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INTERPERSONAL CALLOUSNESS TRAJECTORIES ACROSS ADOLESCENCE

Early Social Influences and Adult Outcomes

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The current study examined the relation between interpersonal callousness trajectories during adolescence (ages 14 to 18) and characteristics of antisocial personality and internalizing problems in young adulthood (age 26), using a community sample of 506 boys. The influence of several parent and peer factors on callousness trajectories during adolescence was also explored. Although the mean interpersonal callousness trajectory for the entire sample was relatively flat, there was substantial individual variability in both the initial status and rate of change of interpersonal callousness over time. Trajectories of interpersonal callousness were associated with higher levels of antisocial personality features in early adulthood but were unrelated to adult internalizing problems. Conduct problems and parent-child communication difficulties were the best predictors of elevated levels of interpersonal callousness throughout adolescence. However, none of the parenting and peer factors examined predicted substantive changes in interpersonal callousness over time.

Keywords: callous; psychopathy; antisocial personality; development; longitudinal; parenting; peers

A defining feature of adult psychopathy is the presence of a callous interpersonal style, including being deceitful, manipulative, grandiose, superficially charming, lacking empathy and guilt, and not accepting responsibility for transgressions. Features of interpersonal callousness (IC) have been identified in children and adolescents, and emerging research suggests that these features delineate a particularly malignant form of antisocial behavior (Frick, Cornell, Barry, Bodin, & Dane, 2003; Loeber, Burke, & Lahey 2002; Loeber et al., 2005; Pardini, 2006; Pardini, Obradović, & Loeber, 2006). Although some have speculated that features of IC in youth are stable across time and represent the foundation for adult antisocial or psychopathic personality disorders (Lynam et al., 2005), relatively few longitudinal studies have examined the within-individual stability of IC during adolescence or examined the association between IC features in adolescence and later adult antisocial personality (AP; for exceptions, see Burke, Loeber, & Lahey, 2007; Loeber et al., 2002). Furthermore, although many researchers have emphasized the potential genetic and neurobiological factors underlying the development of IC, there is little research examining the influence of important

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socializing agents (e.g., parents, peers) on changes in IC during adolescence. However, a growing body of evidence suggests that parenting practices and peer characteristics may be important for understanding the development of IC in youth (Frick, Kimonis, Dandreaux, & Farell, 2003; Kimonis, Frick, & Barry, 2004; Kochanska, Forman, Aksan, & Dunbar, 2005; Pardini, Lochman, & Powell, 2007).

STABILITY OF IC

Although researchers have argued that there is a lack of developmental research on the stability of IC in childhood and adolescence (Hart, Watt, & Vincent, 2002), longitudinal studies have begun to suggest that features of IC are relatively stable in childhood and adolescence. Dadds and colleagues found moderate 1-year stability estimates for features of callousness ($r = .55$) in a community sample of young children (ages 4 to 9) in Australia (Dadds, Fraser, Frost, & Hawes, 2005). Frick and colleagues (2003) reported high 4-year stability estimates for parent ratings of callousness (intraclass correlation = .71) from late childhood to middle adolescence. A more recent study of longitudinal invariance found that the rank-order stability of parent-report IC was moderate ($r = .50, p < .001$) during an 8-year period from childhood to adolescence among boys (Obradović, Pardini, Long, & Loeber, 2007). Although these stability estimates are commensurate to those reported for measures of adult personality (Roberts & DelVecchio, 2000), these studies focused primarily on rank-order stability in IC features over time and did not examine within-individual changes in IC trajectories during adolescence using a more person-oriented approach such as growth curve modeling.

Growth curve modeling provides estimates of stability and change in an attribute across time at the individual level while allowing for the estimation of both the mean trajectory for the entire group and individual variability about this mean trajectory (for details, see Bollen & Curran, 2006). Consequently, this modeling technique is useful for examining important questions about both the absolute and relative stability of IC across time. In the strictest sense, absolute stability refers to consistency in the level of an attribute across time within an individual (Jones, Livson, & Peskin, 2003). In a growth curve model, an attribute with perfect absolute stability would be characterized by a relatively flat mean trajectory across time, with no significant variability beyond sampling fluctuations in rate of change between individuals across time (e.g., IC trajectories remain relatively flat across time for all individuals). On the other hand, relative or differential stability is the extent to which individuals in a group retain the same rank ordering on an attribute across time, despite the fact that their levels on the attribute may change over time (Roberts & DelVecchio, 2000). In a growth model, an attribute with perfect relative stability (in the absence of absolute stability) would be characterized by either an increasing or decreasing mean trajectory across time, but there would be no significant variability beyond sampling fluctuations in the rate of change between individuals across time (e.g., features of IC decrease the same rate across time for all individuals). As a result, growth curve modeling is useful for examining both the absolute and relative stability of IC during adolescence. Moreover, individual differences in growth trajectories can be used to predict substantive adult outcomes (e.g., AP), and early environmental factors (e.g., parent and peer influences) can be used to predict individual differences in IC growth trajectories over time.

ADOLESCENT IC AND ADULT AP

Consistent with the notion that IC is relatively stable during adolescence, some have argued that features of a callous interpersonal style represent the foundation for a psychopathic or AP in adulthood (Lynam, 2002). Along these lines, Lynam and colleagues (2005) found evidence that features of IC in adolescence are associated with the personality traits of low agreeableness and low conscientiousness, which are characteristic of adults with antisocial personality disorder (APD). Furthermore, there is some emerging longitudinal evidence suggesting that IC in adolescent boys is associated with the development of antisocial and psychopathic personality features by early adulthood (Burke et al., 2007; Loeber et al., 2002). However, the investigators did not examine the specificity of the relation between IC during adolescence and later AP outcomes. In regards to specificity, theoretical models and empirical evidence suggest that features of IC during adolescence should be associated with later antisocial outcomes in adulthood but unrelated to other forms of adult psychopathology, especially internalizing problems (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Pardini, 2006).

PARENTING PRACTICES AND IC

Although features of IC may be relatively stable in adolescence, growing evidence indicates that positive parental socialization practices may prevent the development of IC over time. For example, longitudinal research with normally developing children suggests that a supportive parent-child relationship characterized by reciprocal cooperation and shared positive affect is associated with the internalization of prosocial norms (Fowles & Kochanska, 2000; Kochanska, 1997; Kochanska & Murray, 2000; Laible & Thompson, 2002), empathic responding (Kiang, Moreno, & Robinson, 2004) and increased guilt following transgressions (Kochanska, Forman, Aksan, & Dunbar, 2005). In addition, Frick and colleagues (2003) found that school-aged children who were exposed to parenting practices designed to foster a warm and close parent-child relationship (e.g., involvement, positive reinforcement) exhibited decreases in callous-unemotional traits at a 4-year follow-up. Along similar lines, Pardini et al. (2007) found that lower levels of anxiety were related to increases in callous-unemotional traits during a 1-year period only for children who reported experiencing low levels of parental warmth and involvement. However, studies examining the relation between a warm and responsive parent-child relationship and the development of IC from early to late adolescence have not been conducted.

Children who are exposed to high levels of negative parenting practices may also be prone to developing a callous interpersonal style. The use of physical punishment is believed to impede the development of conscience by eliciting high levels of arousal in children, making it more difficult for them to internalize parental messages about prosocial behavior (Gershoff, 2002; Hoffman, 1983; Kochanska, 1997). Longitudinal research shows that young children who are exposed to harsh forms of discipline, including physical punishment, display less guilt following transgressions (Kochanska, Gross, Lin, & Nichols, 2002) and are less concerned about the feelings of others in early childhood (Hastings, Zahn-Waxler, Robinson, Usher, & Bridges 2000). Moreover, longitudinal research has found that an overly negative parenting style (i.e., inconsistent discipline, physical punishment, and poor monitoring) is associated with increases in callous-unemotional features from childhood

to early adolescence (Frick et al., 2003). Higher levels of physical punishment have also been associated with increases in callous-unemotional features in a 1-year period among moderate to highly aggressive elementary school students (Pardini et al., 2007). However, studies examining the influence of parenting practices on changes in IC from early to late adolescence have not been conducted.

PEER INFLUENCE AND IC

Indirect evidence suggests that affiliation with deviant peers during adolescence may also reinforce the development of a callous interpersonal style. Several longitudinal studies have shown that increases in peer delinquency are significantly related to more tolerant beliefs about the acceptability of antisocial behavior, including causing serious harm to others (Henry et al., 2000; Pardini, Loeber, & Stouthamer-Loeber, 2005). In fact, the impact of deviant peers on IC may be stronger than family influences during adolescence, as youth begin spending more time with friends (Larson & Richards, 1991) and begin receiving positive reinforcement from peers for committing interpersonally callous acts (Dishion, McCord, & Poulin, 1999). Along these lines, one study found that delinquent peer affiliation is associated with high levels of IC in early adolescence, particularly among youth with elevated conduct problems (Kimonis et al., 2004). Although this study examined cross-sectional associations, the authors speculated that affiliating with antisocial and violent peers could desensitize youth to the suffering of others and lead to the development of a callous interpersonal style. However, longitudinal studies examining the influence of deviant peers on changes in IC during adolescence are needed.

Although research on the socializing influence of peers has historically focused on negative peer characteristics, it is also possible that prosocial peer relationships may protect adolescents from developing or maintaining an interpersonally callous style over time. Research studies suggest that prosocial peers may have a positive influence during adolescence, including promoting the formation of beliefs emphasizing the importance of helping those in need, doing well in school, and maintaining supportive relationships (for review, see Carlo, Fabes, Laible, & Kupanoff, 1999). However, we know of no studies that have examined the relation between prosocial peers and IC during adolescence. In a related study, Kimonis et al. (2004) failed to find a significant relation between callous-unemotional traits and time spent in prosocial activities during early adolescence. Although this suggests that prosocial involvement with peers may not influence the development IC over time, longitudinal investigations examining prosocial peers in particular are needed before firm conclusions can be drawn.

CURRENT INVESTIGATION

Although the presence of IC features in adolescents has been associated with severe and escalating forms of antisocial behavior, several developmental questions remain to be addressed (Pardini & Loeber, 2007). The current study investigated the notion that IC features are stable personality characteristics in youth by examining both the within (absolute) and between (relative) stability of these features during adolescence (roughly ages 14 to 18) using growth curve analysis. In addition, the notion that trajectories of IC during adolescence serve as the foundation for adult AP (roughly age 26) but are unrelated to other forms of adult psychopathology, like internalizing problems, was examined. Based on emerging research

suggesting that various facets of parent and peer relationships are associated with IC during adolescence, the relation between these social relationship factors and trajectories of IC during adolescence was also examined. The influence of social factors on IC trajectories were examined while controlling for co-occurring problems related to oppositional defiant disorder (ODD), conduct disorder (CD), and attention-deficit hyperactivity disorder (ADHD).

METHOD

DESIGN AND PARTICIPANTS

This investigation used data collected as part of the Pittsburgh Youth Study (PYS), a longitudinal study aimed at understanding the development of delinquency, substance use, and mental health problems in boys (Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998). Although the PYS consists of three separate grade-based cohorts (commonly referred to as the youngest, middle, and oldest cohort), the current study focused on the oldest cohort. The oldest sample was originally selected from a list of names and addresses of all seventh-grade boys in participating Pittsburgh public schools during 1987-1988. A total of 1,165 families were randomly selected from this list for participation in a screening assessment. Most families agreed to participate once contacted (84.6%). As part of the screening assessment, information was collected on the boys' delinquent behavior using forms completed by mothers, teachers, and the boys themselves. Boys who rated in the top 30% on the screening assessment ($n = 256$), as well as a relatively equal number of boys randomly selected from the remainder ($n = 247$), were selected for longitudinal follow-up. Most boys in the follow-up sample were either African American (56%) or Caucasian (41%). Nearly all were living with their biological mother (94%), and approximately half of the boys lived in a household with no biological or acting father (45.3%). Further details of the sample selection, study characteristics, and participants can be found in Loeber et al. (1998).

PROCEDURES

All measures of demographic characteristics, early childhood behavior problems, parenting practices, and peer variables were collected during the first follow-up assessment of the oldest cohort (hereafter referred to as Time 1), which took place 6 months after the screening assessment. At Time 1, the boys had just entered the eighth grade and most were in their early teens (mean age = 13.9, $SD = .80$). Data collection at this phase consisted of an interview with each boy, an interview with his primary caregiver, and questionnaires completed by the boy's primary caregiver and teacher. Families were paid for their participation, and informed written consent was obtained from the boys and their legal guardians prior to the assessment.

Parent-report information on the boys' IC was collected from the first seven follow-up assessments of the oldest cohort (Time 1 to Time 7). The first five follow-up assessments occurred every 6 months (Time 1 to 5), and the last two assessments occurred at 1-year intervals (Time 6 to 7). At the time of the final assessment, participants were in their late teens (mean age = 17.9, $SD = .83$) and completing their senior year in high school (12th grade), unless they had skipped or repeated a grade. Time 7 was the last time that information on IC was collected from the boys' primary caregiver.

TABLE 1: Descriptive Statistics for Study Variables

	N	M	SD
Demographics			
Age	506	13.877	0.796
Family SES	501	36.649	13.185
Disruptive behavior problems			
ODD/CD (P) symptoms	478	2.450	2.835
ADHD (P) symptoms	476	3.559	3.403
Parenting practices			
Poor parent-child communication (PC)	505	35.321	14.115
Low positive parenting (PC)	503	23.379	4.415
Nonpersistent discipline (PC)	503	13.391	2.559
Poor supervision (PC)	503	11.865	2.761
Physical punishment (PC)	501	2.780	0.878
Peer influences			
Peer delinquency (C)	479	7.487	7.372
Nonconventional peers (C)	491	24.812	5.494
Interpersonal callousness (IC)			
IC (P)—Time 1	501	3.332	3.107
IC (P)—Time 2	473	3.159	3.244
IC (P)—Time 3	451	2.956	3.074
IC (P)—Time 4	441	3.075	3.255
IC (P)—Time 5	431	2.910	3.325
IC (P)—Time 6	424	2.881	3.309
IC (P)—Time 7	418	2.864	3.241
Early adult outcomes			
Adult APD symptoms (C)	408	2.208	2.089
Antisocial personality problems (C)	421	3.073	3.324
Anxious/depressed (C)	421	1.776	2.982
Depression score (C)	421	1.682	3.231

Note. SES = socioeconomic status; ODD/CD = oppositional defiant disorder/conduct disorder; ADHD = attention-deficit hyperactivity disorder; C = child report; P = parent report; PC = combined parent and child report; APD = antisocial personality disorder.

Information on the early adult outcomes of internalizing problems and AP were gathered when boys were in their mid-20s (mean age = 26.0, $SD = .82$). This was the last regular assessment of the oldest cohort in the PYS. All participants were paid for completing this assessment, and informed written consent was obtained prior to the interviews. Most interviews were conducted within the participants' homes. Further information regarding the data collection procedures have been described in detail elsewhere (Loeber et al., 1998). Table 1 provides descriptive statistics for variables in the study.

MEASURES

Demographic characteristics. The demographic characteristics of ethnicity, age, and family socioeconomic status (SES) were used as control variables in the current study. These variables have been associated with the development of delinquent behavior in the PYS (Loeber et al., 1998). A Demographic Questionnaire was administered by interviewers to parents at screening to collect information regarding the boys' age and ethnicity as well as information used to calculate the Hollingshead Index of SES for each boy's family at screening (Hollingshead, 1975).

IC. The current study used a parent-report scale of IC that was previously created and validated using all three grade-based cohorts of the PYS (Pardini et al., 2006). The IC construct was assessed using items from the Child Behavior Checklist (CBCL; Achenbach, 1991) as well as supplemental items added to this measure. The initial criteria for item selection were that items should be developmentally appropriate and related in content to previously validated measures of the interpersonal and affective features of psychopathy in youth (Frick, Bodin, & Barry, 2000; Loeber et al., 2002; Lynam, 1997). The eight items that make up the scale describe an interpersonal style that is characterized by deceitfulness (i.e., “you can’t trust what he says,” “does not keep promises,” “acts sneakily”), manipulation (i.e., “manipulates people”), superficial charm (i.e., “when confronted about his behavior, is a fast or smooth talker”), grandiosity (i.e., “exaggerates”), a lack of guilt and remorse (i.e., “doesn’t seem to feel guilty after misbehaving”), and a failure to accept responsibility for transgressions (i.e., “denies having done wrong even when you are certain that he has done it”). Five of the eight items were originally included as part of the interpersonal and affective factor (i.e., Factor 1) of the Childhood Psychopathy Scale (CPS; Lynam, 1997). The three remaining items were selected because of their similarity to items found in other validated measures of callous features in youth (Frick & Hare, 2001; Loeber et al., 2002). All items were rated on a 3-point scale (0 = *not true*, 1 = *sometimes true*, 2 = *very true*). The internal consistency of the IC scale was high during all time points in the current investigation (Time 1 to 7 α 's = .83, .85, .84, .86, .88, .88, .88, respectively). The rank-order stability of the scale was high during 1-year spans in the current study (r 's from .61 to .69, all p 's < .001) and moderate during the 4-year span (Time 1 to Time 7, $r = .49$, $p < .001$). After correcting for correlation attenuation due to of measurement error, these stability estimates are consistent with a previous investigation using the parent-reported IC scale (Obradović et al., 2007).

Several studies have begun to support the reliability and validity of the IC scale in children and adolescents. Factor analytic research using three large school-based samples of male children and adolescents suggests that the IC scale is related to, yet distinct from, traditional conceptualizations of conduct problems, hyperactivity/impulsivity, and inattention (Pardini et al., 2006). In addition, recent research indicates that the parent-reported IC items exhibit structural and metric (e.g., loadings, thresholds) invariance during the period of adolescence examined in the current investigation (Obradović et al., 2007). This study also found that latent constructs measured using the parent-reported IC items exhibited moderate levels of stability in an 8-year period from childhood to adolescence ($r = .50$, $p < .001$). Furthermore, previous studies have found the IC scale is associated with persistent delinquent behavior throughout adolescence (Pardini et al. 2006), and scores on the Psychopathy Checklist-Revised in early adulthood, including the interpersonal/affective dimension of psychopathy (Burke et al., 2007).

To further validate the parent-report IC scale, its association with the previously validated parent-reported Childhood Psychopathy Scale (for details, see Lynam et al., 2005) was examined with 435 adolescent boys (mean age = 16.0) in the youngest cohort of the PYS. At this assessment, the parent-reported CPS and extended CBCL used to create the IC scale were administered as completely separate instruments. The CPS consisted of a set of 41 statements that parents answered about their child using either a *no* (0) or *yes* (1) rating (Lynam et al., 2005). For the CPS, subscales indexing the basic features of psychopathy (e.g., lack of guilt, manipulation) are created by averaging two to five items per subscale. Relevant subscales are summed to create a higher-order interpersonal and affective

features score (referred to as Factor 1) and an impulsive and socially deviant score (referred to as Factor 2). Parent-reported IC was strongly correlated with CPS Factor 1 scores ($r = .776, p < .001$), including each of the lower-order Factor 1 subscales: failure to accept responsibility ($r = .635, p < .001$), untruthfulness ($r = .608, p < .001$), manipulation ($r = .575, p < .001$), callousness ($r = .565, p < .001$), lack of guilt ($r = .455, p < .001$), glibness ($r = .410, p < .001$), and poverty of affect ($r = .370, p < .001$). After controlling for the overlap between Factor 1 and Factor 2 scores in a regression analysis, there was still a strong association between Factor 1 and IC ($\beta = .662, p < .001$), whereas the association between Factor 2 and IC was negligible ($\beta = .150, p < .01$).

EARLY ADOLESCENT BEHAVIOR PROBLEMS

ODD/CD symptoms. The boys' ODD/CD symptoms were assessed using the Revised Diagnostic Interview Schedule for Children, Parent Version (DISC-P; Costello, 1987), a structured interview designed to assess several domains of child psychopathology found in the *Diagnostic and Statistical Manual of Mental Disorders—Third Edition—Revised (DSM-III-R; American Psychiatric Association, 1987)*. As part of the DISC-P, parents provided information on whether or not their child had exhibited 13 CD symptoms (e.g., lying, starting physical fights, destruction of property) and 9 ODD symptoms (e.g., loses temper, argues, defiant). Both symptom scales have shown evidence of good test–retest reliability (Schwab-Stone et al., 1993) and moderate agreement with clinician-rated symptoms (Piacentini et al., 1993). A total ODD/CD symptom score was created by summing the 22 ODD and CD symptoms together (each coded as 1 if the symptom was present, 0 if the symptom was absent). The internal consistency for the combined ODD/CD symptom scale in the current sample was good ($\alpha = .80$).

ADHD symptoms. The DISC-P was also used to assess the boys' ADHD symptoms in early adolescence. The instrument assesses the presence or absence of 14 different symptoms associated with a *DSM-III-R* diagnosis of ADHD. The behaviors fall under the broad categories of attentional difficulties (e.g., easily distracted), hyperactivity (e.g., talks excessively), and impulsivity (e.g., interrupts, difficulty waiting his or her turn). All positively endorsed symptoms were added together (each coded as 1 if the symptom was present, 0 if the symptom was absent), with higher scores indicating a greater number of ADHD symptoms. The ADHD symptom scale has shown evidence of good test–retest reliability (Schwab-Stone et al., 1993) and moderate agreement with clinician-rated symptoms (Piacentini et al., 1993). The internal consistency for this measure was good ($\alpha = .85$).

PARENTING PRACTICES

Information on all parenting practices was collected using both child and parent report. For households with more than one parent, the boys' primary caregiver was identified and asked to complete the measure. In most cases, this was the boys' biological mother (88.7%) or father (5.1%). The boys were instructed to answer items as they related to their relationship with the parent identified as their primary caregiver. Scores from the child and parent were combined for all parenting variables listed below by summing the scores from each informant. Although parent and child reports of parenting practices only tend to exhibit small to moderate correlations, these combined scores have been shown to increase validity

without reducing the reliability for all three samples of the PYS (for further details, see Loeber et al., 1998; Loeber et al., 2000). Several previous investigations have shown that the parenting scales used in the current study are associated with the development of conduct problems and serious antisocial behavior in youth (Loeber et al., 1998; Loeber et al., 2005; van Wijk et al., 2005). Furthermore, evidence suggests that these parenting measures exhibit moderate to high (r 's from .41 to .69) levels of temporal stability over 1-year intervals during adolescence in the oldest cohort of the PYS (Loeber et al., 2000). Further details regarding the creation of the parenting scales described below can be found elsewhere (Loeber et al., 1998; Loeber et al., 2000).

Poor parent-child communication. The Revised Parent-Adolescent Communication Form (RPACF; Loeber et al., 1998) asks boys (29 items) and their parents (30 items) how often they communicate about their emotions, problems, and disagreements. This measure seems to assess the mutually responsive parent-child relationship that has been shown to positively influence the development of prosocial values in previous studies (Hastings et al., 2000; Kochanska, 1997; Kochanska & Murray, 2000). Adolescents were asked questions such as, "Is your parent a good listener?" and "Does your parent insult you when he/she is angry with you?" Examples of questions posed to caregivers include the following: "Do you and your son try to come to a solution when talking about a problem?" and "When you are having a problem with your son, do you give him the silent treatment?" For each item, the respondent indicated how frequently the behavior has occurred using a 3-point scale (0 = *almost never*, 1 = *sometimes*, 2 = *always*). Some items were reverse-scored before being summed so that higher total scores indicated poorer parent-child communication. At Time 1, the internal consistency was high for both for the parent ($\alpha = .90$) and child ($\alpha = .96$) reports of poor communication.

Physical punishment. One item from the Discipline Scale (Loeber et al., 1998) was used to examine the extent to which parents used physical punishment to discipline their child. Parents were asked, "If your son does something that he is not allowed to do or that you don't like, do you slap or spank him, or hit him with something?" The boys were asked a similar question about physical punishment ("If you do something that you are not allowed to do or that your parents don't like, does your mother/father slap or spank you, or hit you with something?"). Both the parent and child responded to the question using a 3-point Likert-type rating scale (1 = *almost never*, 2 = *sometimes*, 3 = *often*). No reliability coefficients were calculated for the Physical Punishment Scale because it consists of a single item.

Low-positive parenting. This scale assesses the frequency with which parents exhibit positive behaviors toward their child (Loeber et al., 1998). Seven questions were included in the child (e.g., "When you have done something that your mother/father likes or approves of, how often does he/she give you a wink or a smile?") and parent (e.g., "When your son did something that you liked or approved of, how often did you give him a wink or a smile?") versions of the instrument. For each question, respondents answered using a 3-point Likert-type scale (1 = *almost never*, 2 = *sometimes*, 3 = *often*). All items were reverse-scored before being summed so that high scores represented lower positive parenting behaviors. At Time 1, the internal consistency was moderate for the parent ($\alpha = .78$) and child ($\alpha = .81$) reports of low-positive parenting.

Poor supervision. This construct was assessed using four items that were administered to both child and caretaker (Loeber et al., 1998). An example of an item for the child report is, "Do your parent(s) know who you are with when you are away from home?" A comparable item on the parent version is, "Do you know who your son's companions are when he is not at home?" Responses for each item were scored on a 3-point Likert-type rating scale (1 = *almost never*, 2 = *sometimes*, 3 = *often*). All items were reverse-scored prior to summing the ratings so that higher ratings indicated poorer parental supervision. At Time 1, the internal consistency was modest for the parent ($\alpha = .62$) and child ($\alpha = .64$) reports of poor supervision.

Nonpersistent discipline. Select items from the Discipline Scale (Loeber et al., 1998) were used to measure parents' tendencies to be inconsistent and lack persistence when disciplining their child. The Nonpersistent Discipline Scale consisted of four items that were asked of both the parent (e.g., "If you warn your son that he will be punished if he does not stop doing something, do you actually punish him if he does not stop?") and child (e.g., "If your mother/father warns you that you will get punished if you do not stop doing something, does s/he do what s/he says and punish you?"). Responses to these items were measured using a 3-point Likert-type rating (1 = *almost never*, 2 = *sometimes*, 3 = *often*). All items were reverse-scored prior to summing the ratings so that higher ratings indicated increased nonpersistent discipline. At Time 1, the internal consistency was modest for the parent ($\alpha = .59$) and child ($\alpha = .61$) reports of nonpersistent discipline.

PEER INFLUENCES

Peer delinquency. The Peer Delinquency Scale (PDS; Loeber et al., 1998) is designed to assess the proportion of the participants' friends who engage in various delinquent behaviors. The current study used an 11-item scale assessing both overt (e.g., strong armed robbery, aggravated assault, destruction of property) and covert (e.g., burglary, auto theft, stealing something less than \$5) delinquency among the participants' peers. For each item, participants rated how many of their friends engaged in a specific delinquent act in the past 6 months using a 5-point scale (from 0 = *none of them* to 4 = *all of them*). Items were summed so that higher scores indicated increased levels of peer delinquency. This Peer Delinquency Scale has been associated with increased beliefs favoring delinquency (Pardini et al., 2005) and the initiation of severe violent delinquency (Loeber et al., 2005) during adolescence. The internal consistency of the peer delinquency scale was high in the current study ($\alpha = .90$).

Nonconventional peers. The Conventional Activities of Peers Scale (Loeber et al., 1998) is an 8-item youth-report measure designed to assess the proportion of the participants' friends who engage in prosocial activities. Specifically, participants were asked how many of their friends engage in positive activities at school (i.e., athletics, clubs), in the community (e.g., YMCA, church groups), and at home (e.g., doing things with family members). Participants rated how many of their friends engaged in these acts in the past 6 months using a 5-point scale (from 0 = *none of them* to 4 = *all of them*). Items were reverse-scored before being summed so that higher scores are indicative of a greater proportion of nonconventional peers. Prior studies have found that this Nonconventional Peer Scale is associated with increased substance use and delinquency in adolescent boys (Loeber et al., 1998). The internal consistency of the scale was good in the current sample ($\alpha = .80$).

YOUNG ADULT OUTCOMES

AP in adulthood. Adult AP symptoms were assessed using the Computerized Diagnostic Interview Schedule, Fourth Edition (CDIS-IV; Robins & Helzer, 1988), which was administered to participants in the oldest cohort in early adulthood. The *CDIS-IV* is a fully structured interview developed for psychiatric epidemiology research that uses a series of standardized probes and follow-up questions to elicit symptoms from the participant (Erdman et al., 1992). It has demonstrated evidence of reliability and construct validity in previous investigations (for a review, see Malgady, Rogler, & Tyron, 1992). As part of the *CDIS-IV*, participants answered several questions designed to assess the seven adult symptoms of APD (e.g., deceitfulness, lack of remorse, irritability, and aggressiveness). Positively endorsed symptoms were summed to create an AP symptom score. The internal consistency for this scale was moderate in the current sample ($\alpha = .79$).

Information on adult AP characteristics was also collected using the *DSM*-oriented Antisocial Personality Problems scale of the Young Adult Self-Report (YASR; Achenbach, 1997; Achenbach, Bernstein, & Dumenci, 2005). This scale consists of items that a multicultural group of psychiatrists and psychologists rated as being “very consistent” with a *DSM-IV* diagnosis of APD (for details, see Achenbach et al., 2005). In the current study, participants were asked to rate themselves on 15 items describing AP characteristics (e.g., “You are mean to others,” “You physically attack people,” “You lie or cheat”) using a 3-point Likert-type scale (0 = *not true*, 1 = *sometimes true*, 2 = *very true*). The items were summed so that higher scores indicated increased levels of AP characteristics. Achenbach et al. (2005) found that the self-report Antisocial Personality Problems Scale exhibits high test-retest during an average interval of 1 week ($r = .87$) and is moderately correlated with reports on AP problems provided by others ($r = .42$). The internal consistency for this scale was modest in the current sample ($\alpha = .69$).

Internalizing problems in adulthood. Information on internalizing problems was collected using the self-reported Short Moods and Feeling Questionnaire (SMFQ; Costello & Angold, 1988). The SMFQ consists of 13 items associated with major depression according to *DSM-III-R* criteria. Participants are presented with a series of descriptive statements and are asked to rate how accurately the statement describes their own feelings and behaviors in the past 2 weeks (e.g., “You felt miserable or unhappy,” “You hated yourself,” “You felt lonely”) using a 3-point scale (0 = *not true*, 1 = *sometimes true*, 2 = *always true*). Several previous investigations have found that the SMFQ is moderately correlated (r 's from .51 to .67) with more extensive measures of depression in children and adolescents, and the measure discriminates between clinically depressed and nondepressed individuals (for review, see Angold, Erkanli, Silberg, Eaves, & Costello, 2002). Items were summed to form a composite score, with higher scores indicating increased levels of depression. In the current sample, the internal consistency of this scale in early adulthood was high ($\alpha = .89$).

Information on internalizing problems was also collected using the Anxious/Depressed Problem Scale of the YASR. This empirically derived scale consists of 14 items related to problems with anxiety (e.g., “You worry a lot”) and depression (e.g., “You are unhappy, sad, or depressed”) in young adults. Participants were asked to rate how “true” each statement is on a 3-point scale (0 = *not true*, 1 = *sometimes true*, 2 = *very true*). Items were summed so that higher scores indicated increased levels of internalizing problems. In support of the

validity of the scale, Achenbach, Howell, McConaughy, and Stanger (1995) found that parent and youth reports of problems with anxiety and depression in adolescence were associated with ratings on the YASR Anxious/Depressed Scale taken 6 years later in early adulthood. The internal consistency of this scale in the current sample was moderate ($\alpha = .82$).

MISSING DATA

Throughout the course of the PYS, participant retention has been high. The proportion of participants with complete data in the oldest cohort of the PYS during each of the seven time points assessing IC ranged from 82.6% to 99.0%, with a majority of participants having complete data on IC at all seven time points ($n = 374$, 68.8%). At the early adult assessment used to measure AP and internalizing problems, participant retention remained high for the oldest cohort (83.2%, $n = 421$). Full-information maximum likelihood (FIML) estimates were used to handle missing data in the current investigation. This procedure uses all available data points to construct parameter estimates under the assumption that the data are missing at random. Even when data are not missing at random, FIML estimation tends to produce less biased estimates than traditionally used techniques for handling missing data, especially when the proportion of missing data is relatively low, as in the current investigation (Enders & Bandalos, 2001; Wothke, 2000). When the current analyses were re-run using complete cases only, the primary results were identical to those using FIML estimates. These analyses are available on request from the primary author.

DATA ANALYSIS PLAN

All models were specified using maximum likelihood estimation with standard errors and a chi-square statistic that are robust to nonnormality (MLR) in Mplus 4.2 (Muthén & Muthén, 1998-2004). To examine the group-level and the within-individual stability in IC across time, an unconditional growth curve model was specified during the first seven assessments of the oldest cohort using commonly recommended procedures (Bollen & Curran, 2006). The latent factors represent the initial level of IC at Time 1 (intercept factor) and the linear change in IC during Times 1 through 7 (slope factor). For the intercept factor, the loadings of the seven IC variables were fixed to 1, and for the slope factor, the loadings were fixed to 0, .5, 1, 1.5, 2, 3, and 4 to model linear change in IC over time while accounting for the switch from 6-month to 12-month assessments. The means of the two latent growth factors were freely estimated, whereas the means of the manifest IC variables were fixed to 0. The variances for the intercept and slope factors, the residual variances of the seven observed variables, and the covariance between the intercept and slope factors were estimated. A quadratic factor was not estimated, because a preliminary analysis of the data suggested that IC scores followed a linear trajectory. The absolute fit of the model was examined using global fit indices, including the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA). For the CFI and TLI, conventional cutoff values of .90 or greater indicate acceptable fit and .95 or greater indicate good fit (McDonald & Ho, 2002; but see Hu & Bentler, 1999; Hutchinson & Olmos, 1998). RMSEA values between .05 and .08 represent an acceptable fit, and values less than .05 indicate a good fit (McDonald & Ho, 2002).

After specifying the unconditional IC growth-curve model, a second model was run to examine hypotheses regarding the relation between IC growth trajectories (intercept, slope) during adolescence and AP characteristics and internalizing problems in young adulthood. For this model, a latent AP construct was specified using the adult APD symptoms from the CDIS-IV and the AP problems scale from the CBC. A latent construct of adult internalizing problems was specified using the total depression score from the RMFQ and the Anxiety/Depression Scale from the CBC. These two latent constructs were simultaneously regressed onto the IC intercept and group factors. Covariances were freely estimated between the latent AP and internalizing constructs, as were the covariances between the IC intercept and growth factors.

The last set of models estimated was designed to examine the association between parent and peer factors on IC trajectories during adolescence after accounting for the influence of demographic confounds (age, race, SES), ODD/CD, and ADHD. To initially examine the relation between these variables and the growth components of IC, a series of independent models for each predictor were conducted. Specifically, the intercept and slope factor of IC during adolescence were regressed onto each of the exogenous predictor variables in separate models. The regressions were first conducted with the intercept of the growth model being specified as the estimated level of IC at Time 1. However, the regression analyses were also repeated with the intercept recentered to represent the estimated level of IC at the last assessment (Time 7). This recentering was used to examine the influence of covariates on model-implied levels of IC at the final assessment in adolescence. This recentering of the intercept was done by changing the loadings for the IC linear slope to -4 , -3.5 , -3 , -2.5 , -2 , -1 , and 0 , during the Time 1 through Time 7 assessments, respectively. Recentering the intercept in this manner does not influence the overall model fit or the estimated linear slope of IC across time (Bollen & Curran, 2006). However, this procedure is often useful for clarifying seemingly counterintuitive findings that can arise when predicting growth curve slopes. For example, it is not uncommon for predictors to be positively associated with the estimated intercept of an attribute at Time 1 (e.g., higher physical punishment related to higher estimated callousness at Time 1) but negatively related to the slope of the attribute over time (e.g., higher physical punishment related to greater decreases in estimated callousness from Times 1 through 7). However, the predictor may continue to exhibit a positive relationship with the intercept when it is re-specified to represent the final assessment point (e.g., higher physical punishment is related to greater estimated callousness at Time 7). This type of finding suggests that the predictor is associated with higher levels of the attribute during the entire trajectory of the latent growth curve, even though the overall magnitude of this effect dissipates over time (e.g., see Hussong, Curran, Moffitt, Caspi, & Carrig, 2004).

Following analyses examining the bivariate relations between each predictor and IC trajectories in separate models, a final model was estimated that included all variables that significantly predicted the estimated IC intercept and slope parameters. In this final model, the latent intercept and slope of IC were simultaneously regressed onto all the significant predictors from the previous bivariate analyses to determine which factors were significantly related to trajectories of IC after controlling for the overlap among the predictors. These analyses were first run centering the intercept at Time 1 and then repeated centering the intercept at Time 7.

RESULTS

UNCONDITIONAL GROWTH MODEL

The estimation of an unconditional growth model was used to examine the notion that trajectories of IC would remain relatively flat over time for the group as a whole as well as a majority of individuals. The unconditional growth model fit the observed data well, $\chi^2(23, N = 506) = 35.966, p = .042, CFI = .987, TLI = .988, RMSEA = .033$. This linear growth model continued to exhibit a good fit to the observed data when the model was run separately for Caucasian, $\chi^2(23, N = 215) = 28.768, p = .188, CFI = .988, TLI = .989, RMSEA = .034$; and for African American boys, $\chi^2(23, N = 291) = 24.518, p = .377, CFI = .997, TLI = .997, RMSEA = .015$.

The mean estimate for the sample intercept was 3.248 and the mean estimated slope was $-.111$, indicating there is an average annual decrease in IC of $-.111$ across time. Although small, this decrease in IC was significantly different from zero, $z = -3.090, p < .05$. However, statistically significant variance estimates were found for the both the intercept, $\hat{\sigma}_I^2 = 7.279, z = 11.421, p < .001$, and slope, $\hat{\sigma}_S^2 = .339, z = 6.052, p < .001$, factors, indicating that there was substantial heterogeneity in both the latent starting point and change of IC over time across individuals. This indicates that adolescent boys differ not only in their initial levels of parent-reported IC, but they also differ in terms of the rate at which their parent-reported IC changes over time. A visual depiction of the mean estimated growth curve for the entire sample as well as a depiction of the individual variability about this curve can be seen in Figure 1. As seen in Figure 1, some individuals experience rapid declines in latent IC, whereas a portion of individuals actually exhibited increases in IC over time. The estimated correlation between the intercept and slope factors was statistically significant and negative, $r = -.358, p < .001$, indicating that boys with higher initial levels of IC tended to have greater decreases in IC over time.

IC TRAJECTORIES PREDICTING ADULT OUTCOMES

The second model was designed to examine the hypothesis that individual differences in the initial level and change in IC during adolescence would be associated with adult APD symptoms but unrelated to internalizing problems in young adulthood. This model exhibited a good fit to the data, $\chi^2(48, N = 506) = 72.377, p = .012, CFI = .985, TLI = .983, RMSEA = .032$. Results indicated that higher values on both the intercept and slope factors of IC were significantly related to higher levels of AP characteristics in young adulthood (see Figure 2). The overall amount of variance explained in the latent AP construct by the IC growth factors was modest, $R^2 = .10$. In contrast, there was no significant relation between the IC growth factors and internalizing problems. These results support the notion that individual differences in both the initial levels of IC in early adolescence and changes in IC during adolescence are associated with a risk for developing AP characteristics by young adulthood but unrelated to adult internalizing problems.

PREDICTING IC GROWTH TRAJECTORIES

The final set of models was used to examine the notion that parent and peer variables would influence IC trajectories during adolescence, even after accounting for demographic confounds, ODD/CD, and ADHD. The initial examination of significant predictors of IC

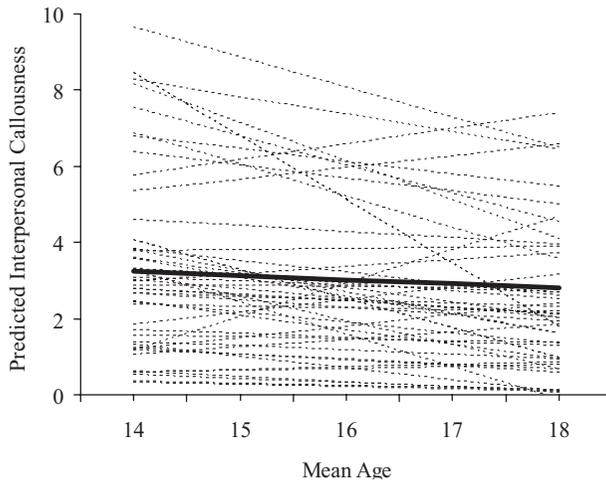


Figure 1: Sample Mean and Select Individual Growth-Curve Trajectories for Interpersonal Callousness Across Adolescence

Note. Solid line is the latent mean trajectory of IC for the entire sample and the dotted lines are 50 randomly selected individual growth curves

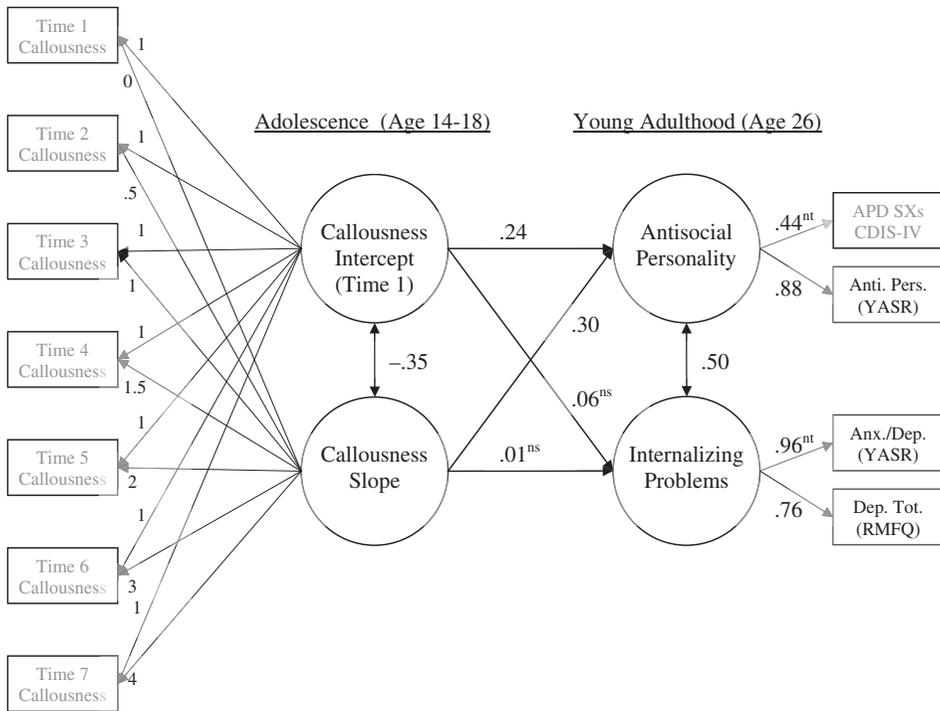


Figure 2: Latent IC Trajectories Across Adolescence Predicting AP and Internalizing Problems in Young Adulthood

Note. Standardized estimates are reported. All values are statistically significant at $p < .05$, except for values labeled “ns” (nonsignificant). Loadings labeled “nt” (not tested) were fixed to 1.0 in the unstandardized model.

trajectories in bivariate models revealed that race and family SES were not significantly related to the initial status or change in IC during adolescence. Although results suggested that the age of the boys predicted higher levels of IC at Time 1, age was associated with greater decreases in IC throughout adolescence. In fact, results indicated that there was no significant association between boys' ages at Time 1 and their IC scores at the final assessment point. Children with higher levels of ODD/CD and ADHD symptoms exhibited higher estimated levels of IC at Time 1. Although higher initial levels of ODD/CD and ADHD were associated with greater decreases in the slope of IC over time, boys with higher levels of ODD/CD and ADHD continued to exhibit higher levels of IC at the final assessment (Time 7).

All of the parenting-practice variables were significantly related to higher estimated levels of IC at Time 1. Although results indicated that higher levels of poor communication, poor supervision, and physical punishment were significantly related to greater decreases in IC over time, these parenting variables were also significantly associated with higher levels of estimated IC at Time 7. Consequently, boys who were exposed to higher levels of poor communication, poor supervision, and physical punishment exhibited higher levels of IC throughout adolescence, despite experiencing greater decreases in IC over time. Although nonpersistent discipline was significantly associated with increased levels of IC at Time 1, this relation was nonsignificant when the intercept was specified as the last assessment point (Time 7).

The predictors of peer delinquency and nonconventional peers were significantly related to higher levels of estimated IC at Time 1. However, higher levels of nonconventional peers were related to greater decreases in IC over time, and the association between nonconventional peers and latent IC scores at Time 7 was nonsignificant. In contrast, results indicated that peer delinquency at Time 1 continued to predict latent IC scores at Time 7.

The final model regressing the IC growth factors on all significant predictors from the bivariate analyses fit the data well, $\chi^2(77, N = 506) = 72.941, p = .013, CFI = .982, TLI = .979, RMSEA = .028$. Results indicated that higher levels of ODD/CD, ADHD, and poor parent-child communication significantly predicted higher estimated levels of callousness at Time 1 (see Figure 3). In addition, no predictors exhibited a significant independent association with the slope of IC in this model. When the model was re-run specifying the intercept to represent estimated IC levels at Time 7, the relation between ADHD and the intercept of IC was reduced to nonsignificance, $z = 1.447, p = .145$ (see Figure 3). In contrast, higher levels of ODD/CD and poor parent-child communication continued to predict higher levels of estimated IC scores at Time 7.

POST HOC ANALYSES—ETHNIC DIFFERENCES

The previously mentioned findings indicated that a linear growth model fit the data well for both African American and Caucasian boys, and ethnicity was not significantly related to the initial status or change in IC trajectories over time. To further explore possible ethnic differences in the predictors and outcomes associated with IC trajectories, a series of multiple group models were run in Mplus 4.2 (Muthén & Muthén, 1998-2004). In multiple-group analysis, parameters can either be set to equivalence across groups or be allowed to take on

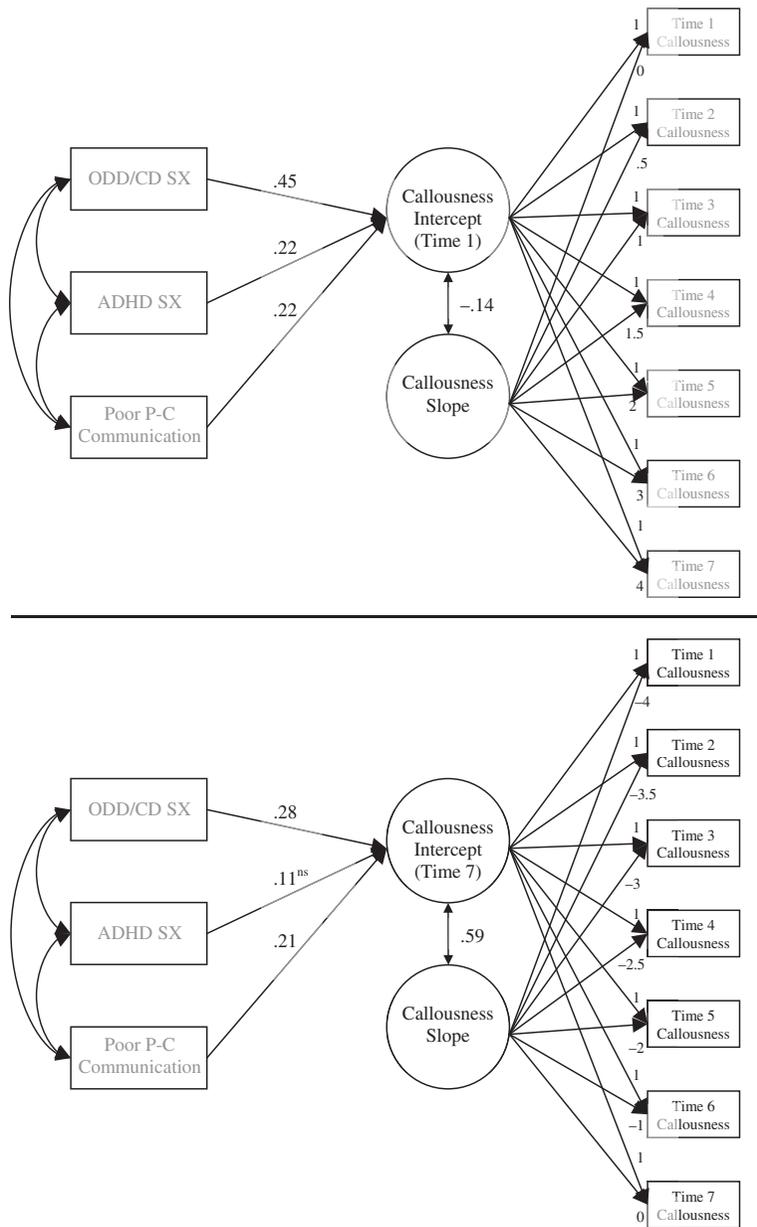


Figure 3: Final Model Predicting IC Trajectories With the Intercept Centered at Time 1 (Top) and Then Recentered at Time 7 (Bottom)

Note. Standardized estimates are reported. All values are statistically significant at $p < .05$, except for values labeled “ns” (non-significant). For simplicity, variables that did not significantly predict the growth curve parameters in the final model are not presented.

group-specific values. For each analysis, a fully constrained model in which all parameters were fixed to be equal for African American and Caucasian boys was contrasted with a more complex model in which certain parameters of interest were freed between the two ethnic

TABLE 2: Bivariate Predictors of Latent Interpersonal Callousness Growth Curve Trajectories Across Adolescence

	<i>Interpersonal Callousness Growth Parameters</i>					
	<i>Intercept (Time 1)</i>		<i>Intercept (Time 7)</i>		<i>Linear Slope</i>	
	β	p	β	p	β	p
Demographics						
Age	.112	.022	-.015	.770	-.148	.013
Race	-.031	.529	-.033	.514	-.005	.930
Family SES	-.089	.073	-.073	.168	.013	.834
Disruptive behavior problems						
ODD/CD (P) symptoms	.694	.000	.412	.000	-.297	.000
ADHD (P) symptoms	.605	.000	.353	.000	-.267	.000
Parenting practices						
Poor parent-child communication (PC)	.489	.000	.326	.000	-.165	.014
Low-positive parenting (PC)	.254	.000	.206	.000	-.040	.552
Nonpersistent discipline (PC)	.136	.016	.086	.119	-.052	.425
Poor supervision (PC)	.302	.000	.122	.035	-.200	.002
Physical punishment (PC)	.225	.000	.111	.038	-.125	.033
Peer influences						
Peer delinquency (C)	.192	.000	.149	.011	-.040	.553
Nonconventional peers (C)	.220	.000	.076	.120	-.160	.004

Note. SES = socioeconomic status; ODD/CD = oppositional defiant disorder/conduct disorder; ADHD = attention-deficit hyperactivity disorder; C = child report; P = parent report; PC = combined parent and child report. Latent intercept and slope factors were regressed onto each predictor in separate models. Each model was run specifying the intercept as the estimated level of interpersonal callousness at Time 1 and then re-run specifying the intercept as the estimated level of interpersonal callousness at the last assessment point (Time 7). Standardized regression parameters are reported.

groups. To determine whether the models were significantly different, a scaled difference chi-square test for comparing two nested models estimated using Satorra-Bentler's (2001) scaling correction for nonnormal data was used. A nonsignificant chi-square difference test indicates that allowing the parameters to differ between the two ethnic groups does not significantly improve the fit of the model to the observed data (i.e., no evidence for significant group differences).

For the analysis involving adult outcomes, a model with all parameters fixed between both ethnic groups was contrasted with one that allowed the regression parameters representing the association between IC trajectories and the adult outcomes of AP and internalizing problems to be freely estimated across groups. Allowing the regression parameters from the IC intercept and slope to the adult outcomes of APD and internalizing problems to be freely estimated for each ethnic group did not significantly improve the fit of the model, $\Delta\chi^2(4) = 4.341$, $p = .362$. Furthermore, the fixed model provided a good fit to the data, $\chi^2(123, N = 506) = 137.934$, $p = .169$, CFI = .991, TLI = .992, RMSEA = .022. Similar analyses were conducted for the bivariate models presented in Table 2, in which the intercept and slope factors of IC were regressed on demographic, family, and peer predictors. In all instances, freeing the regression parameters from the predictors to the intercept and slope of IC did not significantly improve the fit of the model, $\Delta\chi^2(2)$ from 0.555 to 3.904, all p 's > .141.

DISCUSSION

The results from the current investigation provided some unique insights into the developmental trajectories of IC during adolescence in boys. Although there was a statistically significant decrease in the estimated mean levels of IC during 4 years in adolescence, the magnitude of this decline was relatively minor. However, there was substantial individual variability in IC growth trajectories, with some individuals experiencing rapid decreases in IC and others experiencing increases in IC during this developmental period. This suggests that parent-reported IC is not completely stable in either the absolute or relative sense during adolescence. Although it may not seem surprising that levels of IC change across adolescence and that the rate and direction of this change differs between individuals, this finding is important given the overwhelming emphasis on these features as stable, possibly immutable personality traits. Furthermore, the current findings are consistent with longitudinal research suggesting that personality disorder features do not seem as inflexible or enduring as they are made out to be in the *DSM* (Lenzenweger, Johnson, & Willett, 2004). More important, the results from the current study suggest that individual differences in the change in IC during adolescence may have particular relevance for understanding the development of AP features by young adulthood.

IC AND ADULT OUTCOMES

Consistent with prior predictions, trajectories of IC during adolescence were unrelated to adult internalizing problems. However, boys with higher levels of IC in early adolescence (roughly age 14), as well as those who experienced less substantial declines or increases in IC during adolescence (roughly ages 14 to 18), had the highest levels of AP characteristics in early adulthood (roughly age 26). Although this finding is consistent with growing longitudinal research indicating that IC in adolescence is related to the development of antisocial and psychopathic personality features in adulthood (Burke et al., 2007; Loeber et al., 2002), this is the first study to demonstrate the specificity of this relation by showing that IC trajectories are unrelated to internalizing problems in adulthood. Moreover, this is the first study to show that changes in IC across time are associated with AP features in young adulthood, even after controlling for the initial levels of IC in early adolescence. Because the current study used a parent-report measure of IC and self-report measures of adult AP and internalizing problems, these findings cannot be attributed to shared-method variance.

The strength of the association between IC and AP was relatively modest, accounting for only 10% of the variance in the latent AP construct. Some researchers have suggested that relying on self-reports of AP features is problematic, especially because individuals with significant psychopathic features are often deceitful and attempt to present themselves in a positive light (Hare, 2003). As a result, the relatively modest association observed may be partially driven by men underreporting their AP symptoms. In addition, the measures used to assess AP in the current investigation were based on the *DSM-IV* (American Psychiatric Association, 2000) conceptualization of APD, which may not adequately assess the interpersonal and affective features of psychopathic personality. In any case, there is a need to better understand why some boys who exhibit significant levels of IC during adolescence do not go on to exhibit features of an AP in young adulthood.

PARENTING PRACTICES AND IC

Although all of the parenting variables in the current study predicted higher initial IC in adolescence, a dysfunctional parent–child communication style emerged as the most robust predictor of chronic levels of IC across time. This finding is consistent with prior longitudinal research indicating that a supportive parent–child relationship characterized by reciprocal cooperation and shared positive affect is associated with morality development in early childhood (Fowles & Kochanska, 2000; Kochanska, 1997; Kochanska & Murray, 2000; Laible & Thompson, 2002). This mutually responsive relationship is believed to increase children’s receptiveness to maternal socialization and to enhance their willingness to adopt prosocial values (Carlo et al., 1999). For example, parents who facilitate discussions about the impact that their children’s actions have on others are more likely to have children who internalize prosocial beliefs (Laible & Thompson, 2002). In addition, longitudinal research has found that adolescent boys who are exposed to a warm and responsive parent–child relationship are more likely to develop a belief system that views antisocial and violent behaviors as morally “wrong” (Pardini et al., 2005). Consistent with these studies, the current results suggest that a parent–child communication style that is dominated by negative interchanges, rather than shared positive experiences, and involves little reciprocity when discussing difficult issues, is associated with chronic forms of IC during adolescence. Moreover, parent–child communication quality was more important than dysfunctional discipline practices (e.g., physical punishment, inconsistent discipline) in predicting chronic levels of IC in adolescent boys.

Although it is possible that dysfunctional parent–child communication contributed to the development of chronic IC, several alternative explanations are possible. For example, theoretical models have long suggested that children’s behavior problems may negatively influence parenting behavior over time (Patterson, Reid, & Dishion, 1992), with emerging research in this area indicating that child behavior problems predict later increases in dysfunctional parenting (Beauchaine, Webster-Stratton, & Reid, 2005). As a result, it is possible that boys with high levels of IC elicit increased levels of verbal conflict and less warmth from their parents. In addition, it is also possible that the association between poor parent–child communication and IC is driven by shared genetic factors, not environmental influences (for review, see Moffitt, 2005). A recent twin study suggests that extreme levels of callousness and antisocial behavior in young children may largely be accounted for by shared genetic factors (Viding, Blair, Moffitt, & Plomin, 2005). Future studies need to expand on this research by examining the extent to which the co-occurrence between poor parent–child communication and IC can be accounted for by genetic influences.

PEER INFLUENCES AND IC

There was no evidence that exposure to delinquent peers or prosocial peers significantly influenced changes in boys’ IC during adolescence. Although both peer factors were related to higher initial levels of IC in bivariate analyses, these relations were reduced to nonsignificance after accounting for other covariates (e.g., ODD/CD, ADHD, parenting variables) in the final regression model. Kimonis and colleagues (2004) reported a similar finding when examining the relation between callous-unemotional features and delinquent peer affiliation. Specifically, the authors found that the positive association between callousness and delinquent peer affiliation was largely eliminated after controlling for dysfunctional parenting

practices. Although other studies have found that exposure to delinquent peers is associated with increases in beliefs favoring delinquency (Pardini et al., 2005) and an increased risk for future antisocial behavior (Dishion et al., 1999), the current study suggests that peer factors may not substantially influence changes in IC during adolescence.

LIMITATIONS AND FUTURE DIRECTIONS

The findings need to be viewed cautiously in light of several limitations. First, the current study was limited to examining developmental changes in IC from early to late adolescence. Although there was no evidence that parenting and peer characteristics influenced changes in IC during this period, it is possible that features of IC may be more malleable in earlier childhood. Along these lines, it will be important for future studies to examine whether the parent and peer factors examined in the current study influence changes in IC traits in preschool and elementary school children. In addition, the generalizability of the findings is limited by the use of an all-male sample attending public schools within inner-city Pittsburgh. Because researchers have found gender differences in the development of prosocial values during childhood (Kochanska, DeVet, Goldman, Murray, & Putnam, 1994), it will be important to determine whether the current findings apply to IC in females. It is also unclear whether the current findings will generalize to boys living in communities with different social-demographic characteristics, such as those living in more rural settings.

Another limitation of the current study is that items indexing IC were obtained from parent-reported archival data. As a result, the entire range of interpersonal and affective characteristics associated with psychopathic traits could not be adequately assessed, particularly features associated with a lack of empathy and shallow emotions (Frick et al., 2000). Although the current study suggests that the parent-report measure of IC used is a valid indicator of future risk for self-reported AP, future studies should examine whether the findings hold with other measures of callousness in youth, including those that use different informants (e.g., teachers, self-report).

Although growing evidence suggests that features of a callous interpersonal style are relatively stable during adolescence, the current findings suggest that some individuals do exhibit significant changes in these characteristics across time. Furthermore, understanding these developmental changes in callousness during adolescence seems particularly important given that they predict features of an AP more than 7 years later. Although higher levels of ODD/CD and a dysfunctional parent-child relationship are independently associated with an increased risk for exhibiting elevated levels of IC during adolescence, the current study failed to find any parenting or peer factors that were associated with substantive declines in IC across time. As a result, future studies must continue to search for the drivers of developmental changes in IC during adolescence.

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