

Concurrent and prospective effects of psychopathic traits on affective and cognitive empathy in a community sample of late adolescents

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Background: A deficit in affective rather than cognitive empathy is thought to be central to psychopathic traits. However, empirical evidence for empathy deficits in adolescents with psychopathic traits is limited. We investigated the concurrent and prospective effects of psychopathic traits on affective and cognitive trait empathy in late adolescence. **Methods:** A community sample of 107 males and 126 females who were approximately 16-year olds at Time 1 participated in four annual waves. Sex-specific classes of adolescents' psychopathic traits were created using Latent Class Analyses. Subsequently, we investigated class differences in level and development of empathy. **Results:** For both sexes, Latent Class Analyses produced two classes: one class with low and one with moderate levels of psychopathic traits. Consistent with our hypothesis, for both sexes, adolescents with moderate levels of psychopathic traits reported lower mean levels of affective empathy than adolescents with low levels of psychopathic traits. In addition, female adolescents with moderate psychopathic traits reported lower mean levels of cognitive empathy. Male adolescents showed a trend in this direction. No differences between classes were found in development of empathy, which increased over years. **Conclusions:** This is the first study to show that male and female adolescents with higher levels of psychopathic traits have lower levels of affective empathy not only concurrently but also prospectively over a 3-year period. Females additionally showed a similar pattern on cognitive empathy. In this community sample, developmental results suggest that adolescents with higher levels of psychopathic traits have relative rather than absolute empathy deficits. **Keywords:** Psychopathic traits, emotional concern, perspective taking, empathy development.

Children and adolescents with psychopathic traits are characterized by impulsive and antisocial behavior, weak affect, and a narcissistic interpersonal style (Frick & Hare, 2002). Psychopathic traits in adolescence have been linked to adult psychopathy (Lynam, Caspi, Moffitt, Loeber & Stouthamer-Loeber, 2007), and delineate a subgroup of antisocial youngsters with a severe and chronic pattern of antisocial behavior in clinical (Christian, Frick, Hill, Tyler & Frazer, 1997), forensic (Vaughn, Howard & DeLisi, 2008), and community samples (Frick, Stickle, Dandreaux, Farrell & Kimonis, 2005). One characteristic of psychopathic traits that has received substantial theoretical attention is lack of empathy (Blair, 2008). However, empirical evidence for empathy deficits in children and adolescents with psychopathic traits is limited and it is not yet clear which type of empathy deficit characterizes individuals with psychopathic traits most. The aim of the present study was to investigate the effects of psychopathic traits on the development of affective and cognitive empathy in a community sample of male and female adolescents across four waves (age 16–19).

Empathy is a multidimensional phenomenon entailing both affective and cognitive components (Davis, 1996; Hoffman, 2000). Affective empathy involves the vicarious experience of emotions consistent with those of others. Cognitive empathy involves understanding another's emotions by means of simple associations or more complex perspective taking (PT) processes. Empathy may be viewed as a stable tendency (i.e., trait empathy) or a transient, situation-specific phenomenon (i.e., state empathy). In the present study, self-report questionnaires will be used to examine affective and cognitive trait empathy.

Lack of empathy is a defining feature of psychopathic traits (Frick & Hare, 2002), possibly linked to abnormalities in brain circuits involving the amygdala (Blair, 2007). The amygdala is involved in the processing of emotions, especially fear-related information (Olsson & Phelps, 2007), and may therefore be involved in affective empathy. Recent studies have shown amygdala hypoactivity during processing of fearful facial expressions in conduct disordered youths with psychopathic traits (Jones, Laurens, Herba, Barker & Viding, 2009; Marsh et al., 2008). Accordingly, it has been proposed that psychopathy is associated with specific deficits in affective rather than cognitive empathy (Blair, 2008).

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As yet, few studies have investigated the relation between psychopathic traits and both affective and cognitive empathy. Three studies examined state empathy in children with conduct disorder, two studies with boys only (Jones, Happé, Gilbert, Burnett & Viding, 2010; Schwenk et al., 2012) and one study with both boys and girls (Anastassiou-Hadjicharalambous & Warden, 2008). All three studies demonstrated that conduct disordered children with high levels of psychopathic traits are impaired in affective but not in cognitive empathy. A study with male and female juvenile offenders demonstrated an inverse relationship between callous-unemotional traits (i.e., a core feature of psychopathic traits) and *both* affective and cognitive trait empathy (Pardini, Lochman & Frick, 2003). Dadds et al. (2009) examined the relation between psychopathic traits and affective and cognitive trait empathy in a community sample of male and female children, aged 3–13 years. They found that boys but *not* girls with higher levels of psychopathic traits had lower levels of parent-reported affective empathy across all age cohorts. In addition, girls and boys with higher levels of psychopathic traits had lower levels of cognitive empathy in the younger age cohorts. In the older age cohorts (9–13 years), only girls with higher levels of psychopathic traits had lower levels of cognitive empathy. These outcomes illustrate that the relation between psychopathic traits and affective and cognitive empathy may be moderated by sex and age.

Sex differences in empathy have frequently been reported, especially in studies using self-report measures of empathy (reviewed by Eisenberg & Lennon, 1983), with girls being more empathic than boys. Suggestive evidence of sex differences in empathy development has been reported in two cross-sectional studies with adolescents, using measures of affective empathy (Olweus & Endresen, 1998; Van Tilburg, Unterberg & Vingerhoets, 2002). For girls, but not for boys, older age cohorts had higher levels of empathic concern (EC) than younger age cohorts. Thus, these studies suggest that girls and boys differ in level and development of empathy. As yet, no studies have examined empathy development in late adolescents with different levels of psychopathic traits.

Our study aimed to address the relation between psychopathic traits and development of affective and cognitive empathy across four annual waves in a community sample of male and female late adolescents. Our primary aim was to investigate differences in empathy levels between adolescents with different levels of psychopathic traits. In agreement with theoretical evidence (Blair, 2007), we hypothesized that male and female adolescents with higher levels of psychopathic traits would report lower levels of empathy, especially affective empathy. As a secondary aim, we explored whether there were differences in over-time changes of affective and cognitive empathy in adolescents with different

levels of psychopathic traits. As Dadds et al. (2009) reported sex differences in the relation between psychopathic traits and empathy in children and early adolescents, we analyzed males and females separately.

Method

Participants

Data were obtained from the older cohort of a longitudinal study called Research on Adolescent Development And Relationships (RADAR; see Nelemans et al., in press), in which adolescents and their families participated for four annual waves. Of the 244 families who participated, a total of 233 participating adolescents (46% male) were included in the analyses (more details in the missing data section). Mean age at the first measurement wave was 16.77 for males ($SD = 0.43$) and 16.61 for females ($SD = 0.38$). All adolescents identified themselves as being native Dutch and most indicated to live with both of their parents (96%). Ninety percent of adolescents attended education (51% in preparation for University, 24% in preparation for or attending higher professional education, and 15% in preparation for or attending secondary vocational education). Most adolescents' parents were of Dutch origin (97% of mothers, 95% of fathers), completed at least secondary school (99% of mothers, 98% of fathers) and were employed (76% of mothers, 93% of fathers).

Measures

Psychopathic traits (wave 1). To tap adolescents' psychopathic traits, both parents independently filled in the Antisocial Process Screening Device (APSD; Frick & Hare, 2002; Dutch translation by Das, De Ruiter, Van Heteren & Doreleijers, 2004) during the first measurement wave. The APSD has 20 items on a range from 0–2 (0 = not at all true, 1 = sometimes true, 2 = definitely true). The APSD has been well validated (Frick & Hare, 2002), also in a sample of Dutch-speaking adolescents (Bijttebier & Decoene, 2009). In agreement with recommendations for community samples (Frick & Hare, 2002), APSD-total sum scores were used. Internal consistencies for mother-report (Cronbach's $\alpha = .77$) and father-report ($\alpha = .76$) were acceptable.

Affective and cognitive trait empathy (wave 1–4). We measured affective and cognitive trait empathy in four annual waves with adolescent self-reports on the EC and PT scales of the Interpersonal Reactivity Index (IRI; Davis, 1980; Dutch translation validated by Hawk et al., 2013). Both scales are composed of seven items scored on a 5-point rating scale (0 = does not describe me well, 4 = describes me very well). Sum scores for these scales were

created. Previous studies have supported the validity (Davis, 1983) and psychometrical invariance across adolescence of the IRI subscales (Hawk et al., 2013). Internal consistencies for EC and PT scales of measurements 1–4 ranged between .71 and .81 for EC and between .67 and .82 for PT.

Missing data

Of the 244 respondents, 11 respondents could not be included in the analyses. The APSD manual (Frick & Hare, 2002) prescribes deletion of all cases with two or more missings and substitution of incidental missing values by a score of 1: this criterion led to the removal of 10 cases from the analyses and the substitution of eight incidental missing values. One adolescent was removed from the analyses because no data at all were available on the IRI.

Amongst the remaining 233 cases, 93% of adolescents still participated at the last measurement wave. Little's (Little, 1988) MCAR *t*-test on all 21 scales and demographic items indicated a MCAR pattern ($\chi^2 (N = 233, df = 93) = 88.124, p = .624$). These missing data were imputed on a scale level, using expectation maximization (EM; Dempster, Laird & Rubin, 1977) with all IRI, APSD, and demographic information as predictors.¹

Procedures

Before enrollment in the study, participating adolescents and their parents received written information and provided written informed consent. Questionnaires were completed during home visits. For each annual wave, participating families received a financial reward of 35 euro (approximately 45 US dollars). The board of the local research institute approved the study and its consent forms.

Statistical analyses

Males scored on average higher than females on psychopathic traits according to both mothers and fathers, and lower than females on levels of affective and cognitive empathy (Table 1). Consistent with other studies (Dadds et al., 2009; Frick et al., 2005), levels of psychopathic traits were higher for males than females, and therefore, all further analyses were run for males and females separately in order to avoid the confounding of level of psychopathic traits and sex.

First, we aimed to create subgroups of males and females based on their level of psychopathic traits. Because clinical cutoff scores are inappropriate for creating subgroups in a community sample in which only very few individuals or none at all score in the clinical range (Frick & Hare, 2002), we used Latent Class Analysis (LCA) in *Mplus* (version 6.1;

Table 1 Sex differences in psychopathic traits and affective and cognitive empathy

Variable	Males		Females		<i>t</i> (231)	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Psychopathic traits at age 16						
Mother-reported	8.33	4.92	5.99	3.35	4.16 ^a	<.001
Father-reported	9.63	4.50	7.31	4.06	4.13	<.001
Affective empathy						
Age 16	13.58	3.10	16.65	3.05	7.61	<.001
Age 17	15.77	3.57	19.22	3.48	7.46	<.001
Age 18	16.23	4.15	19.94	3.89	7.03	<.001
Age 19	16.26	4.08	20.05	3.93	7.21	<.001
Cognitive empathy						
Age 16	12.42	3.15	13.75	3.20	3.18	.002
Age 17	15.37	4.03	17.63	4.04	4.26	<.001
Age 18	16.73	4.11	18.57	4.03	3.45	.001
Age 19	16.72	4.19	18.68	3.84	3.72	<.001

^aLevene's test for equality of variances was significant ($F(1, 231) = 5.93, p = .016$). Therefore, the *t*-test for 'equal variances not assumed' is reported ($df = 182.26$).

Muthén and Muthén, 1998–2010) on mother- and father-reported psychopathic traits to create groups of adolescents with distinct levels of psychopathic traits. Two criteria were used to determine the quality of the class solution. First, we used an entropy value of .75 or higher as indicative of good classification accuracy (Celeux & Soromenho, 1996). Further, minimum class size should be at least 5% of the total sample to enable meaningful interpretation and sufficient power for further analysis. Thus, each class should contain 12 or more adolescents. Two criteria were further used to determine the number of latent classes within each of the sexes. Adding a class should result in an improvement of model fit, as indicated by a decrease in the Bayesian information criterion (BIC), and a significant parametric bootstrapped likelihood ratio test (BLRT; Nylund, Asparouhov & Muthén, 2007).

Second, to test the concurrent and prospective effects of these latent classes of psychopathic traits on affective and cognitive empathy for adolescents, Repeated Measures ANOVAs on four waves of respectively EC and PT were performed. With all analyses, $\alpha = .05$ was used.

Results

Identifying latent classes of psychopathic traits

Male adolescents. Latent Class Analysis models on males (Tables 2 and 3) revealed that the three-class model did not meet the selection criteria, since one class consisted of only five cases. The two-class model had acceptable entropy, a lower BIC value than the one-class model, and also a significantly better model fit than the one-class model. Hence, we chose this two-class model for subsequent analyses. The two-class model consisted of one large class

Table 2 Results from Latent Class Analyses on adolescents' psychopathic traits

Model	BIC	BLRT (3)	BLRT <i>p</i> -value	Entropy	Class size (<i>n</i>)	
					1	2
Male						
One-class	1286.47				107	
Two-class	1226.08	74.41	<.001	.92	91	16
Female						
One-class	1390.52				126	
Two-class	1365.06	39.97	<.001	.78	103	23

BIC, Bayesian information criterion; BLRT, bootstrapped likelihood ratio test.

($n = 91$) of male adolescents low on psychopathic traits according to both mothers and fathers, and a smaller class ($n = 16$) with moderate levels of psychopathic traits.

Female adolescents. Similar results as for males were obtained for female adolescents (Tables 2 and 3). A three-class model failed to meet the selection criteria, since one class consisted of 10 cases. The two-class model had acceptable entropy. Moreover, relative to the one-class model, the two-class model had a lower BIC value and a significantly better model fit. Hence, the two-class model was chosen for subsequent analyses. The two-class model consisted of one large class ($n = 103$) low on mother- and father-reported psychopathic traits and a smaller class ($n = 23$) with moderate levels of psychopathic traits.

Class differences in empathy

Male adolescents. To examine the concurrent and prospective effects of male classes of psychopathic traits on affective and cognitive trait empathy, we performed repeated measure analyses on affective and cognitive empathy, with Class-Membership as between-subject factor and Time as within-subject factor (Figure 1 and Table 4). As predicted, relative to male adolescents with low levels of psychopathic traits, male adolescents with moderate levels of psychopathic traits had lower overall mean scores of affective empathy, $F(1, 105) = 8.64$, $p = .004$, partial $\eta^2 = .08$. They also showed a trend towards

lower overall mean scores of cognitive empathy, $F(1, 105) = 2.78$, $p = .098$, partial $\eta^2 = .03$.

In addition, we explored empathy development over time. Mean scores increased over waves for both affective empathy, $F(3, 315) = 13.98$, $p < .001$, partial $\eta^2 = .12$, and cognitive empathy, $F(3, 315) = 34.06$, $p < .001$, partial $\eta^2 = .25$, although this development flattened at age 19. Planned contrasts showed that linear and quadratic change were significant for the effect of Time on both affective and cognitive empathy (all $ps < .01$).

We further explored whether developmental changes in empathy would be different for males with low and moderate levels of psychopathic traits. We found no interactions between Time and Class-Membership on affective empathy, $F(3, 315) = 0.47$, $p = .705$, partial $\eta^2 < .01$, or cognitive empathy, $F(3, 315) = 1.28$, $p = .281$, partial $\eta^2 = .01$. Thus, the development of affective and cognitive empathy was not significantly different for the two classes.

Female adolescents. Relative to female adolescents with low levels of psychopathic traits, female adolescents with moderate levels of psychopathic traits had lower overall mean scores on both affective empathy, $F(1, 124) = 5.15$, $p = .025$, partial $\eta^2 = .04$, and cognitive empathy, $F(1, 124) = 9.32$, $p = .003$, partial $\eta^2 = .07$ (Figure 1 and Table 4).

Resembling the development in male adolescents, both affective empathy, Greenhouse-Geisser corrected $F(2.82, 349.58) = 31.29$, $p < .001$, partial $\eta^2 = .20$, and cognitive empathy, Greenhouse-Geisser corrected $F(2.77, 343.61) = 57.97$, $p < .001$, partial $\eta^2 = .32$, mean scores showed an increase over measurement waves and this development flattened at the age 19. Planned contrasts showed that linear and quadratic change were significant for the effect of Time on both affective and cognitive empathy (all $ps < .001$).

Female adolescents in low and moderate psychopathic traits classes did not differ in their development of affective and cognitive empathy over time, as is indicated by the absence of interactions between Time and Class-membership on affective empathy, Greenhouse-Geisser corrected $F(2.82, 349.58) = 0.26$, $p = .846$, partial $\eta^2 < .01$, and cognitive empathy, Greenhouse-Geisser corrected $F(2.77, 343.61) = 0.89$, $p = .441$, partial $\eta^2 < .01$.²

Table 3 Descriptives on psychopathic traits in classes with low (PPT-low) and moderate (PPT-moderate) levels of psychopathic traits

Psychopathic traits	PPT-low			PPT-moderate		
	<i>M</i>	<i>SD</i>	95% CI of mean	<i>M</i>	<i>SD</i>	95% CI of mean
Males						
Mother-reported	6.77	10.31	6.04–7.49	17.05	10.31	13.78–20.33
Father-reported	8.36	11.03	7.60–9.11	16.72	11.03	14.16–19.27
Females						
Mother-reported	4.86	5.98	3.90–5.81	10.56	5.98	8.88–12.23
Father-reported	6.17	11.09	5.40–6.93	11.90	11.09	8.37–15.43

PPT: psychopathic traits.

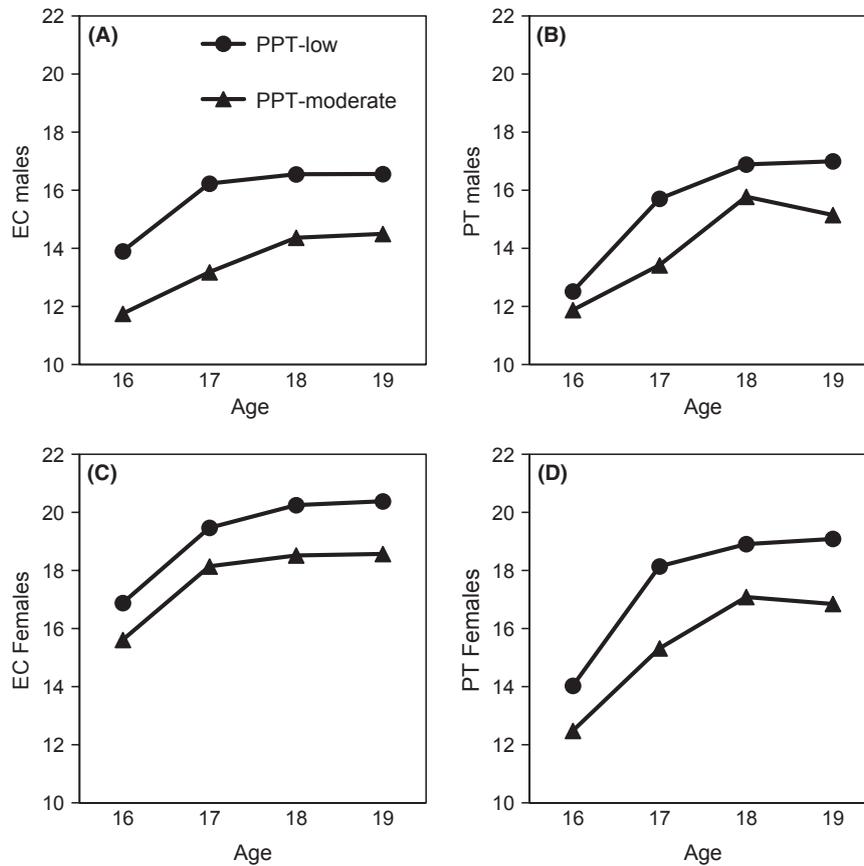


Figure 1 Mean level development of empathy over time in classes with low (PPT-low) and moderate (PPT-moderate) levels of psychopathic traits: (A) affective empathy in males, (B) cognitive empathy in males, (C) affective empathy in females, (D) cognitive empathy in females. EC, empathic concern; PT, perspective taking; PPT, psychopathic traits

Table 4 Descriptives on empathy in adolescent classes with low (PPT-low) and moderate (PPT-moderate) levels of psychopathic traits

Variable	Males				Females			
	PPT-low		PPT-moderate		PPT-low		PPT-moderate	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Affective empathy								
Age 16	13.90	2.82	11.75	3.97	16.88	2.98	15.61	3.19
Age 17	16.23	3.10	13.18	4.86	19.47	3.44	18.14	3.54
Age 18	16.55	3.85	14.37	5.35	20.25	3.75	18.52	4.27
Age 19	16.56	3.54	14.50	6.20	20.38	3.82	18.57	4.16
Cognitive empathy								
Age 16	12.52	3.09	11.88	3.52	14.03	3.04	12.48	3.65
Age 17	15.71	4.07	13.42	3.21	18.14	3.93	15.32	3.81
Age 18	16.89	4.25	15.78	3.13	18.91	4.03	17.09	3.76
Age 19	17.00	4.23	15.15	3.68	19.09	3.67	16.85	4.13

PPT: psychopathic traits.

Discussion

In this study we examined the effects of psychopathic traits on the development of affective and cognitive empathy in a community sample of male and female late adolescents. For both males and females, latent class analyses resulted in a small class with moderate levels of psychopathic traits and a large class with low levels of psychopathic traits. In support of our hypothesis, male and female adolescents with moderate levels of psychopathic traits had lower overall mean levels of affective empathy com-

pared to adolescents with lower levels of psychopathic traits. In addition, female adolescents with moderate levels of psychopathic traits reported lower overall mean levels of cognitive empathy. Male adolescents reported a trend in this direction. As to empathy development: across sexes affective and cognitive empathy increased over time, with no significant interactions between time and class-membership.

The findings that higher levels of psychopathic traits are associated with overall lower mean levels of

affective empathy are consistent with theory that psychopathic traits are characterized by a particular deficit in affective empathy (Blair, 2008). Furthermore, they extend previous results by Dadds et al. (2009) by showing that this relation holds for male *late* adolescents, and by showing that male adolescents with higher levels of psychopathic traits report lower levels of affective empathy not only concurrently, but also 3 years after psychopathic traits were measured. Although our results replicated those of Dadds et al. (2009) in several ways, there was also one major difference. Dadds and colleagues did not find a relation between psychopathic traits and affective empathy in females, yet this relation was observed in our study. Their results may differ from ours because they used a younger sample and because they used a parent-report instead of a self-report measure of empathy. Although self-report measures may introduce reporter bias, we would argue that self-reports of empathy are preferable in older individuals who are able to reflect on themselves, because empathy is essentially an internal process.

In addition to reporting lower overall mean levels of affective empathy, females with higher levels of psychopathic traits reported lower overall mean levels of cognitive empathy. These results resemble the findings for the older cohort of Dadds et al. (2009), who found a negative relation between psychopathic traits and cognitive empathy for 9–13 year old girls, but not for boys. In our study we could not explicitly test for a sex difference in the relation between psychopathic traits and cognitive empathy due to the use of sex-specific class criteria. The absence of a significant finding for males could be due to limited power, since the male adolescent class with moderate psychopathic traits was approximately two-thirds the size of the respective female class. However, an increasing number of studies in community, clinical, and forensic samples suggests that psychopathic traits manifest themselves differently and have different predictive value in females and males (reviewed by Verona, Sadeh & Javdani, 2010). Future studies should further investigate differences and similarities between male and female adolescents in psychopathic traits and their relation to key variables such as empathy.

Theoretically, it is proposed that psychopathic traits increase an individual's risk for antisocial behavior (at least partly) because of their associated affective empathy deficits (Blair, 1995; Blair, Peschardt, Budhani, Mitchell & Pine, 2006). Affective empathy presumably functions as an inhibitor of aggressive or antisocial behavior, because perpetrators share the discomfort of their victims. It is thought that individuals with psychopathic traits fail to experience affective empathy, which may increase their risk of developing antisocial behavior. The current findings support the hypothesis that psychopathic traits are associated with weak affective empathy. Future studies should investigate

whether lower levels of affective empathy indeed *mediate* the relation between psychopathic traits and antisocial behavior.

Theoretical (Blair, 2008) and empirical evidence in clinical samples (for instance, Schwenk et al., 2012) suggest that psychopathic traits are related to affective, not cognitive empathy deficits. However, our findings showed deficits in cognitive empathy among female adolescents with higher levels of psychopathic traits. Dadds et al. (2009) found similar deficits in cognitive empathy in girls and younger boys with higher levels of psychopathic traits. Therefore, our results cannot be considered an incidental finding. One potential explanation for these findings is that individuals with higher levels of psychopathic traits are less motivated to take the others perspective because they lack EC. Notably, the correlation between EC and PT in this study was considerable, ranging between $r = .43$ and $.55$ over waves. Moreover, the formulation of several items of the PT scale seems to imply that one takes the other's perspective in order to be fair or just towards the other person. For instance, one of these items states: 'before criticizing somebody, I try to imagine how I would feel if I were in their place'. Individuals with higher levels of psychopathic traits may have other motivations for PT, for instance increasing their ability to manipulate the other, and report less PT in line with a lower other-oriented motivation. Future studies should consider potential overlap between affective and cognitive empathy when investigating their unique relations with psychopathic traits.

Our results also showed that empathy development was not significantly different for adolescents with different levels of psychopathic traits. Affective and cognitive empathy increased over years for both adolescents with moderate and low psychopathic traits. Hence, the lower levels of empathy over time in adolescents with higher levels of psychopathic traits did not mark an absolute stable empathy deficit, but a relative empathy deficit instead. The absence of such an absolute empathy deficit may be the result of the relatively normal community sample we used, in which nobody scored in the clinical range of psychopathic traits. Alternatively, psychopathic traits may not designate an incapability for being empathic. Instead, individuals with psychopathic traits may only be relatively deficient in empathy and indeed show empathy development.

In addition to the results relevant to our primary and secondary research questions, our study produced several other results of interest. First, we found age-related increases in affective and cognitive empathy for males as well as females. Although these results are consistent with longitudinal studies in adolescence (Eisenberg, Cumberland, Guthrie, Murphy & Shepard, 2005; Mestre, Samper, Frías & Tur, 2009), they are not consistent with cross-sectional studies that showed that for females, but not for males, older cohorts had higher levels of EC

than younger cohorts (Olweus & Endresen, 1998; Van Tilburg et al., 2002). However, these inconsistent results might be explained by cohort effects: the lack of age effects on EC across different cohorts might reflect the use of different cohorts rather than true developmental changes in EC. A second finding of interest was that females, compared to males, had higher levels of affective and cognitive empathy across measurements. This has been a consistent finding in previous research (Eisenberg & Lennon, 1983). Finally, mothers and fathers reported higher levels of psychopathic traits in male than in female adolescents, which has been found before (Dadds et al., 2009; Frick et al., 2005).

These results should be interpreted in light of a number of limitations, however. First, this study used a community sample in which no individuals had psychopathic traits in the clinical range. Therefore, results cannot be generalized to clinical or forensic samples. Secondly, we did not distinguish between adolescents on the basis of specific features of psychopathic traits. This is in line with recommendations in the APSD manual (Frick & Hare, 2002) to use total scores for community samples. Therefore, we are unable to specify features of psychopathic traits that may drive the empathy deficits found in this study. Third, our study did not include a measure of intelligence, which would have aided the interpretation of our results, since there are reports that low intelligence is a characteristic of antisocial individuals with low callous-unemotional traits (e.g. Frick & Hare, 2002). Fourth, our research design makes it impossible to draw any conclusions about the developmental sequence of psychopathic traits and empathy, since this would require a design in which both concepts are simultaneously measured at multiple time points. Fifth, although our results demonstrate a relation between psychopathic traits and empathy, we did not illuminate the mechanism underlying this relation.

In summary, this is the first study to show that higher levels of psychopathic traits are associated with relatively lower mean levels of affective empathy across four annual waves in a community sample of male and female late adolescents. Female adolescents with higher levels of psychopathic traits addi-

tionally showed lower mean levels of cognitive empathy across waves, whereas males showed a trend in this direction. Because even adolescents with higher levels of psychopathic traits showed an increase in empathy over time, these findings provide support for *relative* empathy deficits in individuals with psychopathic traits. Empathy is thought to inhibit antisocial behavior; therefore, chronically lower levels of empathy may place individuals with psychopathic traits at a greater lifetime risk for developing antisocial behavior.

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Notes

¹All results were replicated when analyses were restricted to respondents with available data on each wave.

²All main results were replicated when LCAs were run on males and females combined and sex was added as a covariate in the subsequent Repeated Measures ANOVAs. Adolescents with moderate levels of psychopathic traits had significantly lower levels of both affective and cognitive empathy than adolescents with low levels of psychopathic traits, but they did not differ in empathy development, which increased over time and flattened at age 19. In addition, females had higher overall levels of affective empathy than males. There were no interaction effects between psychopathic traits and sex.

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Key points

- As predicted, higher levels of psychopathic traits are concurrently and prospectively related to lower mean levels of affective trait empathy in both male and female adolescents.
- In addition, higher levels of psychopathic traits are concurrently and prospectively related to lower mean levels of cognitive trait empathy in female adolescents, and a trend in this direction was observed in male adolescents.
- Adolescents with higher levels of psychopathic traits are not marked by an absolute stable empathy deficit but rather a relative deficit.

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