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CALLOUS-UNEMOTIONAL TRAITS ARE ASSOCIATED WITH DEFICITS IN RECOGNIZING COMPLEX EMOTIONS IN PREADOLESCENT CHILDREN

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The aims of the current study were to show that the affective component of psychopathy (callous-unemotional traits) is related to deficits in recognizing emotions over and above other psychopathy dimensions and to show that this relationship is driven by a specific deficit in recognizing complex emotions more so than basic emotions. The authors administered the Child Eyes Test to assess emotion recognition in a community sample of preadolescent children between the ages of 10 and 12 (N = 417; 53.6% boys). The task required children to identify a broad array of emotions from photographic stimuli depicting the eye region of the face. Stimuli were then divided into complex or basic emotions. Results demonstrated a unique association between callous-unemotional traits and complex emotions, with weaker associations with basic emotion recognition, over and above other dimensions of psychopathy.

The ability to recognize and attribute mental states to facial emotions (referred to as emotion recognition) is one of the first steps in predicting and responding to the behavior of others (Blair, 2005). This aspect of socioemotional processing plays an important role in maintaining relationships and developing empathy (Blair, 2005). Deficits in emotion recognition are associated with a wide range of psychopathology, including psychopathy, a personality pathology that designates a subgroup of antisocial youth and adults who engage in more severe and aggressive behaviors (Edens, Campbell, & Weir, 2007; Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005; Hart, Kropp, & Hare, 1988) and display a distinct cognitive and emotional profile (Frick & White, 2008; Marsh et al., 2011). Current research in both youth and adults has focused on the affective component of psychopathy, which consists of characteristics such as reduced affect, lack of empathy, and

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lack of remorse. Importantly, in juvenile samples the affective component of psychopathy has been suggested to drive the relationship with emotion recognition deficits (Dadds, Masry, Wimalaweera, & Guastella, 2008; Dawel, O'Kearney, McKone, & Palermo, 2012; Frick & White, 2008; Sharp, 2008).

Within the child literature, however, there have been opposing theoretical positions on whether psychopathic traits relate to specific emotion recognition deficits or to a global deficit in emotion recognition. On the one hand, Blair et al. (2001) theorized that children with psychopathic traits have a specific impairment in recognizing emotions that signal distress such as fear and sadness. He hypothesized that, in normal development, the ability to recognize distress cues in others is a uniquely (specialized) developed mechanism that controls aggressive impulses. This mechanism, termed the Violence Inhibition Mechanism, is thought to be activated when distress is perceived, which then results in increased autonomic activity—attention and freezing. In support of Blair's position, some studies have found the ability to recognize fear and sadness (as opposed to other emotions) to be uniquely impaired in individuals with psychopathy, which explains their tendency toward aggression (Blair et al., 2001, 2004; Del Gaizo & Falkenbach, 2008; Fairchild, Van Goozen, Calder, Stollery, & Goodyer, 2009; Hastings, Tangney, & Stuewig, 2008; Montagne et al., 2005). However, other studies that examined differential performance between specific emotions have found either no deficits or superior recognition of fear and sadness in individuals with psychopathy, as well as impairments in recognizing a broader range of emotions and mental states (Ali & Chamorro-Premuzic, 2010; Book, Quinsey, & Langford, 2007; Dolan & Fullam, 2004; Eisenbarth, Alpers, Segre, Calogero, & Angrilli, 2008; Glass & Newman, 2006; Hastings et al., 2008; Munoz, 2009; Seara-Cardoso, Neumann, Roiser, McCrory, & Viding, 2012; Wai & Tiliopoulos, 2012; Woodworth & Waschbusch, 2007).

These contradictory findings are in line with a second theoretical approach to this question, as proposed by Dadds, Jambrak, Pasalich, Hawes, and Brennan (2011). These authors have suggested that children with higher levels of psychopathic traits possess a more general impairment in attention to social cues that may underlie a pervasive deficit across all emotions and related mental states, with no deficit specific to fear and sadness.

A third possibility that may explain discrepant findings is the possibility that children with psychopathic traits have a specific deficit in recognizing complex emotions (e.g., hate, annoyance, confusion, boredom, shame, guilt, and nervousness), rather than basic emotions (happiness, sadness, anger). Although this hypothesis is yet to be tested in relation to psychopathic traits in adults or children, Adolphs, Baron-Cohen, and Tranel (2002) used the Reading the Mind in the Eyes Test (Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997) to examine whether adult patients with amygdala damage showed deficits in complex and/or basic emotions. To this end, they divided photographic stimuli depicting the eye region of the face into complex and basic emotions. They found a deficit in recognizing complex mental states but not basic emotions in a group of patients with amygdala damage. The amygdala, which plays a role in processing emotion from facial expressions (Phelps & LeDoux, 2005), displays abnormal functioning in individuals with

psychopathy (Blair, 2003; Frick, Ray, Thornton, & Kahn, 2014). Previous findings have demonstrated reduced amygdala activation during functional neuroimaging tasks (Birbaumer et al., 2005; Blair, 2010; Kiehl et al., 2001) as well as structural abnormalities (Weber, Habel, Amunts, & Schneider, 2008) in adults with psychopathic traits. These findings have recently been extended to children and adolescents (see DeLisi, Umphress, & Vaughn, 2009, for a review). For instance, among a group of children and adolescents with externalizing behavior and callous-unemotional traits, reduced amygdala -activation was found while viewing images of emotional faces (Jones, Laurens, Herba, Barker, & Viding, 2009; Marsh et al., 2008). These deficits mimic those found in patients with amygdala damage (Adolphs, 2003), suggesting that an underlying deficit in amygdala function partly drives the emotion-processing deficits present in psychopathy. If amygdala dysfunction is implicated in psychopathy, and amygdala damage specifically associates with complex but not basic emotion recognition in adults as shown by Adolphs et al. (2002), it is reasonable to hypothesize that psychopathic traits in children may associate with complex but not basic emotion recognition.

Against this background, the first aim of the current study was to replicate findings suggesting that deficits in emotion recognition are uniquely associated with the affective factor of psychopathy (callous-unemotional traits) in children, while controlling for associations with the behavioral factors of psychopathy, gender, age, and verbal intelligence. This replication is needed because it will confirm that deficits in emotion recognition are specific to impairment in the affective domain of psychopathy in preadolescent children. Second, we aimed to examine the possibility that emotion recognition deficits associated with the affective domain of psychopathy were driven by deficits in recognizing complex, more subtle emotions, rather than deficits in recognizing basic emotions. Thus, our aim here was not to pit Dadds' general emotions approach to the emotion understanding in psychopathy against Blair's specific emotions approach, but rather to examine a third possibility that has not yet been considered: namely, that impairment in recognition of complex emotion is more pronounced than basic emotions in association with symptoms of psychopathy in the affective domain. Based on research identifying associations between amygdala function and psychopathy, and amygdala lesion studies as discussed earlier, we expected to find a deficit in recognizing complex emotional states, but not basic emotions, associated with higher levels of callous-unemotional traits.

To accomplish these aims, we administered the Child Eyes Test (CET; Baron-Cohen et al., 1997) along with a measure of child psychopathic traits that is characterized by three distinct but correlated factors similar to those found in adult offenders (Cooke & Michie, 2001): (a) a grandiose/manipulative dimension; (b) a callous/unemotional dimension; and (c) an impulsive/irresponsible dimension. In all, support for our hypotheses would suggest that (a) deficits in emotion recognition are associated with the affective component of psychopathy (callous-unemotional traits) in preadolescent children and (b) such deficits primarily reflect deficits for recognizing complex emotions.

METHODS

PARTICIPANTS

Participants were 440 children (53.6% boys) from 17 elementary schools in the Netherlands between the ages of 10 and 12 (*M* age = 11.33 years, *SD* = .69; range 10–12.9). The parental consent rate was 95.5 %. Most children (75%) were Caucasian; 25% had other (e.g., Surinam/Lesser Antilles, North African) or mixed ethnic/cultural origins. Children with incomplete data on any of the main study variables (CET and YPI) were excluded. The final dataset was therefore *n* = 417. Data for the CET and YPI were missing-completely-at-random, and analyses to examine systematic differences between those for whom YPI and CET data were complete (*n* = 417) and those for whom data were incomplete (*n* = 23) showed no differences in terms of gender or age.

MEASURES

Emotion Recognition. The Child Eyes Test (CET; Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001) was adapted from the adult Reading the Mind in the Eyes Test developed by Baron-Cohen et al. (1997) by retaining picture stimuli but replacing answer choices with child-level vocabulary (for instance, answer choices from one stimuli on the CET include friendly, sad, surprised, and worried). Baron-Cohen et al. developed the measure as a test of theory of mind, but in recent years the test has been used more often as a test of emotion recognition. The test comprised 28 photographs of the eye region of adult faces. The participant is asked to pick which of four words best describes what the person in the photo is thinking or feeling. Three of the four words are foil mental state terms, while the fourth is deemed "correct." The position of the four words is randomized for each item. For the first aim of the study (to examine whether callous-unemotional traits are uniquely associated with deficits in emotion recognition over and above other components of psychopathy), we used the total score on the CET. To differentiate basic and complex emotions in the current study, we used the system of categorization developed by Adolphs et al. (2002), who followed the categorization of Baron-Cohen et al. (1997) on the adult version of the CET. Because the stimuli from the adult version are parallel to those of the child version, CET stimuli were categorized as either basic emotions (e.g., sad, happy, worried; 11 total stimuli), , or complex emotions (e.g., interested, remembering, not believing, serious; 17 total stimuli). For the total score and each subscale, correct responses are summed so that higher scores indicate better emotion recognition.

Psychopathic Traits. The Youth Psychopathic Traits Inventory–Child Version (YPI-CV; Van Baardewijk et al., 2008) was used in the current study to index psychopathic traits. The YPI (Andershed, Kerr, Sattin, & Levander, 2002) was chosen because psychopathic traits are framed as characteristics that should seem neutral or even appealing to those with psychopathic traits (e.g., "I usually feel calm when other people are scared") instead of framing

items as deficits like other measures (e.g., "My emotions are more shallow than others"). Moreover, the YPI has been shown to have convergent validity by demonstrating a strong correlation with the affective/interpersonal aspects of the PCL:YV (Skeem & Cauffman, 2003).

The YPI-CV is an age-appropriate adaptation of the YPI that matches the cognitive, emotional, and verbal development and social realities of 9- to 12-year-olds. Like its adolescent equivalent, and in line with the three-factor conceptualization of psychopathy (Cooke & Michie, 1997, 2001), the YPI-CV is composed of 10 five-item subscales measuring different psychopathic traits and has three higher-order factors: a grandiose/manipulative factor (composed of the subscales dishonest charm, grandiosity, lying, and manipulation); a callous/unemotional factor (composed of the subscales callousness, unemotionality, and remorselessness); and an impulsivity/irresponsibility factor (composed of the subscales impulsiveness, thrill-seeking, and irresponsibility). Both the YPI and its Child Version have shown good psychometric properties in terms of reliability, stability, and concurrent as well as criterion validity and predictive validity (Andershed et al., 2002; Skeem & Cauffman, 2003; Van Baardewijk et al., 2008). Respondents are asked to rate the degree to which the individual statements or items apply, using a 4-point Likert-type scale (1 = *Does not apply at all*, 2 = *Does not apply well*, 3 = *Applies fairly well*, and 4 = *Applies very well*). Cronbach's alpha for the three YPI factors in the present sample were .86 for the grandiose/manipulative factor, .82 for the callous/unemotional factor, and .79 for the impulsivity/irresponsibility factor.

Verbal Intelligence. The Peabody Picture Vocabulary test III (PPVT-III; Dunn & Dunn, 1997; Dutch version: Schlichting, 2005) is a measure of receptive vocabulary. In the test, the examiner orally presents a stimulus word with a set of pictures and the participant is asked to select the picture that best represents the word's meaning. In our sample, booklets 10–14 of the PPVT-III-NL, fitting the age range of our sample, were administered classically. The participants marked their answers in their individual booklet. Good reliability and validity have been shown for the PPVT-III (Dunn & Dunn, 1997).

PROCEDURES

Ethical guidelines were followed in conducting the research. Positive consent from parents was obtained. The parental consent rate was 95.5%. It was pointed out to all children that the results would remain confidential and that neither parents nor teachers would be informed of their individual answers. All children with parental consent chose to participate. Children completed questionnaires in groups in a 1-hour session during regular school time. Children received a small gift (e.g., markers) in exchange for their participation.

TABLE 1. Participant Characteristics and Descriptive Statistics on Main Study Variables

	Full sample (N = 417)				Boys (n = 230)		Girls (n = 187)	
	Min	*Max*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Age	10.0	12.9	11.33	.69	11.36	.71	11.30	.66
Verbal intelligence	80	130	103.67	10.07	103.53	10.59	103.85	9.43
Grandiose/manipulative	1	3.53	1.69	.46	1.76	.45	1.52	.36
Callous/unemotional	1	3	1.65	.43	1.83	.47	1.51	.38
Impulsive/irresponsible	1.13	3.80	2.13	.48	2.23	.50	2.03	.42
CET	6	27	17.34	3.67	16.90	3.81	17.96	3.41
CET-Basic	1	10	5.70	1.73	5.45	1.71	6.01	1.72
CET-Complex	3	15	9.93	2.37	9.89	2.47	9.98	2.25

CET = Child Eyes Test.

DATA ANALYTIC STRATEGY

To determine whether the affective component of psychopathy uniquely predicted complex but not basic emotion recognition, we first examined bivariate associations between main study variables as well as potential covariates (gender, age, and verbal intelligence). Next, we used multivariate General Linear Modelling (GLM) in SPSS. The YPI subscales (grandiose/manipulative, callous/unemotional, and impulsive/irresponsible) were entered as independent variables in addition to variables that correlated with basic or complex emotions in the bivariate analyses. Basic emotion recognition and complex emotion recognition were entered as dependent variables simultaneously.

RESULTS

BIVARIATE ASSOCIATIONS BETWEEN MAIN STUDY VARIABLES AND POTENTIAL COVARIATES

We began our analyses by examining descriptive statistics and bivariate relations between variables. Table 1 summarizes means and standard deviations for the main summary variables. We ran independent sample t tests to investigate mean differences between boys and girls. As expected, boys showed significantly higher means on all three psychopathy dimensions, including grandiose/manipulative (t = –5.86; df = 418; p < .001; d = –.59), callous/unemotional (t = –7.43; df = 418; p < .001; d = –.74), and impulsive/irresponsible (t = –4.42; df = 418; p < .001; d = –.44). Gender was therefore controlled for in subsequent multivariate analyses. No gender differences were found for verbal intelligence or age.

Table 2 summarizes the bivariate relations between main study variables. The relationship between CET performance and all psychopathy dimensions was negative and significant: grandiose/manipulative (r = –.22; p < .001), callous/unemotional (r = –.29; p < .001), and impulsive/irresponsible (r = –.18; p < .001). Age correlated negatively with verbal intelligence (r = –.33;

TABLE 2. Bivariate Correlations Between Main Study Variables (*N* = 417)

	1	2	3	4	5	6	7	8
1. Gender	1							
2. Verbal intelligence	–.02	1						
3. YPI Grandiose/Manipulative	.28**	–.05	1					
4. YPI Callous/Unemotional	.34**	–.06	.48**	1				
5. YPI Impulsive/Irresponsible	.21**	–.04	.58**	.46**	1			
6. CET	–.14**	.20**	–22**	–29**	–.18**	1		
7. CET Basic Emotions	–.06	.12*	–.16**	–.19**	–.17**	.63**	1	
8. CET Complex Emotions	.07	.12*	–.12*	–.19**	–.11*	.74**	.57**	1

**Correlation is significant at the .01 level (2-tailed). *Correlation is significant at the .05 level (2-tailed).

p < .001), but did not correlate with any of the psychopathy dimensions or CET performance. Verbal intelligence was positively correlated with CET performance (r = .20; p < .001), but not with any of the psychopathy dimensions. Verbal intelligence was therefore included as a covariate in subsequent analyses.

MULTIVARIATE ASSOCIATIONS BETWEEN YPI SUBSCALES AND COMPLEX EMOTION RECOGNITION

The results of GLM analyses with the three psychopathy dimensions (grandiose/manipulative, callous/unemotional, and impulsive/irresponsible), gender, and verbal intelligence as independent variables and basic and complex emotion recognition as dependent variables modeled simultaneously showed significant Wilks's Lambda values for gender (p = .029), verbal intelligence (p = .001), callous-unemotional traits (p = .023), but not grandiose/manipulative traits (p = .60) or impulsive/irresponsible traits (p = .48). Results of the parameter estimates including confidence intervals are summarized in Table 3. Results clearly show that when all three psychopathy dimensions are modeled together in a regression framework, the callous-unemotional traits subscale is the only one that predicts emotion recognition. Moreover, the callous-unemotional traits subscale associates uniquely with complex emotion recognition, but not with basic emotion recognition.

DISCUSSION

Over the past 10–15 years, a significant body of literature has supported associations between emotion recognition deficits and psychopathy in both adults and children (Dawel et al., 2012; Marsh & Blair, 2008). Our first aim in the current study was to replicate unique relations between callous-unemotional traits (relative to other psychopathy subfactors) and emotion recognition deficits in preadolescent children. Consistent with prior research (Dadds et al., 2006) we demonstrated in a large community sample of children that callous-unemotional traits were uniquely associated with difficulties in emotion recognition.

TABLE 3. Results of a Multivariate GLM With the Dimensions of Psychopathy, and Relevant Covariates as Independent Variables and Both Basic and Complex Emotion Recognition as Dependent Variables

	Dependent variables							
	Basic emotion recognition				Complex emotion recognition			
			95% CIs				95% CIs	
Independent variables	B	*p*	LL	UL	B	*p*	LL	UL
Grandiose/manipulative	–.159	.524	–.651	.332	–.316	.356	–.989	.357
Callous/unemotional	–.314	.159	–.752	.123	–.812	.008	–1.411	–.214
Impulsive/irresponsible	–.263	.235	–.698	.172	–.033	.912	–.628	.562
Gender	–.347	.056	–.704	.009	.316	.203	–.171	.804
Verbal intelligence	.029	.001	.011	.046	.033	.007	.009	.057

Our second aim was to examine differential emotion recognition (i.e., complex and basic emotion recognition) in relation to psychopathic traits in preadolescent children. Amygdala functioning has been linked to emotion processing, and researchers have hypothesized that amygdala dysfunction is further related to emotion recognition deficits in psychopaths (Phelps & LeDoux, 2005). Two prominent approaches to explaining the emotion recognition deficits associated with psychopathy have been developed, both implicating the amygdala. Blair et al.'s (2001) approach has emphasized specific deficits for the processing of fear and sadness, while Dadds et al.'s (2011) approach has suggested more general attention deficits that would lead to pervasive emotion recognition deficits across all emotions. In the present study, we suggested a third possibility. Specifically, we propose a direct extension of empirical research on individuals with amygdala damage (Adolphs et al., 2002), which has highlighted specific deficits in recognizing complex emotions compared to basic emotions after amygdala damage. To the extent that the amygdala plays a key role in psychopathy-related emotion deficits (Blair et al., 2001; Dadds et al., 2011), we hypothesized that emotion recognition deficits in psychopathy are driven by impairment in recognizing complex emotions rather than basic emotions.

Consistent with this hypothesis, the results of the current study demonstrate that the core component of psychopathy, callous-unemotional traits (a putative correlate of amygdala dysfunction; Blair, 2003), is associated with a deficit in recognizing complex emotions, but less so with basic emotions. Unfortunately, previous literature investigating emotion recognition in psychopathy has typically neglected the inclusion of stimuli of more complex emotions, focusing solely on the six basic emotions. Additionally, a large portion of this literature has neglected examining specific differences between the factors of psychopathy, therefore obscuring possible differential relations between the factors of psychopathy and emotion recognition. That callous-unemotional traits were uniquely associated with complex but not basic emotion recognition when taking into account the subcomponents of psychopathy somewhat challenges the notion that psychopathic traits uniquely associate only with deficits in recognizing fear and sadness. Al-

though we cannot directly test this hypothesis using the CET stimuli, the fact that emotion recognition of more complex emotions (e.g. hatred,, annoyance, confusion, boredom, shame, guilt, and nervousness) more strongly associated with callous-unemotional traits than basic emotions (e.g., happiness, sadness, anger, fear) suggests that emotion recognition deficits may be more pervasive (or general, as suggested by Dadds et al., 2011) at least with regard to complex emotions, and not as specific as suggested by Blair (2005). In this regard, it is important to note that while the results of the multivariate analyses favored complex emotions, zero-order associations were of the same magnitude for callous-unemotional traits and for both basic and complex emotion recognition. Therefore, our findings support the notion that both basic emotion recognition and complex emotion recognition relate to callous-unemotional traits, but that this association is stronger for complex emotion recognition.

The question naturally arises as to why this may be the case. In their study, Adolphs et al. (2002) found that amygdala damage impairs recognition of complex emotions more than it impairs recognition of basic emotions. Thus, while the amygdala does participate in the processing of information of basic information from facial expressions (especially those with negative valence, including but not limited to fear; see Adolphs, 2003), deficits are more pronounced when complex mental states that typically require "social context and a concept of a social self that is situated within a social group" is at stake (Adolphs, 2003; p. 333). Perhaps then, the amygdala dysfunction in psychopathy impedes basic emotion recognition, and as task complexity increases and more demands are placed on amygdala function, the impairment becomes more pronounced.

When interpreting our findings, it should also be kept in mind that we used experimental stimuli depicting the eye region of the face only. Although this is a strength of the current study (psychopathic traits appear to relate to deficits in attending to the eye region of the face; see, for example, Dadds et al., 2011), the null findings in the current study for basic emotions may reflect this difference in facial stimuli. In addition, prior work has shown that complex emotions are recognized disproportionately by information from the region of the eyes in the face (Adolphs et al., 2002; Baron-Cohen et al., 1997, 2001). Taken together, these findings make it clear that the exact nature of the emotion recognition stimuli can differentially influence results.

Another important point to consider in interpreting our results is that most studies of adult psychopathy have failed to find any relations with emotion recognition deficits using the Eyes Test. For instance, Richell et al. (2003) failed to find differences between psychopathic and nonpsychopathic groups on the Eyes Test and suggested that cortical regions compensate for reduced amygdala functioning in adults with psychopathy. That there may exist developmental differences in Eyes Test performance from childhood through to adolescence is possible, given that important developmental shifts occur in the processing of emotional stimuli during adolescence that may have implications for psychopathic traits. Specifically, during adolescence and adulthood, cortical regions, specifically prefrontal regions (e.g., right

dorsolateral prefrontal cortex), are still developing (Gordon, Baird, & End, 2004). Although no empirical work has been done in children, the possibility exists that compensation as suggested for adult psychopaths takes place to a lesser degree in preadolescence compared to adolescence and adulthood (Richell et al., 2003; Sharp, 2008), given the fact that regions of the prefrontal cortex, including the right superior temporal sulcus, are still developing (Blakemore, den Ouden, Choudhury, & Frith, 2007). This possibility makes preadolescence an ideal period in which to observe relations between emotion recognition deficits purported to be associated with amygdala dysfunction.

There are several limitations to the current study. First, studies of psychopathic traits in community samples have been suggested to be important for the field, given the promise of community samples to assess constructs across the full latent trait (Cicchetti, 2006; Cicchetti & Cohen, 2006). However, the rescoring of the CET according to complex versus basic emotions should be attempted for forensic samples as well as clinical samples where the level of psychopathic traits may be higher and clinically significant. Second, there is significant debate about what the CET really measures. While the task was originally developed and used as a theory of mind task (e.g., Baron-Cohen et al. 1997, 2001), recent users of the task have conceptualized it as a test of emotion recognition (Adolphs et al., 2002; Guastella et al., 2010; Harrison, Tchanturia, & Treasure, 2010; Maurage et al., 2011) based on the task activation of areas in the brain associated with emotion recognition (Shamay-Tsoory, Aharon-Peretz, & Perry, 2009). Related to the general construct validity of the CET is the validity of Adolphs et al.'s (2002) categorization system for use in children. The current study is the first to utilize this system in children and, although innovative, its use should be examined through studies of external validity. Third, high correlations between the YPI subscale scores (*r*s = .46–.58) may have accounted for the zero-order relationships between the impulsive/irresponsible and grandiose/manipulative factors with emotion recognition deficits, raising the possibility that the YPI is not a good measure of callous-unemotional traits. Other measures of callous-unemotional traits have been developed with good psychometric properties, for example, the Inventory of Callous-Unemotional Traits (Essau, Sasagawa, & Frick, 2006; Kimonis et al., 2008) and should be considered for future research in this regard. Fourth, a major limitation of the current study was the fact that our study design cannot rule out alternative hypotheses for impairment in emotion recognition associated with callous-unemotional traits. Future studies specifically designed to pit the complex versus basic emotion recognition idea against the general versus specific emotion recognition approaches of Dadds et al. (2011) and Blair et al. (2001), respectively, will be important to test, possibly leading to the integration of these approaches.

In conclusion, the study of emerging personality disorders is still in its infancy, but given the treatment-resistant nature of these disorders, it is highly important to find ways of identifying and treating youngsters early, before maladaptive interpersonal patterns at the core of these disorders are estab-

lished. Early identification necessitates a better understanding of the etiology and correlates of disorders. In this sense, the current study builds on other findings about the social-cognitive and affective correlates of psychopathic traits in youngsters.

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