friendships. Behavior Therapy. 1996; 27:373–390.

Dodge KA, Bates JE, Pettit GS. Mechanisms in the cycle of violence. Science. 1990; 250:1678–1683. [PubMed: 2270481]

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Dodge KA, Pettit GS, Bates JE. Socialization mediators of the relation between socioeconomic status and child conduct problems. Child Development Special Issue: Children and poverty. 1994; 65:649–665.

Dutton DG, Corvo K. Transforming a flawed policy: A call to revive psychology and science in domestic violence research and practice. Aggression and Violent Behavior. 2006; 11:457–483.

Ehrensaft MK, Cohen P, Brown J, Smailes E, Chen H, Johnson JG. Intergenerational Transmission of Partner Violence: A 20-Year Prospective Study. Journal of Consulting and Clinical Psychology. 2003; 71:741–753. [PubMed: 12924679]

Foshee VA, Benefield T, Suchindran C, Ennett ST, Bauman KE, Karriker-Jaffe KJ, Mathias J. The development of four types of adolescent dating abuse and selected demographic correlates. Journal of Research on Adolescence. 2009; 19:380–400. [PubMed: 27170829]

Foshee VA, Ennett ST, Bauman KE, Benefield T, Suchindran C. The association between family violence and adolescent dating violence onset: Does it vary by race, socioeconomic status, and family structure? The Journal of Early Adolescence. 2005; 25:317–344.

Foshee VA, McNaughton Reyes HL, Ennett ST, Suchindran C, Mathias JP, Karriker-Jaffe KJ, Benefield TS. Risk and protective factors distinguishing profiles of adolescent peer and dating violence perpetration. Journal of Adolescent Health. 2011; 48:344–350. [PubMed: 21402262]

Frick PJ, Hare RD. The antisocial process screening device. Toronto: Multi-Health Systems. 2001

Fritz PAT, Slep AMS. Stability of physical and psychological adolescent dating aggression across time and partners. Journal of Clinical Child & Adolescent Psychology. 2009; 38:303–314. [PubMed: 19437292]

Ge X, Conger RD, Cadoret RJ, Neiderhiser JM, Yates W, Troughton E, Stewart MA. The developmental interface between nature and nurture: A mutual influence model of child antisocial behavior and parent behaviors. Developmental Psychology. 1996; 32:574–589.

Giordano PC, Soto DA, Manning WD, Longmore MA. The characteristics of romantic relationships associated with teen dating violence. Social Science Research. 2010; 39:863–874. [PubMed: 21037934]

Gondolf EW, White RJ. Batterer program participants who repeatedly reassault psychopathic tendencies and other disorders. Journal of Interpersonal Violence. 2001; 16:361–380.

Goodnight JA, Bates JE, Newman JP, Dodge KA, Pettit GS. The interactive influences of friend deviance and reward dominance on the development of externalizing behavior during middle adolescence. Journal of Abnormal Child Psychology. 2006; 34:573–583. [PubMed: 16823636]

Goodnight JA, Bates JE, Pettit GS, Dodge KA. Parents' campaigns to reduce their children's conduct problems: Interactions with temperamental resistance to control. International Journal of Developmental Science. 2008; 2:100–119.

Grann M, Wedin I. Risk factors for recidivism among spousal assault and spousal homicide offenders. Psychology, Crime and Law. 2002; 8:5–23.

Henggeler, SW., Schoenwald, SK., Borduin, CM., Rowland, MD., Cunningham, PB. Multisystemic therapy for antisocial behavior in children and adolescents. New York: Guilford Press; 2009.

Hollingshead, AA. Unpublished manuscript. Yale University; New Haven, CT: 1979. Four-factor index of social status.

Holtzworth-Munroe A, Meehan JC. Typologies of men who are maritally violent: Scientific and clinical implications. Journal of Interpersonal Violence. 2004; 19:1369–1389. [PubMed: 15492053]

Holtzworth-Munroe A, Meehan JC, Herron K, Rehman U, Stuart GL. Testing the Holtzworth-Munroe and Stuart (1994) batterer typology. Journal of Consulting and Clinical Psychology. 2000; 68:1000–1019. [PubMed: 11142534]

Johnson WL, Giordano PC, Manning WD, Longmore MA. The age-IPV curve: Changes in the perpetration of intimate partner violence during adolescence and young adulthood. Journal of Youth and Adolescence. 2015; 44:708–726. [PubMed: 25081024]

Kiff CJ, Lengua LJ, Zalewski M. Nature and nurturing: Parenting in the context of child temperament. Clinical Child and Family Psychology Review. 2011; 14:251–301. [PubMed: 21461681]

Kim HK, Laurent HK, Capaldi DM, Feingold A. Men's Aggression Toward Women: A 10-Year Panel Study. Journal of Marriage and Family. 2008; 70:1169–1187. [PubMed: 19122790]

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Langer A, Lawrence E, Barry RA. Using a Vulnerability-Stress-Adaptation Framework to Predict Physical Aggression Trajectories in Newlywed Marriage. Journal of Consulting and Clinical Psychology. 2008; 76:756–768. [PubMed: 18837593]

Magdol L, Moffitt TE, Caspi A, Silva PA. Developmental Antecedents of Partner Abuse: A Prospective-Longitudinal Study. Journal of Abnormal Psychology. 1998; 107:375–389. [PubMed: 9715573]

Margolies PJ, Weintraub S. The revised 56-item CRPBI as a research instrument: Reliability and factor structure. Journal of Clinical Psychology. 1977; 33:472–476.

Marshall AD, Holtzworth-Munroe A. Recognition of wives' emotional expressions: A mechanism in the relationship between psychopathology and intimate partner violence perpetration. Journal of Family Psychology. 2010; 24:21. [PubMed: 20175605]

Martin LE, Potts GF. Reward sensitivity in impulsivity. Neuroreport. 2004; 15:1519–1522. [PubMed: 15194887]

Mathes EW, Severa N. Jealousy, romantic love, and liking: Theoretical considerations and preliminary scale development. Psychological Reports. 1981; 49:23–31.

Melby, JN., Conger, RD. The Iowa family interaction rating scales: Instrument summary. In: Kerig, P., Lindahl, KM., editors. Family observational coding systems: Resources for systematic research. Mahwah, NJ: Erlbaum; 2001.

Miller S, Gorman-Smith D, Sullivan T, Orpinas P, Simon TR. Parent and peer predictors of physical dating violence perpetration in early adolescence: Tests of moderation and gender differences. Journal of Clinical Child & Adolescent Psychology. 2009; 38:538–550. [PubMed: 20183640]

Moffitt TE, Caspi A. Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. Development and Psychopathology. 2001; 13:355–375. [PubMed: 11393651]

Monahan KC, Steinberg L, Cauffman E. Affiliation with antisocial peers, susceptibility to peer influence, and antisocial behavior during the transition to adulthood. Developmental Psychology. 2009; 45:1520. [PubMed: 19899911]

O'Leary KD. Developmental and affective issues in assessing and treating partner aggression. Clinical Psychology: Science and Practice. 1999; 6:400–414.

Olson SL, Schilling EM, Bates JE. Measurement of impulsivity: Construct coherence, longitudinal stability, and relationship with externalizing problems in middle childhood and adolescence. Journal of Abnormal Child Psychology. 1999; 27:151–165. [PubMed: 10400061]

Pettit, GS., Bates, JE., Holtzworth-Munroe, A., Marshall, AD., Harach, LD., Cleary, DJ., Dodge, KA. Aggression and insecurity in late adolescent romantic relationships: Antecedents and developmental pathways. In: Huston, AC., Ripke, MN., editors. Developmental contexts in middle childhood: Bridges to adolescence and adulthood. Cambridge studies in social and emotional development. New York: Cambridge University Press; 2006. p. 41-61.

Preacher KJ, Hayes AF. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. Behavior research methods. 2008; 40:879–891. [PubMed: 18697684]

Rauer AJ, Pettit GS, Lansford JE, Bates JE, Dodge KA. Romantic relationship patterns in young adulthood and their developmental antecedents. Developmental Psychology. 2013; 49:2159–2171. [PubMed: 23421803]

Sameroff AJ. Developmental systems and psychopathology. Development and Psychopathology. 2000; 12:297–312. [PubMed: 11014740]

Schaefer ES. Children's report of parental behavior: An inventory. Child Development. 1965; 36:413–424. [PubMed: 14300862]

Schafer J, Caetano R, Cunradi CB. A path model of risk factors for intimate partner violence among couples in the United States. Journal of Interpersonal Violence. 2004; 19:127–142. [PubMed: 15005998]

Schafer JL, Graham JW. Missing data: Our view of the state of the art. Psychological Methods. 2002; 7:147–177. [PubMed: 12090408]

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Shortt JW, Capaldi DM, Kim HK, Kerr DCR, Owen LD, Feingold A. Stability of intimate partner violence by men across 12 years in young adulthood: Effects of relationship transitions. Prevention Science. 2012; 13:360–369. [PubMed: 21311973]

Simons RL, Lin K, Gordon LC. Socialization in the family of origin and male dating violence: A prospective study. Journal of Marriage and the Family. 1998; 60:467–478.

Snyder J, McEachern A, Schrepferman L, Just C, Jenkins M, Roberts S, et al. Contribution of peer deviancy training to the early development of conduct problems: Mediators and moderators. Behavior Therapy. 2010; 41:317–328. [PubMed: 20569781]

Snyder JJ, Patterson GR. Individual differences in social aggression: A test of a reinforcement model of socialization in the natural environment. Behavior Therapy. 1995; 26:371–391.

Stice E, Gonzales N. Adolescent temperament moderates the relation of parenting to antisocial behavior and substance use. Journal of Adolescent Research. 1998; 13:5–31.

Straus MA, Hamby SL, Boney-McCoy S, Sugarman DB. The revised conflict tactics scales (CTS2). Journal of Family Issues. 1996; 17:283–316.

Vest JR, Catlin TK, Chen JJ, Brownson RC. Multistate analysis of factors associated with intimate partner violence. American Journal of Preventive Medicine. 2002; 22:156–164. [PubMed: 11897459]

Wolfe DA, Crooks CV, Lee V, McIntyre-Smith A, Jaffe PG. The effects of children's exposure to domestic violence: A meta-analysis and critique. Clinical Child and Family Psychology Review. 2003; 6:171–187. [PubMed: 14620578]

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Public Health Significance Statement

This study suggests that variables from early childhood and adolescence must be considered when designing and evaluating efforts to treat and prevent intimate partner aggression, and that targeting social risk factors may be especially important for males and individuals with a history of resistance to control temperament.

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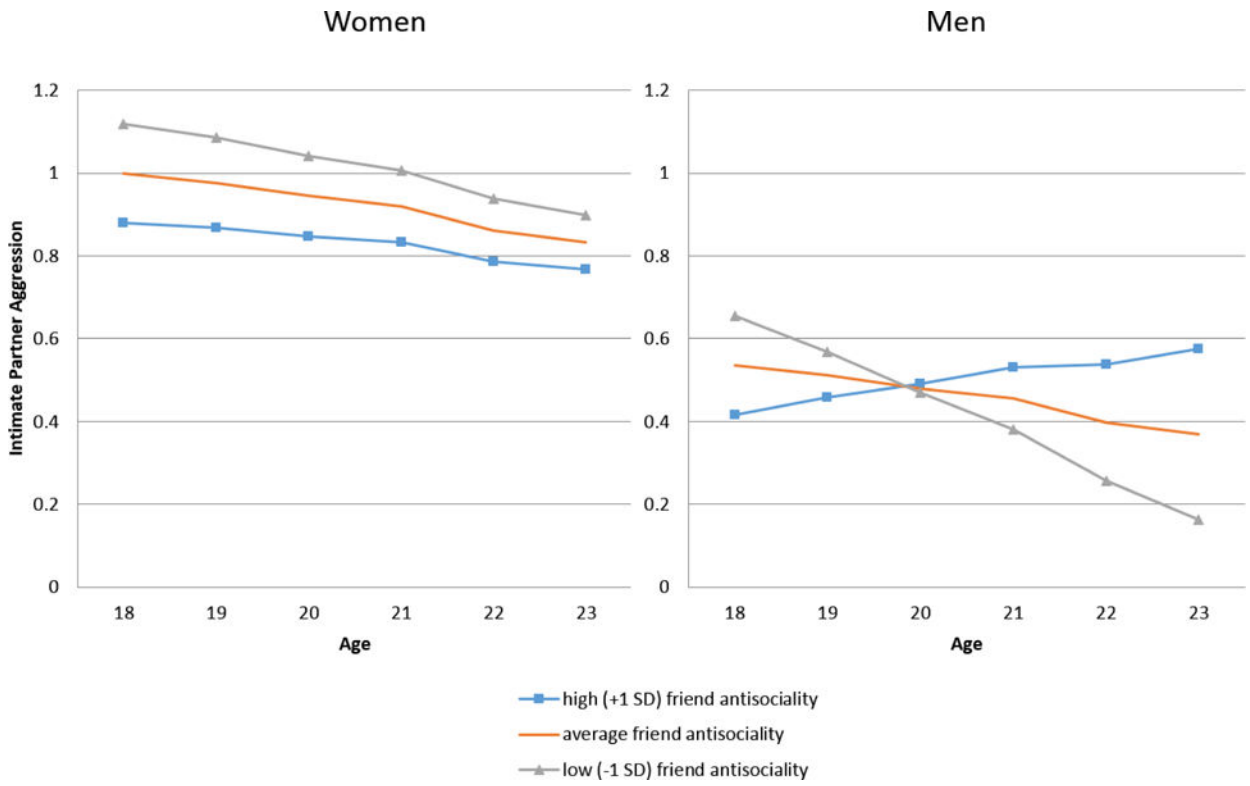

Figure 1.

Model-implied trajectories of IPA at high, average, and low levels of friend antisocial behavior, as moderated by sex

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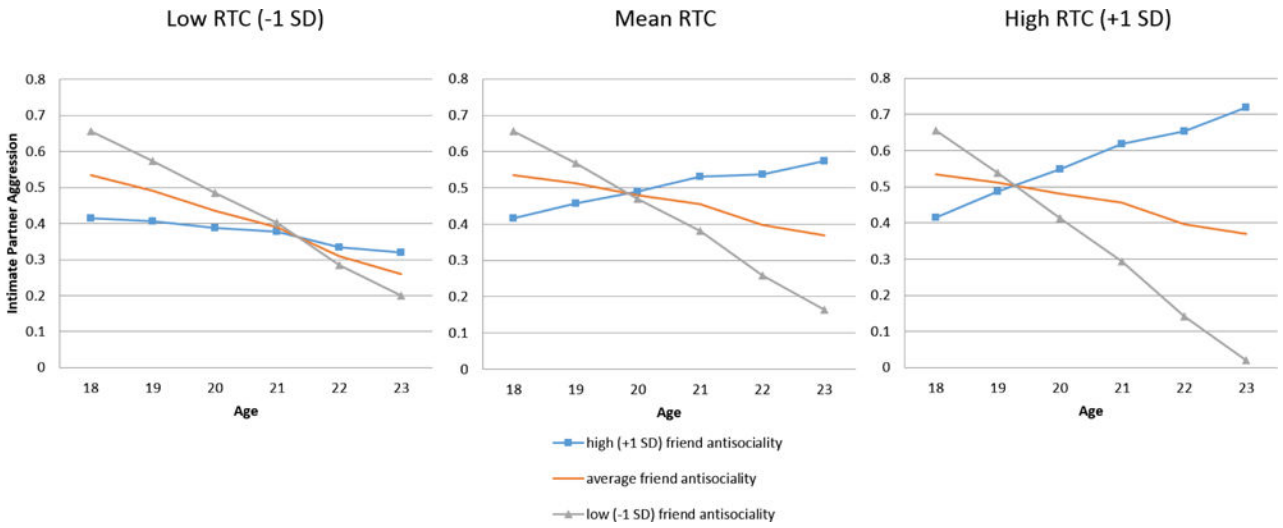

Figure 2.

Model-implied trajectories of IPA at high, average, and low levels of friend antisocial behavior, as moderated by level of resistance to control temperament (RTC)

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Table 1

Items from Assessments of Intimate Partner Aggression

Items at ages 18, 22, and 23:	**Items at ages 19, 20, and 21:**
How often have you threatened to throw something?	I threatened to hit or throw something at my boyfriend/girlfriend.
How often have you pushed, grabbed, or shoved?	I pushed or shoved my boyfriend/girlfriend. I grabbed my boyfriend/girlfriend.
How often have you hit?	I punched or hit my boyfriend/girlfriend with something that could hurt. I slapped my boyfriend/girlfriend.

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Table 2

Descriptive Statistics for Continuous Variables

	N	MEAN	SD	Min	Max	% missing
Socioeconomic status (age 16)	445	39.26	13.86	6.00	66.00	24
Resistance to control (age 5)	551	3.59	1.12	1.00	7.00	06
Antisocial behavior (age 16)	446	11.61	7.48	0.00	42.00	24
Psychopathic traits (age 16)	408	10.75	4.96	0.00	25.00	30
Fear of abandonment (age 18)	437	7.88	4.04	5.00	40.00	25
Interpersonal jealousy scale (age 18)	389	27.39	10.80	7.00	63.00	33
Friend antisocial behavior (age 16)	463	2.17	0.72	1.00	4.56	21
Parent-teen problem solving (age 16)	399	6.86	1.54	1.00	9.00	32
Maternal warmth (age 16)	460	2.59	0.64	1.00	9.00	21
Maternal monitoring (age 16)	464	4.18	0.62	1.33	5.00	21
Relationship duration (age 18)[1]	237	7.73	4.36	1.00	12.00	59
Relationship duration (age 19)[1]	253	9.23	3.90	1.00	12.00	57
Relationship duration (age 20)[1]	257	9.75	3.69	1.00	12.00	56
Relationship duration (age 21)[1]	263	10.10	3.45	1.00	12.00	55
Relationship duration (age 22)[1]	297	10.15	3.47	1.00	12.00	49
Relationship duration (age 23)[1]	314	10.35	3.21	1.00	12.00	46
Intimate partner aggression (age 18)[1]	239	0.49	1.23	0.00	7.00	59
Intimate partner aggression (age 19)[1]	237	0.40	1.15	0.00	6.00	59
Intimate partner aggression (age 20)[1]	250	0.47	1.34	0.00	9.00	57
Intimate partner aggression (age 21)[1]	263	0.33	1.11	0.00	9.00	55
Intimate partner aggression (age 22)[1]	286	0.37	0.78	0.00	5.00	51
Intimate partner aggression (age 23)[1]	313	0.34	0.95	0.00	9.00	56

[1]The large percentage of missing data for relationship duration and intimate partner aggression variables is due in large part to many participants not being in relationships and therefore not eligible to complete relationship-oriented interviews.

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Table 3

Descriptive Statistics for Relationship Subsamples from Ages 18 to 23 Years

	Age 18	Age 19	Age 20	Age 21	Age 22	Age 23
Total N in relationships	240	242	251	270	304	314
Reported any perpetration of aggression	56 (23%)	38 (16%)	43 (17%)	36 (13%)	67 (22%)	64 (20%)
Gender						
Male	106 (44%)	101 (42%)	95 (38%)	110 (41%)	135 (44%)	144 (46%)
Female	134 (56%)	141 (58%)	156 (62%)	160 (59%)	169 (56%)	169 (54%)
Same partner as previous year[1]	–	118 (49%)	149 (59%)	169 (62%)	187 (62%)	206 (66%)
Relationship Status[1]						
Dating	–	185 (76%)	183 (73%)	176 (65%)	145 (48%)	114 (36%)
Cohabiting	–	32 (13%)	37 (15%)	52 (19%)	93 (31%)	105 (33%)
Married	–	25 (10%)	29 (12%)	42 (16%)	66 (22%)	95 (30%)

[1]Information not collected at age 18.

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Table 4

Bivariate Correlations between Non-Categorical Predictors

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.	SES															
2.	RTC	−.06														
3.	ASB	−.07	.11*													
4.	Psych	.10	.08	51**												
5.	FOA	.05	.11*	.22**	.24**											
6.	IJS	−.05	.02	.20**	.28**	.36**										
7.	FrASB	−.03	.02	.58**	40**	.08	.15**									
8.	ProbSlv	.31*	−.04	−.25**	−.14**	.02	−.01	−.24**								
9.	Warmth	−.01	.03	−.04	−.20**	−.10*	−.05	−.02	.25**							
10.	Monitor	.02	−.17*	−.24**	−.18**	−.07	−.09	−.28**	.31**	19**						
11.	Length18	−.13	−.03	−.04	.06	.00	.22**	.00	.00	.07	.05					
12.	Length19	−.21**	.06	−.02	−.11	−.03	.10	−.04	−.02	−.01	−.09	.12				
13.	Length20	−.05	.00	−.01	.08	−.11	.05	−.02	−.06	.04	−.03	.09	.30**			
14.	Length21	−.06	−.10	−.04	−.09	.04	−.03	−.01	.03	.05	−.01	.12	.08	.18*		
15.	Length22	−.07	−.04	−.15*	−.09	.01	−.06	−.17*	.03	−.09	.00	.08	.13	.11	.09	
16.	Length23	−.09	−.11*	.03	−.02	−.04	.06	−.04	.06	−.02	−.03	.10	.13	.11	.13	.31**

Note. SES = socioeconomic status; RTC = resistance to control temperament; ASB = antisocial behaviors; Psych = psychopathic traits; FOA = fear of abandonment; IJS = interpersonal jealousy scale; FrASB = friend antisocial behavior; ProbSlv = parent-teen problem solving; Lengthxx = Total months out of the year in a relationship.

* $p < .05$;

** < .01.

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Table 5

Bivariate Correlations between Continuous Predictors and Intimate Partner Aggression

	Intimate partner aggression at age:					
	18	**19**	**20**	**21**	**22**	**23**
Socioeconomic Status	−.19*	−.12	−.16*	−.14*	−.09	−.19*
Resistance to control temperament	.12	.10	−.02	.08	.14*	.13*
Antisocial behavior	.19*	.18*	.14*	.11*	.08	.15*
Psychopathic traits	.31*	.16*	.22*	.17*	.12	.17*
Fear of abandonment	.32*	.28*	.14*	.15*	.16*	.09
Interpersonal jealousy scale	.23*	.19*	.11	.17*	.13*	.15*
Friend antisocial behavior	.05	.06	.12	.17*	.09	.20*
Parent-adolescent problem solving	−.01	−.21*	−.20*	−.22*	−.09*	−.18*
Maternal warmth	−.01	−.02	−.07	−.06	−.09	−.01
Maternal monitoring	−.14*	−.21*	−.01	−.13*	−.07	−.16*
Family stress	.17*	.00	.07	.18*	−.03	.02
Relationship duration (age 18)	.16*	.09	−.03	.02	−.04	.09
Relationship duration (age 19)	−.13	.16*	−.02	−.04	−.02	−.03
Relationship duration (age 20)	.03	.10	−.02	.03	.01	.04
Relationship duration (age 21)	−.14	−.12	−.05	−.02	−.09	.01
Relationship duration (age 22)	−.05	.11	−.08	−.06	.09	−.04
Relationship duration (age 23)	.03	.11	−.12	−.07	−.05	.02

*$p < .05$.

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Table 6

Unstandardized Coefficients from Prediction of Intercept and Slope from Latent Growth Curve Model of Intimate Partner Aggression from Ages 18–23 Years Including only Demographic Variables and Temperamental Resistance to Control.

	Intimate partner aggression growth curve parameters					
	Outcome = Intercept			**Outcome = Slope**		
Predictor:	***b***	***SE***	***p***	***b***	***SE***	***p***
Intercept	–	–	–	**−.151**	**.033**	**<.001**
Sex (0=male, 1=female)	**.358**	**.126**	**.005**	−.007	.018	.696
Race (0=EA[1], 1=AA[2])	**.661**	**.261**	**.011**	.011	.029	.696
Temperamental resistance to control	.106	.062	.086	**.021**	**.010**	**.033**

Note. Statistically significant ($p < .05$) effects in bold. $N = 466$.

[1]European American;

[2]African American.

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Table 7

Unstandardized Coefficients from Prediction of Intercept and Slope from Latent Growth Curve Model of Intimate Partner Aggression from Ages 18–23 Years

	Intimate partner aggression growth curve parameters					
	DV = Intercept			DV = Slope		
Predictor:	***b***	***SE***	***p***	***b***	***SE***	***p***
Main Effects						
Intercept	–	–	–	**−.149**	**.046**	**.001**
Sex (0=male, 1=female)	**.403**	**.128**	**.002**	.006	.024	.798
Race (0=EA[1], 1=AA[2])	**.609**	**.249**	**.015**	.006	.035	.856
Socioeconomic status	**−.149**	**.073**	**.041**	−.008	.016	.625
Socioeconomic status × sex	−.081	.127	.522	.004	.023	.859
Resistance to control temperament	.033	.056	.554	**.020**	**.009**	**.031**
Antisocial behavior	.061	.102	.551	−.027	.017	.120
Psychopathic traits	**.282**	**.082**	**.001**	.007	.020	.719
IJS/FOA	**.291**	**.094**	**.002**	−.002	.017	.915
Friend antisocial behavior	−.113	.071	.115	**.047**	**.018**	**.011**
Parent-child relationship	−.037	.068	.592	−.005	.011	.627
Moderated/Interaction Effects						
Friend behavior × RTC	.015	.058	.789	**.026**	**.011**	**.025**
Friend behavior × sex	−.010	.132	.940	**−.061**	**.024**	**.011**
Parent-child relationship × RTC	**−.110**	**.050**	**.028**	.006	.014	.684
Parent-child relationship × sex	−.258	.134	.053	−.012	.026	.646

Note. RTC = Resistance to control temperament. Statistically significant ($p < .05$) effects in bold.

$N = 466$.

[1]European American;

[2]African American.

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Table 8

Unstandardized Coefficients from Tests of Mediation

Predictor, Mediator, Outcome	Predictor to Mediator		Mediator to Outcome		Indirect Effect	
	b	*p*	*b*	*p*	*b*	*95% CI*
RTC, Peer Antisociality, Slope of IPA	.031	.556	**.047**	**.011**	.001	−.002, .009
RTC, Parent-Teen Relations, Slope of IPA	**−.126**	**.022**	−.005	.627	.001	−.003, .006
RTC, Antisocial Behavior, Slope of IPA	**.115**	**.018**	−.027	.119	−.003	−.016, .001
Race[1], Socioeconomic Status, Intercept of IPA	**−.917**	**.000**	**−.149**	**.041**	**.137**	**.018**, **.318**

Note. RTC = Resistance to control temperament. Statistically significant ($p < .05$) effects in bold. $N = 466$.

[1]European American = 0; African American = 1.