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Empathy Problems in Youth with Disruptive Behavior Disorders, with and without Callous Unemotional Traits

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Empathy, generally defined as the ability to understand and share in another's emotional state, is important for moral understanding, motivating prosocial behavior (Eisenberg & Miller, 1987; Hoffman, 2008), and inhibiting unwanted behaviors such as delinquency and aggression (Miller & Eisenberg, 1988). Empathy problems are often associated with oppositional defiant disorder (ODD), and conduct disorder (CD), also referred to as disruptive behavior disorders (DBD) (American Psychiatric Association, 2000). Children and adolescents with DBD may have empathy problems that are most striking in those with psychopathic tendencies or callous unemotional (CU) traits. CU traits are a precursor of the interpersonal–affective dimension of adult psychopathy, and central to the construct of psychopathic tendencies in youth (Frick & Hare, 2001; Lynam & Gudonis, 2005). In the fifth edition of the *Diagnostic Statistical Manual of Mental Disorders* (DSM-5) a specifier *with limited prosocial emotions* has been added to the classification of CD. This specifier applies to those who meet the criteria of CD, and also show a callous and unemotional interpersonal style, that is, lack of empathy, lack of guilt, and shallow affect (American Psychiatric Association, 2013). Given the clinical importance of CU traits, it is important to examine whether lack of empathy can contribute to a differentiation between CD subtypes.

A growing body of research suggests that CU traits and psychopathic tendencies in children and adolescents are associated with significant impairments in empathy, especially emotional empathy (Blair, 2008, 2013; Blair, Leibenluft, & Pine, 2014). Yet, relatively few studies have directly compared youth with a CD diagnosis with and without CU traits on empathic responsiveness. In addition, although CU traits are tied to CD in the DSM-5 taxonomy of externalizing spectrum disorders, CU traits also co-occur with ODD and attention deficit hyperactivity disorder (ADHD) (e.g., Herpers, Rommelse, Bons, Buitelaar, & Scheepers, 2012). ODD and CD are

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frequently comorbid with ADHD (American Psychiatric Association, 2013), and ADHD, in turn, has been linked to reduced empathy (e.g., Barkley, 2006; Braaten & Rosén, 2000; Marton, Wiener, Rogers, Moore, & Tannock, 2009), raising the question as to whether the empathy problems associated with CU traits are similar for those with pure DBD as for those with ADHD comorbidity.

Furthermore, empathy is a rather complex multidimensional construct (Davis, 2006), including affective and cognitive components, trait empathy (the tendency of an individual to respond empathically across different situations), state empathy (empathic reactions evoked within empathy-inducing situations), empathy-related processes and behavior. Previous reviews on empathy dysfunction in psychopathic youth (Blair, 2013; De Wied, Gispen-De Wied, & Van Boxtel, 2010; Frick, Ray, Thornton, & Kahn, 2013) have solely focused on aspects of affective versus cognitive empathy, but have made no distinction between trait and state empathy. This distinction is important, however, for at least two reasons: First, reviews on empathy in relation to pathological aggression (Lovett & Sheffield, 2007) and normative levels of externalizing behavior (Miller & Eisenberg, 1988) demonstrate stronger inverse relationships between empathy and antisocial behaviors for questionnaire measures of trait empathy than for indexes of state empathy. Second, and more important, based on the hypothesis that CU traits may have a strong underlying genetic component (see Viding & McCrory, 2012 for a review), affecting neural circuits including the amygdala (Blair, 2013), there is reason to suggest that youth with CU traits will show particular deficits in both state and trait empathy. This chapter will take full account of the multidimensional construct of empathy, and discuss results obtained with measures of affective versus cognitive state and trait empathy separately.

A first aim of this chapter is to examine the nature of empathy problems in clinically referred DBD youth with CU traits. A second aim is to examine whether a lack of empathy contributes to a differentiation between DBD subtypes. A third aim is to explore whether the empathy problems associated with CU traits are similar for those with pure DBD as for those with ADHD comorbidity. We start by considering the various components of empathy, using Davis' organizational model (1996, 2006), which emphasizes the connections between all components. Next, we reflect on the DSM-5 (American Psychiatric Association, 2013) classifications of ODD and CD, summarize studies conducted with undifferentiated samples (not accounting for CU or psychopathic traits) of DBD youth, followed by studies examining empathy problems in DBD children and adolescents with high versus low CU traits. We close the chapter with clinical implications and suggestions for future research.

Empathy-Related Components

Davis' (1996, 2006) *organizational model of empathy-related constructs* treats empathy as a multidimensional phenomenon, involving traits (empathic tendencies), states (intrapersonal outcomes), affective and cognitive components. Affective empathy is a vicarious affective response more in line with another's situation than one's own (Hoffmann, 2000). A distinction is often made between empathy, sympathy, and personal distress (Batson, 2009; Eisenberg, Shea, Carlo, & Knight, 1991). Empathy concerns an affect match between an observer and someone else's affective state, that is, feeling *with* another person. Sympathy, also labeled empathic concern, is an

Table 7.1 Key terms in Chapter 7.

Trait empathy	The tendency of an individual to respond empathically across different situations.
State empathy	Empathic reactions evoked during empathy-inducing situations.
Motor empathy	Spontaneous and automatic mimicry processes, which may lead to the automatic transmission of emotions.
Affective empathy	A vicarious affective response more in line with another person's situation than one's own. Affect matches, sympathy and/or personal distress are all considered aspects of affective empathy.
Cognitive empathy	The ability to understand and represent another person's emotional state, thoughts and beliefs. Perspective taking, ToM, and empathic accuracy may all be considered aspects of cognitive empathy.

emotion oriented towards the other, that is, feeling *for* the other person. Personal distress is an aversive, self-focused, reaction which may consist of feelings of discomfort or anxiety when perceiving someone else's affective state, thus feeling *by* another person (Batson, 2009). Cognitive empathy is the ability to understand someone else's affective state without necessarily being in an affective condition oneself (Walter, 2012). Perspective taking, Theory of Mind (ToM; the ability of an individual to infer what another person is feeling or thinking, and what he or she may do based on those inferences), and empathic accuracy may all be considered aspects of cognitive empathy (see Table 7.1).

The tendency to share affective responses (affective trait empathy), and to engage in empathy-related cognitive processes such as role taking (cognitive trait empathy) may affect both empathy-related processes and intrapersonal outcomes (i.e., affective and/or cognitive state empathy). Empathy-related processes, in turn, may differ in terms of cognitive control, ranging from primitive processes such as motor mimicry to the most advanced cognitive processes such as perspective taking. Motor mimicry, sometimes referred to as motor empathy (Blair, 2007), is thought to be an early component in the process of empathy. Motor mimicry may lead to the automatic transmission of emotions, and contribute to emotional contagion (Hatfield, Rapson, & Le, 2009). Evidence suggests that both humans (Molenberghs, Cunnington, & Mattingley, 2012) and other primate species (Iacoboni, 2005; Rizzolatti, 2005) possess a mirror neuron system underlying automatic mimicry, suggesting an evolutionary history for the capacity of empathy. Motor mimicry plays an important role in the development of empathy, especially in the preverbal years (Hoffman, 2000). As the cognitive system develops, higher order cognitive processes come to play a more important role, producing more sophisticated affective and cognitive empathic responses. Table 7.1 provides an overview of the key terms discussed in this chapter.

Brain-imaging studies suggest that distinct but interacting brain structures are involved in affective and cognitive empathy (see Shamay-Tsoory, 2009; Singer, 2006; Völlm et al., 2006). The insula and limbic structures are involved in affective empathy, while prefrontal brain areas are involved in perspective-taking processes and ToM. The cognitive and affective empathy networks may also include the mirror neuron system in premotor areas (Carr, Iacoboni, Dubeau, Mazziotta, & Lenzi, 2003). As such, it is possible that motor, affective and cognitive components of empathy become selectively, or jointly impaired with consequential differences in conduct problems and treatment options.

Measuring Empathy

Different empathy indexes have been developed to assess motor mimicry and aspects of either the affective or cognitive components (or both) of state and trait empathy (e.g., Eisenberg & Fabes, 1990; Zhou, Valiente, & Eisenberg, 2003). Motor mimicry is usually studied within a laboratory setting where individuals are exposed to static or dynamic emotional facial expressions. Facial mimicry can be assessed using visual coding techniques (e.g., Marsh, Beauchaine, & Williams, 2008a), or facial electromyographic (EMG) procedures (e.g., De Wied, Van Boxtel, Zaalberg, Goudena, & Matthys, 2006). Facial EMG is a more sensitive measure, which may capture both automatic facial mimicry and facial expressions of vicarious emotional experiences (e.g., Dimberg, 1990; Dimberg, Thunberg, & Elmehed, 2000).

State empathy is routinely assessed within laboratory or field settings. Empathic responses are often elicited by more complex, empathy inducing stimuli, such as video-vignettes portraying other persons experiencing negative or positive emotions (e.g., Cohen & Strayer, 1996; De Wied, Van Boxtel, Matthys, & Meeus, 2012). Affective and cognitive outcomes can be measured at different levels of empathic functioning. Self-report, facial and autonomic indexes of empathy have all been used to assess empathy-related responses in children and adolescents with DBD (e.g., Cohen & Strayer, 1996; De Wied et al., 2012; Marsh et al., 2008a). In addition, brain event-related potential (ERP) technique (e.g., Cheng, Hung, & Decety, 2012) and functional Magnetic Resonance Imaging (fMRI) (e.g., Decety, Michalska, Akitsuki, & Lahey, 2009) have been employed to assess brain activity while respondents witness another person experiencing pain.

There are advantages and disadvantages associated with each type of index (e.g., Zhou et al., 2003). Self-report indexes are easy to administer, but appear to be affected by demand characteristics, such as the sex of the experimenter, and social desirability. Social desirability bias may influence facial indexes of empathy, although facial EMG responses suffer less from such biases than observational measures since it captures – in part – automatic mimicry processes (Dimberg, Thunberg, & Grunedal, 2002). Autonomic indexes of empathy, such as heart rate (HR), are relatively free from social desirability bias, but may be difficult to interpret. Some researchers consider HR acceleration to reflect empathy (e.g., Anastassiou-Hadjicharalambous & Warden, 2008b), others suggest that HR acceleration reflects self-focused personal distress reactions, and HR deceleration empathic concern (e.g., Eisenberg et al., 1988a, 1988b).

Over the years, various questionnaire measures have been developed to assess the dispositional tendency to engage in empathy-related processes (trait empathy) such as perspective taking or vicarious affective responding. Frequently used self-report questionnaire measures of empathy are the Empathy Index for Children and Adolescents (IECA, Bryant, 1982) and the Interpersonal Reactivity Index (IRI, Davis, 1983). The IECA is a 22-item self-report questionnaire, developed to assess affective empathy in children from the age of six years and older. The IRI is a 28-item self-report questionnaire, developed to assess both affective and cognitive empathy in adolescents and adults.

DBD: A Heterogeneous Disorder

Diagnostic Criteria for ODD and CD

In the DSM-5 (American Psychiatric Association, 2013) ODD and CD are categorized as the disruptive, impulsive-control, and conduct disorders. ODD is characterized by a frequent and persistent pattern of angry/irritable mood, argumentative/defiant behavior or vindictiveness. ODD may be a developmental precursor of CD, especially for those with the childhood-onset type. The essential feature of CD is a repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules are violated. The behaviors fall into four main groupings: aggression towards people and animals, destruction of property, deceitfulness or theft, and serious violations of rules. A distinction is made between individuals who show at least one symptom of CD prior to 10 years of age (childhood-onset type), and those who show no symptom characteristics before 10 years of age (adolescent-onset type). Moreover, a specifier *with limited prosocial emotions* has been added to the DSM-5 classification of CD, which applies to those who meet the criteria for CD, and also show a callous and unemotional interpersonal style. Characteristics of the specifier are lack of guilt, lack of empathy, no concern about performance and shallow affect. Those who qualify for the specifier are most likely to have the childhood-onset type of CD, and to have conduct disorder that persists into adulthood.

Multiple Pathways to Conduct Disorder

The subtyping of CD is based on research suggesting that antisocial individuals with CU traits not only differ in the severity and stability of antisocial behavior (Lynam & Gudonis, 2005), but also exhibit distinct emotional and cognitive characteristics (Frick et al., 2013), discrete pathophysiology (Blair, 2013; Blair et al., 2014), and different responses to treatment (Waller, Gardner, & Hyde, 2013), suggesting an etiologically distinct subgroup of antisocial youth. In their developmental model of antisocial behavior, Frick and Viding (2009) have outlined three pathways to conduct problems: one adolescent-onset pathway and two childhood-onset pathways. Youth with adolescent-onset conduct problems are proposed to show an exaggeration of normal adolescent rebellion. Youth with childhood-onset conduct problems may show distinct pathways depending on the presence or absence of CU traits. Youth with CU traits show a temperamental style characterized by low emotional arousal and insensitivity to punishment cues that interferes with the normal development of empathy, guilt and other aspects of conscience. Youth without CU traits may show high levels of emotional arousal, cognitive deficits, such as low verbal intelligence, and problems related to ineffective parenting, which may lead to emotion regulation problems (Frick & Viding, 2009, see also Frick et al., 2013 for a comprehensive review).

Empathy Problems in DBD Subtypes

Blair (2007, 2013) suggests that DBD youth with CU traits are likely to encounter *affective* empathy problems because of a genetic predisposition to show reduced amygdala responsiveness to distress cues. The amygdala contributes to aversive conditioning and the processing of distress cues, especially fear-related information (Olsson & Phelps, 2007). Abnormalities in this circuit may critically hamper socialization, and structurally affect empathy development. Indeed, brain imaging studies show reduced amygdala activation while processing fearful facial expressions in DBD youth with CU traits (Marsh et al., 2008b) and in boys with conduct problems and CU traits (Jones, Laurens, Herba, Barker, & Viding, 2009), relative to controls. Significant differences between DBD subtypes have more recently been demonstrated by Viding and colleagues (2012): DBD boys with high-CU traits show less amygdala reactivity to pre-attentively presented fearful faces than those with low CU traits. Amygdala dysfunction in individuals with psychopathic traits may also affect the attention network (White et al., 2012), possibly leading to fear-recognition deficits (e.g., Dadds, El Masry, Wimalaweera, & Guestella, 2008a). Reduced amygdala responsiveness to distress cues can structurally affect empathy development in youth with high CU traits. This may become apparent in dispositional characteristics (trait empathy), but also in primitive processes (such as mimicry) and more sophisticated empathic responses (state empathy).

DBD youth without CU traits may also show empathy problems (e.g., De Wied et al., 2012). However, their ability to empathize with others may be affected by different sources, such as negative sentiments, hostile attributions, or poor regulatory skills. The tendency to misperceive others intentions as more threatening or hostile than is the case, is listed as an associated feature of CD in the DSM-5 (American Psychiatric Association, 2013). Negative sentiments and hostility may reduce empathic responding, as demonstrated in studies with healthy students (e.g., Lanzetta & Englis, 1989; Singer, 2006). Alternatively, it is possible that poor regulatory skills are related to empathy problems in DBD youth without CU traits. Eisenberg and colleagues (1994) argue that people who are sensitive to others' distress, but poor in emotion regulation, may be prone to personal distress. This could be true for DBD individuals without CU traits because they may have a highly sensitive *basic threat circuit* (amygdala, hypothalamus, periquaductal grey (PAG)) due to early trauma, violence or neglect (Blair, 2013), and poor regulatory skills (e.g., Beauchaine, Gatzke-Kopp, & Mead, 2007). To summarize, both DBD subtypes are likely to have empathy problems. However, youth with DBD and high CU traits may have empathy problems because of under-responsiveness to distress cues, whereas those without CU traits may have empathy problems because of over-responsiveness to distress cues, poor regulatory skills, and/or hostility bias (De Wied et al., 2010).

Empirical Evidence for Empathy Problems in DBD Youth

An increasing number of studies suggest that antisocial youth with CU or psychopathic traits are poor empathizers (e.g., Blair, 2013; Blair et al., 2014; Frick et al., 2013). Still, only a minority of studies have investigated empathy dysfunction in *clinical* samples of youth with DBD. This chapter focuses on empathy dysfunction in clinical samples of children and adolescents with DBD. We will start reviewing studies conducted with undifferentiated samples of DBD youth, followed by studies that accounted for CU or psychopathic traits. We included studies that investigated a) clinical samples of ODD or CD youth (8-18 years) diagnosed according the DSM-IV

(American Psychiatric Association, 2000) criteria by clinicians, or with a well-validated and reliable diagnostic instrument, and b) state and/or trait empathy. Accordingly, we did not include studies conducted with community samples using screening instruments to assess conduct problems (ODD/CD) (e.g., Lockwood et al., 2013; Sebastian et al., 2012), or studies with children from special schools without clinical assessments of ODD/CD (Blair, 1999). However, we did include one study with children attending special schools scoring in the clinical range of CD problems as assessed with a screening instrument following DSM-IV criteria (Jones, Happé, Gilbert, Burnett, & Viding, 2010).

Studies with Undifferentiated Groups of DBD Youth

Motor Empathy. De Wied and colleagues (2006) investigated facial EMG responses to dynamic facial expressions in DBD boys and controls. DBD boys showed subnormal facial EMG reactivity to angry faces, but not to happy faces. Using the same sample, De Wied and colleagues also examined facial EMG responses to more complex empathy-inducing film clips (De Wied, Van Boxtel, Posthumus, Goudena, & Matthys, 2009). Because EMG responses to empathy-inducing film clips may reflect facial expressions of empathic experiences in addition to spontaneous mimicry responses, findings from this study will be discussed below with other studies on *affective state empathy.*

Affective State Empathy. A total of five studies investigated affective empathy, three with DBD boys (De Wied, Goudena, & Matthys, 2005; De Wied et al., 2009; Marsh et al., 2008a) and two with CD adolescents (Cohen & Strayer, 1996; Decety et al., 2009). De Wied and colleagues examined verbal, facial and autonomic responses to empathy-inducing film clips portraying negative (sadness and anger) and positive (happiness) emotions. Relative to controls, DBD boys reported less empathy (De Wied et al., 2005), and showed less facial EMG and HR reactivity in response to negative (not positive) emotions (De Wied et al., 2009). Consistent with the one study on motor empathy (discussed above), the results of De Wied and colleagues (2005, 2009) suggest that DBD boys are selectively impaired in dysphoric (not euphoric) empathy. Marsh and colleagues (2008a), however, found no indications of affective empathy impairments in DBD boys on various autonomic measures and an observational measure of facial mimicry to a sadness-inducing film clip. As for studies with adolescents, Cohen and Strayer (1996) were the first to show that CD adolescents reported less affective empathy in relation to various empathy-inducing film clips than controls. Decety and colleagues (2009) demonstrated that DBD boys, relative to controls, show increased brain reactivity in parts of the limbic system (involved in affective empathy) to pictures of others in pain accidentally inflicted by someone else. In sum, these studies support that DBD boys have impaired affective empathy, especially when witnessing other persons in distress.

Cognitive state empathy. To our knowledge, three studies have investigated cognitive empathy in DBD youth, two with children (Downs & Smith, 2004; Happé & Frith, 1996) and one with adolescents (Cohen & Strayer, 1996). Downs and Smith (2004) demonstrated that ODD boys obtained lower scores than controls on emotion recognition and false belief tasks. Similarly, Cohen and Strayer (1996) demonstrated that CD adolescents showed impaired cognitive attributions to empathy-inducing film clips. In contrast, Happé and Frith (1996), found no differences between CD children and controls on a false belief task. However, the CD children scored lower than controls on items that required ToM according to the Vineland Adaptive Behavior Scales (VABS; Sparrow, Balla, & Cicchetti, 1984) interview (Happé & Frith, 1996). Given the distinct methods, samples, and the limited number of studies, it is still too soon to draw conclusions about possible cognitive empathy impairments in DBD youth.

Affective and Cognitive Trait Empathy. One study with DBD boys (De Wied et al., 2005) and two with CD adolescents (Cohen & Strayer, 1996; Sterzer, Stadler, Poustka, & Kleinschmidt, 2007), showed that both DBD boys and CD adolescents obtained lower scores on questionnaire measures of affective empathy. Cohen and Strayer (1996) also demonstrated that CD adolescents are impaired in their perspective-taking abilities, assessed with Davis' IRI (1983).

In sum, most studies with undifferentiated samples of DBD youth suggest a systematic impairment in affective trait and state empathy. Impairments in cognitive empathy have also been demonstrated, though studies are few, and results are inconsistent. Initial evidence suggests that DBD boys may have impaired motor empathy, but these findings need replication before we can draw conclusions.

Empirical Studies with DBD Subtypes

Affective State Empathy. In total six studies examined affective state empathy, two with children (Anastassiou-Hadjicharalambous & Warden, 2008b; Schwenck et al., 2012) and four with adolescents (Cheng et al., 2012; De Wied et al., 2012; Marsh et al., 2011; Marsh et al., 2013). The majority of these studies reveal affective empathy problems in both DBD subtypes. Anastassiou-Hadjicharalambous and Warden (2008b) assessed self-report and autonomic responses of CD children (24% had comorbid ADHD) and controls to an empathy-inducing film clip portraying fear. Both CD children with and without CU traits reported less empathy than controls; no significant differences were found between subtypes. Interestingly, CD children with high CU traits showed lower HR activity and lower HR change from baseline than CD children with low CU traits and controls, suggesting less empathic concern. Those with low CU traits did not differ from controls on HR indexes of empathy. Schwenck and colleagues (2012) used self-report indexes to examine empathy in CD children (34% comorbid ADHD) and controls to empathy-inducing film clips (specific emotions were not reported). CD children with high CU traits reported less affective empathy than controls. No differences occurred between the CD subtypes, nor did the low CU children report less affective empathy than controls. Findings remained the same after excluding children with ADHD.

As for studies with adolescents, Marsh and colleagues (2011) asked DBD adolescents (62% had ADHD comorbidity) with psychopathic traits and controls to recall emotional events, and to report their experienced physiological arousal during those events. Relative to controls, DBD adolescents with psychopathic traits reported less physiological arousal during fearful experiences. De Wied and colleagues (2012) examined empathy in DBD male adolescents (68% had ADHD comorbidity) with high and low CU traits and controls, using facial EMG, self-report and autonomic indexes of empathy. All respondents were exposed to film clips involving negative (sadness, anger) and positive (happiness) emotions. Compared to controls, both subtypes showed less facial responsiveness (less frowning muscle activity) to sadness, and reported less empathic happiness. Moreover, high CU adolescents reported less empathic sadness, and showed less HR deceleration to sadness than controls. Importantly, significant differences in HR change from baseline were found between DBD subtypes: DBD adolescents with high CU traits showed less HR change from baseline during sadness than those with low CU traits, indicating less empathic concern. Low-CU adolescents did not differ from controls in HR change from baseline during sadness. Because the majority of the adolescents also had ADHD, the authors were unable to determine whether the results were exemplary for pure DBD or DBD with ADHD comorbidity (De Wied et al., 2012).

In an ERP study, Cheng and colleagues (2012) studied the cortical reactivity of CD adolescent offenders with high or low psychopathic traits (ADHD comorbidity not reported) and controls. Researchers measured cortical reactivity from brain regions associated with early affective arousal and late cognitive processing, during exposure to pictures of individuals in painful or non-painful situations. In response to painful situations (relative to non-painful situations), CD adolescents with high psychopathic traits showed early affective arousal and late cognitive-processing deficits, whereas those with low psychopathic traits only showed late cognitive-processing deficits. The psychopathic subtype, however, demonstrated intact late cognitive-processing reactivity in response to pictures in which someone was intentionally harmed. In other words, findings suggest an impaired early affective arousal to empathy-eliciting stimuli for CD adolescents with high (not low) psychopathic traits, but an intact capacity to understand social situations in which someone is intentionally harmed.

In one fMRI study, Marsh and colleagues (2013) compared DBD adolescents (57% had ADHD comorbidity) and psychopathic traits with a control group. All adolescents were exposed to pictures of hands and feet in a painful or non-painful situation, and asked to imagine that the situation was either happening to themselves or to someone else. Relative to controls, DBD adolescents with psychopathic traits showed reduced reactivity in the anterior cingulate cortex (ACC) and ventral striatum, cortical areas associated with pain. In response to pictures of others in pain, they also showed reduced reactivity in the left amygdala/uncus, left superior frontal gyrus, and insula than controls. Results remained unchanged when those with ADHD were excluded from the analyses, suggesting that ADHD did not affect the results. In short, studies with DBD children and adolescents quite consistently reveal that both DBD subtypes are impaired in affective empathy as assessed by self-report, facial and autonomic measures of empathy. Differences between DBD subtypes have only been found on autonomic indexes of affective empathy.

Cognitive State Empathy. Three studies examined ToM in children with CD (Anastassiou-Hadjicharalambous & Warden, 2008a; Schwenck et al., 2012) and children with clinical levels of CD problems (Jones et al., 2010), with inconsistent results. Anastassiou-Hadjicharalambous and Warden (2008a) examined affective and cognitive perspective taking (aspects of cognitive empathy) in CD children (31% had ADHD comorbidity) with high versus low CU traits and controls. Relative to controls, the CD children with low CU traits showed impaired affective and cognitive perspective taking. The CD children with high CU traits only showed impaired affective perspective taking compared to controls. Interestingly, the high-CU children still outperformed the low CU children on affective perspective taking. The authors suggested that the weak cognitive perspective-taking skills of those with low CU traits may negatively affect their affective perspective-taking skills. A second study conducted by Jones and colleagues (2010) revealed no differences in ToM abilities between children with CD problems and high or low CU traits (ADHD comorbidity not reported), both subtypes also did not differ relative to controls. Likewise, clinically diagnosed CD children (34% had ADHD comorbidity) with high and low CU traits showed no differences in ToM, and both groups also showed no differences relative to controls. Omitting children with ADHD from the analyses did not change the results (Schwenck et al., 2012).

Affective and Cognitive Trait Empathy. Three studies with children (Anastassiou-Hadjicharalambous & Warden, 2008b; Jones et al., 2010; Pasalich, Dadds, & Hawes, 2014), and one with adolescent offenders (Cheng et al., 2012) reveal inconsistent results. Using an affective empathy self-report questionnaire (IECA, Bryant, 1982), Anastassiou-Hadjicharalambous and Warden (2008b) demonstrated that CD children with both high and low CU traits report less affective empathy than controls, with no significant differences between CD subtypes. Jones and colleagues (2010) demonstrated that boys with CD problems (comorbid symptoms not reported) and high-CU traits care less about being punished for their actions, care less about their victim's feelings, and place greater value on being the boss than controls. No significant differences emerged between those with high and low CU traits, nor between those with low CU traits and controls (Jones et al., 2010). A more recent correlational study (Pasalich et al., 2014), revealed an inverse relationship between CU traits and parent-reported affective and cognitive empathy in DBD children (24% ADHD), as assessed by the Griffith Empathy Measure (GEM: Dadds et al., 2008b). Researchers also found some evidence for an interaction effect between CU traits and ASD symptoms in relation to affective empathy. That is, higher CU traits were associated with lower affective empathy for moderate to high ASD symptoms. In addition, ASD symptoms were negatively related to cognitive empathy. Results did not change when researchers accounted for ADHD comorbidity. In the Cheng and colleagues (2012) study, CD adolescent offenders (ADHD comorbidity not reported) with high or low psychopathic traits and controls completed a self-report questionnaire measuring both affective and cognitive trait empathy (IRI, Davis, 1996). Surprisingly, both subtypes reported less cognitive rather than affective trait empathy compared with controls. No differences emerged between CD subtypes. In sum, results suggest that CD children with high CU traits have impaired affective trait empathy, but CD subtypes do not seem to differ in this respect. Interestingly, preliminary evidence suggests that CU traits might also be related to impaired cognitive trait empathy.

Discussion

This chapter reviewed empirical studies on empathy problems in clinically referred DBD youth with and without CU traits. A first aim was to examine the nature of empathy dysfunction in those with CU traits. The relatively few studies show consistent evidence for impaired affective empathy in DBD children and adolescents with CU traits on indexes of both state (Anastassiou-Hadjicharalambous & Warden, 2008b; Cheng et al., 2012; De Wied et al., 2012; Marsh et al., 2011; Marsh et al., 2013; Schwenck et al., 2012) and trait empathy (Anastassiou-Hadjicharalambous & Warden, 2008b; Jones et al., 2010; Pasalich et al., 2014). Studies with undifferentiated groups of DBD youth also show consistent evidence for affective empathy impairment on indexes of both state and trait empathy (e.g., Cohen & Strayer, 1996;

Decetey et al., 2009; De Wied et al., 2005, 2006, 2009; Sterzer et al., 2007), suggesting that impaired affective empathy is common across the broader range of disruptive behavior disorders.

As for cognitive empathy, the overall pattern of results is less consistent in samples of both undifferentiated and differentiated DBD youth. At least three studies suggest that CU traits may be associated with impaired cognitive empathy (Anastassiou-Hadjicharalambous & Warden, 2008a; Cheng et al., 2012; Pasalich et al., 2014). Interestingly, two studies used measures of cognitive empathy that might also involve affective components, that is, affective perspective taking (Anastassiou-Hadjicharalambous & Warden, 2008a), and cognitive trait empathy assessed with questionnaire items that might tap into affective components (Pasalich et al., 2014). Accordingly, the above-mentioned impairments in cognitive empathy could be due to the involvement of affective components in the assessment tools. Negative associations between CU traits and aspects of cognitive empathy have previously been found when affective components were involved. For example, adult offenders with significant levels of psychopathic traits showed impaired affective (not cognitive) ToM abilities, relative to controls (Shamay-Tsoory, Harari, Aharon-Peretz, & Levkovitz, 2010). High-CU individuals may have an affective-specific impairment, which becomes apparent in their weak affective empathy, but also in their cognitive empathy abilities when it taps into emotional components.

A second aim was to investigate whether a lack of empathy contributes to a differentiation between DBD subtypes. As of yet, no between-group differences have been reported with indexes of cognitive state empathy, or with self-report and facial indexes of affective state empathy. However, significant differences have been demonstrated with autonomic indexes of affective state empathy. DBD subtypes differ in heart rate reactivity while observing others in distress, that is, high CU individuals show less heart rate change from baseline than low CU individuals. Interestingly, this pattern is seen in children with CD (Anastassiou-Hadjicharalambous & Warden, 2008b) and adolescents with DBD (De Wied et al., 2012). Similar results have also been found in an earlier study with emotionally disturbed children (DSM classifications of ODD and/or CD were not reported) conducted by Blair (1999). Blair obtained children's skin conductance responses to distressing (e.g., crying face), threatening (e.g., angry face), and neutral pictures (e.g., hairdryer). Children with high levels of psychopathic traits showed less skin conductance responses to distressed pictures than those with low levels of psychopathic traits and controls. Thus, high- and low-CU individuals from different samples, show distinct patterns of autonomic reactivity to distress cues, which possibly stem from genetically influenced abnormalities in the limbic system including the amygdala (Blair, 2013).

Abnormalities in the amygdala are proposed to affect the processing of distress cues (Olsson & Phelps, 2007), which may hamper socialization. Distortions in the amygdala are also thought to affect aversive stimulus-reinforcement associations. Accordingly, children with lesions in this area may learn to use (instrumental) aggression to achieve their goals because they do not acquire an uncomfortable feeling (i.e., aversive arousal) of others' distress. In others words, they do not feel aversely aroused or "punished" for their aggressive acts (Blair, Peschardt, Budhani, Mitchell, & Pine, 2006).

So far, no studies have demonstrated significant differences between the DBD subtypes on self-report indexes of affective (or cognitive) trait empathy. Based on the assumption that CU traits delineate a distinct causal pathway to conduct problems

(Frick et al., 2013), we may expect particular deficits in both state and trait empathy for high CU individuals. It is quite possible that self-report questionnaires of empathy are not sensitive enough to capture differences in trait empathy between the DBD subtypes. Even so, amygdala dysfunction, early trauma, and/or neglect may all hamper empathy development, leading to reduced empathic experiences across different situations for both DBD subtypes.

It is suggested that the mechanisms underlying empathy problems may be different for DBD subtypes. High-CU individuals may show little empathy due to reduced sensitivity to distress cues (Blair, 2013), or impaired attention to the eyes (Dadds et al., 2006; Dadds et al., 2008a; Dadds, Jambrak, Pasalich, Hawes, & Brennan, 2011) because of a hyposensitive amygdala. Low-CU individuals may show little empathy for a variety of reasons (De Wied et al., 2012), such as hostility bias (Dodge, Price, Bachorowski, & Newman, 1990; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002), and/or enhanced sensitivity to distress cues combined with poor regulatory skills (Eisenberg et al., 1994). It is thought that individuals with low CU traits may have a hypersensitive basic threat circuit (Blair, 2013), as seen in their increased amygdala reactivity to fearful faces (Viding et al., 2012). To date, empirical studies on empathy dysfunction in DBD subtypes are scarce, and most studies demonstrate deficits without providing evidence for the mechanisms involved. Understanding the underlying mechanisms is essential, however, to improve prevention and intervention programs.

A third aim of the chapter was to explore whether the empathy problems associated with CU traits are similar for those with pure DBD as for those with comorbid ADHD. Upon examination of the samples, we can observe that five studies were conducted with CD youth and four with DBD youth. Seven out of nine studies reported on ADHD comorbidity, but only three tested whether the results remained the same after controlling for ADHD (Marsh et al., 2013; Pasalich et al., 2014; Schwenck et al., 2012). Although strong conclusions cannot be drawn, initial evidence seems to suggest that empathy problems in youth with DBD are not related to ADHD comorbidity. Because ADHD has also been related to empathy problems (Barkley, 2006) accounting for ADHD is important to gain more insight into the nature of empathy problems in DBD. Future studies should aim to control for ADHD or recruit samples with pure DBD individuals, and compare empathy-related responding to samples with pure ADHD individuals.

Clinical Implications

A clear understanding of the nature and cause of empathy problems associated with DBD and DBD subtypes is crucial to improve differential diagnostic procedures and treatment options. Currently, limited empirical evidence suggests that self-report measures of affective empathy (state and trait) are not able to make a distinction between the DBD subtypes. This stresses the need to develop new empathy indexes for diagnostic purposes in clinical practice.

The hypothesis that empathy inhibits aggression implies that enhancing empathic skills may reduce aggressive behavior. It is therefore not surprising that empathy training is generally included in broader interventions to reduce aggressive behavior in antisocial youth. Yet, it seems that these interventions mainly focus on enhancing aspects of cognitive empathy, that is, perspective-taking skills. For example, the EQUIP program – an intervention to reduce antisocial behavior in juvenile delinquents – focuses on improving moral development by enhancing perspective-taking skills (Gibbs, Potter, & Goldstein, 1995). Strengthening perspective-taking skills is perhaps the best option so far, given the current lack of programs to improve affective empathy. However, based on the assumption that the two empathy components interact (see Shamay-Tsoory, 2009; Singer, 2006; Völlm et al., 2006), it could be possible that promoting aspects of cognitive empathy may also enhance affective empathy.

In addition, it is suggested that the empathy problems in DBD subtypes are related to impairments in distinct underlying mechanisms. This may call for different treatment approaches to improve empathy-related responding in both subtypes. For those with CU traits, for example, improving emotion recognition (because of the possibility of impaired attention to the eyes) may enhance empathy-related responding. Indeed, initial findings suggest that emotion recognition training significantly improves affective trait empathy and conduct problems in children with significant levels of CU traits (Dadds, Cauchi, Wimalaweera, Hawes, & Brennan, 2012). For those without CU traits, however, one could speculate that improving self-regulation skills might be more effective to stimulate empathy.

Conclusion

It is proposed that distinct underlying mechanisms may be involved in the empathy problems associated with DBD subtypes. Relatively few studies have investigated empathy in clinically referred DBD youth, and those that have reveal deficits without providing evidence for the mechanisms involved. Both DBD subtypes show more consistent impairments in aspects of affective than cognitive empathy. Evidence for significant differences between subtypes is scarce, and is only demonstrated in studies that used autonomic measures of affective state empathy. Given the limited number of studies, considerably more research with multi-measure approaches is needed to examine the nature and causes of not only state but also trait empathy in DBD youth with and without CU traits.

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