

**EMPATHY IN ADOLESCENCE AND YOUNG ADULTHOOD: EVIDENCE
FROM ATYPICAL DEVELOPMENT, BEHAVIOUR, AND CULTURE**

by

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ABSTRACT

The concept of empathy is to date unclear, with evidence showing mixed results on the association between empathy and socio-emotional functioning. Although it is widely accepted that some specific features, such as emotion regulation, can alter the experience of empathy, the extent of such influence is still unclear. The aim of this thesis is to investigate cognitive and affective components of empathy and its association with emotional variables in typical and atypical populations, and discuss the impact of these emotional variables on social behaviour. Our findings demonstrated cross-cultural differences in emotional expressivity and emotion regulation in typically developing individuals, and provided evidence on the role of these variables as potential mediators in the relationship between empathy and indirect aggression. In addition, an empathy questionnaire was translated into the Spanish language and validated, providing a new tool to assess cognitive and affective components of empathy. A behavioural task was developed to assess empathic accuracy, providing an ecologically valid measure of empathy. Our findings within clinical populations showed that offenders with substance abuse problems who reported higher levels of callous-unemotional traits had greater probabilities of recidivism, suggesting the inclusion of callous-unemotional traits in assessment batteries as a reliable instrument to evaluate potential risks after release. Expressive suppression was found to be a potential protective factor for substance use initiation. In individuals with autism, our findings showed the existence of a general impairment in social perception, which was not explained by difficulties in empathy or visual perspective taking, and a cognitive deficit in empathy that seemed to be specific to the perspective taking subcomponent. Taken together, our results led to the discussion about the relevance of target treatments focused on the improvement of empathy and social perception abilities to overcome emotional difficulties while improving the quality of social relations.

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LIST OF ABBREVIATIONS

ToM	Theory of Mind
FEFs	Emotional Face Expressions
ASD	Autism Spectrum Disorders
DBD	Disruptive Behaviours Disorders
ODD	Oppositional Defiant Disorder
CD	Conduct Disorder
VPT	Visual Perspective Taking
CU	Callous-unemotional
SAP	Substance Abuse Problems
EA	Empathic Accuracy
BD	Behavioural Difficulties

CHAPTER I

GENERAL INTRODUCTION¹

¹ Part of the content from this chapter has been published as a book chapter (peer-reviewed), but its format has been altered in places to achieve consistency throughout this thesis: Vilas Sanz, S.P., Ludlow, A., & Reniers, R. (2016). Empathy Dysfunction: Deconstructing social functioning in Autism Spectrum Disorders and Conduct Disorder. In D.F. Watt & J. Panksepp (Eds.), *Psychology and Neurobiology of Empathy*: Nova Science Publishers

General introduction

1. The empathy construct

The capacity to experience empathy is an important ability in the repertoire of human social behaviours, as it allows us to share and understand the emotional states of others (Rameson, Morelli, & Lieberman, 2012; Reniers, Corcoran, Drake, Shryane, & Völlm, 2011). It plays an essential role in both emotional communication and regulation of relationships by helping us to appropriately predict, comprehend, and respond to the perceived feelings and actions of another person (Bernhardt & Singer, 2012; Decety & Moriguchi, 2007; Decety & Svetlova, 2012; Smith, 2009b). Therefore, empathy can be understood as an inner human capacity based on social, affective, and cognitive competences, and hence it is considered indispensable for our ability to function successfully in the social world (Decety & Svetlova, 2012; Pouw, Rieffe, Oosterveld, Huskens, & Stockmann, 2013).

It is generally accepted that empathy is a complex, multidimensional construct (Davis, 1983) that plays a fundamental role in prosocial behaviour (Decety & Michalska, 2010; Eisenberg, 2007; Leiberg & Anders, 2006; Masten, Morelli, & Eisenberger, 2011). Although empathy is commonly understood as the ability to share and comprehend the emotional state of others (Cohen & Strayer, 1996; de Wied, Goudena, & Matthys, 2005), there is still no general agreement in how empathy should be defined and characterised. For example, there is an overlap in concepts such as sympathy, compassion, and empathy (see Cuff, Brown, Taylor, & Howat, 2014 for a review). Features such as affective resonance (contagion), valuing another's welfare and an intrinsic motivation to reduce suffering are also thought to be essential components of empathy (Watt, 2007). However, relationships between empathy and

these components are still under discussion (Batson, Eklund, Chermok, Hoyt, & Ortiz, 2007; Decety & Meyer, 2008; Pavey, Greitemeyer, & Sparks, 2012).

It is also acknowledged that the capacity to empathize can be influenced and partially explained by individual differences, so that some individuals may empathize more easily than others (Leiberg & Anders, 2006; Walter, 2012). Likewise, other factors such as cultural values have been considered to influence the ability to empathize with other people (Wang et al., 2003). For example, evidence has consistently shown that cultural norms and values influence how, when, and to whom, people express emotions, which emotions are sanctioned or encouraged, and under what conditions (Butler, Lee, & Gross, 2007; Safdar et al., 2009). These two aspects (i.e., emotional expressivity and emotion regulation) have been associated with an increased ability to emphasize with others (Eisenberg et al., 1996; Murphy, Shepard, Eisenberg, Fabes, & Guthrie, 1999; Roberts & Strayer, 1996); thereby supporting the idea that cultural norms and values can in fact explain cultural differences in empathy. Recently, evidence has proposed empathy as a key aspect of intercultural adjustment, suggesting that this ability can enhance our understanding of other people and help decrease conflict, which may facilitate intercultural adjustment as a result (Rasoal, Eklund, & Hansen, 2011; Wang et al., 2003).

Cross-cultural research has identified four meaningful dimensions of cultural variability that have often been used to predict and explain cultural differences in the processing of emotions (Hofstede, 1984, 1991, 2001). Among these dimensions, individualism (i.e., which characterises cultures focused on an individual's needs) and collectivism (i.e., which defines cultures that place the needs of the group above one's own

needs) has become particularly popular (Hofstede, 1984; Hofstede, Hofstede, & Minkov, 1997). However, despite the amount of evidence focusing on cultural dimensions to explain cross-cultural differences in empathy, results are still mixed. For example, some studies have revealed a positive relationship between empathy and collectivism but not individualism (Duan, Wei, & Wang, 2008; Heinke & Louis, 2009), while others have reported a negative association between individualistic values and empathy (Declerck & Bogaert, 2008). Furthermore, the vast majority of studies investigating cultural differences in empathy and related emotional variables have focused on Asian and American cultures, with little research having conducted cross-cultural comparisons among European countries (see for example Fernández, Carrera, Sánchez, Paez, & Candia, 2000; Mosquera, Manstead, & Fischer, 2000).

Another aspect of empathy still under debate is the appropriateness of the measures used to assess this ability. For example, many studies have used self-report measures (Chlopan, McCain, Carbonell, & Hagen, 1985; Spreng, McKinnon, Mar, & Levine, 2009) due to its easy and brief administration (Batson, 1990). However, others have highlighted the influence of inaccurate self-evaluations and social desirability bias associated with these measures (Eisenberg & Fabes, 1990; Levenson & Ruef, 1992), while suggesting the use of behavioural and physiological measures (Eisenberg & Fabes, 1990; Strayer, 1993) as better alternative to assess empathy. Importantly, these are not exempt from disadvantages either, e.g., lack of practicality or reactivity to equipment (Eisenberg, Fabes, Bustamante, & Mathy, 1990), thereby supporting the relevance of this discussion.

2. Components of empathy

Previous studies suggest that there are two main components in empathy, namely cognitive and affective. Affective aspects refer to the ability to be perceptive of and vicariously experience the feelings of another person, whereas cognitive aspects include the capacity to build a working model of the emotional states of another person in order to comprehend his/her feelings (Reniers et al., 2011).

2.1. Affective empathy

Affective empathy has usually been considered an emotional experience where the feelings of another person are shared through basic affective resonance/contagion mechanisms (Kerem, Fishman, & Josselson, 2001). It has also been described as the vicarious experience of feelings that are compatible with those of another person (de Wied et al., 2005).

Two main forms of affective empathy have been dissociated (Blair, 2005). The first form involves an immediate response to the emotional display of another person, including unconscious rapid mimicry of facial and vocal expressions and body movements (contagion). It is triggered by innate or acquired stimuli, and is determined by both mental simulations and emotional images (Hatfield, Cacioppo, & Rapson, 1992; Hatfield, Cacioppo, & Rapson, 1993; Hatfield, Forbes, & Rapson, 2013). We automatically and continuously mimic and synchronise other's expressions and behaviours, thereby affecting our own emotional experience and enhancing the perception and feeling of a reflection of others' emotions (Hatfield et al., 2013; Schoenewolf, 1990). Affective empathy appears dependent on this rapid emotion, driving the evocation of an emotional response. The emotional response can be expressed from both verbal and non-verbal expressions and by showing sympathy or a kind of

shared distress with the suffering party (Gleichgerrcht et al., 2012; Leiberg & Anders, 2006; Reniers et al., 2011; Sze, Gyurak, Goodkind, & Levenson, 2011; Walter, 2012).

The second form of affective empathy involves a more cognitively mediated process that enables an affective response to other emotional stimuli, such as a response to an emotional phrase of another person (e.g., “Adam just lost his house”). The perception of an emotional person automatically elicits an internal representation of that emotional state, which allows the observer to identify the emotions of this person and to display the corresponding autonomic, somatic, and motor responses (Leiberg & Anders, 2006; Preston, 2007), by using gestures or facial expressions. In this sense, affective empathy can be understood as a momentary resonance with the emotional state of another person (Kerem et al., 2001) through the vicarious experience of the other person’s emotion that is congruent and comparable with but not necessarily identical to the emotion of the other person (Eisenberg & Strayer, 1990; Walter, 2012). Notably, affective empathy entails more than basic affective sharing/resonance processes. For example, helpful, comforting or sympathetic responses are also typically activated, self-other differentiation has to be maintained, and an intrinsic motivation to reduce other’s suffering is present (Watt, 2007).

2.2. Cognitive empathy

Cognitive empathy is commonly understood as the ability to infer another person’s mental states, including their feelings, by means of representation of the person’s internal mental state (Gleichgerrcht et al., 2012; Reniers et al., 2011) through Theory of Mind (ToM) or more advanced perspective taking mechanisms (de Wied et al., 2005). Cognitive empathy is deemed to be a higher-order and more cognitive process that encompasses conscious

comprehension of the internal state of another person, while assuming a basic differentiation between self and others (Brook & Kosson, 2013). Visual, auditory, semantic, and contextual information is processed and used to represent and reconstruct the cognitive and emotional state of this other person. Subsequently, ideas about the other person are generated, compared and adjusted based on the consistency with one's own cognitive and emotional state and with incoming information (Reniers et al., 2011). As a result, a more cognitive model of the internal states of this person is developed, which does not necessarily indicate that the perceiver experiences an affective state similar to what is observed (Walter, 2012).

Cognitive empathy has often been defined as basically equivalent to ToM (Blair, 2005). Others, however, have suggested that cognitive empathy is part of a broader cognitive concept including both ToM and the process of mentalising about emotional states of others ('affective ToM') (Shamay-Tsoory, Harari, Aharon-Peretz, & Levkovitz, 2010; Walter, 2012). Whereas cognitive empathy specifically involves comprehension and attribution of other people's feelings, ToM focuses on less affective and on more cognitive internal states (intentions, attitudes and beliefs). Therefore, although overlapping processes are thought to facilitate both cognitive empathy and ToM, the two constructs are potentially partially discriminable on a psychological level (Reniers et al., 2011). Furthermore, while cognitive ToM involves a cognitive understanding to infer mental states from others (desires, beliefs, or intentions) and differentiate them from one's own, affective ToM may require empathic abilities to recognise other's feelings (Bodden et al., 2013; Kalbe et al., 2010; Shamay-Tsoory et al., 2010).

3. Empathy in atypical populations

The importance of empathy in social interaction can be informed by studying individuals with known difficulties in socio-emotional functioning (Clark, Winkielman, & McIntosh, 2008). One such group includes individuals with Autism Spectrum Disorders (ASD), a group primarily characterised by impairments in social relations and social communication (DSM 5; American Psychiatric Association, 2013).

3.1. Autism Spectrum Disorders

These individuals show deficits in several empathy-related processes, including rapid and spontaneous mimicry of emotional expression and emotional contagion (Kasari, Sigman, Yirmiya, & Mundy, 1993; McIntosh, Reichmann-Decker, Winkielman, & Wilbarger, 2006; Moody & McIntosh, 2006). The cause of these empathy deficits is still unknown. However, one possibility is that they relate to mechanisms that enable the perception, understanding and processing of other's cognitive and emotional states, as well as related impairments in social functioning, difficulties which appear intrinsic to the disorder (Green, Gilchrist, Burton, & Cox, 2000; Greimel et al., 2010; Schwenck et al., 2012; Smith, 2009b).

The Pervasive Developmental Disorders are a group of syndromes with severe impairments in certain areas of development (Gleichgerrcht et al., 2012). Thus far, the family of ASD has included several subtypes of autism in current classification schemes: Autistic Disorder, Asperger's Syndrome (thought to be a milder version of autism and distinguished by the absence of significant language delay and general intellectual skills in the normal range), and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). Importantly, the terms Asperger's Syndrome and PDD-NOS have disappeared in the DSM 5,

and these subtypes have been subsumed into the diagnosis of ASD (Zwickel, White, Coniston, Senju, & Frith, 2011) and is characterised by persistent deficits in social communication and interaction, with both perceptual and social difficulties being considered core characteristics (Schultz, 2005). In addition, restricted, repetitive patterns of behaviours, interests, and activities are characteristic and limit or impair everyday functioning (DSM 5; American Psychiatric Association, 2013; Lai, Lombardo, Chakrabarti, & Baron-Cohen, 2013). This lifelong disorder is diagnosed in childhood and its behavioural expressions may differ across individuals and development (Hill & Frith, 2003; Sucksmith, Allison, Baron-Cohen, Chakrabarti, & Hoekstra, 2013).

Individuals with ASD may suffer from mutism to non-communicative speech with language disturbances such as echolalia (reiteration of words/ phrases previously said by another person as an echo and without understanding their meaning) or idiosyncrasy (statement of irrelevant sentences). They are generally unable to comprehend complex humour, irony or sarcasm, and have difficulties with developing non-verbal communication (Kerig, Ludlow, & Wernar, 2012), as well as an inability to use nonverbal communicative cues that seems to complicate their social interactions (Smith, 2009b). In addition, individuals with ASD are characterised by social withdrawal and isolation (Frith, 1989; Riby & Hancock, 2008), and show difficulties in face-to-face social situations since their joint attention and social orienting are impaired. Accordingly, impairments in processing one's own emotions are found in individuals with ASD (Berthoz, Lalanne, Crane, & Hill, 2013). It is important to note that these social, communicative and behavioural impairments are thought to be associated with deficits in ToM (Baron-Cohen, 1997) and certain aspects of empathy (Baron-Cohen & Wheelwright, 2004; Gleichgerrcht et al., 2012), such as impaired affect recognition and

perspective taking abilities (Hirvelä & Helkama, 2011). A relation between reduced empathy and alexithymia has also been reported in individuals with ASD, highlighting the overlap between empathy and alexithymia. Alexithymia is a subclinical disorder characterized by difficulties in recognizing and describing one's own emotional state. It is thought to be associated with deficits in emotional regulation and difficulties in differentiating one's own emotional state from those of others (Cook, Brewer, Shah, & Bird, 2013; Moriguchi & Komaki, 2013). Although ASD and alexithymia are independent constructs, both conditions have overlapping comorbidity (Cook et al., 2013) and share several features. For example, both are associated with emotional deficiencies such as impaired emotion recognition (Kano et al., 2003; Parker, Taylor, & Bagby, 1993) and reduced empathy capacities (Decety & Moriguchi, 2007; Feldmanhall, Dalgleish, & Mobbs, 2013).

3.1.1. Impairments in affective empathy

Different theories have been proposed regarding the status of both cognitive and affective empathy in individuals with ASD (Hirvelä & Helkama, 2011). For instance, some studies have reported lower levels of both cognitive and affective empathy (Grove, Baillie, Allison, Baron-Cohen, & Hoekstra, 2014; Mathersul, McDonald, & Rushby, 2013b; Shamay-Tsoory, Tomer, Yaniv, & Aharon-Peretz, 2002), with deficits in the former component being more prominent than in the latter (Mazza et al., 2014). On the other hand, the “extreme male brain theory” (Baron-Cohen, 2002) suggests that individuals with ASD have weak affective empathy (Smith, 2009a), thereby considering ASD as an extreme of the normal male profile. In particular, it suggests that individuals with ASD not only have a weak capacity to empathize but also have a strong capacity to systemize (the drive to analyse information to derive the underlying rules that govern behaviour) (Baron-Cohen, 2002; Smith, 2009b).

Evidence is not consistent however as further evidence shows that individuals with ASD present with reduced cognitive empathy but analogous levels of affective empathy (e.g., empathic concern for the suffering of others) (Dziobek et al., 2008; Rogers, Dziobek, Hassenstab, Wolf, & Convit, 2007; Rueda, Fernández-Berrocal, & Baron-Cohen, 2015). It may be that impairments in affective empathy relate to deficits in the cognitive ability to recognise and process others' and one's own emotions, rather than to the capacity for experiencing emotional distress or concern towards others (Hirvelä & Helkama, 2011). In sharp contrast, the "empathy imbalance hypothesis" (Smith, 2006, 2009b) and the "intense world hypothesis" (Markram, Rinaldi, & Markram, 2007), both postulate that individuals with autism have not only heightened affective empathy but are over-aroused and hyper-reactive in emotional situations (Smith, 2009a). However, these theories have received less support from empirical research.

3.1.2. Impairments in cognitive empathy

Individuals with autism are impaired in the basic understanding that people have internal mental states (Hill & Frith, 2003; Zwickel et al., 2011), thereby struggling to perceive and correctly understand social aspects such as second-order belief, irony, deception or 'white lies' (Smith, 2009b). Indeed, several studies have shown that individuals with ASD have overt impairments in the process of deducing their own and other people's mental states (Golan, Baron-Cohen, & Golan, 2008; Greimel et al., 2010). Deviant activation patterns in the neural network for ToM (Castelli, Frith, Happé, & Frith, 2002; Pelphrey, Morris, & McCarthy, 2005; Wang, Lee, Sigman, & Dapretto, 2006; Wang, Lee, Sigman, & Dapretto, 2007), including problems processing facial expressions (Greimel et al., 2010), have also been observed in

ASD. Importantly, the lack of understanding of the correspondence between inner states and affective expressions seems to impact their emotional development (Kerig et al., 2012).

Emotion recognition. Individuals with ASD show delayed development of emotion recognition abilities, which are necessary for the comprehension of other's emotional and mental states, and considered as core social cognitive functions (Adolphs, 2001, 2003). Impairments in this ability have been found in ecological life-like tasks and in recognition of facial expressions, vocal intonation, and body language (Golan et al., 2010). Although evidence suggests the presence of a deficit in the processing of facial emotions (see Harms, Martin, & Wallace, 2010 for a review), there is substantial inconsistencies between studies that should be clarified (see meta-analysis from Uljarevic & Hamilton, 2013). For instance, some studies have reported impairments in the recognition of specific negative facial expressions, including fear (Howard, Sparkman, Cohen, Green, & Stanislaw, 2005; Howard et al., 2000; Pelpfrey et al., 2002), surprise (Baron-Cohen, Spitz, & Cross, 1993), sadness (Boraston, Blakemore, Chilvers, & Skuse, 2007; Corden, Chilvers, & Skuse, 2008; Wallace, Coleman, & Bailey, 2008), anger (Ashwin, Chapman, Colle, & Baron-Cohen, 2006; Bal et al., 2010) and disgust (Golan et al., 2010; Humphreys, Minshew, Leonard, & Behrmann, 2007; Wallace et al., 2008). Others have shown deficits for all negative basic emotions (Ashwin et al., 2006) or even for positive emotions (Humphreys et al., 2007). In contrast, other studies have suggested that the recognition of complex social emotions such as pride and embarrassment from facial expressions is impaired (Capps, Yirmiya, & Sigman, 1992; Heerey, Keltner, & Capps, 2003), while recognition of basic emotions such as anger, fear, disgust and happiness may be less affected (Adolphs, Sears, & Piven, 2001; Tracy, Robins, Schriber, & Solomon, 2011). It is important to note that methodological issues could have

contributed to the inconsistencies of these results, including the different tasks used to assess emotion recognition (see Uljarevic & Hamilton, 2013 for more details).

Importantly, even when individuals with ASD can discern emotional expressions they are still found not to process the emotionally expressive face in the same way others do (Dawson et al., 2004; Swettenham et al., 1998). This may emerge from impairments in social attention, specifically; the ability to prioritise socially relevant information such as the eyes and face, suggesting that many social cues emerging from these facial expressions may be missed in their immediate social environment (Dawson et al., 2004; Swettenham et al., 1998). Furthermore, deficits in the recognition of complex emotions have been associated with a failure in perceptual, cognitive and neural processes (Tracy et al., 2011). According to Frith (2003), there is a predisposition to pay attention to and process individual facial details discreetly, instead of as a whole or gestalt, that complicates the understanding of a situation, especially when emotions are briefly shown and the observer's concentration is reduced (Tracy et al., 2011). In addition, Baron-Cohen (2006) suggests that a preference for observing mouths rather than eyes observed in ASD may explain their emotion recognition deficits, as paying attention to the mouth may be a less efficient strategy for face recognition and understanding expressions than paying attention to the eyes (Golan et al., 2010; Tracy et al., 2011).

Perspective taking. Numerous studies have empirically demonstrated impairments in perspective taking ability in ASD, who reflected lower levels of self-reported perspective taking (Hirvelä & Helkama, 2011) and poorer performance than typically developing children on perspective taking tasks (Reed & Peterson, 1990; Tibbetts & Rehfeldt, 2005). Perspective

taking ability has been broadly studied with particular focus on the capacity of individuals with autism to take another person's visuospatial viewpoint, which is known as visual perspective taking. This ability entails two dissociable mechanisms: first-level (VPT-1) and second-level (VPT-2) visual perspective taking. The former refers to the capacity to see an object by following their line of sight, whereas the latter entails the ability to understand what another person experiences when he/she sees an object (Brunyé et al., 2012; David et al., 2010; Hamilton, Brindley, & Frith, 2009).

Earlier studies regarding VPT-1 in individuals with autism found that this ability is intact (Baron-Cohen, 1989b; Hobson, 1984; Leekam, Baron-Cohen, Perrett, Milders, & Brown, 1997; Leslie & Frith, 1988; Reed & Peterson, 1990), whereas more recent studies have reported a poorer performance in individuals with autism when compared to controls (Reed, 2002; Warreyn, Roeyers, Oelbrandt, & De Groote, 2005). Experimental outcomes regarding VPT-2 have also been inconsistent. For instance, Yirmiya, Sigman, and Zacks (1994) and Hamilton et al. (2009) found impairments in VPT-2 in children and adolescents with autism, which were suggested to be linked to mentalising ability (Hamilton et al., 2009), while Reed and Peterson (1990) and Tan and Harris (1991) did not.

3.2. Disruptive behaviours

This idea of a deficit in emotional functioning has also been central to the development of the concept of psychopathy, such that deficits in prosocial attitudes and behaviours as well as a lack of concern about emotional reactions from others are often present (Blair, Peschardt, Budhani, Mitchell, & Pine, 2006). Importantly, developmental precursors to adult psychopathy are thought to exist in children with a diagnosis of Disruptive

Behaviours Disorders (DBD). This group of externalising disorders is characterised by a failure in process of socialization as well as by a oppositional, aggressive, rule-breaking and antisocial behaviours, and includes both Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) (de Wied et al., 2005). Individuals with disruptive behaviours exhibit evidence of basic empathy dysfunction involving both poor capacities for affective resonance or unresponsiveness towards others' emotions, and a lack of concern for others' welfare that may help to generate their anomalous social learning (de Wied et al., 2005; de Wied, van Boxtel, Zaalberg, Goudena, & Matthys, 2006; Green et al., 2000; Schwenck et al., 2012).

Although several disorders within this group are of relevance to the study of empathy, one of the most commonly investigated is CD. This is a severe childhood-onset disorder (Buitelaar et al., 2013; de Wied, Gispen-de Wied, & van Boxtel, 2010; Pardini & Frick, 2013) defined by a recurring and persistent pattern of behaviour that breaches the rights of others or major societal norms, and generates deficits in daily functioning (DSM 5; American Psychiatric Association, 2013; Matthys & John, 2011). Symptoms associated with this disorder include lying, meanness and cruelty towards others including physical cruelty and violence, disobedience and refusal conducts regarding social rules, and truancy (Berkout, Young, & Gross, 2011; Decety, Michalska, Akitsuki, & Lahey, 2009). CD is considered a childhood antecedent to antisocial personality disorder and persistent criminal behaviour in adulthood (Decety et al., 2009; Pardini & Frick, 2013). CD can also be preceded by and presented with ODD, which is characterised by angry or irritable mood, argumentative or defiant behaviour, and vindictiveness that echo both emotional and behavioural symptomatology (DSM 5; American Psychiatric Association, 2013).

Furthermore, CD often occurs together with callous-unemotional (CU) symptoms, such as lack of remorse or guilt, lack of concern about the feelings of others, lack of concern over poor or problematic performance in important activities and developmental tasks (e.g., schoolwork), and reduced or shallow affect (Buitelaar et al., 2013). Indeed, the strong association of CD with the comorbid presence of CU has resulted in a division of individuals with CD in two main groups. A first group, CD with high CU traits, is described by proactive aggressive manifestations, impairments in emotional processing, low fearful inhibition, and diminished emotional responsiveness. The second group, CD with low CU traits, is characterised by reactive aggressiveness, lack of impulse control and impairments in the processing of social cues (Anastassiou-Hadjicharalambous & Warden, 2008a; Frick, Cornell, Barry, Bodin, & Dane, 2003; Frick & Ellis, 1999; Frick & Moffitt, 2010; Herpers, Rommelse, Bons, Buitelaar, & Scheepers, 2012; Pardini & Frick, 2013). Importantly, individuals with a more severe array of social deficits, mainly characterised by the manifestation of callous and unemotional symptoms, are now encompassed in a CD specified group, named with a “limited prosocial” specifier (DSM 5; American Psychiatric Association, 2013).

3.2.1. Impairments in affective empathy

Individuals with CD display reduced concern for the welfare and feelings of other people (de Wied et al., 2010; Green et al., 2000; Schwenck et al., 2012). They show abnormalities in the global regulation of motivation and affect (Rubia, 2011) and tend to assess negative pictures as less arousing and aversive than typically developing individuals (Herpertz et al., 2005). Furthermore, lower levels of guilt and fear and higher levels of excitement and happiness have been observed after describing moral transgressions, suggesting a link between emotional responses and criminal behaviour (Cimbora & McIntosh,

2003). Impairments associated with affective empathy have also been reported in individuals with conduct problems and CU traits. More specifically, these individuals show reduced vicarious arousal (measured through heart rate) (Anastassiou-Hadjicharalambous & Warden, 2008b; de Wied et al., 2010; Herpertz et al., 2005) and lower empathy levels in various forms of self-report (Cohen & Strayer, 1996; Lovett & Sheffield, 2007). Likewise, individuals with DBD (see de Wied et al., 2010 for a review) have been found to exhibit lower levels of affective empathy (de Wied et al., 2005), and deficits in facial reactivity to angry expressions (de Wied et al., 2006) and reduced heart rate reactivity in response to sadness (de Wied, Boxtel, Posthumus, Goudena, & Matthys, 2009; de Wied, van Boxtel, Matthys, & Meeus, 2012).

Juvenile psychopaths with high CU traits also show impairments in empathy in response to other's pain coupled with a relative insensitivity to actual physical pain, despite understanding the intentions of the transgressor. Their affective understanding may be key to the levels of aggressive behaviours they display (Cheng, Hung, & Decety, 2012). Further empathy impairments of individuals with psychopathy/ psychopathic tendencies (Blair, Mitchell, & Blair, 2005) include: reduced physiological response to others' distress or sad expressions (Blair, 1999; Blair, Jones, Clark, & Smith, 1997), atypical neural responses to others' pain (Decety, Skelly, & Kiehl, 2013; Lockwood, Sebastian, et al., 2013; Marsh et al., 2013) and reduced affective responses to fearful faces (Seara-Cardoso, Neumann, Roiser, McCrory, & Viding, 2012). Lower self-reported levels of affective empathy have also been reported in this population (Wai & Tiliopoulos, 2012).

3.2.2. Impairments in cognitive empathy

Individuals with CD (Schwenck et al., 2012) and psychopathy (Blair et al., 1996; Dolan & Fullam, 2004; Richell et al., 2003) are commonly thought to have intact cognitive empathy but impaired affective empathy. However, studies have reported mixed results regarding cognitive empathy deficits (Bons et al., 2013; Schwenck et al., 2012) suggesting that further empirical investigation is needed.

Emotion recognition. Several studies have demonstrated that individuals with CD have impaired facial emotion recognition abilities and show specific deficits in the recognition of anger, disgust, fear, sadness, and surprise (Fairchild, Stobbe, van Goozen, Calder, & Goodyer, 2010; Fairchild, Van Goozen, Calder, Stollery, & Goodyer, 2009), suggesting that individuals with CD have specific difficulties with the recognition of negative emotions (Bons et al., 2013). These deficits may be associated with either biased perception of emotions (Cadesky, Mota, & Schachar, 2000) or reduced attention to the eyes (Bons et al., 2013). However, there is division of opinion on this point as others have concluded that there is no evidence of impaired emotion recognition in individuals with CD (Pajer, Leininger, & Gardner, 2010; Schwenck et al., 2012). The time of onset of CD may influence the ability to recognise emotions. Fairchild et al. (2009) found impairments in the recognition of fear only in boys with adolescent onset of CD, whereas childhood onset of CD was associated with deficits in the recognition of anger, disgust, fear and happiness (Cadesky et al., 2000; Collin, Bindra, Raju, Gillberg, & Minnis, 2013; Syngelaki, Fairchild, Moore, Savage, & van Goozen, 2012). Children with psychopathic tendencies have also been found to exhibit deficits in the recognition of sadness and fear (Blair, Colledge, Murray, & Mitchell, 2001; Stevens, Charman, & Blair, 2001). In contrast, emotion recognition has often been found to be intact in

adults with psychopathy (see Blair, 2007), with few studies reporting difficulties in the recognition of disgusted expressions within this population (Blair et al., 2004; Kosson, Suchy, Mayer, & Libby, 2002).

Perspective taking. Although it is known that the ability to take another person's perspective acts as an inhibitor for antisocial behaviours (Anastassiou-Hadjicharalambous & Warden, 2008a), findings regarding perspective taking in CD are still inconsistent. Some studies have observed intact ability for perspective taking (Happé & Frith, 1996), while others have reported diminished perspective taking (Chandler, Greenspan, & Barenboim, 1974; Waterman, Sobesky, Silvern, Aoki, & McCaulay, 1981). According to Anastassiou-Hadjicharalambous and Warden (2008a), impairments in cognitive perspective taking, referred to as the capacity to perceive and understand other people's thoughts in order to take another person's perspective, are specific to children with CD and low CU traits. In contrast, deficits in affective perspective taking, defined as the capacity to infer the emotions generated by these thoughts, may be present in both subgroups of CD (high and low CU). This suggests that individuals with CD and high CU traits may be able to use cognitive perspective taking and implies a possible dissociation between affective and cognitive perspective taking.

3.3. Deficits in affective and cognitive empathy in ASD and disruptive behaviours

Deficits in empathy have been found to underlie both ASD and disorders associated with disruptive behaviours. The research so far highlights that empathy in these disorders should not be viewed simply as a global deficit, but rather considered in light of their difficulties in the subcomponents of empathy, affective and cognitive. Despite the term

‘empathy dysfunction disorders’ is applied to both ASD and disruptive behaviours, these can be discriminated in terms of the subtype of empathy deficit demonstrated (Blair, 2005).

Amongst the most common findings from studies addressing both disorders is the existence of a double dissociation between affective and cognitive empathy (Dziobek et al., 2008; Shamay-Tsoory, Aharon-Peretz, & Perry, 2009). While ASD are consistently reported with problems in cognitive empathy, affective empathy has been inconsistently reported as relatively intact (Dziobek et al., 2008; Hirvelä & Helkama, 2011) or selectively impaired (Mathersul et al., 2013b; Rogers et al., 2007; Shamay-Tsoory et al., 2002). Individuals with CD show a contrasting pattern. For example, Schwenck et al. (2012) found that boys with ASD exhibit deficits in cognitive empathy and display good affective empathy abilities, whereas children with CD and high CU traits have impaired affective empathy but intact cognitive empathetic abilities. Three tasks were administered for this study: an animated-shapes-task to assess emotional perspective taking; the morphing task to measure the capacity to recognise emotions with neutral and emotional facial expressions from the Karolinska directed emotional faces set, and the video sequences task to assess both cognitive and affective empathy by visualising nine film-clips with people in different emotional situations. In the third task, children were asked to identify the emotions observed in the videos and describe protagonist’s feelings by taking his/her perspective. They were also asked to report their level of emotional affection. Results revealed that boys with ASD showed impairments in their ability to take another person’s perspective in both the animated-shapes task and the video sequences task, whereas children with CD did not display any difficulty for emotion recognition nor for basic perspective taking tasks. While individuals with CD and high CU were less moved by the emotional situation of another person when watching the scenes of the

video sequences task, children with ASD reported to be more emotionally affected by the video scenes compared to children with CD.

Bons et al. (2013) found in their review that juveniles with CD and high CU traits might show lack of normal emotionality (impairments in affective empathy), with these deficits being more noticeable in relationship to sad and fearful emotional expressions. Individuals with CD were also found to show reduced facial mimicry and clear impairments in emotion recognition associated with negative emotions that seem to be particularly predictive of a comorbid presence of high CU traits. According to this review, even though results regarding emotion recognition abilities in individuals with ASD are somewhat inconsistent, this ability seems to be impaired for all basic emotions (deficits in cognitive components of empathy), especially when individuals are tested through tasks with complex or low intensity emotions, which might elicit more subtle deficits in emotion recognition.

These outcomes are also consistent with the empathy imbalance theory proposed by Smith (Smith, 2006, 2009b). Smith suggests that the capacity to empathize in disorders such as autism or antisocial personality disorder/psychopathy (adulthood disorders closely related to CD) can be separated in two different systems: emotional (defined as the vicarious sharing of emotion consistent with basic contagion concepts) and cognitive (described as mental perspective taking). In addition, Hansman-Wijnands and Hummelen (2006) propose that autism involves a cognitive deficit represented by an inability to take another's perspective whereas psychopathy implicates more an emotional impairment related to insensitivity, manipulation and exploitation of others. Similarly, Robbins and Jack (2006) suggest that while psychopathy is mainly characterised by lack of concern for the suffering of others,

which may be related to particular impairments in their affective empathetic responses to others (“hot” or “instinctive” empathy), individuals with autism show the opposite profile. These exhibit poor abilities in mentalising and deficits in their cognitive empathetic responses (“cold” or “intentional” empathy). Based on this evidence, Smith proposes that individuals with ASD show low cognitive empathy, making the social world unpredictable and confusing. Smith also suggests that even though an insensitivity to affective components is clear, individuals with antisocial personality disorder show intact cognitive empathy abilities (Smith, 2006, 2009b), a suggestion supported by Blair (2005). Further verification for the dissociation of the two empathy subcomponents has been found through recent studies such as Jones, Happé, Gilbert, Burnett, and Viding (2010), who provided for first time evidence demonstrating such association in boys with psychopathic tendencies and those with ASD. The authors found that boys with psychopathic tendencies show deficits in areas associated with affective empathy, including a reduced concern about the consequences of aggressive behaviours towards others. Furthermore, boys with psychopathic tendencies seem to attribute considerably less fear to themselves, although no deficits in their perspective taking were found. In contrast, individuals with ASD show deficits in perspective taking but not in affective components of empathy.

Several social aspects such as prosocial and aggressive behaviours have been frequently associated with empathy (Batanova & Loukas, 2012), deeming empathy as a potential inhibitor of aggression (Stanger, Kavussanu, & Ring, 2012). Early evidence has found hostile attribution biases regarding their interpretation of other people's actions in aggressive children (Dodge, 1980) and a poor understanding of the emotional consequences of transgressions (Arsenio & Fleiss, 1996), suggesting that the delay in understanding

emotional consequences of social and moral transgressions may contribute to the violation of social rules and norms. The significance of empathy to the study of social interaction is therefore closely associated with aggressive behaviour and social transgression. Importantly, an association between criminal behaviour and substance abuse disorders has often been identified in the literature (Mumola & Karberg, 2006; Ruiz, Douglas, Edens, Nikolova, & Lilienfeld, 2012), suggesting the former as a risk factor for the latter (Chassin, Ritter, Trim, & King, 2003; Menard, Mihalic, & Huizinga, 2001). The opposite association has also been reported, with alcohol and drug intoxication being considered as predisposing factors to criminal behaviour (Boles & Miotti, 2003; Lundholm, Haggård, Möller, Hallqvist, & Thiblin, 2013). Taking into account this association and the importance that deficits in empathy have in understanding the social functioning of individuals with Substance Abuse Disorders (Preller et al., 2013), this is considered as a clinical population of interest in the present thesis. Although research on empathy is still limited within this population, deficits have been identified in both cognitive and affective empathy and two related areas: recognition of emotional face expressions (EFEs) and emotion regulation.

3.4. Substance Abuse Disorders

Substance abuse is generally understood as an intentional and inappropriate use of legal (alcohol) and/or illegal substances (drugs) (Smith et al., 2013). It has been found to impact negatively on both one's physical and psychological well-being, and to constitute a significant health concern due to the highly addictive nature of these illicit substances (Brick, 2012; Degenhardt & Hall, 2012). For example, persistent use of illicit substances has been shown to cause long-lasting changes in the brain, which can in turn contribute to the development of addiction (Nestler, 2005; Volkow & Li, 2004).

3.4.1. Impairments in cognitive and affective empathy

Evidence on empathy impairments in substances abusers is still lacking. To our knowledge, only six studies have investigated empathy in drug abusers. The earliest studies show inconsistent results despite the similarities in their methodology (i.e., in both studies participants were recruited from self-help groups and both administered the same self-report questionnaire to measure empathy). While the first showed a positive association between empathy and abstinence (McCown, 1989), the second failed to find this correlation (McCown, 1990). More recent studies report reduced levels of affective empathy and intact abilities for cognitive empathy in polysubstance abusers (Ferrari, Smeraldi, Bottero, & Politi, 2014) and cocaine users (Preller et al., 2013) compared to controls. While those who use cocaine recreationally and those with cocaine dependence both had intact skills for emotion recognition, more errors were found for dependent-cocaine users in perspective taking, with increased errors being associated with increased cocaine intake. These errors when making inferences about others' emotions, thoughts and intentions, could be explained by difficulties in the integration of social information, difficulties in processing emotional feedback in complex scenarios, and reduced sensitivity to social rewards often attributed to substance abusers (Preller et al., 2013; Volkow, Baler, & Goldstein, 2011). Notably, these studies failed to determine the impact of abstinence duration on empathy.

More recently, Hysek et al. (2013) investigated the effects of MDMA (i.e., ecstasy) in healthy subjects treated with only one dose of this substance, and found that MDMA negatively affects recognition of EFEs of fear, anger and disgust, but increases affective empathy and prosocial behaviour. Although these results seem to contradict the association between substance abuse and reduced affective empathy, they should be interpreted with

caution. Evidence has previously shown that MDMA has atypical effects on emotion, including an increase in prosocial feelings such as friendliness, sociability and love, that seem to be specific to MDMA rather than common to various types of drugs of abuse (Bedi, Hyman, & de Wit, 2010; Dumont et al., 2009). In addition, in the current study empathy was measured using the Multifaceted Empathy Test (MET) (Dziobek et al., 2008). To assess affective empathy, participants were asked to rate how much they were feeling for the individual in each scene and how much they were aroused by each scene using a 9-points scale. This suggests that results could have reflected an inaccurate report of what participants thought they were feeling, rather than an actual increase in participants' empathy levels.

In the context of alcohol dependence and abuse, studies have reported mixed results. Martinotti, Nicola, Tedeschi, Cundari, and Janiri (2009) found lower levels of self-reported empathic processing in alcohol-dependent patients when compared to healthy control subjects. However, empathy levels before dependency were not known, leaving the question whether reduced levels of empathy may be considered a pre-morbid feature or consequence of alcohol dependence. In a later study, Maurage, Grynberg, Noël, Joassin, Philippot, et al. (2011) found lower levels of self-reported affective empathy in patients with a diagnosis of alcohol dependence when compared to controls, although no group differences were observed for cognitive empathy. Importantly, lower levels of affective empathy have been associated with the severity of self-reported interpersonal problems, supporting the idea that individuals with lower levels of affective empathy may be more prone to use alcohol as a coping strategy due to a more frequent experience of social problems (Thoma, Friedmann, & Suchan, 2013).

In a more comprehensive study, Dethier and Blairy (2012) investigated both cognitive and affective aspects of empathy in individuals with alcohol dependence and reported deficits in two performance based facets of empathy. Participants were classified in two groups: those with an earlier-onset (which appears before 25 years of age and is associated with a high familial risk of alcoholism) and those with a late-onset (which appears after 25 years of age and considered to be affected by environmental factors). The first facet, attribution of intentions from EFEs in social situations (e.g., aggressiveness, rejection, dominance, and affiliation), was understood as cognitive empathy, whereas the second facet, emotional contagion based on EFEs exhibited by other people, referred to affective empathy. Alcohol abusers with a late-onset attributed more intentions of rejection and less intentions of affiliation compared to controls, suggesting impaired cognitive empathy, whereas those with an earlier-onset showed stronger mimicry for angry expressions and more schemas of social isolation and instability, suggesting impaired affective empathy. However, these results should be interpreted with caution due to the measures used to assess empathy. Affective empathy was only assessed as emotional contagion while cognitive empathy was only assessed as attribution of intentions, thereby ignoring further aspects of both components, such as the affective response to others' feelings (as a second form of affective empathy) or the attribution of others' attitudes, feelings and beliefs (as another aspect of cognitive empathy).

Contrary to the previous studies, Thoma, Winter, Juckel, and Roser (2013) reported intact self-reported levels of cognitive and affective empathy in individuals with alcohol dependence. However, empathy task based performance was impaired relative to controls, consistent with earlier findings. Overall, findings in both substance and alcohol abusers show

inconsistencies. While some studies reported reduced levels of affective empathy and intact abilities for cognitive empathy in cocaine users and polysubstance abusers (Ferrari et al., 2014), evidence has also shown more errors in perspective taking ability of cocaine-dependent individuals (Preller et al., 2013). Evidence in alcohol abusers also shows discrepancies, with some studies reporting intact self-reported levels of both cognitive and affective empathy (Thoma, Winter, et al., 2013), and others showing lower levels of self-reported affective empathy but no difficulties in cognitive empathy (Maurage, Grynberg, Noël, Joassin, Philippot, et al., 2011). Of interest is evidence showing impairments in empathy using task based performance (Thoma, Winter, et al., 2013), as it suggests that inconsistencies across studies may be more related to the type of measures used to assess empathy rather than an actual lack of empathy deficits. In fact, the lack of difficulties found in the cognitive component of empathy using self-report measures (Ferrari et al., 2014; Maurage, Grynberg, Noël, Joassin, Philippot, et al., 2011; Thoma, Winter, et al., 2013) could be related to difficulties of substance abusers to perceive their own deficits in this domain.

3.4.2. Impairments in the recognition of emotional face expressions

It has been suggested in the literature that difficulties in the recognition of EFEs to be particularly important for substance use initiation (Ernst et al., 2010) and a potential contributor to the communication and social problems observed in substance abusers (Kornreich et al., 2002). In support of how widespread these deficits appear to be in this population, a recent meta-analysis by Castellano et al. (2015) found large deficits in emotion perception for individuals with drug and alcohol use disorders.

Chronic heavy cannabis users have been found to report low accuracy and sensitivity in the recognition of basic EFEs (Hindocha et al., 2014), and a slow reaction in the identification of emerging expressions of happiness, sadness and anger (Platt, Kamboj, Morgan, & Curran, 2010). Both regular recreational cocaine users and methamphetamine abusers also exhibit significantly less accuracy in the recognition of emotions (Henry, Mazur, & Rendell, 2009), especially fearful face expressions, compared to healthy subjects and occasional users of cocaine (in the case of cocaine users) (Kemmis, Hall, Kingston, & Morgan, 2007; Kim, Kwon, & Chang, 2011; Morgan & Marshall, 2013). Difficulties in the accurate recognition of happiness, anger, sadness and surprise are also present in opiate-dependent patients under methadone maintenance treatment and detoxified opiate-dependent individuals (Kornreich et al., 2003).

All the studies reviewed have shown problems in the identification of negative emotions, although these difficulties are not limited to the recognition of emotions with negative valence. Some of this evidence has also found deficits in the recognition of positive emotions, such as happiness, thereby contradicting to some extent the idea of happiness being a less ambiguous emotion and more distinguishable from neutral faces than other negative expressions, such as sadness (Adolphs & Tranel, 2004; Kuypers, Steenbergen, Theunissen, Toennes, & Ramaekers, 2015). Importantly, research has also shown that these difficulties in emotion recognition accuracy are still present in cannabis-dependent individuals (Bayrakçı et al., 2015), ecstasy users (Hoshi, Bisla, & Curran, 2004), and opiate-dependent patients (Kornreich et al., 2003) after period of sustained abstinence, which varies across studies. Evidence shows that abstinence helps improve speed of processing of emotional stimuli, which is especially important considering that the speed in recognizing other people's

emotional expressions allows a quick adjustment of behavior and facilitates successful interpersonal communication (Martin et al., 2006).

Evidence on EFE recognition in alcoholism is less consistent (see D'Hondt, Campanella, Kornreich, Philippot, & Maurage, 2014; Donadon & de Lima Osório, 2014), with some studies revealing a clear deficit and others failing to identify differences between alcoholics and controls (Dethier, El Hawa, Duchateau, & Blairy, 2014). Whilst there is a suggestion from some studies that alcoholism leads to a deficit towards negative emotions (Frigerio, Burt, Montagne, Murray, & Perrett, 2002; Kornreich et al., 2001; Philippot et al., 1999; Townshend & Duka, 2003), others have considered this deficit to extend to more complex and positive emotions (i.e., thoughtfulness, flirtation, confidence) (Maurage, Grynberg, Noël, Joassin, Hanak, et al., 2011). These inconsistencies could be explained by the fact that EFE recognition deficit may not be directly caused by a failure in emotion processing or emotion labelling, but rather be consequence of perceptual difficulties or an impaired auditory-visual integration of complex social stimuli (i.e., faces and voices) (Maurage, Campanella, Philippot, Pham, & Joassin, 2007; Maurage et al., 2013; Maurage et al., 2008).

Importantly, evidence has shown a tendency for alcoholics and recovering alcoholics to rate facial expressions as being more intense compared to control subjects. Oscar-Berman, Hancock, Mildworf, Hutmacher, and Weber (1990) found that Korsakoff and non-Korsakoff alcoholics overestimated the intensity conveyed by full-blown facial expressions. This finding was confirmed by Philippot et al. (1999), who then extended it to EFEs of moderate and weak intensity as well as to neutral faces, and by Townshend and Duka (2003), who also found enhanced intensity for fear responses. While the tendency to overestimate emotions seems to

diminish with sustained abstinence (Kornreich et al., 2001; Kumar, Khess, & Singh, 2011), deficits in EFE recognition (i.e., poor accuracy) are thought to persist after mid-term and long-term abstinence (3 months to 9 years) (Foisy et al., 2007; Kornreich et al., 2001).

3.4.3. Impairments in emotion regulation

Another aspect that is considered essential for interpersonal functioning is the ability to regulate emotions (also referred to as emotional control or affect regulation in the literature). This is defined as an emotional process that influences which emotions we have, when we have them, and how we experience and express them (Gross, 1998), and involves psychological strategies such as expressive suppression or cognitive reappraisal to decrease, maintain or increase emotions (Gross, 2002). Emotion regulation has a significant impact on both the expression of positive and negative emotions, and is related to socially appropriate behaviour and adjustment (Christensen & Aldao, 2015; Eisenberg, Fabes, Guthrie, & Reiser, 2002; Gross, 2013) and empathy (Eisenberg et al., 1996; Murphy et al., 1999). Individuals who cannot effectively regulate their emotional responses tend to experience longer and more severe periods of distress. These are often associated with mental health problems (Tull & Aldao, 2015) and risky behaviours (Weiss, Sullivan, & Tull, 2015), such as drug and/or alcohol abuse. Indeed, it has been suggested that individuals may use illicit substances either for enhancing emotional states such as euphoria (Cooper, Frone, Russell, & Mudar, 1995), or as an attempt to cope with, escape from or down-regulate negative emotions (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004). Difficulties in this ability are therefore considered a risk factor for substance use (Berking & Wupperman, 2012; Sher & Grekin, 2007; Weiss et al., 2015). Evidence also suggests that this susceptibility to drug reinforcement and substance abuse could be associated with personality dimensions, such as anxiety sensitivity,

depression, impulsivity and sensation seeking (Sher, Bartholow, & Wood, 2000). In fact, personality factors have been shown to differentiate substance abusers based on clinical profile that includes age of onset of substance use disorder and pattern of substance use, among other variables (Cloninger, 1987; Woicik, Stewart, Pihl, & Conrod, 2009).

During early abstinence, cocaine-dependent individuals show difficulties in emotional awareness and inhibition of inappropriate or impulsive behaviours under stressful situations (components of emotion regulation) compared to healthy subjects (Fox, Axelrod, Paliwal, Sleeper, & Sinha, 2007), with difficulties in emotion regulation being associated with increased self-reported problems in impulse control and perceived stress (Fox, Bergquist, Casey, Hong, & Sinha, 2011). Further evidence suggests that the strategies used to regulate emotions vary across drug abusers. While methamphetamine-dependent individuals regulate the impact of their emotions by cognitively reappraising them, opioid-dependent individuals tend to suppress them. The suppression of one's own emotions is also common in individuals with depression, which corresponds with the comorbid depressive symptoms often seen in opioids users (Mohajerin, Dolatshahi, Shahbaz, & Farhoudian, 2013). Furthermore, recent findings provide support for the association between emotion regulation difficulties and substance misuse (Buckholdt et al., 2015) and reveal that in individuals with substance use disorders there is a limited access to emotion regulation strategies, especially when these experience negative emotions. It is suggested that such relationship is mediated by the use of maladaptive strategies, e.g., denial or suppression (Di Pierro, Benzi, & Madeddu, 2015).

In the early stages of abstinence alcohol-dependent individuals also exhibit difficulties in emotion regulation when compared to social drinkers (Fox, Hong, & Sinha, 2008), and a

higher use of response modulation (often described as a maladaptive emotion regulation strategy) and a lower use of cognitive change than controls (Petit et al., 2015). While the former emotion regulation strategy is positively associated with the level of craving, the latter is positively related to rehabilitation duration. In alcohol dependents individuals, less adaptive emotion regulation strategies are related to high levels of self-discrepancies and distress, which are in turn associated with higher levels of alcohol consumption (Poncin, Dethier, Philippot, Vermeulen, & de Timary, 2015). Berking et al. (2011) further investigated these difficulties and found that lower levels of emotion regulation in alcohol abusers before engaging in treatment predicted alcohol use during treatment, while lower levels of emotion regulation after treatment predicted alcohol use during the three following months.

Importantly, only few of these studies compare levels of emotion regulation across different stages of early abstinence in an attempt to determine whether improvements occur with sustained abstinence. In particular, Fox et al. (2007, 2008) studied levels of emotion regulation of both cocaine-dependent and alcohol-dependent individuals during their first week of abstinence and after a longer period of abstinence (i.e., 3 to 5 weeks), and found that both show improvements in this ability over time.

4. Thesis structure

This thesis will investigate cognitive and affective components of empathy and its association with emotional variables in typical and atypical populations, and will discuss the impact of these emotional variables on social behaviour. In addition, it will explore the effect of culture on empathy in its association with emotional and behavioural features. Finally, it will contribute to the existing literature by (1) a translating and validating a questionnaire of

empathy to the Spanish language, and (2) developing an adapted version of a behavioural task to measure empathic accuracy. The thesis reports on data from five studies using either self-report questionnaires or behavioural measures to investigate (1) empathy, (2) emotional performance, focused on emotion regulation and emotional expressivity, (3) social behaviour, and in particular aggressiveness and antisocial traits, and (4) social perception (i.e., emotion recognition and Theory of Mind), within typical and atypical populations. In addition to the introductory chapter (chapter 1), which reviews the construct of empathy, its functioning in atypical populations and its association with emotional and social variables, the thesis contains five empirical chapters and a final discussion chapter (chapter 7).

The first empirical chapter, chapter 2, will include a comparative study between British and Spanish cultures investigating the direct and indirect relationships between empathy and indirect aggression (understood as a negative social behaviour) through emotional variables (i.e., emotional expressivity and emotion regulation), while studying the contribution of culture to empathy in typically developing individuals. This chapter also presents the translation and validation of a self-report questionnaire assessing cognitive and affective components of empathy to the Spanish language, which will be used as a main measure in the next chapter. Chapter 3 will investigate empathy, emotion regulation, emotional expressivity, and social support in Spanish male adults with substance abuse problems and criminal behaviour. The contribution of emotional variables to criminal recidivism (i.e., a negative social behaviour) and substance abuse severity will be examined.

Chapters 4 and 6 will study empathy in a clinical population of adolescents with ASD. Chapter 4 will focus on the study of emotion recognition, ToM, perspective taking and self-

reported empathy, and will investigate the contribution of these variables to each other. In this chapter, several measures will be used, including an ecologically valid measure to assess emotion recognition and ToM (i.e., the Awareness of Social Inference), an experimental task assessing perspective taking, and a self-report questionnaire measuring cognitive and affective empathy, to compare a group of adolescents with ASD with a matched control group. In chapter 5, the thesis will present the development of a behavioural measure of empathy, known as empathic accuracy task. Using this empathy task, this chapter will also examined the effect of participants' characteristics (i.e., gender, self-reported levels of empathy, emotional expressivity, and emotion regulation) on behavioural levels of empathy in typically developing young adults. These results will allow extending the study of empathy in the following chapters, through the combination of self-report questionnaires with this behavioural task, while extending results from previous chapters on the association between empathy and social behaviour.

Chapter 6 will further investigate behavioural and self-reported levels of empathy in a larger sample of adolescents with ASD. Empathic abilities of adolescents with ASD will be compared with those abilities from adolescents with behavioural difficulties. The results from all studies will be discussed in chapter 7.

CHAPTER II

**EMPATHY AND SOCIO-EMOTIONAL FUNCTIONING:
A CROSS-CULTURAL COMPARISON BETWEEN BRITISH AND SPANISH
ADOLESCENTS AND YOUNG ADULTS**

Abstract

The processing of emotions, which is essential for interpersonal relationships, varies among individuals and across cultures, thereby becoming a significant contributor to intercultural adjustment. The purpose of the study was to establish cross-cultural comparisons in empathy, emotional expressivity, emotion regulation, and indirect aggression in a sample of 645 adolescents and young adults from United Kingdom and Spain. The differences between British and Spanish individuals were further investigated by studying the effects of cognitive and affective empathy on aggression, and the role of emotion regulation and emotional expressivity in such association. Results revealed that empathy and aggression were not significantly different between British and Spanish participants. However, Spanish individuals reported increased emotional expressivity compared to British individuals, who in contrast described regulating their emotions more. Results also demonstrated that affective empathy had an indirect effect on aggression through expressive suppression and negative expressivity in British individuals. In Spanish individuals, both cognitive and affective empathy had an indirect effect on aggression through expressive suppression. Understanding the emotional strategies used by each culture will facilitate social interactions and adjustment between these individuals, which becomes crucial in emerging multicultural societies.

Keywords: empathy, emotional expressivity, emotion regulation, indirect aggression, interpersonal relationships, cross-cultural differences

Introduction

The processing of emotions requires flexibility and adaptability to the explicit circumstances in which they take place, thereby varying not only among individuals but also across cultural contexts (Butler et al., 2007; Frijda & Mesquita, 1994; Mesquita & Albert, 2007). Indeed, previous studies have demonstrated cultural differences in the experience and expression of emotions (Fernández et al., 2000), suggesting that cultural contexts and shared values can play a significant role in people's emotional experience (Basabe et al., 2000).

Cross-cultural research has identified four meaningful dimensions of cultural variability that can be used to predict and explain cultural differences in emotion and behaviour (Hofstede, 1984, 1991, 2001). Among these dimensions, individualism-collectivism has been the most widely studied. Individualistic cultures are characterised by the tendency to place one's own needs above the needs of one's in-group, thereby focusing on an individual's needs, interests and desires (or those of their immediate family) with "ego-focused" emotions (anger, frustration or pride) (Hofstede et al., 1997). In contrast, collectivistic cultures tend to place the needs of one's in-group above one's own needs and stress values such as conformity, obedience (loyalty) and harmony, with people becoming integrated into strong and cohesive in-groups (Hofstede, 1984). Although early research has shown that the perception and expression of emotions is more intense in individualistic than collectivistic cultures (Markus & Kitayama, 1991; Matsumoto, 1991; Wallbott, Matsumoto, & Tsutomu, 1988), a later cross-cultural comparison between American and European countries demonstrated that the masculinity-femininity dimension was more relevant than individualism-collectivism to explain the cultural differences in emotional experience (Paez & Vergara, 1995). This, the masculinity-femininity dimension was related to the division of

emotional roles between women and men (Hofstede, 2011). Dominant values in feminine societies include caring for others, significance of warm relationships, and acceptance of emotional expressions (e.g., crying) in both males and females. In masculine societies independence, competition and material success are more prominent (Hofstede et al., 1997). Individuals from feminine countries (e.g., Spain and Chile) tend to express their emotions more strongly than individuals from more masculine countries (e.g., Belgium and Mexico) (Fernández et al., 2000; Fernández & Vergara, 1998; Paez & Vergara, 1995), and to show greater subjective well-being of emotional experiences (Arrindell et al., 1997).

It is widely accepted that cultural norms and values influence how, when, and to whom, people express emotions, which emotional responses are sanctioned or encouraged, and under what conditions (Butler et al., 2007; Safdar et al., 2009). Two aspects of the processing of emotions seem particularly relevant in cross-cultural research. Emotional expressivity, which refers to the observable behavioural responses associated with the experience of emotions (e.g., smiling) (Gross & John, 1995), and emotion regulation, which is defined as the processes by which individuals influence the characteristics of their emotions (Gross, 1998). Although research has shown that the value placed on emotions and the norms guiding their expression differ across cultures (Davis et al., 2012; Mesquita & Albert, 2007), the extent of this variability still remains unclear.

According to Hofstede (1984); 1991, 2001), individualistic values are positively associated with emotional expressivity (Matsumoto, Yoo, & Fontaine, 2008; Van Hemert, Poortinga, & van de Vijver, 2007), whereas collectivistic values are related to lower frequency and intensity of emotional expressions (especially unpleasant emotions) and a

greater predisposition to “other-focused” emotions (e.g., sympathy or shame) (Duan et al., 2008; Hofstede, 1984; Matsumoto, 2006). This could be attributed to the consideration of emotions as dangerous, irrelevant, or illness causing (Eid & Diener, 2001), or to the necessity to control emotional expressions in order to ensure the maintenance of social harmony (Oyserman, Coon, & Kemmelmeier, 2002). Increased emotional expressivity has also been found in femininity-oriented cultures (Fernández et al., 2000; Paez & Vergara, 1995), whereas cultural masculinity has been associated with unpleasantness of emotional experience (see meta-analysis by Basabe et al., 2000). Cross-cultural differences also appear in emotion regulation, with members of collectivistic cultures suppressing the expression of emotions more (Butler et al., 2007; Matsumoto, Yoo, & Nakagawa, 2008) and reporting to use emotion regulation more frequently than members of individualistic cultures, in an attempt to preserve social harmony (for a review see Ford & Mauss, 2015). Although it has been suggested that cultures with individualistic values may be prone to using cognitive reappraisal (i.e., antecedent-focused strategy that involves the reformulation of the meaning of a situation) rather than expressive suppression (i.e., response-focused strategy that involves the inhibition of behaviours associated with emotional responding) (Goldin, McRae, Ramel, & Gross, 2008), evidence is still minimal (Matsumoto, Yoo, & Nakagawa, 2008).

The impact that emotion has on abilities that contribute to interpersonal success is also considered especially significant in cross-cultural research. This includes, for example, empathy, which has been defined as the ability to build a working model of others’ emotional states (cognitive empathy) while being sensitive to and vicariously experience others’ feelings (affective empathy) (Reniers et al., 2011). Research on interpersonal functioning reveals that an increased ability to experience and express positive and negative emotions is related to

higher levels of empathy (both cognitive and affective), and suggests that positive emotions (e.g., happiness, surprise) may facilitate cooperative and social interactions, whereas negative emotions (e.g., concern, sadness) may motivate sharing, comforting and helping (Roberts & Strayer, 1996). Likewise, higher levels of emotion regulation have been associated with affective components of empathy (Eisenberg et al., 1996; Murphy et al., 1999). Indeed, empathy is considered a key aspect of intercultural adjustment as it enhances understanding and decreases conflicts between people from different cultures (Rasoal et al., 2011; Wang et al., 2003).

Although dimensions of cultural variability have been previously used to explain cross-cultural differences in empathy, results are mixed. Some studies have revealed a positive relationship between both cognitive and affective empathy, measured as perspective taking and empathic concern respectively on the Interpersonal Reactivity Index (IRI: Davis, 1980) and using items designed by Nelson and Baumgart (2004), and collectivism but not individualism (Duan et al., 2008; Heinke & Louis, 2009). This indicates that cultures with higher levels of collectivist values exhibit higher levels of both cognitive and affective empathy than cultures with lower levels of collectivism. Others have reported a negative association between individualistic values and empathic processing (Declerck & Bogaert, 2008), as measured on the Empathy Quotient (EQ: Baron-Cohen & Wheelwright, 2004).

Furthermore, emotional responses have been suggested to be shaped by social contexts (Gross, 1998), and considered indispensable for guiding interpersonal relationships (Butler et al., 2007; Frijda & Mesquita, 1994). Since emotions motivate people to engage in behaviour (Matsumoto, Yoo, & LeRoux, 2007), cultural variations in emotion may suggest that culture

also has a significant effect on shaping social behaviour. In fact, research has shown that cultures characterised by collectivistic values, high moral discipline, high level of egalitarianism, low uncertainty avoidance, and predisposition to social order, exhibit, in general, lower levels of aggression (Bergeron & Schneider, 2005). In contrast, there is evidence suggesting a certain universality of norms and beliefs on aggression across cultures, such as disapproval of drastic forms of aggressive behaviour and acceptance of aggressive responses induced by gross provocation (Ramírez, 1993), that underlines aggression as a common feature of human social relationships.

To date, cross-cultural research on emotion regulation, emotional expressivity, and empathy is limited, with the vast majority of studies focussing on Asian and American cultures, and little research addressing cross-cultural differences in emotional functioning across European countries. Furthermore, the cultural features common to Asian cultures but independent of individualism-collectivism could underlie the differences found in emotion. Therefore, the present study firstly aimed to establish cross-cultural comparisons using two Western European countries with distinct culture and heritage that have attracted so far little comparative research: United Kingdom (UK) and Spain.

Following the Hofstede (1984); 1991, 2001) framework, in which British respondents score higher in individualism than their Spanish equivalents; British culture was defined as more individualistic, while the Spanish culture was conceptualised as more collectivistic. It is however important to note that Spanish culture integrates aspects of both individualist and collectivistic values, sharing features with both individualistic and collectivist traditional societies. For example, Spain is considered similar to individualist cultures in terms of its

affective autonomy (e.g., valuing novelty, creativity and excitement) (Schwartz, 1994a, 1994b), but also similar to collectivist cultures considering its emphasis on interpersonal harmony and pleasantness (Smith, Dugan, Peterson, & Leung, 1998). In view of the complexities relating to individualism-collectivism values, the previously observed differences in feminine and masculine values between British and Spanish cultures becomes especially significant in the study of emotional functioning across these two cultures. Since masculinity has been found to be moderately high in Anglo countries and moderately low in some Latin countries like Spain, (Hofstede, Hofstede, & Minkov, 2010; Hofstede & McCrae, 2004); the British culture was conceptualised as more masculine-orientated and the Spanish culture was defined as more feminine-orientated.

The use of these two groups (i.e. UK and Spain) with different levels of individualism-collectivism values, and most importantly femininity-masculinity values, allows the testing of specific hypotheses about the role played by culture in emotional expressivity, emotion regulation, empathy, and interpersonal functioning. For the present study, indirect aggression, defined as the intentional behaviour of harming others in covert ways (Björkqvist, Österman, & Kaukiainen, 1992), was used as a measure of interpersonal functioning. Considering the target population (i.e., typically developing adolescents and young adults), this was selected for two main reasons. First, because the ability to use indirect aggression usually increases during late childhood and early adolescence along with increased social maturation and complexity in social intelligence (Björkqvist et al., 1992; Card, Stucky, Sawalani, & Little, 2008) and second, because it is generally considered to be a more adaptive strategy than direct confrontation (Archer & Coyne, 2005).

First, we predicted that Spanish individuals would have higher levels of emotional expressivity than British individuals (hypothesis 1) considering that femininity values (more prominent in Spain) are associated with stronger expression of emotions (Fernández et al., 2000; Paez & Vergara, 1995). Furthermore, both UK and Spain differ in their attitude towards the open expression of emotions (Gordon, 1989), with Spain being considered as an impulsive-oriented country (Quinones et al., 2016), which also support this hypothesis. Consequently, Spanish participants were expected to suppress their emotions less, thereby exhibiting lower levels of expressive suppression than British individuals do (hypothesis 2). Spanish individuals were also expected to have higher levels of both cognitive and affective empathy than British individuals (hypothesis 3) seeing that both cognitive and affective empathy are higher in collectivistic (i.e., Spain) than individualistic cultures (i.e., UK) (Duan et al., 2008; Heine & Louis, 2009).

The second aim of the study was to investigate the direct and indirect effects of cognitive and affective empathy on emotional expressivity, emotion regulation, and indirect aggression in both samples through mediation models. Evidence suggests that difficulties in emotion regulation may elicit over-arousal when seeing another person in distress, thereby increasing the likelihood of being overwhelmed with negative affective states. This may consequently impede the experience of empathy and increase aggressive behaviour (Eisenberg, 2005; Eisenberg & Fabes, 1992; Roberton, Daffern, & Bucks, 2012). This is also consistent with the negative relationship found between empathy and a wide range of aggressive behaviours (for a review see Jolliffe & Farrington, 2004; Lovett & Sheffield, 2007), including indirect aggression (Kaukiainen et al., 1999; Yeo, Ang, Loh, Fu, & Karre, 2011). We first theorised that cognitive empathy would have a direct negative effect on

aggression (hypothesis 4), similar to Yeo et al. (2011), in both British and Spanish samples. Second, considering that emotional expressivity was expected to be more prominent in the Spanish culture, we anticipated that higher levels of cognitive and affective empathy would predict increased emotional expressivity in Spanish individuals. Consequently, lower levels of indirect aggression were expected (hypothesis 5). This is in agreement with the fact that aggressive children express more negative emotions than their less aggressive peers (Eisenberg et al., 1993; Eisenberg et al., 1994) and the positive relation found between empathy (cognitive and affective) and expressivity (Roberts & Strayer, 1996). Finally, we anticipated that higher levels of affective empathy would predict higher levels of emotion regulation in the British culture, since within this culture emotional regulation would have a stronger contribution. As a result, we expected lower levels of indirect aggression (hypothesis 6). This corresponds with the idea that individuals who have difficulties regulating intense negative emotions are more predisposed to aggression during emotionally arousing situations (Eisenberg & Fabes, 1992; Eisenberg et al., 1997) and the positive relationship found between affective empathy and emotion regulation (Eisenberg et al., 1996; Murphy et al., 1999).

Finally, considering the lack of valid and reliable psychometric measures of cognitive and affective empathy, particularly among individuals from different ethnicities and linguistic communities, our last aim was to translate and validate the Spanish version of the Questionnaire of Cognitive and Affective Empathy (QCAE: Reniers et al., 2011). This will provide a valid tool for assessing cognitive and affective empathy in Spanish populations of adolescents and adults. In addition, the translation and validation of this questionnaire will allow us to use it in further investigations, including the present study and the study in chapter 3.

Method

Participants

A total 809 adolescents and young adults aged between 16 and 29 participated in the study. Participants were recruited from secondary schools and universities located in the West Midlands of the UK ($n=285$), and in Madrid, Spain ($n=524$). In the UK, participants were recruited from three secondary schools: one independent (30.2%) and two comprehensive (34.4%), and one university (35.4%). In Spain, participants were recruited from one state-subsidised school (12.4%) and 2 universities, one private (22.9%) and one public (64.7%). In both countries, university students were recruited from various disciplines.

For the purpose of this research, the cultural background of participants was determined by both country of origin and residence. Only participants who reported to be born and living in either the UK or Spain were included in this study. Accordingly, 65 participants who reported to be born in a different country than the UK or Spain were excluded from later analysis. The mean substitution method for missing subscale items was used to deal with missing data. Incomplete data from 21 participants with less than 10% of missing data in any questionnaire's subscale were imputed and included for later analysis. Data from 99 participants with more than 10% of incomplete data in any subscale were excluded.

The final sample consisted of 645 participants aged between 16 and 29 ($M_{age}=19.49$ years, $SD=2.32$), with 63.6% ($n=410$) of this sample being females. The vast majority of participants were white (90.1%, $n=581$), and 35.3% ($n=228$) were born and were currently living in the UK (see Table 2.1 for sample characteristics).

Table 2.1

Sample characteristics for British and Spanish samples

	British participants		Spanish participants	
	Schools	University	School	Universities
Sample size	153	75	51	366
Age in years				
Range	16-19	18-29	16-21	17-28
M (SD)	17.10 (.57)	21.91 (2.18)	17.13 (.86)	20.34 (1.78)
Gender				
Male	48 (31%)	20 (27%)	15 (29%)	152 (41%)
Female	105 (69%)	55 (73%)	36 (71%)	214 (59%)
Ethnicity				
White	106 (69%)	65 (87%)	50 (98%)	360 (98%)
Black-African	---	1 (1%)	---	---
Asian	36 (24%)	3 (4%)	---	1 (0.3%)
Hispanic	---	---	---	4 (1%)
Mixed	11 (7%)	6 (8%)		1 (0.3%)
Did not report	---	---	1 (2%)	---

Note. The group “Black-African” includes Black, African-Caribbean, and African-American ethnicities; the group “Asian” includes Asian-Indian and Asian-Oriental ethnicities.

Materials

Measures of empathy. Cognitive and affective levels of empathy were assessed using two questionnaires, the Questionnaire of Cognitive and Affective Empathy (QCAE; Reniers et al., 2011) and the Basic Empathy Scale (BES; Jolliffe & Farrington, 2006). The QCAE is a questionnaire with 31-items rated on a scale of 1 (*strongly disagree*) to 4 (*strongly agree*) that assesses self-reported levels of cognitive and affective empathy. The first refers to the ability to build a working model of others’ emotions whereas the second involves being sensitive to and vicariously experiencing others’ feelings. This questionnaire has demonstrated to have a

clear factor structure, good reliability (with Cronbach's α coefficients ranging from .65 to .85 for its five subscales) and verified convergent and construct validity (Reniers et al., 2011). The BES is a self-report questionnaire with 20 items rated on a 5-point-likert scale (ranging from *strongly disagree* to *strongly agree*) that also assesses cognitive and affective levels of empathic responsiveness. The first component is defined as the understanding of others' emotions whereas the second refers to emotional congruence with others' emotions (Jolliffe & Farrington, 2006). The BES has shown sufficient construct validity and high internal validity, with Cronbach's α coefficient of .79 for its cognitive scale and .85 for its affective scale. This questionnaire was used to examine the convergent validity of the QCAE-Spanish version.

Measures of emotion. The Berkeley Expressivity Questionnaire (BEQ; Gross & John, 1997) is a self-report questionnaire with 16 items rated on a 7-point-likert scale (ranging from *strongly disagree* to *strongly agree*). It assesses three aspects of emotional expressivity: negative and positive expression of emotions, and impulse strength. Negative expressivity refers to the expression of emotions such as anger, fear, nervousness, and upset, while positive expressivity includes, for example, warmth and friendliness. Impulse strength refers to the difficulty to control strong emotional impulses (Gross et al., 1997; Gross & John, 1995). The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) is a self-report questionnaire with 10 items rated on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) that assesses the tendency to regulate emotions by means of two strategies. The first, cognitive reappraisal, refers to the ability to reduce the emotional impact of a situation by changing the way we interpret it (Gross, 2002). The second, expressive suppression, is defined as the intentional inhibition of our emotional expressive behaviour when observing emotional stimuli (Gross & Levenson, 1993). These questionnaires have a clear factor structure, show

good internal consistency and satisfactory test-retest reliability, with Cronbach's α coefficients of .73 for expressive suppression, .79 for cognitive reappraisal, and between .71 and .76 for the three subscales of the BEQ (Gross & John, 1997, 2003).

Measures of aggression. The Indirect Aggression Scale-Aggressor version (IAS-A; Forrest, Eatough, & Shevlin, 2005) is a 25-item questionnaire rated on a scale of 1 (*never*) to 5 (*regularly*) that includes three subscales: social exclusionary that refers to sophisticated behaviours to socially exclude the victim; malicious humour that involves the use of humour to harm the victim by means of sarcasm, embarrassment or direct verbal aggressions; and guilt induction that refers to the intentional induction of guilt using emotional blackmail, undue pressure, and coercion. The psychometric analysis of this relatively novel measure has demonstrated satisfactory reliability and validity (Cronbach's α coefficients ranging from .81 to .84 for its three subscales).

Spanish version of the questionnaires. In Spain, all participants completed Spanish versions of the BEQ (translated by Moreno & Jorge, 2006), ERQ (translated by Rodríguez-Carvajal, Moreno-Jiménez, & Garrosa, 2006) and IAS-A (translated by Anguiano-Carrasco & Vigil-Colet, 2011). These have shown satisfactory psychometric properties in the present study, with Cronbach's α coefficients of .80 for cognitive reappraisal and .78 for expressive suppression, and Cronbach's α coefficients of .85 and .91 for the BEQ and IAS-A, respectively. Participants also completed the Spanish translation of the QCAE, which was developed for the purpose of this study, and the BES (translated by Salas-Wright, Olate, & Vaughn, 2012), which also showed satisfactory internal consistency (Cronbach's α coefficient of .85) in this study.

Construction of the Spanish version of the QCAE. Due to the limited number of valid and reliable psychometric measures of cognitive and affective empathy, particularly among individuals from different ethnicities and linguistic communities, we translated and validated the Spanish version of the QCAE (Reniers et al., 2011). Two bilingual psychologists translated all items and the response scale into Spanish. Discrepancies between the two independent translations were discussed and a consensual final translation was agreed. Two bilingual speakers, who were not familiar with the research topic, translated the Spanish version back into English. Inconsistencies were identified and resolved by discussion (see Appendix A for the final version).

Procedure

Parental consent was obtained in advance for all participants recruited at the secondary schools in both countries. Informed consent was obtained from all participants before the completion of the measures. At universities in Spain and secondary schools in both countries, data were collected in a classroom setup. Due to logistic limitations, students from the British university completed the study online by using LimeSurvey (Schmitz, 2012): an open source application to develop, publish and collect online surveys. Both studies followed the same procedure in that detailed information on the study was provided and informed consent was obtained. Participants were then presented with the five questionnaires in a fixed order (i.e., ERQ, QCAE, IAS-A, BEQ, and BES). The measures were completed during classroom sessions of approximately 40 minutes, which gave ample time to complete the measures, while online data were collected without time limitation. No incentives were given for participation in the study. Ethical approval for this research project was granted by the Research Ethics Committee of the University of Birmingham.

Analyses strategy

All analyses were performed using SPSS Version 20 (IBM SPSS Inc., Armonk, NY). A significance alpha level of .05, and two-tailed tests were used for statistical analyses. First, the factor structure of the Spanish version of the QCAE (QCAE-SV) was analysed (third aim of the present study) using goodness-of-fit tests and indices with the AMOS 21 statistical software program (SPSS Inc., Chicago, IL). Correlational analyses to confirm convergent validity of the QCAE-SV were also conducted.

Secondly, in order to establish cross-cultural comparisons between British and Spanish samples (first aim of the present study) separated Welch's adjusted F ratios were performed to compare emotional expressivity, emotion regulation, empathy, and indirect aggression across both cultures. Non-parametric tests were employed due to non-normality of the data. Pairwise comparisons among the levels of any main effect, simple main effect or averaged main effect were made among adjusted means using SPSS, which provided results for corrected *post hoc* comparisons.

Finally, individual effects of cognitive and affective empathy were analysed as predictors of emotional expressivity, emotion regulation, and indirect aggression (second aim of the present study) by using multiple linear regressions. Three-step mediational analyses were carried out separately for the UK and Spanish samples using a bootstrapping method with 5,000 resamples and 95% confidence intervals.

Results

QCAE-Spanish Version

The factor structure of the QCAE-SV was confirmed using the Spanish sample ($n=507$) with the AMOS 21 statistical software program (SPSS Inc., Chicago, IL). Items were combined into item parcels to deal with non-normally distributed indicators, where each parcel represented the mean of item pairs or triplets that were assumed to be theoretically comparable, and psychometrically unidimensional, as done in Reniers et al. (2011). Both the first and second order models (for details on these models see Reniers et al., 2011) provided satisfactory fit for the data (see Table 2.2 for model fit statistics).

Table 2.2

Goodness-of-fit tests and indices for the factor structure of the QCAE-SV

GOF measure	Criteria	Model 1	Model 2
χ^2 GOF	$p>.2$	Chi2(80)=252.29 $p<.001$	Chi2(85)=258.64 $p<.001$
BS bootstrap	$p>.2$	$p=.001$	$p=.001$
RMSEA (90% CI)	$=<.05$	0.067 (.06-.08)	0.064 (.06-.07)
CFI	$>=.95$.93	.93
TLI	$>=.95$.90	.91
SRMR	small	.06	.06
AIC	small	332.29	328.64

Note. GOF: goodness of fit; BS: Bollen-Stine; RMSEA: root mean squared error of approximation; CI: confidence interval; CFI: Bentler's Comparative Fit Index; TLI: Tucker–Lewis Index, SRMR: standardised root mean square residual; AIC: Akaike's Information Criterion.

Cognitive and affective empathy scores on the QCAE-SV and Spanish version of the BES showed moderate to strong positive correlations: $r(412)=.43$, $p<.001$ for cognitive

empathy; $r(415)=.66, p<.001$ for affective empathy, confirming convergent validity. These correlations were similar from those observed in the British sample: $r(225)=.57, p<.001$ for cognitive empathy; and $r(225)=.74, p<.001$ for affective empathy.

Empathy, emotion regulation, emotional expressivity, and indirect aggression across cultures

Since the assumption of homogeneity of variance was not met for this data, we used the obtained Welch's adjusted F ratios to compare emotional expressivity, emotion regulation, empathy, and indirect aggression across cultures. Significant differences were found in negative, $F(1, 467.59)=19.66, p<.001, \eta_p^2=.03$, and positive expressivity of emotions, $F(1, 454.45)=16.67, p<.001, \eta_p^2=.03$, with Spanish individuals having higher levels of both negative and positive emotional expressivity than British participants. No differences were found in impulse strength, $F(1, 427.22)=.33, p=.57, \eta_p^2=.00$.

Significant differences also emerged in cognitive reappraisal, $F(1, 442.847)=10.54, p<.001, \eta_p^2=.02$, and expressive suppression, $F(1, 474.66)=54.36, p<.001, \eta_p^2=.08$, with British individuals reporting higher levels in both emotion regulation strategies than Spanish participants. However, no differences were found between British and Spanish individuals in either cognitive empathy, $F(1, 436.06)=1.37, p=.24, \eta_p^2=.00$, affective empathy $F(1, 455.26)=.14, p=.71, \eta_p^2=.00$, or indirect aggression, $F(1, 493.36)=.11, p=.74, \eta_p^2=.00$ (see Table 2.3 for descriptive statistics on measures of emotion, empathy and indirect aggression). Considering the significant age-differences found between British ($Mdn=17.48$) and Spanish individuals ($Mdn=19.65$), $U=26616.5, Z= -8.55, p<.001, r= -.34$, these analyses were repeated using age as a covariate (see Table 2.4).

Table 2.3

Medians, standard deviations and p values comparing British and Spanish samples on measures of emotional expressivity, emotion regulation, empathy and indirect aggression

	British sample		Spanish sample		<i>p</i>
	Mdn	SD	Mdn	SD	
Negative expressivity (BEQ)	3.67	1.08	4	1.09	<.001
Positive expressivity (BEQ)	5.25	1.07	5.75	1.04	<.001
Impulse strength (BEQ)	4.83	1.41	5	1.27	.72
Cognitive reappraisal (ERQ)	29	6.71	27	6.30	<.001
Expressive suppression (ERQ)	15	4.92	12	5.02	<.001
Cognitive empathy (QCAE)	58	7.76	59	7.16	.58
Affective empathy (QCAE)	36	5.36	35	5.21	.13
Indirect aggression (IAS-A)	37.50	10.16	37	10.84	.41

Note. Statistical differences between groups correspond with separate T-test analyses.

Table 2.4

Tests of between subjects effects of cultural background on emotional expressivity, emotion regulation, empathy, and indirect aggression controlling for age

	<i>F</i>	<i>MSE</i>	<i>P</i>	η_p^2
Negative expressivity (BEQ)	21.71	25.31	<.001	.03
Positive expressivity (BEQ)	17.26	18.21	<.001	.03
Impulse strength (BEQ)	.11	.20	.74	.00
Cognitive reappraisal (ERQ)	14.68	614.29	<.001	.02
Expressive suppression (ERQ)	51.97	1291.97	<.001	.08
Cognitive empathy (QCAE)	.49	26.72	.48	.00
Affective empathy (QCAE)	.05	1.35	.83	.00
Indirect aggression (IAS-A)	.58	63.38	.45	.00

Results from the general linear model analysis (ANCOVA) in Table 2.4 confirmed that, after controlling for age, cultural background (British *versus* Spanish) only had a significant effect on positive and negative expressivity and emotion regulation.

Contribution of cognitive and affective empathy to emotion regulation, emotional expressivity, and indirect aggression in both cultures

Individual effects of cognitive and affective empathy were then analysed as predictors of emotional expressivity, emotion regulation, and indirect aggression. In order to compare cultures, multiple linear regressions were carried out separately for the UK and Spanish samples. Tolerance and VIF values were computed, and no collinearity between the variables included in the regression analyses was observed (see Table 2.5 for correlations).

Table 2.5

Correlations between predictor variables on the contribution of cognitive and affective empathy to emotion regulation, emotional expressivity, and indirect aggression in British and Spanish samples

	1	2	3	4	5	6
Spanish sample	2. Expressive suppression	.05	--			
	3. Negative expressivity	-.04	-.53**	--		
	4. Positive expressivity	.06	-.52**	.50**	--	
	5. Impulse strength	.05	-.28**	.48**	.51**	--
	6. Cognitive empathy	.11*	-.16**	.11*	.31**	.23**
	7. Affective empathy	.07	-.18**	.31**	.34**	.58**
	2. expressive suppression	-.16*	--			
British sample	3. Negative expressivity	-.01	-.59**	--		
	4. Positive expressivity	.29**	-.47**	.42**	--	
	5. Impulse strength	.11	-.33**	.40**	.49**	--
	6. Cognitive empathy	.24**	-.05	-.05	.16*	.14*
	7. Affective empathy	.05	-.19**	.26**	.28**	.51**
						.32**

Note. * $p<.05$, ** $p<.01$; number 1 refers to the variable cognitive reappraisal.

A significant effect of age on cognitive reappraisal ($\beta=.19$, $R^2=.04$, $t=2.82$, $p<.01$), cognitive empathy ($\beta=.15$, $R^2=.02$, $t=2.29$, $p<.05$), and aggression ($\beta= -.25$, $R^2=.06$, $t= -3.89$,

$p<.001$) was found in the UK sample and on affective empathy ($\beta= -.10$, $R^2=.02$, $t= -2.70$, $p<.001$) in the Spanish sample. Therefore, age was used as a covariate in following analyses.

UK Sample

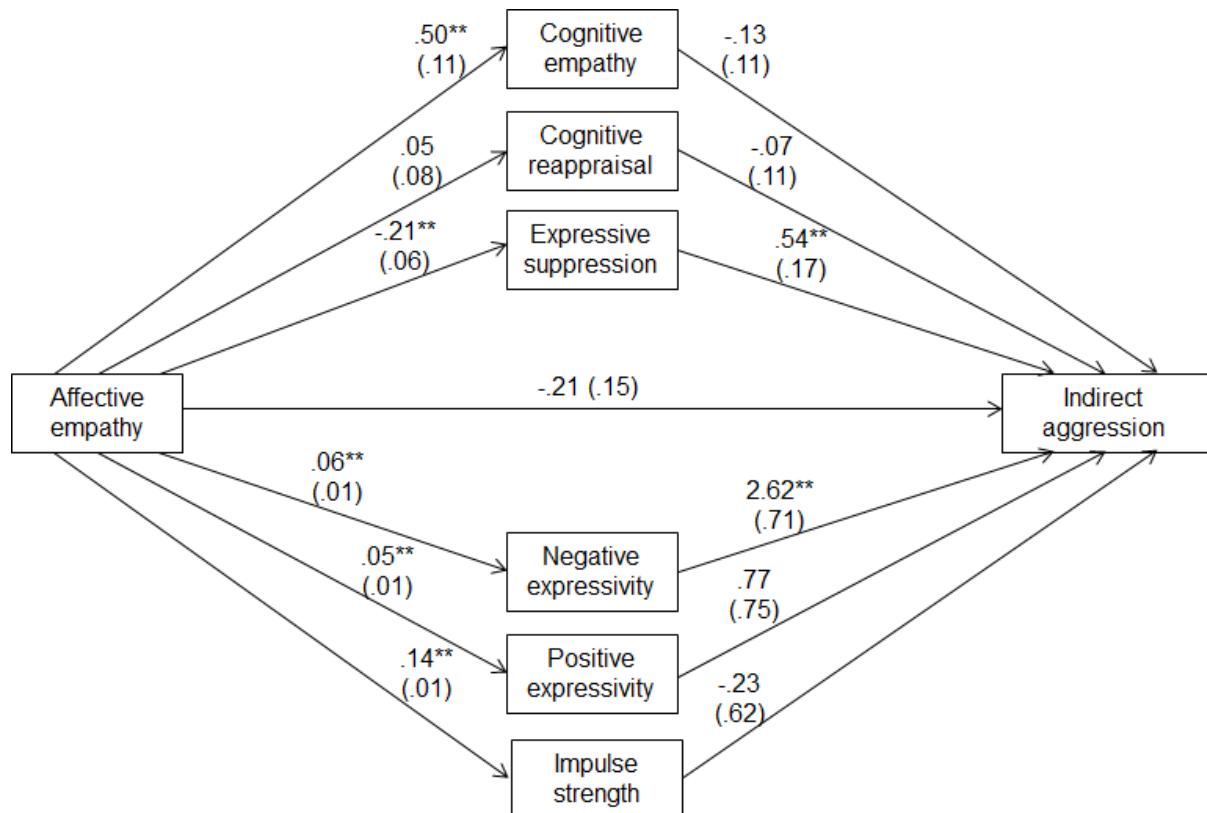
A three-step mediational analysis showed firstly a significant relationship between cognitive empathy and indirect aggression ($\beta= -.18$, $R^2=.09$, $t= -2.70$, $p<.01$), after controlling for the effect of age, with lower levels of cognitive empathy predicting higher levels of indirect aggression. Results also showed that cognitive empathy significantly predicted levels of cognitive reappraisal ($\beta=.21$, $R^2=.08$, $t=3.26$, $p<.001$) but not levels of expressive suppression ($\beta= -.08$, $R^2=.01$, $t= -1.17$, $p=.26$). There were no effects of cognitive empathy on positivity ($\beta=.11$, $R^2=.01$, $t=1.64$, $p=.10$) or negativity ($\beta= -.04$, $R^2=.02$, $t= -.54$, $p=.59$), but it did significantly predict impulse strength ($\beta=.13$, $R^2=.03$, $t=1.97$, $p<.05$).

A second analysis showed that there was no significant relationship between affective empathy and indirect aggression ($\beta= -.13$, $R^2=.08$, $t= -1.96$, $p=.05$). Results also showed that affective empathy did not significantly predict levels of cognitive reappraisal ($\beta=.04$, $R^2=.04$, $t=.62$, $p=.53$) but did significantly predict expressive suppression ($\beta= -.23$, $R^2=.05$, $t= -3.45$, $p<.001$). There were significant effects of affective empathy on positivity ($\beta=.24$, $R^2=.06$, $t=3.58$, $p<.001$), negativity ($\beta=.06$, $R^2=.10$, $t=4.44$, $p<.001$) and impulse strength ($\beta=.54$, $R^2=.29$, $t=9.41$, $p<.001$). Finally, a mediation analysis was conducted using the levels of cognitive and affective empathy, cognitive reappraisal, expressive suppression, negative and positive emotional expressivity, and impulse strength as simultaneous predictors of indirect aggression. Affective empathy indirectly influenced indirect aggression through its effects on expressive suppression ($\beta= -.11$, $t=3.20$, $p<.001$) and negativity ($\beta=.15$, $t=3.68$, $p<.001$),

$R^2=.16$, $F(8, 214)=5.83$, $p<.001$. Significant Sobel tests confirmed the indirect effects of expressive suppression, $Z= -2.21$, $p<.05$, and negative emotional expressivity, $Z=2.63$, $p<.01$, on indirect aggression. Figure 2.1 illustrates the direct and indirect effects of affective empathy on cognitive empathy, emotion regulation, emotional expressivity, and indirect aggression. There was no evidence of indirect effects between cognitive empathy and aggression through affective empathy, emotion regulation, or emotional expressivity.

Figure 2.1

Mediational effect of affective empathy on indirect aggression through cognitive empathy, emotion regulation, and emotional expressivity for the British sample



Note. ** $p<.001$; standardised regression coefficients and bootstrapped standard errors for mediation paths; covariates included in the model: age.

These findings were confirmed using a bootstrapping method with 5,000 resamples and 95% confidence intervals (Hayes, 2013). The confidence intervals did not include 0,

confirming that there were no indirect effects between cognitive empathy and aggression through affective empathy, emotion regulation, or emotional expressivity.

Spanish sample

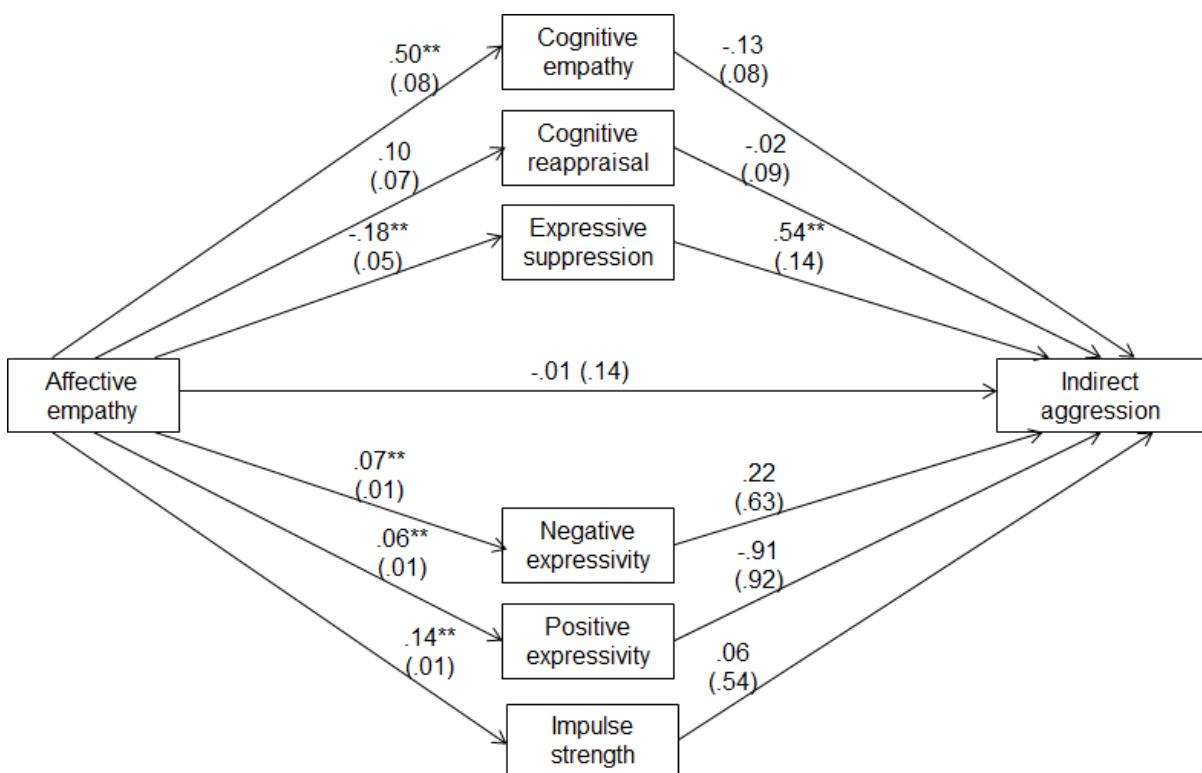
The same approach to the analysis was adopted for the Spanish sample. A three-step mediational analysis showed a significant relationship between cognitive empathy and aggression ($\beta = -.15$, $R^2 = .03$, $t = -3.10$, $p < .01$), so lower levels of cognitive empathy predicted higher levels of indirect aggression. Results also showed that cognitive empathy did not significantly predict levels of cognitive reappraisal ($\beta = .07$, $R^2 = .01$, $t = 1.45$, $p = .15$) but did predict expressive suppression ($\beta = -.17$, $R^2 = .03$, $t = -3.41$, $p < .001$). There were significant effects of cognitive empathy on positivity ($\beta = .33$, $R^2 = .11$, $t = 6.99$, $p < .001$), negativity ($\beta = .13$, $R^2 = .02$, $t = 2.61$, $p < .01$), and impulse strength ($\beta = .21$, $R^2 = .05$, $t = 4.40$, $p < .001$).

A second analysis showed that there was a significant relationship between affective empathy and indirect aggression ($\beta = -.10$, $R^2 = .02$, $t = -1.99$, $p < .05$). Results also showed that affective empathy did not significantly predict levels of cognitive reappraisal ($\beta = .09$, $R^2 = .01$, $t = 1.72$, $p = .09$), but did significantly predict levels of expressive suppression ($\beta = -.19$, $R^2 = .04$, $t = -3.78$, $p < .001$). There were significant effects of affective empathy on positivity ($\beta = .34$, $R^2 = .11$, $t = 7.14$, $p < .001$), negativity ($\beta = .35$, $R^2 = .12$, $t = 7.44$, $p < .001$), and impulse strength ($\beta = .59$, $R^2 = .34$, $t = 14.28$, $p < .001$). Finally, a mediation analysis was conducted using the levels of cognitive and affective empathy, cognitive reappraisal, expressive suppression, negative and positive emotional expressivity, and impulse strength as simultaneous predictors of indirect aggression. Affective empathy indirectly influenced aggression only through its effect on expressive suppression ($\beta = -.10$, $t = 3.83$, $p < .001$), $R^2 = .11$, $F(8, 397) = 4.89$, $p < .001$.

Significant Sobel tests, $Z= -2.52$, $p<.01$ confirmed the indirect effect of expressive suppression on indirect aggression. Figure 2.2 illustrates the direct and indirect effects of affective empathy on cognitive empathy, emotion regulation, expressivity, and indirect aggression. Again, these findings were confirmed using a bootstrapping method with 5,000 resamples and 95% confidence intervals (Hayes, 2013).

Figure 2.2

Mediational effect of affective empathy on indirect aggression through cognitive empathy, emotion regulation, and emotional expressivity for the Spanish sample



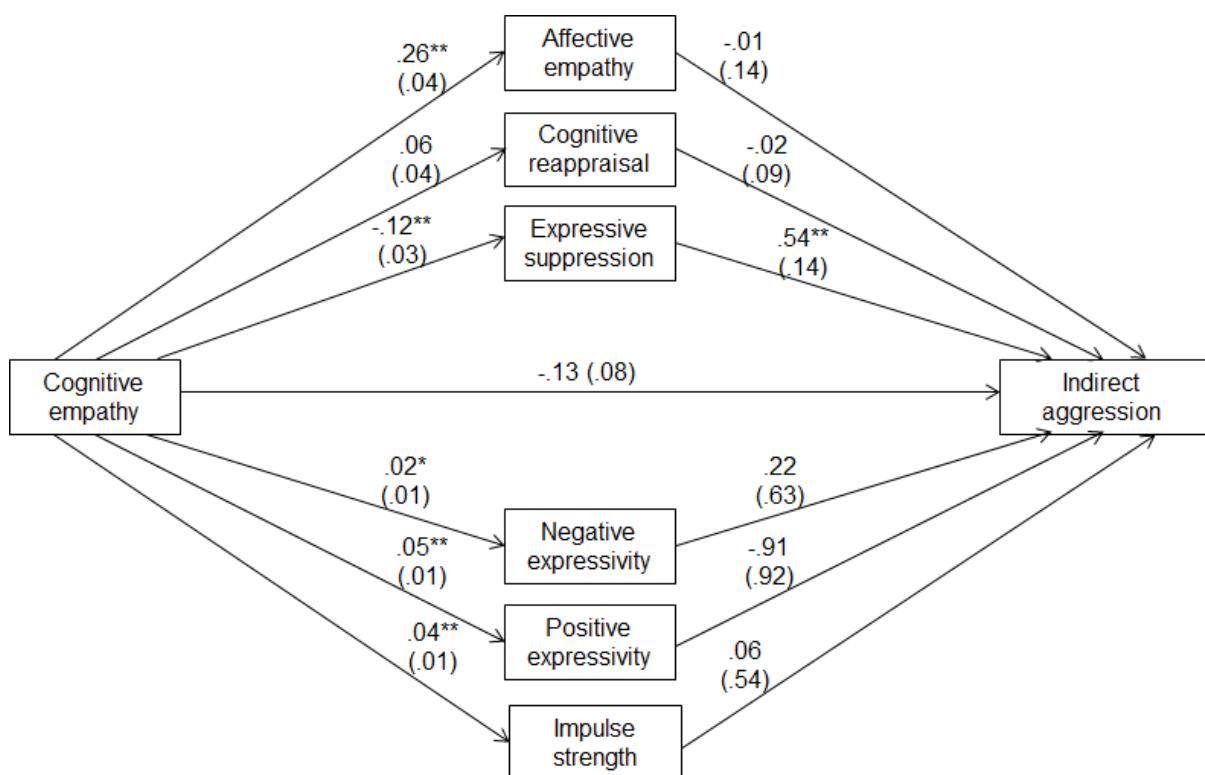
Note. ** $p<.001$; standardised regression coefficients and bootstrapped standard errors for mediation paths; covariates included in the model: age.

Cognitive empathy also influenced indirectly aggression through its effect on expressive suppression ($\beta= -.06$, $t=3.83$, $p<.001$), $R^2=.11$, $F(8, 397)=4.89$, $p<.001$. This was

confirmed by the Sobel tests, $Z = -2.63$, $p < .01$. Figure 2.3 illustrates the direct and indirect effects of cognitive empathy on affective empathy, emotion regulation, expressivity, and indirect aggression.

Figure 2.3

Mediator effect of cognitive empathy on indirect aggression through affective empathy, emotion regulation, and emotional expressivity for the Spanish sample



Note. * $p < .01$, ** $p < .001$; standardised regression coefficients and bootstrapped standard errors for mediation paths; covariates included in the model: age.

Discussion

This study investigated the influence of cultural background on emotional and interpersonal functioning by comparing emotional expressivity, emotion regulation, cognitive and affective empathy, and indirect aggression between British and Spanish adolescents and young adults (first aim of the present study). First, we found cross-cultural differences in emotional expressivity and emotion regulation, with Spanish individuals reporting higher levels of emotional expressivity than British individuals, who in contrast reported increased emotion regulation. Furthermore, our results indicated that these differences were not due to age differences. Second, we found that levels of cognitive and affective empathy did not differ between British and Spanish individuals. Likewise, no significant differences were found for self-reported levels of indirect aggression.

Research has shown that both emotional expressivity and emotion regulation differ across cultures (Eid & Diener, 2001; Gross & John, 1995; Matsumoto, Yoo, & Nakagawa, 2008), and our results on cross-cultural differences in emotional expressivity provided further support for these differences. More in particular, we found that Spanish individuals displayed higher levels of emotional expressivity for both positive and negative emotions compared to British individuals, as predicted in our first hypothesis 1. These findings are consistent with evidence suggesting that individuals from feminine-oriented cultures (like the Spanish culture) are prone to expressing their emotions, especially positive emotions, more strongly than those from masculine-oriented cultures (like the British culture) (Fernández et al., 2000; Fernández & Vergara, 1998; Paez & Vergara, 1995). Previous research has also revealed that cultural femininity is related to a lower frequency of negative emotions (i.e., anger and sadness) (Basabe et al., 2002); however, our results contradicted these findings and suggest

that individuals from feminine cultures may in fact exhibit increased negative expressivity. Despite being generally considered as a collectivist culture that emphasises interpersonal harmony and pleasantness (Smith et al., 1998), Spain has been found to be similar to individualist cultures in relation to its affective autonomy (e.g., valuing novelty, creativity and excitement) (Schwartz, 1994a, 1994b). It could be argued that, similarly to Latin American countries (e.g., Mexico), the cultural concept of “*simpatía*” (Ramírez-Esparza, Gosling, & Pennebaker, 2008; Triandis, Marin, Lisansky, & Betancourt, 1984) could enable to promote harmony through the free and lively expression of both positive (Ruby, Falk, Heine, Villa, & Silberstein, 2012) and negative emotions in the Spanish culture, rather than by controlling its expression. As a result, this could reflect Spain as a unique combination of vibrant emotional expression and relational harmony. In addition, feminine cultures have been considered cooperative societies that stress the significance of sympathy and concern for the weak (Hofstede et al., 2010). Perhaps within these cultures, individuals displaying negative emotions, such as fear or sadness, are likely to motivate sharing, comforting and helping responses in other people (Roberts & Strayer, 1996), which may encourage as a result the expression of negative emotions as a way to engage in social relationships.

The idea of Spain being a culture that merges free emotional expression and relational harmony also corresponds with our results concerning emotional regulation, in which we found that British participants reported higher levels of both cognitive reappraisal and expressive suppression when compared to Spanish participants, as predicted in our second hypothesis. According to the literature, collectivistic cultures tend to suppress the expression of emotions (Butler et al., 2007; Matsumoto, Yoo, & Nakagawa, 2008) more frequently than individualistic cultures, in an attempt to preserve social harmony (for a review see Ford &

Mauss, 2015). However, seeing that Spain may endorse harmony through the free expression of emotions, Spanish individuals could avoid the suppression of their emotions and diminish the use of cognitive reappraisal strategies. This would explain our results, in which Spanish individuals reported using less the strategies to regulate emotions compared to British individuals, even though the former is a more collectivistic culture than the latter.

Furthermore, our results are in line with the idea of increased emotional expressivity being characteristic of femininity-oriented cultures (like Spain) (Fernández et al., 2000; Paez & Vergara, 1995), and cultural masculinity being associated with unpleasantness of emotional experience (see meta-analysis by Basabe et al., 2000). Perhaps because masculine-oriented cultures (e.g., British culture) do not feel comfortable with the open manifestation of emotional expressions, the expression of emotions is avoided by using all the available strategies to regulate or lessen these expressions.

In contrast to our third hypothesis, we found no significant differences between British and Spanish individuals in either cognitive or affective empathy. Our findings indicated that both British and Spanish individuals tended to experience empathy in similar situations, as specified by the questionnaires items (e.g., I get very upset when I see someone cry). Therefore, our results suggest that empathy is a stable feature, at least across British and Spanish cultures, that may contribute to intercultural adjustment (Rasoal et al., 2011; Wang et al., 2003). The findings from the current study failed to find differences between individualistic and collectivistic cultures in empathy, as previous studies did (Duan et al., 2008; Heinke & Louis, 2009). This could suggest that the cultural dimension individualism-collectivism does not play a prominent role in empathy, at least not in the comparison

between these two cultures. Yet, Spain comes out as more individualistic when compared with other countries that strongly embrace collectivistic values, such as China or Taiwan, which may have given rise for the significant differences found in previous studies.

Importantly, individualistic and collectivistic values do not only differ across but also within cultures, with people exhibiting both individualistic and collectivistic tendencies in different degrees regardless of their cultural background (Duan et al., 2008; Triandis, 1995). This variability could additionally have contributed to our lack of a significant difference in levels of empathy experienced by our British and Spanish participants. Furthermore, the fact that emotional expressivity and emotion regulation emerged as relevant aspects of the Spanish and British cultures respectively, and that two these emotional abilities were previously associated with empathy (Eisenberg et al., 1996; Murphy et al., 1999; Roberts & Strayer, 1996), brings into question whether emotional abilities contributing to empathy vary across cultures, regardless of the analogous levels of empathy shown by these two cultures.

Finally, we found no significant differences between British and Spanish individuals in indirect aggression, which is consistent with previous research supporting the idea of a certain universality of norms and beliefs on aggression (Ramírez, 1993) and extended this evidence to its indirect form. Considering the negative relationship between empathy and indirect aggression, and the role of empathy as an inhibitor of aggression (Jolliffe & Farrington, 2004; Kaukiainen et al., 1999; Lovett & Sheffield, 2007; Richardson, Hammock, Smith, Gardner, & Signo, 1994; Yeo et al., 2011), it could be argued that empathy mitigates the likelihood of aggression in both British and Spanish cultures in a similar way. This may explain the lack of differences in indirect aggression across these two cultures.

The second aim of the present research was to investigate more in depth cross-cultural differences by studying the direct associations between empathy and indirect aggression, and to examine whether emotion regulation and emotional expressivity mediate this association in both samples. It is worth noting that this is the first study to investigate emotion regulation and emotional expressivity as potential mediators in the relationship between empathy and indirect aggression. As predicted in our fourth hypothesis, we found a significant negative relationship between cognitive empathy and self-reported indirect aggression in both British and Spanish individuals, with lower levels of cognitive empathy predicting higher levels of indirect aggression, similar to findings by Yeo et al. (2011). This provides further support for the negative relationship between cognitive empathy and indirect aggression, and suggests that cognitive empathy may be an effective inhibitor of indirect aggression. This is to some extent consistent with findings by Kaukiainen et al. (1999), who found that empathy was negatively correlated with indirect aggression, although they failed to differentiate between cognitive and affective empathy; and those by Richardson et al. (1994), who found that under conditions of moderate threat perspective taking was associated with the inhibition of aggressive behaviour.

In addition, we found that in the Spanish sample, both cognitive and affective empathy significantly predicted expressive suppression (both components of empathy were negatively correlated with expressive suppression) but not cognitive reappraisal, according to our fifth hypothesis. In the British sample, cognitive empathy significantly predicted cognitive reappraisal (both cognitive empathy and cognitive reappraisal were positively correlated), whereas affective empathy significantly predicted expressive suppression (both components were negatively correlated), corresponding with our sixth hypothesis. Overall, our results are

in accordance with research stating that affective components of empathy are associated with higher levels of emotion regulation (Eisenberg et al., 1996; Murphy et al., 1999), and extend this association to the cognitive component of empathy.

On one hand, our results suggest that individuals who are able to understand correctly others' emotional states tend to have an increased ability to regulate the impact of emotions by cognitively reappraising them (this was observed only in the British sample). This also corresponds with the idea of cognitive reappraisal being an adaptive strategy to regulate emotions which has a positive effect on someone's well-being and social relationships (Gross & John, 2003). On the other hand, our findings also indicate that individuals who are sensitive to and able to experience others' emotions tend to suppress their own emotions less (i.e., express their emotions more), which is important for interpersonal functioning, as expressive suppression is, in general, considered a maladaptive strategy (Gross & John, 2003; Gross & Levenson, 1997). In line with this, we found that affective but not cognitive empathy significantly predicted positive and negative expressivity in the British sample. However, in the Spanish sample, both cognitive and affective empathy predicted positive and negative expressivity. Both empathy and emotional expressivity were positively correlated in both samples, indicating that higher levels of empathy are associated with increased expression of emotions (both positive and negative), which corresponds with findings Roberts and Strayer (1996).

Finally, we found that expressive suppression and negative expressivity played a role in mediating the association between affective empathy and indirect aggression in the British sample. More in particular, we found that British individuals with higher levels of affective

empathy suppressed their emotions less (i.e., expressed their emotions more), and as a result, displayed reduced levels of indirect aggression. Considering that expressive suppression is, in general, seen as a maladaptive strategy (Gross & John, 2003; Gross & Levenson, 1997), it is possible that diminishing the use of expressive suppression (i.e., allowing to express their emotions more) becomes an adaptive strategy for social interactions, thereby being negatively associated with affective empathy. Indeed, individuals who tend to use expressive suppression are reluctant to share their emotions and avoid close relations, which reduce social support and may eventually disturb behaviour (Gross & John, 2003). These individuals also showed an increased tendency to express negative emotions, which facilitated in turn higher levels of indirect aggression. According to previous evidence suggesting that negative emotional experiences (e.g., anger or sadness) can trigger aggressive behaviour (Berkowitz, 1988), our results indicated that individuals with increased sensitivity to and ability to vicariously experience others' emotions (i.e., affective empathy) may become overwhelmed with negative affect and, as a result, respond aggressively in an attempt to cope with this aversive situation.

In the Spanish sample, individuals with higher levels of both cognitive and affective empathy reported to use less expressive suppression (i.e., express their emotions more), displaying as a result lower levels of indirect aggression. Again, a reduced use of expressive suppression (i.e., allowing expressing emotions more) becomes an adaptive strategy for social interactions, by reducing levels of indirect aggression. The main difference with the British sample is that for both components of empathy (cognitive and affective) the suppression of emotions mediated the association with aggression in the Spanish sample.

Taken together, this study provides novel evidence on the cross-cultural differences between British and Spanish individuals in emotion and interpersonal functioning and proposes different pathways for the association between empathy and aggression across-cultures. Despite the strengths of the study, some limitations must be taken into consideration. First, self-report questionnaires were administered using two different processes of recruitment: through Internet and with paper-questionnaires. However, evidence suggests that online-questionnaires are reliable and similarly responded than paper-questionnaires (Ritter, Lorig, Laurent, & Matthews, 2004), keeping the consistency of responses and the integrity of the test (Riva, Teruzzi, & Anolli, 2003). We therefore do not anticipate any significant differences between the groups being caused by the different methods of administration of the questionnaires. Whilst the anonymity of the online approach can reduce response bias, (Dommeyer, Baum, & Hanna, 2002; Nulty, 2008) ensuring participants that their answers are kept confidentially and informing them that they can choose not to answer questions they do not feel comfortable with can likewise reduce response bias in paper-questionnaires approach.

In addition, further research is needed to generalise the results. Future studies should include a wider age range to analyse the effect of cultural background on emotional functioning across the life span. Further cross-cultural comparison should include both Western and non-Western cultures to allow comparisons between and within these cultures. Comparisons between Eastern and Western European countries should be included to expand the scope of our results. Finally, it would be of interest to investigate whether further abilities (e.g., emotional intelligence, assertiveness, prosocial behaviour, or openness) mediate the relationship between empathy and aggression in different cultural settings.

In summary, the present study demonstrates a good reliability and validity for the QCAE-SV, providing a valid tool for assessing cognitive and affective empathy in Spanish populations of adolescents and young adults. This is especially significant as validated instruments assessing empathy are still lacking among individuals from different ethnicities and linguistic communities. Furthermore, the validation of this questionnaire provides with a tool that allows assessing both cognitive and affective components of empathy separately, which is essential in research considering the differences between the two empathy subcomponents (see chapter 1 for more detailed evidence).

In addition, the present findings show the stability of empathy across adolescent and young adults from the UK and Spain, while highlighting the significance of emotion regulation in the British culture and the significance of emotional expressivity for Spanish individuals. We found further evidence for the cross-cultural stability of aggression, and extended this evidence to its indirect form. In so doing, this study contributes to existing psychological research by establishing for first time a comparison between British and Spanish cultures that focuses on empathy and interpersonal functioning. This is important because both cultures are more similar than the usually compared cultures (Western versus Asian), which allows studying different aspects of cultural variation in regards to emotion. This is also the first study exploring emotional abilities as potential mediators in the relation between empathy and aggression in two different cultural settings. Our findings highlight the significance of further investigations on how empathy mitigates aggressive behaviour and which variables can affect this relationship, including cross-cultural factors. As evidence shows that aggression complicates social interactions while empathy facilitates intercultural

adjustment, a better understanding of the relationship between these two factors becomes necessary to facilitate social adjustment in the emergent multi-ethnic societies.

This is one of the first studies to show cross-cultural comparisons in empathy levels using British and Spanish samples. Although differences were found in the pathways in the association between empathy and aggression across cultures, no significant differences in levels of cognitive and affective empathy were recorded. Importantly, in typically developing populations, culture did not appear to directly impact on ability to empathize. A question that has significant importance is whether atypical development can affect the way in which one is able to empathize and factors that contributes to these differences. Therefore, in the following chapter, empathy in adults with substance abuse disorders will be addressed.

CHAPTER III

EMPATHY, EMOTIONAL PROCESSING, AND SOCIAL SUPPORT IN INDIVIDUALS WITH HISTORIES OF SUBSTANCE ABUSE AND CRIMINAL BEHAVIOUR

Abstract

Research reveals that individuals with mental health disorders, especially those with substance abuse disorders, are at increased risk of committing crimes. This relationship seems to go beyond a simple co-occurrence with evidence suggesting several potential factors as key aspects in such association. The aim of the study was to examine the differences in empathy, CU traits, emotion regulation, emotional expressivity, and social support in a sample of 83 Spanish males classified in three groups: individuals with substance abuse problems, offenders, and offenders with substance abuse problems. The contribution of emotional variables to criminal recidivism and substance abuse severity was also investigated. Results showed that the three groups differed in cognitive empathy, online simulation, proximal responsiveness, and uncaring traits. However, no significant differences were found in emotion regulation, expressivity, or social support. Although no differences were found in empathy between the two groups of substance abusers (offenders and non-offenders), both non-offenders and offenders with substance abuse problems reported lower levels of empathy and higher levels of uncaring traits than offenders with no substance abuse problems. Finally, CU traits were found to predict criminal recidivism, whereas expressive suppression and social support were predictors of the onset of substance use, with higher levels of expressive suppression predicting a later onset and higher levels of social support predicting an earlier onset. This is the first comparative research within these three populations and thus, it provides with a better understanding of the emotional and social characteristics of individuals with both behaviours.

Keywords: empathy, CU traits, emotion regulation, emotional expressivity, social support, substance abuse, and offenders

Introduction

Research has generally found that individuals with certain mental health disorders are at increased risk of committing crimes (Hodgins & Janson, 2002), with the relationship between substance abuse disorders and criminal behaviour considered to be one of the strongest (Mumola & Karberg, 2006; Ruiz et al., 2012). For example, Fazel, Bains, and Doll (2006) found increased prevalence rates for substance abuse problems among inmates than in the general population, with the estimated prevalence for alcohol abuse varying between 18% and 30%, and the occurrence of drug abuse ranging from 10% to 48% in male inmates. In comparison, the estimate prevalence for males in the general population was found to be slightly lower (20%) for alcohol dependence and two-to-10-fold below (9%) for drug dependence (Kessler et al., 1994). In addition, results from a meta-analysis conducted by Bennett, Holloway, and Farrington (2008) showed that the likelihood of offending was between three and four times superior for drug users than for non-drug users, with heroin, crack and cocaine being the most common drugs linked to crime, and specifically, to property crime and shoplifting.

However, the nature and direction of this relationship is complex and no causal relationship has been proven yet. Some authors have suggested a reciprocal relationship, in which the manifestation of offending behaviour indicates that the use of illicit substances is more likely to occur, and vice versa (Mulvey, Schubert, & Chassin, 2011). Other researchers have proposed a bidirectional relationship. On one hand, criminal activities can provide individuals with financial resources to obtain illicit substances, and its use can be encouraged by the deviant social environments where these individuals develop such criminal activities (Menard et al., 2001), by providing models, opportunities and approval for engaging in

alcohol and drug use (Chassin et al., 2003). On the other hand, alcohol and drug intoxication can be a predisposition to criminal behaviour, particularly to violent offenses (Boles & Miotto, 2003; Lundholm et al., 2013), while committing crimes, especially acquisitive or property-related crimes, can also be consequence of an economic necessity (Stewart, Gossop, Marsden, & Rolfe, 2000; White, Tice, Loeber, & Stouthamer-Loeber, 2002). Thus, these crimes (i.e., economic-compulsive crimes) likely occur as a means to obtain funds to support substance use (Goldstein, 1985).

The variations in the relationship between different illicit substances and different offences seem to be essential to understand better this connection. In terms of alcohol use, empirical evidence has consistently shown a strong positive, but not necessarily causal, association between alcohol and violence (Markowitz, 2005), proposing alcohol as a risk factor for variety of violent offenses, such as assault and homicide (Boles & Miotto, 2003; Darke, 2010; Rossow, 2001). Recent research has gone beyond this association proposing a causal relationship between alcohol misuse and both violent behaviour (Boden, Fergusson, & Horwood, 2012) and impulsive crimes, including assault, property damage, vandalism, and arson (Boden, Fergusson, & Horwood, 2013). This association corresponds with evidence suggesting that alcohol intake can alter cognitive process and reduce inhibitory control, self-awareness, and selective disinhibition, leading to heightened aggressive behaviour (Chermack & Giancola, 1997; Heinz, Beck, Meyer-Lindenberg, Sterzer, & Heinz, 2011; Parker & Auerhahn, 1998; Taylor & Chermack, 1993). These alterations, together with the disinhibiting properties of alcohol that increase poor judgment and impulsivity (Hussong, Curran, Moffitt, Caspi, & Carrig, 2004), make individuals more prone to commit violent crimes (Lundholm et al., 2013). This is especially significant because previous involvement in violent crimes has

been found to be a strong predictor of violent recidivism (Collins, 2010; Roberts, Zgoba, & Shahidullah, 2007). Importantly, this evidence is in line with the psychopharmacological model of crime proposed by Goldstein (1985), which claimed that the alterations in cognitive functioning caused by the use of illicit substances can predispose to commit crimes. Although research has also suggested that there is a relationship between drug use and violent behaviour, the empirical support for this idea is still mixed (Boles & Miotto, 2003; Hoaken & Stewart, 2003; White & Gorman, 2000). For example, cocaine and amphetamine use has been related to violent crime (Boles & Miotto, 2003), while heroin use has been more associated with acquisitive crime, i.e., shoplifting, burglary and robbery offences (van der Zanden, Dijkgraaf, Blanken, van Ree, & van den Brink, 2007). In contrast, cannabis use has been related, in general, to a lower propensity for crime (Fridell, Hesse, Jæger, & Kühlhorn, 2008) and has shown a reduction in violence during intoxication (Hoaken & Stewart, 2003).

Taken together, the relationship between substance abuse and criminal behaviour seems to go beyond a simple co-occurrence. Indeed, evidence not only reveals substance abuse as a significant contributor to criminal recidivism, i.e., persistence of criminal behaviour that leads to rearrests (Belenko, 2006; Cartier, Farabee, & Prendergast, 2006; Cottle, Lee, & Heilbrun, 2001; Gendreau, Little, & Goggin, 1996; Håkansson & Berglund, 2012; Stoolmiller & Blechman, 2005), but also suggests the existence of several potential factors that could play a role in this relationship. Amongst one of the most crucial factors to be identified is the ability to empathize with others, as deficits in this ability are thought to contribute to both criminal behaviour and substance abuse. For example, two meta-analyses have found evidence for a significant negative relationship between empathy and offending, with cognitive empathy being more strongly related to offending than affective empathy

(Jolliffe & Farrington, 2004; Van Langen, Wissink, Van Vugt, Van der Stouwe, & Stams, 2014). Importantly, the association between empathy and offending has been reported as being stronger for violent offenders, who exhibit relatively lower levels of empathy, than non-violent offenders (Jolliffe & Farrington, 2004). Furthermore, low cognitive levels of empathy has been found to be a significant predictor of criminal recidivism (Bock & Hosser, 2014), showing even a higher predictive value for violent recidivism than for general recidivism. While violent recidivism has been defined as the frequency of offenses committed with physical violence or threats after release, such as manslaughter or murder; general recidivism is understood as the tendency to reiterate non-violent criminal patterns after release, including vandalism and property offences among others (Lauterbach & Hosser, 2007; Mulder, Brand, Bullens, & Van Marle, 2011).

Research has also shown deficits in empathy for substance abusers (Ferrari et al., 2014; Preller et al., 2013) (see chapter 1 for a more detailed review). In terms of drug abuse, recent studies have found reduced levels of affective empathy and intact abilities for cognitive empathy in polysubstance abusers (Ferrari et al., 2014) and cocaine users (Preller et al., 2013) compared to controls. Although MDMA has been found to increase affective empathy and prosocial behaviour (Hysek et al., 2013); previous evidence shows that MDMA has atypical effects on emotion that seem to be specific to this substance rather than common to all drugs of abuse (Bedi et al., 2010; Dumont et al., 2009). In alcohol dependence, studies have reported mixed results. Some research has found lower levels of self-reported empathic processing in alcohol-dependent patients compared to controls (Martinotti et al., 2009). Other studies have however revealed lower levels of self-reported affective empathy but no group

differences for cognitive empathy (Maurage, Grynberg, Noël, Joassin, Philippot, et al., 2011), or even intact cognitive and affective empathy (Thoma, Winter, et al., 2013).

Despite the amount of work published about the relationship between empathy and crime, and between empathy and substance abuse, there is still a lack of evidence about how and why empathy deficits are involved in crime and substance abuse when these two behaviours occur together. This is, however, especially significant considering both the complex relationship described between crime and substance abuse, and the contribution of one behaviour (i.e., substance abuse) to the recurrence of the other (i.e., criminal behaviour). Furthermore, clinical evidence has revealed that engagement in substance abuse treatment is a reliable predictor of positive outcomes in the rehabilitation of offenders (Casares-López et al., 2013; Chandler, Fletcher, & Volkow, 2009), in which the enhancement of empathy seems to be an important component for treatment success (Covell & Scalora, 2002; Day, Casey, & Gerace, 2010). This evidence further supports the need for more research on empathy that helps explain its role in both behaviours and increases our understanding of such relationship.

One of the aspects that could shed light on the link between lower levels of empathy, criminal behaviour, and substance abuse problems is the presence of CU traits. These are characterised by the lack of empathy and guilt, shallow affect, and poverty in emotional expression, and are considered an extension of the interpersonal affective dimension of adult psychopathy (Frick & Hare, 2001). Indeed, a negative relationship has been found between CU traits and empathy (Kimonis et al., 2008; Pardini & Byrd, 2012), with all the components of CU traits, i.e., callous, uncaring, and unemotional traits, being negatively related to affective empathy, but only the uncaring facet being negatively linked to cognitive empathy

(Muñoz, Qualter, & Padgett, 2011). In addition, evidence has consistently shown an association between elevated CU traits and delinquency (Frick et al., 2003; Frick, Ray, Thornton, & Kahn, 2014), suggesting that CU traits can contribute to the identification of individuals at greater risk of reoffending (Kahn, Byrd, & Pardini, 2013). Research into the association between the CU traits and criminal behaviour within adults is still limited (i.e., understanding criminal behaviour in relation to the offences committed and not the presence of psychopathy). However, Kahn et al. (2013) found in a recent study that, in young men, elevated CU traits predicted an increased probability of being charged with a serious offense (e.g., homicide, robbery, aggravated assault and burglary) and a higher number of criminal charges. Therefore, self-reported levels of CU traits could be considered as a strong predictor of future offending. It is important to mention that the assessment of CU traits in adult populations gains special interest as previous studies have often failed to comprehensively assess CU traits and have only focused on their value in combination with other measures of psychopathy, such as the Psychopathy Checklist–Revised (PCL-R; Hare, 1991). This has prevented researchers from drawing conclusions about unique associations between CU trait and criminal behaviour (for two exceptions see Kahn et al., 2013; Walters, Knight, Grann, & Dahle, 2008). Furthermore, evidence has also suggested that elevated CU traits could increase the likelihood of being risk-seeking and being involved in rewarding behaviours (Frick & White, 2008), which could make these individuals more susceptible to engage in risky substance use (Ray, Thornton, Frick, Steinberg, & Cauffman, 2015; Wymbs et al., 2012).

The significance of emotional aspects in understanding criminal behaviour and substance abuse also extends to the regulation and expression of emotions. A considerable body of evidence has revealed that deficits in emotion regulation contribute to aggressive

and/or violent behaviour (Bufkin & Luttrell, 2005; Davidson, Putnam, & Larson, 2000; Roberton et al., 2012). This evidence is in line with recent results showing that offenders with higher levels of aggression report more difficulties accepting and regulating their own emotions (Roberton, Daffern, & Bucks, 2014, 2015), especially negative emotions such as anger. Indeed, difficulties in the regulation of anger have been related to a variety of offences, including murder (Berkowitz, 1993), violent offences (Davey, Day, & Howells, 2005), and intimate partner violence (Shorey, Brasfield, Febres, & Stuart, 2011). While the under-regulation of emotions may trigger aggressive behaviours in an attempt to repair, terminate, or avoid uncomfortable emotional states; the over-regulation of emotions may also lead to aggressive behaviour through enhanced negative affect and physiological arousal, decreased inhibitions and alterations in decision making processes (Roberton et al., 2012).

Furthermore, negative emotional states, such as dysphoria, stress and anger, have been observed in a wide range of offenders (Day, 2009), and have been considered to be closely related to criminal recidivism (Hanson & Harris, 2000; Zamble & Quinsey, 2001) and violence. For example, violent offenders have been found to report higher levels of anger and an increased tendency for hostile attributions compared to non-violent offenders (Lim, Day, & Casey, 2011). Accordingly, anger expression is generally seen as a significant antecedent for many forms of violence (Farzan-Kashani & Murphy, 2015; Howells, 2004; Novaco, 2011), including violent offences (for a review see Chereji, Pintea, & David, 2012). However, it is important to note that the over-control of anger reactions has also been observed in violent offenders, which suggests that inhibited or unexpressed anger could also be a precursor of some forms of violence (Davey et al., 2005).

Likewise, a relationship between substance abuse and negative emotions has been reported. For example, sadness and hostility have been associated with increased alcohol use (Hussong, Hicks, Levy, & Curran, 2001), while depressed mood and feelings of hopelessness have been linked to a greater substance use (Mason, Hitch, & Spoth, 2009) and distress intolerance has been related to alcohol and cannabis problems (Buckner, Keough, & Schmidt, 2007). Researchers have also pointed out that individuals dependent on cocaine, heroin, or marijuana tend to experience high levels of state and trait anger, while individuals dependent on heroin report to have less control of their anger expressions than healthy controls (Aharonovich, Nguyen, & Nunes, 2001; De Mojá & Spielberger, 1997). Evidence suggests that alcohol and/or drug use may be encouraged as a strategy to escape/ avoid negative emotions (Baker et al., 2004; Cooper et al., 1995; Kuntsche, Knibbe, Gmel, & Engels, 2005).

In line with this hypothesis, difficulties in emotion regulation have been found to contribute to the development of substance use disorders and to worsen its severity (Wilcox & Adinoff, 2015; Wilcox, Pommy, & Adinoff, 2016), and have been considered as a risk factor for continued substance use (Kober & Bolling, 2014). In particular, evidence has revealed that individuals with substance use disorders report greater difficulties regulating negative emotions than healthy controls, suggesting that these difficulties may lead to a continuous use of illicit substances in an attempt to escape from or down-regulate unpleasant emotions (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Tice, Bratslavsky, & Baumeister, 2001). Previous research shows that individuals dependent on cocaine (Fox et al., 2007) as well as alcohol-dependent individuals (Fox et al., 2008) exhibited difficulties in emotion regulation, especially during early abstinence. Notably, after a longer period of abstinence, both cocaine and alcohol abusers presented improvements in selective emotion regulation aspects (see

chapter 1 for a more detailed review). This finding is especially relevant for treatment success, as evidence has shown that both negative emotionality and the ability to regulate negative emotions are important predictors of treatment persistence in individuals with substance use disorders (Hopwood, Schade, Matusiewicz, Daughters, & Lejuez, 2015).

The alterations in emotional processing (i.e., empathy, emotion regulation and negative expressivity) observed in individuals with substance abuse problems are also crucial to understand their social difficulties. In particular, the negative association found between substance abuse and interpersonal problems (Kornreich et al., 2002; Preller et al., 2013) provides support for the hypothesis of a vicious circle in substance abusers, where deficits in emotional processing may impede the development and maintenance of healthy interpersonal relationships, leading to negative social consequences such as social isolation (Dethier & Blairy, 2012). Alcohol and/or drugs could subsequently be used as a coping mechanism to face social problems, creating a vicious circle where each relapse brings further adverse effects on their emotional and interpersonal functioning (Philippot et al., 1999; Uekermann, Channon, Winkel, Schlebusch, & Daum, 2007). Therefore, positive social support, i.e., alternative social networks that offer competitive reinforcement for abstinence, becomes crucial for helping substance abusers reduce risk of relapse to both alcohol and drug use, and consequently, achieve and maintain abstinence (Dobkin, Civita, Paraherakis, & Gill, 2002; Garmendia, Alvarado, Montenegro, & Pino, 2008; Groh, Jason, & Keys, 2008; Moos, 2007). Furthermore, a lack of social support has also been associated with an increased risk for criminal behaviour (Cullen, 1994) and recidivism. In particular, family support seems to contribute to positive outcomes after release, such as employment and reduced substance use (La Vigne, Visher, Castro, & Center, 2004; Sullivan, Mino, Nelson, & Pope, 2002; Visher,

Kachnowski, La Vigne, & Travis, 2004), thereby facilitating the transition from prison to community and reducing the likelihood of reoffending (Naser & La Vigne, 2006).

The first aim of the present research was to investigate the differences in empathy, CU traits, emotion regulation, emotional expressivity, and social support among individuals with substance abuse problems, offenders, and offenders with substance abuse problems. To the best of our knowledge, no research has focused on studying these three populations together, despite the strong relationship found between substance abuse and offending, and the similarities observed between these two populations in a number of emotional and social characteristics. Firstly, we predicted that offenders with substance abuse problems would show lower levels of cognitive empathy, but not affective empathy, than both offenders and substance abusers (hypothesis 1). This is consistent with the negative association found between empathy (particularly its cognitive component) and offending, and between empathy (both cognitive and affective) and substance abuse (see references in the introduction section). Although both substance abusers and offenders have shown increased CU traits, taking into account the inverse association found between uncaring traits and cognitive empathy (Muñoz et al., 2011) and our previous hypothesis, we predicted that offenders with substance abuse problems would show higher levels of uncaring traits than both offenders and substance abusers (hypothesis 2).

According to evidence from neuroscience, a continuous use of illicit substances can cause long-lasting changes in the brain (Nestler, 2005; Volkow & Li, 2004) that may in turn have a negative effect on emotional processing. Therefore, it could be argued that difficulties in emotion processing (e.g., emotion regulation and emotional expressivity) may become

worse in those individuals who continuously use illicit substances. Relying on this assumption, we also hypothesised that both groups of substance abusers (with and without histories of criminal behaviour) would report more difficulties in two emotion regulation strategies (i.e., cognitive reappraisal and expressive suppression) (hypothesis 3) and higher levels of negative expressivity than the group of offenders (hypothesis 4). Finally, seeing that positive social support is suggested to reduce risk of relapse to substance use (Dobkin et al., 2002; Groh et al., 2008) and criminal recidivism (Naser & La Vigne, 2006); no differences across groups were expected (hypothesis 5).

The lack of research focusing on individuals with a history of reoccurring behaviours for both offending and/or substance abuse also indicates a need for studies examining the contribution of emotional variables to criminal recidivism and substance abuse severity. Therefore, our second aim was to investigate whether emotional variables specifically predicted criminal recidivism in this group of participants. Based on previous findings, it was anticipated that lower levels of empathy as well as higher levels of CU traits and negative expressivity would contribute to predict criminal recidivism (hypothesis 6) (Hanson & Harris, 2000; Kahn et al., 2013; Zamble & Quinsey, 2001). Although it was assumed that both cognitive and affective empathy would predict criminal recidivism, a greater effect was expected from cognitive empathy, as shown by Bock and Hosser (2014). Seeing that previous violent offences are a strong predictor of violent recidivism (Collins, 2010; Roberts et al., 2007), we anticipated that the severity of the offence and the level of associated violence would also contribute to predict recidivism (hypothesis 7).

Finally, in view of evidence showing empathy deficits in substance abusers (see above) and suggesting difficulties in emotion regulation as a risk factor for continued substance use (Kober & Bolling, 2014), we hypothesised that lower levels of cognitive and affective empathy and emotion regulation would predict more severe substance use (hypothesis 8). Furthermore, evidence has revealed that negative emotions, such as guilt or hostility, are associated with an earlier onset of alcohol and drugs use and that these emotions can influence quality and frequency of alcohol use (Ohannessian & Hesselbrock, 2009; Schuckit et al., 2006). Thus, we anticipated that higher levels of negative emotional expressivity would predict more severe substance use (hypothesis 9). Finally, since evidence has shown that social support helps reduce risk of relapse and maintain abstinence (Dobkin et al., 2002; Garmendia et al., 2008; Groh et al., 2008), and considering that higher levels of perceived family support have been associated with a later onset of substance use (Averna & Hesselbrock, 2001), lower levels of social support were also expected (hypothesis 10).

Method

Participants

Total 83 males aged between 22 and 60 participated in the study. Participants were recruited from a prison ($n=58$) and a rehabilitation centre for substance abusers ($n=25$) located in Madrid, Spain. Participants recruited from the rehabilitation centre had no criminal record. In the prison, 37 participants (64%) with substance abuse problems (SAP) were recruited from one ward that supports substance abuse rehabilitation. This ward is a therapeutic community inside the prison, but independent from the rest of wards, managed by a well-recognised non-governmental organisation in Spain that works on substance abuse rehabilitation. Only inmates who demonstrate an authentic motivation to stop abusing substances are admitted to this ward. At the time of the study, 63 inmates (60 males, 3 females) with alcohol and/or drug abuse problems were serving their sentences in this ward. In addition, 21 inmates without SAP (36%) were recruited from another ward, where an intra-penitentiary program focused on the significance of coexistence and respect among inmates is developed. This is known as respect ward. Only inmates who engage in a code of conduct, i.e., avoiding violence, and commit to attending professional training programmes are admitted to this ward. Rehabilitation programs for SAP are not conducted within this ward.

The mean substitution method for missing subscale items was selected to deal with missing data. Incomplete data from seven participants with less than 10% of missing data in any questionnaire's subscale were imputed and included for later analysis. Data from twelve participants with more than 10% of incomplete data were excluded. The final sample consisted of 71 males aged between 22 and 60 ($M_{age}=39.55$ years, $SD=9.29$), with the vast majority of participants being white and Spanish (80%). Sixteen percent of the sample was

Hispanic and reported being born in Latin American countries including Brazil, Bolivia, Colombia, Venezuela, Peru and Guatemala, and 4% of participants were African-Arabic, born in Algeria or Morocco. Participants with SAP and no criminal record had in general a higher level of education, with 44% having completed university studies, and had more qualified jobs (with 48% of these participants reporting having performed skilled or highly skilled jobs) compared to those participants recruited from prison. The vast majority of inmates with SAP reported having completed only primary education (61%) (i.e., an educational period lasting six academic years that starts when children are 4 years old) and to perform semi-skilled jobs (32%). Although a substantial number of inmates without SAP reported having completed at least up to the sixth form level (35%, with another 24% having completed university studies), 35% of participants from this group reported performing unskilled jobs. Only one participant reported performing a skilled job.

In addition, inmates with SAP showed the highest rate of unemployment, with 17 out of 31 participants reporting to be unemployed before entering into prison. However, the vast majority of these participants ($n=15$) failed to report the length of unemployment. In addition, only 58% of inmates with SAP reported having worked uninterruptedly during more than 2 years, which reveals a more irregular pattern of employment in this group compared to participants from the rehabilitation centre and inmates without SAP. These two groups showed instead great similarities in their employment patterns, as the vast majority of them (87% and 82%, respectively) reported having been regularly working for more than 2 years. None of these participants reported having worked less than 6 months or never having regularly worked. Table 3.1 shows descriptive statistics for the three groups of participants.

Table 3.1

Sample characteristics for participants from RC, inmates with SAP and inmates without SAP

	Participants from RC (n=23)	Inmates with SAP (n=31)	Inmates without SAP (n=17)
Age range (in years)	31-59	22-57	27-60
M (SD)	41.50 (8.02)	35.42 (8.06)	44.75 (10.15)
Ethnicity			
White-European	22 (96%)	26 (84%)	9 (53%)
African-Arabic	--	3 (10%)	--
Hispanic	1 (4%)	2 (6%)	8 (47%)
Level of education			
Primary	3 (13%)	19 (61%)	2 (12%)
Secondary	3 (13%)	8 (26%)	5 (29%)
Sixth form	7 (30%)	4 (13%)	6 (35%)
University	10 (44%)	--	4 (24%)
Type of job			
Unskilled job	2 (9%)	14 (45%)	6 (35%)
Semi-skilled job	10 (43%)	10 (32%)	9 (53%)
Skilled job	6 (26%)	6 (20%)	1 (6%)
Highly skilled job	5 (22%)	1 (3%)	--
Not reported	--	--	1 (6%)
Unemployment	10 (43.5%)	17 (55%)	4 (23.5%)
Length unemployment			
Less than 6 months	4 (40%)	--	1 (25%)
6 to 24 months	3 (30%)	1 (6%)	1 (25%)
More than 2 years	2 (20%)	1 (6%)	1 (25%)
Not reported	1 (10%)	15 (88%)	1 (25%)
Regular employment pattern			
Never/ Up to 6 months	--	2 (6%)/ 4 (13%)	--
6 months-2 years	3 (13%)	7 (23%)	2 (12%)
More than 2 years	20 (87%)	18 (58%)	14 (82%)
Not reported	--	--	1 (6%)

Table 3.1

Continued

	Participants from RC (<i>n</i> =23)	Inmates with SAP (<i>n</i> =31)	Inmates without SAP (<i>n</i> =17)
Living in/ with			
Alone	3 (13%)	2 (7%)	3 (18%)
Shared house	--	3 (10%)	1 (6%)
Parents	9 (39%)	9 (29%)	1 (6%)
Partner	7 (30.5%)	9 (29%)	4 (23%)
Partner and children	3 (13%)	6 (19%)	7 (41%)
Parents and children	--	--	1 (6%)
Other relative(s)	1 (4.5%)	1 (3%)	--
Homeless	--	1 (3%)	--
Governmental benefits	4 (17%)	3 (10%)	1 (6%)
Monthly income			
Less than 300€	1 (4%)	3 (10%)	1 (6%)
300-600€	3 (13%)	5 (16%)	2 (12%)
600-1.100€	2 (9%)	4 (13%)	5 (29%)
1.200-1.800€	9 (39%)	9 (29%)	3 (18%)
1.900-2.900€	3 (13%)	6 (19%)	1 (6%)
More than 3.000€	5 (22%)	3 (10%)	4 (23%)
Not reported	--	1 (3%)	1 (6%)

Note. RC: rehabilitation centre; SAP: substance abuse problems. Participants from prison answered all these questions according to their situation just before going to prison. Level of education refers to the highest level of education completed. Type of job refers to the longest job carried out; however, for participants who have had numerous jobs; this refers to the most recent one. Unemployment displays the percentage of participants who were unemployed at the time of the study. The length of unemployment refers to the last period of unemployment, in case the participant had experienced more than one. Regular employment pattern refers to the length of time that participants had been working uninterruptedly in their last job until the time of the study. Governmental benefits variable shows the percentage of participants who received benefits during the last three months.

Materials

Participants were asked to complete socio-demographic questions and five self-report questionnaires concerning empathy, emotion, and social support. In order to assess the criminal background of participants in prison, information regarding sentence(s) received, offence(s) committed, aggravating and/or extenuating circumstances, time already spent in prison and time left to be served, was collected by using a protocol with 13 questions developed by the researcher. Information provided by the participants was verified by the personnel from prison (i.e., the director of the therapeutic community ward and a social worker from the respect ward) after participants provided consent for the researcher to access their criminal record. In addition, participants with SAP were also asked to provide informed consent for the researcher to access and use their personal information on past and current substance abuse history. This information was obtained through the participants' responses to the European Addiction Severity Index (EuropASI). In both centres, trained psychologists administered the EuropASI at the time of treatment admission (i.e., between May 2008 and August 2014). Participants from the rehabilitation centre were asked to confirm that they had no criminal record.

Substance abuse history. The European Addiction Severity Index (EuropASI; Kokkevi & Hartgers, 1995) is an adaptation of the Addiction Severity Index (ASI; McLellan, Luborsky, Woody, & O'Brien, 1980) that was used to evaluate participants' substance use. The EuropASI is a semi-structured interview that assesses several aspects of substance abuse, including medical status, employment/ support status, drug/ alcohol use, legal status, family and social relationships, as well as psychiatric problems. It has shown excellent reliability (with Cronbach's α coefficients ranging between .46 to .92) and validity across a range of

types of patients and treatment settings in several European countries (Gerevich, Bácskai, Kó, & Rózsa, 2005; Mäkelä, 2004). For the purpose of the study, information on illicit substances used, duration of such use, presence of related medical illness (e.g., hepatitis or HIV), length of abstinence (if experiencing any), previous treatment for SAP, and family history of SAP was used.

Measures of empathy. Cognitive and affective levels of empathy were assessed using the Questionnaire of Cognitive and Affective Empathy (QCAE; Reniers et al., 2011). Cognitive component of empathy involves two main aspects: perspective taking (i.e., ability to put oneself in other's place to see things from other's perspective) and online simulation (i.e., an effortful attempt to put oneself in another person's place by imagining what that person is feeling). Affective component of empathy includes three aspects: emotion contagion, which assesses the automatic mirroring of others feelings, and proximal and peripheral responsivity. These refer to affective responses in close social and detached contexts, respectively. See methods section in chapter 2 for a more detailed description of this measure and its psychometric properties. This questionnaire has shown satisfactory psychometric properties in the present study, with Cronbach's α coefficients of .83 for cognitive empathy and .65 for affective empathy.

Furthermore, we used the Inventory of Callous–Unemotional Traits (ICU; Frick, 2004) to evaluate participants' lack of empathy. The ICU is a 24-items self-report questionnaire rated on a four-point scale from 0 (*not at all true*) to 3 (*definitely true*) that assesses three aspects of CU traits: uncaring, callous, and unemotional traits. These traits reflect, in addition to the lack of empathy, lack of guilt and poverty in emotional expression. This questionnaire

was chosen due to (1) its easy administration, i.e., the short length (i.e., 24-items) and amount of time required to be completed and (2) our interest to examine the predictive utility of CU traits within adult populations of offenders. In fact, the use of this questionnaire allows to comprehensively measure CU traits, in contrast to other measures of psychopathy, such as the PCL-R, where the affective scale is only composed of four items (i.e., lack of remorse/guilt, shallow affect, callous/lack of empathy, and failure to accept responsibility for actions) thereby limiting the comprehensive assessment of CU traits. Although the parent, teacher, and self-report versions of the ICU are available, only the self-report version of the ICU was used in the current study. The inclusion of the parent and teachers' version would have been useful to avoid (1) potential social desirable responses and (2) inaccurate responses caused by a potential lack of insight of participants. However, this information was not obtained due to the limited access to the participants' parents and teachers, as the vast majority of participants came from broken homes or unstable family environments, and were not attending formal education programmes at the time of the study. This questionnaire has shown evidence for the generalizability of its factor structure, and has demonstrated acceptable to good reliability (with Cronbach's α coefficients ranging from .45 to .88 for its three subscales) and good construct validity in a variety of clinical and forensic samples (Kimonis et al., 2008; Roose, Bijttebier, Decoene, Claes, & Frick, 2010). Although the validation of this measure has mainly focused on samples of adolescents, the ICU has also demonstrated acceptable to good reliability, with Cronbach's α coefficients ranging from .55 to .84 for the three original subscales, in a community sample of male adults (Byrd, Kahn, & Pardini, 2013). In the present study, this questionnaire has revealed satisfactory psychometric properties with Cronbach's α coefficients of .62 for callousness, .75 for uncaring traits and .80 for unemotional traits.

Measures of social support. The Medical Outcomes Study-Social Support Scale (MOS-SSS; Sherbourne & Stewart, 1991) is a 18-items self-report questionnaire scored on a scale from 1 (*none of the time*) to 5 (*all of the time*) that explores social networks and multiple dimensions of functional social support. This includes affectionate support (i.e., attachment or affect), emotional/ informational support (i.e., guidance or appraisal), tangible support (i.e., reliable alliance), and positive social interactions. This questionnaire has demonstrated to have good internal consistency, with Cronbach's α coefficients ranging from .91 and .96, good test-retest reliability, and verified construct validity (Sherbourne & Stewart, 1991). In addition, this questionnaire has been previously used in samples of substance abusers (Wasserman, Stewart, & Delucchi, 2001), offenders (Kim & Mazza, 2014), and substance abusers in prison (Rodríguez-Martínez et al., 2010), showing in general good internal consistency (Cronbach's α coefficients ranging from .91 and .97). This questionnaire has shown satisfactory psychometric properties in the present study, with a Cronbach's α coefficient of .96.

Measures of emotion. Two questionnaires were used to assess different aspects of emotions, including emotion regulation and emotional expressivity. The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) and the Berkeley Expressivity Questionnaire (BEQ; Gross & John, 1997). See methods section in chapter 2 for a more detailed description and of these measures and its psychometric properties. Both questionnaires have shown satisfactory psychometric properties in the present study, with Cronbach's α coefficients of .77 for cognitive reappraisal and .63 for expressive suppression (both assessed by the ERQ), and Cronbach's α coefficients of .85 for the BEQ.

Procedure

Participants were recruited during a 3-week period. Potential participants who expressed interest in the study and met basic inclusion criteria were given the opportunity to discuss the study with the researcher. Eligibility criteria included age, i.e., all participants had to be older than 18 years to participate in the study; gender, only males were included; capacity to provide informed consent; and fluency in Spanish to be able to complete all the measures. In the prison, only individuals who fell into one of the following categories were eligible: (1) inmates with SAP who were engaged in a rehabilitation programme inside the prison, and (2) inmates who had never experienced problems with alcohol or drugs. In the rehabilitation centre, only individuals with SAP who were following a rehabilitation programme and had no criminal record were eligible. In both centres, the same procedure was followed. Participants were presented with detailed information on the study, and informed consent was obtained before the completion of the measures. Participants were then presented with the questionnaires in a fixed order (i.e., QCAE, ICU, MOS-SSS, ERQ, and BEQ), and these were completed in a quiet room during one-to-one sessions with the researcher of approximately 50 minutes, giving plenty of time to complete all the measures. Participants were not compensated for their participation in this study. Ethical approval for this research project was granted by the Research Ethics Committee of the University of Birmingham, UK.

Analyses strategy

All analyses were performed using SPSS Version 20 (IBM SPSS Inc., Armonk, NY). First, descriptive statistics on the substance abuse history and criminal background of participants were calculated to explore the distribution of each variable. A classification system to differentiate among offender subgroups was developed based on the nature of the

offense. The first category, direct contact, included crimes committed against another individual using violence (violent offenders), while the second, non-violent offences, did not involve direct contact or violence against another person (non-violent offenders). For the purposes of the current study, an additional classification representing the severity of the offence and the level of associated violence was created. Inmates were classified in three groups according to the type of offence committed: (1) non-violent and low severe offence(s), (2) non-violent but highly severe offence(s), and (3) violent and highly severe offence(s), following the classification used in the Spanish jurisprudence.

Second, in order to establish comparisons across groups (first aim of the present study) a Kruskal-Wallis H test was performed to compare empathy, CU traits, emotion regulation, emotional expressivity, and social support among three groups of participants. Non-parametric tests were employed due to non-normality of the data. A significance alpha level of .05, and two-tailed tests were used for statistical analyses. Pairwise comparisons among the levels of any main effect, simple main effect or averaged main effect were made among adjusted means using SPSS, which provided results for corrected *post hoc* comparisons. In the result section, adjusted *p*-values were reported. Finally, multiple regression analysis was used to investigate whether empathy, CU traits, negative expressivity, and type of offence (according to its severity and level of associated violence) could significantly predict criminal recidivism. This was defined as the total number of offences committed. A second multiple regression analysis was also conducted to study the role of empathy, emotion regulation, and social support in the prediction of substance abuse severity, i.e., onset of substance use and number of years using substances. A bootstrapping method with 5,000 resamples and 95% confidence intervals was used in all regression analyses.

Results

Descriptive statistics on substance abuse history

Participants from the rehabilitation centre reported having used between one and three illicit substances (including both alcohol and drugs) on a regular basis during their lifetime. Overall, the average number of drugs regularly used was two, and the substances most frequently used were alcohol (91%), cocaine (74%), and cannabis (30%). Participants' age of first use ranged between 13 and 21, and the average length of use was 21 years. Only one participant reported having used injected drugs. Importantly, 10 participants reported having previously experienced at least one period of abstinence from alcohol, while 11 participants also reported having been previously abstinent from drugs.

Participants with SAP recruited from prison informed having used regularly between one and six illicit substances, including alcohol, cocaine, amphetamine, cannabis, heroin, methadone, benzodiazepines, inhalants, and hallucinogens during their lifetime. Although the average number of illicit substances regularly used was larger in this group than in participants from the rehabilitation centre, the substances most frequently used were the same: alcohol (77%), cocaine (87%), and cannabis (61%). Participants from prison reported an earlier onset of substance use, which ranged between 9 and 20 years old, than those from the rehabilitation centre. Importantly, 19% of participants from this group ($n=6$) reported having used injected drugs. Fifteen participants reported having previously experienced at least one period of abstinence from alcohol, whereas 25 participants reported having been previously abstinent from drugs. It is important to note that both periods of abstinence were longer in this group. Table 3.2 shows descriptive statistics on substance abuse history for both groups of participants with SAP.

Table 3.2

Means (standard deviations) on variables associated with substance abuse history for the two groups of participants with SAP

	Participants from RC	Inmates with SAP
Number of drugs regularly used	1.95 (.78)	2.90 (1.23)
Not reported	n=1	n=2
Average length of alcohol use (in years)	18.95 (9.29)	15.08 (7.62)
Average length of cocaine use (in years)	13.35 (6.19)	13.19 (7.21)
Average length of cannabis use (in years)	11.43 (6.70)	18.58 (19.74)
Onset of substance use (in years)	15.95 (2.26)	13.83 (2.31)
Overall length of substance use (in years)	21.05 (7.52)	17.17 (7.26)
Months of abstinence from alcohol	10.00 (12.22)	18.93 (24.12)
Range months of abstinence	1-42	1-8
Months of abstinence from drugs	12.18 (12.26)	16.04 (18.72)
Range months of abstinence	1-42	2-84

Note. RC: rehabilitation centre; SAP: substance abuse problems.

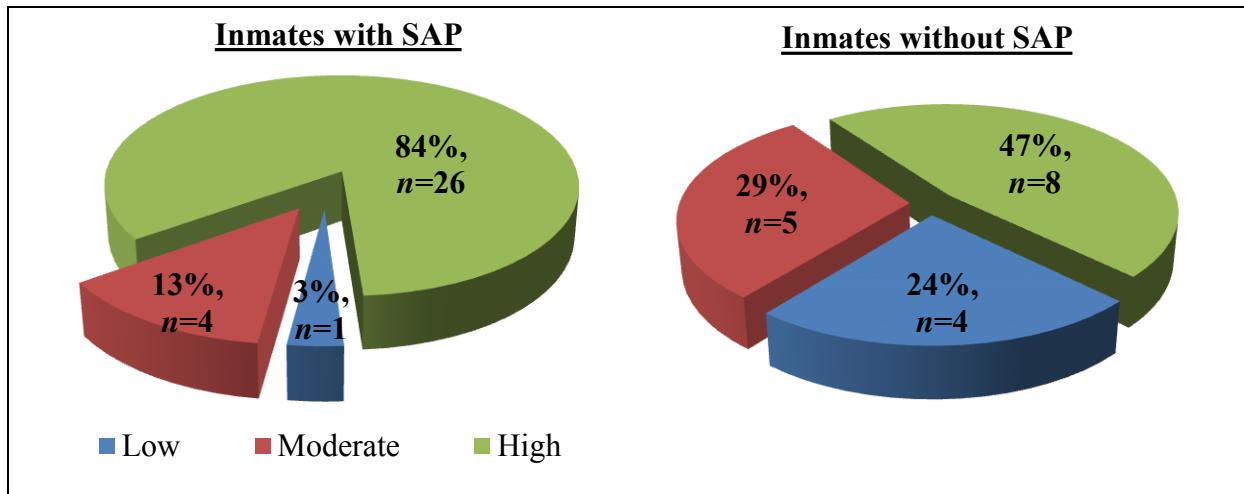
Descriptive statistics on criminal background

About 18% of inmates without SAP reported having been previously incarcerated, serving sentences of 6, 8 and 72 months for committing offences of low, moderate and high severity respectively. Another 82% reported having committed a single offence. Participants were incarcerated for committing narcotic offences (59%), i.e., hazardous substance dealing and drug trafficking; theft and assault (12%); offence against traffic safety (6%); and other offences such as fraud, falsification, tax offence and cybercrime (24%) (see Figure 3.1 for the severity of these offences). These offences were also classified as violent or non-violent (see Table 3.3 for statistics). Participants' sentences varied between 6 months and 15 years. On average, participants had already spent 16 months incarcerated, with 41% having spent less than 12 months imprisoned and 69% having spent between 12 and 37 months in prison.

Nearly half of inmates with SAP (52%) reported having been previously imprisoned, serving sentences between 3 months and 13 years. From these, 16% of participants engaged in rehabilitation treatments for SAP during their previous period in prison. About 90% of inmates with SAP reported having committed more than one offence during their lifetime ($M=9.81$, $SD=9.78$), which contrasts starkly with the percentage of inmates without SAP (82%) reporting having committed a single offence. The vast majority of participants (71%) were incarcerated for committing robbery (i.e., attempted robbery with violence, robbery with intimidation, strong-arm robbery, robbery with violence, and robbery with violence and intimidation), domestic abuse, attempted homicide, and manslaughter. Around 23% were incarcerated for committing narcotic offences, 3% for committing theft and 3% for offences against traffic safety (see Figure 3.1 for the severity of these offences).

Figure 3.1

Classification of the offences committed according to its severity by inmates with and without SAP



Note. Low severe offences included fraud, falsification, tax offence, and cybercrime; moderately severe offences include theft, offence against traffic safety, and hazardous substance dealing; highly severe offences include drug trafficking, assault, robbery, attempt homicide, manslaughter, and domestic abuse. This classification was developed following the classification used in Spanish jurisprudence.

The sentences of inmates with SAP oscillated between 5 months and 23 years, and approximately 42% of these participants reported having received a lessened sentence due to extenuating circumstances, i.e., drug addiction (39%) and inebriation (3%). Although these participants reported having committed more offences considered highly severe (see Figure 3.1), participants without SAP have longer sentences to serve than those sentences from participants with SAP. On average, participants with SAP had already spent 22 months incarcerated at the time of the study. In particular, 45% had spent less than 12 months imprisoned, another 45% had spent between 12 and 26 months in prison, and the remaining 10% had served significantly longer sentences (i.e., 2 years and 6 months, 5 years and 8 months, and 16 years and 7 months). Table 3.3 shows descriptive statistics on criminal background for both groups of inmates.

Table 3.3

Descriptive statistics on variables related to criminal background for both groups of inmates

	Inmates without SAP (n=17)	Inmates with SAP (n=31)
Participants in pre-trial detention	12% (n=2)	10% (n=3)
Participants previously incarcerated	18% (n=3)	52% (n=16)
Length previous sentence served (in months)	28.67 (37.54)	48.42 (50.06)
Length current sentence (in months)	63.00 (43.88)	58.86 (57.72)
Time already spent in prison	15.96 (10.39)	21.97 (35.18)
Type of offence committed		
Violent offences	6% (n=1)	29% (n=9)
Non-violent offences	94% (n=16)	71% (n=22)

Note. SAP: substance abuse problems. Violent offences included robbery with intimidation or violence, strong-arm robbery, manslaughter, domestic abuse, attempt of homicide and assault. Non-violent offences involved fraud, falsification, tax offence, theft, cybercrime, offences against traffic safety, hazardous substance dealing and drug trafficking.

Empathy, emotion regulation, emotional expressivity, and social support across groups

A Kruskal-Wallis H test was carried out to examine the differences in the total scores as well as each of the subscales scores for cognitive and affective empathy, CU traits, emotion regulation, emotional expressivity, and social support, among individuals with SAP, offenders, and offenders with SAP. Results showed that there were statistically significant differences in cognitive empathy, $\chi^2(2)=6.52, p<.05$, online simulation, $\chi^2(2)=14.47, p<.001$, proximal responsiveness, $\chi^2(2)=6.63, p<.05$, and uncaring traits, $\chi^2(2)=6.93, p<.05$ (see Table 3.4 for mean rank scores on empathy and uncaring traits measures across groups). Analysis failed to reveal significant differences across groups for the remaining variables. Table 3.5 shows medians, standard deviations, and significance *p* values across the three groups on measures of empathy, CU traits, emotion regulation, emotional expressivity, and social support.

Table 3.4

Mean rank scores on measures of empathy and uncaring traits across groups

	<i>n</i>	QCAE			ICU
		Cognitive empathy	Online simulation	Proximal responsiveness	Uncaring traits
Participants from RC	23	31.74	34.43	30.65	41.89
Inmates with SAP	31	33.08	28.45	34.02	37.65
Inmates without SAP	17	47.09	51.88	46.85	25.03

Note. RC: rehabilitation centre; SAP: substance abuse problems.

Post hoc analysis, conducted using pairwise comparisons with adjusted significance levels for multiple comparisons, revealed that levels of cognitive empathy were not significantly different across the three groups. Levels of online simulation were significantly lower in inmates with SAP (mean rank=28.45, *p*<.001) and participants from the rehabilitation centre (mean rank=34.43, *p*<.05) compared to inmates without SAP (mean

rank=51.88). No significant differences were found in online simulation between participants from the rehabilitation centre and inmates with SAP ($p=.87$). Likewise, levels of proximal responsiveness were significantly lower in participants from the rehabilitation centre (mean rank=30.65) compared to inmates without SAP (mean rank=46.85, $p<.05$). No significant differences were found between participants from the rehabilitation centre and inmates with SAP (mean rank=34.02, $p=1.00$), or between the two groups of inmates ($p=.11$). In addition, levels of uncaring traits were significantly higher in participants from the rehabilitation centre (mean rank=41.89) compared to inmates without SAP (mean rank=25.03, $p<.05$). No significant differences were found between participants from the rehabilitation centre and inmates with SAP (mean rank=37.65, $p=1.00$), or between the two groups of inmates ($p=.13$).

To further explore the similarities and differences across groups, Mann-Whitney tests were run to compare inmates with SAP and participants from the rehabilitation centre, and inmates with and without SAP. Levels of cognitive and affective empathy as well as the lack of it (i.e., CU traits) were investigated by using both the total scores and each of the subscales scores. No significant differences were found in any of these variables between the two groups of substance abusers. In the two groups of inmates, Mann-Whitney analysis revealed significant differences in cognitive empathy, $U=156.0$, $Z= -2.32$, $p<.05$, $r= -.33$, online simulation, $U=91.5$, $Z= -3.73$, $p<.001$, $r= -.58$, and proximal responsiveness, $U=164.5$, $Z= -2.15$, $p<.05$, $r= -.34$. Higher levels of cognitive empathy, online simulation and proximal responsiveness were found in inmates without SAP (Mdn=64, 30 and 14, respectively) compared to inmates with SAP (Mdn=57, 24, and 12, respectively). In contrast, levels of uncaring traits were found to be higher in inmates with SAP (Mdn=6) than in inmates without SAP (Mdn=3),

$U=164.5$, $Z= -2.14$, $p<.05$, $r= -.33$. No significant differences were found in the remaining variables (see Table 3.5 for statistics on empathy variables).

Table 3.5

Medians (standard deviations) and p values on measures of empathy, CU traits, emotion regulation, emotional expressivity, and social support comparing the three groups

	Participants from RC	Inmates with SAP	Inmates without SAP	P
Cognitive empathy (QCAE)	56.50 (7.83)	53.50 (7.00)	66.00 (8.22)	<.05
Perspective taking	30.50 (6.15)	31.00 (4.00)	33.00 (5.68)	.31
Online simulation	25.00 (4.26)	24.00 (4.29)	31.00 (3.58)	<.001
Affective empathy (QCAE)	34.00 (3.85)	33.00 (5.01)	37.00 (5.25)	.26
Emotional contagion	12.00 (1.88)	10.00 (2.78)	11.00 (2.64)	.40
Proximal responsivity	12.00 (2.32)	12.00 (2.62)	14.00 (2.68)	<.05
Peripheral responsivity	10.00 (2.15)	10.00 (1.95)	10.00 (1.53)	.98
CU traits (ICU)	21.00 (9.86)	18.50 (8.09)	17.00 (6.00)	.18
Callous	5.00 (4.01)	6.00 (4.06)	5.00 (2.37)	.26
Uncaring	7.00 (3.75)	6.00 (3.18)	3.00 (3.54)	<.05
Unemotional	7.50 (4.75)	6.00 (3.54)	7.00 (3.11)	.21
Cognitive reappraisal (ERQ)	24.50 (6.57)	29.00 (7.00)	28.00 (6.94)	.42
Expressive suppression (ERQ)	16.00 (5.51)	16.00 (5.24)	17.00 (5.30)	.23
Emotional expressivity (BEQ)	4.69 (0.79)	5.01 (1.07)	4.94 (0.89)	.56
Negative expressivity	3.58 (1.08)	3.83 (1.03)	4.00 (0.87)	.15
Positive expressivity	5.88 (1.16)	5.88 (1.18)	5.75 (1.34)	.85
Impulse strength	5.00 (1.15)	5.17 (1.45)	5.17 (1.22)	.71
Social support (MOS-SSS)	66.50 (17.90)	74.50 (14.62)	83.00 (21.43)	.58
Emotional support	27.00 (8.78)	31.00 (6.82)	34.00 (9.23)	.49
Instrumental support	16.00 (4.23)	15.00 (3.65)	16.00 (5.15)	.90
Positive social interactions	14.50 (4.25)	16.00 (3.69)	17.00 (4.65)	.69
Affective support	10.50 (3.12)	11.50 (3.13)	13.00 (3.68)	.37

Note. RC: rehabilitation centre; SAP: substance abuse problems; significance p values were obtained from Kruskal-Wallis H test when comparing the three groups of participants.

Prediction of criminal recidivism in inmates with SAP

Levels of cognitive and affective empathy, callous, uncaring and unemotional traits, negative expressivity, and type of offence committed (i.e., severity of the offence and the level of associated violence) were used to predict criminal recidivism (i.e., number of offences committed) by using multiple regression analysis. Tolerance and VIF values were analysed, and no collinearity was found. No independent variables were highly correlated. Table 3.6 shows correlations between predictor variables. The effect of substance abuse severity, i.e., age of first use and number of years using illicit substances on criminal recidivism, was controlled by entering these two variables in the first step of the regression. Using the enter method it was found that both callous and uncaring traits were significant predictors of criminal recidivism (see Table 3.7 for multiple regression statistics), with higher levels of callous and uncaring traits predicting higher number of offences. The model explained 54% of the variance of criminal recidivism. These findings were confirmed using a bootstrapping method with 1,000 resamples and 95% confidence intervals (Hayes, 2013).

Table 3.6

Spearman's rho correlations between predictor variables of criminal recidivism

	2	3	4	5	6	7	8	9
1. Age of first use	.04	-.25	.13	-.22	-.06	.37*	-.08	-.22
2. Years using substances		-.01	-.18	-.43*	-.11	-.21	-.02	-.41*
3. Cognitive empathy (QCAE)			.36*	-.25	-.36*	-.24	.24	-.06
4. Affective empathy (QCAE)				-.27	-.35	-.33	.48**	-.07
5. Callous traits (ICU)					.32	.22	-.37*	.48**
6. Uncaring traits (ICU)						.28	.01	.32
7. Unemotional traits (ICU)							-.47**	-.21
8. Negative expressivity (BEQ)								-.04

Note. * $p < .05$, ** $p < .01$; number 9 refers to the variable severity of offence.

Table 3.7

Multiple regression statistics for the predictor variables of criminal recidivism

	B	SE(B)	B	t	p
Step 1					
Age of first use	.09	.81	.02	.11	.92
Years using substances	-.26	.26	-.19	-1.00	.33
Step 2					
Cognitive empathy (QCAE)	.17	.31	.10	.56	.59
Affective empathy (QCAE)	.97	.49	.46	1.97	.06
Callous traits (ICU)	1.17	.49	.53	2.38	<.05
Uncaring traits (ICU)	1.68	.64	.71	2.62	<.05
Unemotional traits (ICU)	-.64	.83	-.23	-.77	.45
Negative expressivity (BEQ)	-3.39	2.76	-.34	-1.23	.23
Severity of offence	-.58	3.33	-.46	-1.75	.10

Note. Step 1: $R^2=.04$, $\Delta R^2=-.04$, $F(2, 26)=.50$, $p=.61$; Step 2: $R^2=.54$, $\Delta R^2=.32$, $F(7, 19)=2.45$, $p<.05$.

Prediction of substance abuse severity in inmates with SAP

Firstly, levels of cognitive and affective empathy (QCAE total scores), expressive suppression and cognitive reappraisal (ERQ total scores), negative expressivity (BEQ subscales score) as well as social support (MOS-SSS total scores) were used to predict the age of first use of illicit substances. This variable was used to assess the severity of substance abuse. Tolerance and VIF values were analysed, and no collinearity was found. No independent variables were significantly correlated (see Table 3.8). Multiple regression analysis showed that expressive suppression and social support significantly predicted the onset of substance use. The effect of the number of offences committed was statistically controlled by entering this variable in the first step of the regression model (see Table 3.9 for multiple regression statistics). Higher levels of expressive suppression and lower levels of

social support predicted a later onset of substance use, and explained 61% of its variance. These findings were confirmed using a bootstrapping method with 1,000 resamples and 95% confidence intervals (Hayes, 2013).

Table 3.8

Spearman's rho correlations between predictor variables of the participants' age of first use of alcohol and/or illicit substances

	2	3	4	5	6	7
1. Offences committed	.08	.17	-.03	.21	-.13	-.03
2. Cognitive empathy (QCAE)		.36*	.06	-.27	.24	.08
3. Affective empathy (QCAE)			-.01	-.08	.48**	-.08
4. Cognitive reappraisal (ERQ)				.47**	-.16	-.03
5. Expressive suppression (ERQ)					-.57**	.10
6. Negative expressivity (BEQ)						.06

Note. * $p < .05$, ** $p < .01$; number 7 refers to the variable social support.

Table 3.9

Multiple regression statistics for the predictor variables of the participants' age of first use of alcohol and/or illicit substances

	B	SE(B)	B	t	P
Step 1					
Number of offences committed	.05	.08	.12	.59	.56
Step 2					
Cognitive empathy (QCAE)	-.02	.08	-.06	-.31	.76
Affective empathy (QCAE)	.08	.13	.16	.60	.56
Cognitive reappraisal (ERQ)	.03	.08	.07	.35	.73
Expressive suppression (ERQ)	.42	.14	.88	2.99	<.01
Negative expressivity (BEQ)	.70	.69	.29	1.01	.32
Social support (MOS-SSS)	-.08	.03	-.44	-2.52	<.05

Note. Step 1: $R^2 = .02$, $\Delta R^2 = -.03$, $F(1, 23) = .35$, $p = .56$; Step 2: $R^2 = .61$, $\Delta R^2 = .45$, $F(6, 17) = 4.32$, $p < .01$.

A second multiple regression analysis was conducted to examine whether these variables, i.e., levels of cognitive and affective empathy, expressive suppression, cognitive reappraisal, negative expressivity, and social support, could predict the number of years using illicit substances, after controlling for the number of offences committed. This variable was also used to assess the severity of substance abuse. However, none of these variables was found to be a significant predictor of the length of time using illicit substances, $R^2=.28$, $\Delta R^2=-.04$, $F(6, 16)=.99$, $p=.47$.

Discussion

The current study aimed to examine the similarities and differences between substance abusers, offenders, and offenders with SAP in emotional variables, including empathy, CU traits, emotion regulation and emotional expressivity, as well as in perceived social support. Our results showed that the three groups differed from each other in cognitive empathy, and its subcomponent online simulation, proximal responsivity (subcomponent of affective empathy) and uncaring traits with non-offenders and offenders with substance abuse problems reporting lower levels of both cognitive and affective subcomponents of empathy and higher levels of uncaring traits than offenders with no substance abuse problems. However, no significant differences were found in the remaining variables. To our knowledge, this is the first research that has focused on a comparison between these three populations, providing with a clearer understanding of the emotional and social characteristics of individuals with both types of behaviours.

Contrary to our expectations, our results demonstrated a lack of significant differences in cognitive and affective aspects of empathy as well as CU traits between the two groups of substance abusers (with and without histories of criminal behaviour). These individuals reported significantly lower levels of cognitive empathy, online simulation, and proximal responsivity, and higher levels of uncaring traits than inmates without SAP, suggesting that substance abusers have, in general, more difficulties in their ability to cognitively and affectively empathize with others than offenders without SAP. Indeed, this lack of significant differences between the two groups of substance abusers corresponds with the idea of a continuous use of illicit substances causing long-lasting changes in the brain (Nestler, 2005; Volkow & Li, 2004) that may consequently have an adverse effect on emotional variables

such as empathy. Although both offenders and substance abusers could have difficulties in empathy, these difficulties may become more severe in individuals with SAP due to the neurobiological changes associated with the toxic effects of alcohol and drugs on the brain (Goldstein & Volkow, 2002; Harper, 2009; Volkow & Li, 2004). Furthermore, this could explain why both groups of substance abusers reported lower levels of empathy when compared to inmates without SAP. However, the differences found in empathy between the two groups of inmates (with and without histories of substance abuse) could also be attributed to the severity of the offence committed and the level of associated violence. In our sample, a higher percentage of inmates with SAP had committed more severe and violent offences than inmates without SAP, with the former reporting lower levels of empathy and higher levels of uncaring traits than the latter. These results are, in fact, in line with the negative association found between empathy and violent offending (Jolliffe & Farrington, 2004; Van Langen et al., 2014) and the positive association observed between CU traits and the tendency of being charged with serious offenses (Kahn et al., 2013).

Furthermore, our study aimed to investigate whether social and emotional variables predicted criminal recidivism and severity of substance abuse in a sample of offenders with SAP. Two main conclusions can be drawn from our results. Firstly, self-reported CU traits (callous and uncaring) were unique predictors of criminal recidivism. Secondly, self-reported levels of expressive suppression (a strategy used to regulate emotions) and perceived social support were robust predictors of the age of onset of substance use. This supports, to some extent, prior work indicating that certain emotional and social variables can predict criminal recidivism (Kahn et al., 2013) and onset of substance use (Averna & Hesselbrock, 2001;

Ohannessian & Hesselbrock, 2009; Schuckit et al., 2006), and extends it to the study of a population that has often been overlooked.

According to our hypotheses, we found that individuals who reported higher levels of callous and uncaring traits had greater probabilities of committing offences after release. This finding corresponds with previous research showing that callousness and uncaring are significant predictors of prompt violent and general criminal recidivism (Kahn et al., 2013; Kimonis, Kennealy, & Goulter, 2016). Further evidence has related CU traits to increased instrumental and non-instrumental forms of aggression (Frick et al., 2003; Kruh, Frick, & Clements, 2005), with callous traits having been specifically linked to proactive aggression (Fanti, Frick, & Georgiou, 2009), thereby showing the effect of CU traits on disruptive behaviours. In fact, CU traits have been considered especially relevant for the identification of severe patterns of antisocial behaviour (Frick & Dickens, 2006), including criminal behaviour. The callous affect subscale of self-report measures of psychopathy, including the Self-Report Psychopathy Scale–III (SRP–III; Williams, Paulhus, & Hare, 2007), the Levenson Self-Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) and the Psychopathic Personality Inventory–R (PPI–R; Lilienfeld & Widows, 2005), has also been associated with externalising behaviours, such as crime and aggression (Seibert, Miller, Few, Zeichner, & Lynam, 2011). In fact, interpersonal and affective components of psychopathy (e.g., CU traits) are considered to be a significantly predictor of criminal recidivism (Douglas, Vincent, & Edens, 2006; Hemphill, Hare, & Wong, 1998; Rice & Harris, 2013; Walters, 2003). In contrast, our results demonstrated that unemotional traits did not show a significant effect on criminal recidivism, suggesting a weak relationship between unemotional traits and externalising behaviours. This finding agrees with past evidence

showing that unemotional traits are more related to measures of socio-emotional competence, such as reduced empathy and less positive affect, rather than antisocial behaviours (Kimonis et al., 2008).

Importantly, these results increase our knowledge about the usefulness of CU traits, specifically in its self-report form and within a clinical population. To our knowledge, this is the first study that has demonstrated the predictive value of self-reported CU traits for criminal recidivism using a sample of male adult offenders with SAP. This is especially significant considering that a substantial amount of past studies have focused on the role of CU traits in criminal behaviour in adolescence (Frick et al., 2003; Frick et al., 2014) but not in adulthood. Furthermore, our results highlight the usefulness of including measures of CU traits in adult assessment batteries, especially within risk-assessment contexts such as prisons, as an instrument to evaluate potential risks after release. Although psychopathy is currently accounted for the assessment of criminal recidivism in Spanish prisons, particularly using the Psychopathy Checklist-Revised (PCL-R; Hare, 1991); to our knowledge, the use of measures assessing CU traits is still no present to evaluate risk for criminal recidivism in Spanish prisons. Instead, the measures that are currently used focus on the assessment of the risk for violent behaviour, evaluation of socio-emotional adjustment, and manifestation of mental disorders, among others (for a more detailed list of the available measures in Spanish to assess the risk of recidivism see Ballesteros Reyes, Graña Gómez, & Andreu Rodríguez, 2006; Echeburúa, Muñoz, & Loinaz, 2011).

In the prediction of criminal recidivism, neither empathy (cognitive and affective), negative expressivity nor severity of the offence were found to be significant predictors.

Although past research has reported cognitive empathy as a significant predictor of recidivism (Bock & Hosser, 2014), the relationship between empathy and criminal behaviour is thought to vary depending on the type of offender (Jolliffe & Farrington, 2007; Marshall & Maric, 1996), with deficits in empathy being more prominent in violent offenders than in non-violent offenders (Jolliffe & Farrington, 2004). In our sample, inmates with SAP were classified as more violent in comparison to inmates without SAP; however, both groups of inmates were recruited from specific wards allocated to non-violent offenders. None of our participants reported homicide, murder, arson, or sexual convictions, and only one out of 31 reported a manslaughter conviction. However, these types of offences have often been included in studies where empathy has emerged as a significant predictor of recidivism (Bock & Hosser, 2014; Mulder et al., 2011). Perhaps the fact that participants from our study committed less violent offences compared to those committed by participants from other studies could explain why empathy did not predict criminal recidivism in our sample. Indeed, this argument could also explain why the severity of the offence and the level of associated violence did not predict criminal recidivism either, as opposed to previous research (Collins, 2010; Hanson & Harris, 2000; Lim et al., 2011; Roberts et al., 2007).

Finally, we found that expressive suppression and perceived social support predicted the onset of substance use in offenders with SAP. More specifically, our results showed that higher levels of expressive suppression predicted a later onset of substance use, thereby proposing expressive suppression as a potential protective factor for substance use initiation. In certain individuals, the use of this emotion regulation strategy could serve as a self-protective mechanism against negative emotional experience. Earlier evidence has suggested that expressive suppression involves a decrease in the emotions experienced, often-negative

emotions, by interfering with the attention paid to such emotions (Gross & John, 2003), and that this can be used, in certain occasions, to maintain interpersonal relationships (Gross, 2002). The fact that expressive suppression helps avoid negative emotional states may initially prevent individuals from using other strategies less adaptive, such as alcohol and/or drugs use, to cope with social situations. However, a chronic use of expressive suppression in everyday life has also been found to increase negative experiences. In particular, people who have often used expressive suppression report an accurate awareness of their lack of authenticity, and a tendency to experience an incongruence between their emotions and the outer expression of these emotions (Gross & John, 2003), which has been related to distress and depressive symptoms (Sheldon, Ryan, Rawsthorne, & Ilardi, 1997). Therefore, it is feasible to believe that an extended use of expressive suppression could eventually predisposed individuals to choose other strategies, such as substances use, to cope with these negative emotional states. However, it is also important to mention that the present study only report assumptions about the causal relationships between these factors, and hence further research is needed to understand whether a prolonged use of expressive suppression predisposes to substance abuse as a coping mechanism for negative emotions, or if the reverse relationship is also possible. In fact, substances of abuse can cause long-lasting changes in the brain (Nestler, 2005; Volkow & Li, 2004) that could impair emotional processing. Therefore, the use of longitudinal studies investigating difficulties in emotion regulation strategies in populations at higher risk of abusing substances (e.g. children of alcohol and drug abusers) would be of great interest to clarify causal relationships between these factors.

In addition, we found that higher levels of perceived social support predicted an earlier onset of substance abuse, contradicting previous research in which higher levels of perceived

family support were related to a later onset of drugs use (Averna & Hesselbrock, 2001). However, it is important to mention that the levels of social support reported by participants of our study do not necessarily correspond with positive social support. Participants could have referred to social support perceived from deviant environments, in terms of family and friends, which has been suggested as a risk factor for substance use. This could include support received from families where there is parental alcohol and/or drug use, deviant peers that accept and encourage substance use, and communities where drugs are available (Chassin et al., 2003; Chen, Storr, & Anthony, 2009; Hawkins, Catalano, & Miller, 1992). This type of support could provide this individuals with models, opportunities and approval for engaging in alcohol and drug use (Chassin et al., 2003), leading to an earlier onset of substance use. Future studies should therefore focus on the investigation of actual positive support, while controlling for the interference of deviant support, in order to confirm this hypothesis.

Unexpectedly, neither empathy nor negative expressivity predicted the onset of substance use. It is therefore possible that difficulties in empathy play a role in the maintenance of substance use, i.e., considering the previously mentioned hypothesis of a vicious circle, but not in its initiation. In terms of negative emotional expressivity, the literature suggests an association between negative emotions and an earlier onset of alcohol and drugs use (Ohannessian & Hesselbrock, 2009; Schuckit et al., 2006); however, our findings do not support this idea. Nevertheless, the type of emotions assessed and the characteristics of participants included in our study could explain this discrepancy. For example, while previous evidence has focused on negative emotions such as guilt, hostility, anger, sadness, hopelessness, or distress separately, our study assessed simultaneously the expression of four negative emotions (i.e., anger, fear, nervousness, and upset). In addition,

our study included a single group of individuals dependent on alcohol as well as different types of illicit substances (i.e., cocaine and cannabis), and did not differentiate between different types of substance abusers. It may be the case that the association between substance abuse and negative emotional states is specific to certain emotions and types of illicit substances, rather than common to all of them.

There are some limitations in this study that should be taken into consideration. Firstly, this study was based on a male sample, and hence, our results are not representative of the population at large. Although male gender has been consistently reported as a relatively stable predictor of criminal recidivism (Spjeldnes & Goodkind, 2009), future studies should seek to replicate our results among female prisoners with SAP. Future studies should also include prisoners from other regions of the world to study the potential effects of cultural norms, as well as inmates charged with more severe offences to further investigate the impact of empathy on criminal recidivism. Secondly, the sample size was limited, as the number of participants within the group of inmates without SAP was particularly small. Indeed, a power analysis revealed that a sample of 63 (21 participants per group) is necessary for an effect size 0.80, $p<.05$. Although this could have reduced the likelihood of obtaining statistically significant results, considering the characteristics of the populations targeted (clinical and forensic) the restrictions in recruitment were difficult to overcome.

In addition, we defined criminal history and criminal recidivism using only official records, and hence, we may have underestimated the degree to which participants actually offended, i.e., the actual number of offences committed. Future studies, should therefore include both self-report information and official records to measure more accurately criminal

behaviour (see Monahan et al., 2001). Although the use of self-report questionnaires could be considered as a limitation in the current study, the use of these measures in substance use and criminal behaviour has previously received considerable support in the literature (Cartier et al., 2006; Harrison, 1995; Johnson et al., 2000; Nieves, Draine, & Solomon, 2000). Our study failed to differentiate participants according to the type of substance abused. Seeing that different types of illicit substance could have a different effect on emotional and social variables, further research should separately target participants based on the substance used. In addition, it would be of interest to assess personality factors, such as anxiety sensitivity, depression, impulsivity and sensation seeking, in order to differentiate substance abusers based on their clinical profile (as suggested by Cloninger, 1987; Woicik et al., 2009), and determine whether different models of substance use exist.

In summary, this is the first comparative research within these three populations that has shown differences in empathy across groups while highlighting the significance of CU traits in criminal recidivism as well as expressive suppression and perceived social support in the prediction of the onset of substance use. Indeed, the comparison of these three populations has provided with a clearer understanding of the emotional and social characteristics of individuals with both types of behaviours. Furthermore, this research highlights the necessity for further investigation in this area, especially in the association between substance use and emotional variables. Of particular interest are our results on the prediction of the onset of substance use through expressive suppression and social support. Previous evidence has shown that difficulties in regulating emotions may reinforce the use of substances as a mechanism to cope with negative affective states (Baker et al., 2004). This may subsequently create a vicious circle where each relapse brings further negative consequences in terms of

interpersonal functioning. For this reason, more studies should investigate the impact of deficits in emotion understanding on thought processes, behaviour, and interpersonal functioning. In fact, research in both emotional and social aspects is essential to develop effective programmes focused on the prevention of substance abuse and to ensure the success of clinical treatments. In addition, this research shows differences in cognitive and affective empathy, and uncaring traits between inmates with and without substance abuse problems, which highlights the necessity to develop target treatments focused on different aspects for each population, even though both are convicted offenders. Finally, the present study proposes the use of measures CU traits as valuable tools to assess potential risk for criminal recidivism, and recommends including these measures in risk-assessment batteries. A final important question that arose from these results is whether there are other clinical disorders that are also affected in their ability to empathize with others, and if there are further factors contributing to these differences. Therefore, in the following chapter, empathy and social cognition abilities in adolescents with ASD will be addressed.

CHAPTER IV

SOCIAL PERCEPTION IN ADOLESCENTS WITH AUTISM SPECTRUM DISORDERS: INTERACTION BETWEEN EMOTION RECOGNITION, THEORY OF MIND, SOCIAL COMMUNICATION, EMPATHY, AND VISUAL PERSPECTIVE TAKING

Abstract

ASD are characterised by deficits in the ability to discriminate emotions from facial expressions, ToM, and empathy, and these have been suggested to underlie the social and communication difficulties commonly observed in individuals with these conditions. Likewise in the assessment of empathy, limitations about the ecological validity associated with the use of static stimuli to evaluate ToM in ASD have been raised. The main aim of this study was to investigate emotion recognition and ToM in a sample of 12 adolescents with ASD by using an ecologically valid measure: the Awareness of Social Inference Test. In addition, the relationships between emotion recognition, ToM, self-reported empathy, and visual perspective taking were examined. Overall, our findings revealed that participants with ASD were generally impaired in the recognition of basic and complex emotions and had a deficit in ToM, which was not explained by difficulties in empathy or perspective taking. The results support the manifestation of deficits in social perception in individuals with ASD, while questioning whether empathy difficulties are a key factor for the understanding of social and communication deficits in this population.

Keywords: ASD, emotion recognition, ToM, empathy, visual perspective taking and social and communication deficits

Introduction

ASD refer to a group of pervasive neurodevelopmental disorders characterised by severe deficits in certain areas of development (Gleichgerrcht et al., 2012) that comprises several subtypes of autism (see chapter 1 for a more detailed description). Main diagnostic criteria of ASD conditions include long-lasting deficits in social communication and interaction across multiple contexts (including poor social-emotional reciprocity and difficulties establishing developmentally appropriate relationships) as well as restricted, repetitive patterns of behaviours, interests and activities that can limit or impair everyday functioning (DSM-5; APA 2013; Lai et al., 2013; Mathersul et al., 2013b).

Within social contexts, the ability to discriminate emotions from facial expressions is considered necessary for successful interactions (Harms et al., 2010) and thus, difficulties in this ability are commonly understood as a key aspect of the social deficits of individuals with ASD (Dawson, Webb, & McPartland, 2005; Schultz, 2005). Although evidence has generally shown a deficit in the processing of facial emotions (see Harms et al., 2010 for a review), it is still unclear whether emotion recognition is a key and universal deficit in this population (see a meta-analysis from Uljarevic & Hamilton, 2013). For example, some evidence has shown a more general deficit on emotion reading tasks (Corbett et al., 2009; Davies, Bishop, Manstead, & Tantam, 1994; Loveland, Bachevalier, Pearson, & Lane, 2008) that other studies have failed to find (Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997; Castelli, 2005; Da Fonseca et al., 2009). Likewise, evidence on selective deficits in the recognition of emotions is mixed. Baron-Cohen et al. (1993) found a selective deficit in the recognition of surprise, which was suggested to be associated with difficulties in ToM. However, later studies failed to find deficits in the recognition of this emotion (Baron-Cohen et al., 1997; Castelli, 2005;

Spezio, Adolphs, Hurley, & Piven, 2007). More recently, some studies have found deficits in the recognition of positive emotions (Humphreys et al., 2007), whereas others have limited this deficit to the recognition of negative facial expressions. This includes reduced accuracy in the identification of anger (Ashwin et al., 2006; Bal et al., 2010), disgust (Golan et al., 2010; Humphreys et al., 2007; Wallace et al., 2008), sadness (Boraston et al., 2007; Corden et al., 2008; Wallace et al., 2008) or fear (Howard et al., 2000; Pelphrey et al., 2002). Further evidence has suggested that the deficit in the recognition of emotions is more related to complex social emotions, such as pride and embarrassment, rather than to the recognition of basic emotions (Capps et al., 1992; Heerey et al., 2003) or with a brief or more subtle presentation of the emotional stimuli (Rump, Giovannelli, Minshew, & Strauss, 2009). In contrast, evidence showing that the recognition of basic and some more complex emotions (e.g., pride) are less affected (Baron-Cohen, Wheelwright, Jolliffe, & Therese, 1997; Teunisse & de Gelder, 2001) or not affected at all (Adolphs et al., 2001; Lacroix, Guidetti, Rogé, & Reilly, 2009; Loveland, Steinberg, Pearson, Mansour, & Reddoch, 2008; Piggot et al., 2004; Tracy et al., 2011). See chapter 1 for more details on emotion recognition deficits in ASD.

Deficits in ToM (i.e., a failure of a mentalising mechanism) have also been observed in ASD and again suggested to underlie the social deficits of individuals with these conditions (Baron-Cohen, 1997, 2010; Baron-Cohen, 1991; Baron-Cohen et al., 1997; Happé, 1994). ToM, also referred to as mentalising (Frith, Morton, & Leslie, 1991), has been defined as the ability to understand and infer other's feelings, intentions, beliefs and desires, which allows to explain and predict other's behaviour (Premack & Woodruff, 1978). While the ability to judge what a person may be thinking is known as first-order ToM; the ability to be aware of what another person may be intending for their conversational partner to think is known as second-

order ToM (McDonald et al., 2006). Importantly, advanced ToM can be separated into two different constructs, cognitive and affective, which have been associated with different neural networks (Abu-Akel & Shamay-Tsoory, 2011; Bodden et al., 2013; Kalbe et al., 2010; Shamay-Tsoory & Aharon-Peretz, 2007). The first, cognitive ToM, is defined as the cognitive understanding necessary to infer the mental states (desires, beliefs, or intentions) from another person and to differentiate these from one's own, and is considered necessary for second-order false belief ToM tasks. The second, affective ToM, involves more empathic abilities to recognise other's emotional states (i.e., feelings) (Bodden et al., 2013; Kalbe et al., 2010; Shamay-Tsoory et al., 2010), and is required for tasks such as recognition of faux pas (Mathersul et al., 2013b; McDonald & Flanagan, 2004).

The ability to understand more complex emotions, such as sarcasm, is thought to depend on both cognitive and affective ToM (Mathersul et al., 2013b; McDonald & Flanagan, 2004). Indeed, ToM judgements have been found to be especially relevant to understand social behaviour in general, as well as non-literal language (e.g., metaphors) and the intended meaning of literally untrue comments (e.g., lies or sarcasm) in particular (Happé, 1993; Martin & McDonald, 2004; Sullivan, Winner, & Hopfield, 1995). The inability to comprehend humour, irony, sarcasm, metaphors and white lies, together with marked difficulties in the use of non-verbal communication behaviours (Kerig et al., 2012; Smith, 2009b) have been suggested as core characteristics in ASD. This supports the existence of deficits in the basic understanding that people have internal mental states (i.e., ToM deficits) previously reported in ASD (Hill & Frith, 2003; Philip et al., 2012; Yirmiya, Erel, Shaked, & Solomonica-Levi, 1998; Zwickel et al., 2011).

However, although research has widely investigated ToM deficits in ASD, it is still unclear the extent of such deficits. For example, some evidence has shown that autistic children fail to use first-order ToM in false-belief tests (Baron-Cohen, Leslie, & Frith, 1985); while others studies have reported that even though children with ASD are able to pass simple ToM tasks, they fail to pass more advanced tasks such as second-order false belief tests (Baron-Cohen, 1989a; Happé, 1994). The most commonly used test of advanced ToM, the Reading the Mind in the Eyes Test, has also presented mixed results. Some studies have found subtle ToM deficits (Baron-Cohen et al., 1997; Baron-Cohen et al., 1997) while others have shown intact abilities (Couture et al., 2010; Ponnet, Roeyers, Buysse, De Clercq, & Van Der Heyden, 2004). It has been suggested that this task may measure complex emotion recognition rather than ToM (Jarrold, Butler, Cottington, & Jimenez, 2000; Johnston, Miles, & McKinlay, 2008; Mathersul et al., 2013b), which could explain the inconsistencies across studies. It seems most likely, however, that the limited ecological validity associated with the use of static stimuli to evaluate ToM in ASD underlies these mixed results (Baron-Cohen et al., 1997; Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001; Kleinman, Marciano, & Ault, 2001). Indeed, intact abilities for simple ToM tasks but difficulties in advanced ToM tasks using more complex and naturalistic stimuli have been observed in higher functioning children and adults with ASD (Baron-Cohen, O'Riordan, Stone, Jones, & Plaisted, 1999; Happé, 1994), suggesting that ToM deficits may only be apparent when a complex naturalistic task is used (Roeyers, Buysse, Ponnet, & Pichal, 2001).

Along with psychopathy, ASD have been described as empathy disorders (Blair, 2005; Gillberg, 1992), suggesting a deficit in cognitive empathy as a core characteristic in

individuals with these conditions (Grove et al., 2014; Mathersul et al., 2013b; Rueda et al., 2015). These have particularly shown difficulties in the perspective taking component of cognitive empathy (Hirvelä & Helkama, 2011) (see chapter 1 for more details on cognitive and affective empathy deficits in ASD). Some evidence has suggested that ToM share cognitive processes with the ability to see the world from someone else's point of view, known as perspective taking (Hamilton et al., 2009), as both abilities require the simultaneous representation of two differing perspectives (Aichhorn, Perner, Kronbichler, Staffen, & Ladurner, 2006), thereby suggesting a link between both abilities. In individuals with ASD, studies investigating perspective taking abilities have paid special attention to the ability to take another person's visuospatial viewpoint, known as visual perspective taking (VPT) (see Pearson, Ropar, & Hamilton, 2013 for a review).

This ability requires the use of both spatial and social information through two dissociable mechanisms that are sequentially developed (Flavell, 1977): first-level (VPT-1) and second-level (VPT-2) visual perspective taking. The former refers to the basic ability to judge whether another person can or cannot see an object by following their line of sight (Brunyé et al., 2012; David et al., 2010; Hamilton et al., 2009). The latter involves the ability to understand that two different people seeing the same object at the same time do not necessarily see this object in the same way (Flavell, 1977; Masangkay et al., 1974; Pearson et al., 2013). Research focuses on VPT-1, where tasks only require visual information transformation (Surtees, Apperly, & Samson, 2013), has generally demonstrated that this ability is intact in ASD (Baron-Cohen, 1989b; Hobson, 1984; Leekam et al., 1997; Leslie & Frith, 1988; Reed & Peterson, 1990). However, other studies have reported a poorer performance on VPT-1 tasks in ASD compared controls (Reed, 2002; Warreyn et al., 2005).

In experimental studies regarding VPT-2, where the tasks involve superior spatial information processing, results are mixed, with some reporting impairments in adolescents and children (Hamilton et al., 2009; Yirmiya et al., 1994) that others failed to find (Tan & Harris, 1991).

Taken together, evidence shows the relevance of ToM, cognitive empathy and perspective taking ability in ASD, suggesting that deficits in these three areas may limit or impair the social functioning of individuals with these conditions. However, evidence on the extent of these deficits in ASD is still mixed, with important criticism for the lack of ecological valid measures to assess these abilities in ASD. Therefore, the first aim of the study was to investigate emotion recognition and ToM in adolescents with ASD by using an ecologically valid test, the Awareness of Social Inference Test (TASIT; McDonald, Flanagan, & Rollins, 2002), which relies on everyday conversational interactions. Using audio-visual vignettes of indirect speech, this test provides closer links to real-life situations than either faces showing static emotional expressions or abstract text-based measures of mentalising judgments and inferences (e.g., first-order and second-order false-belief tasks, recognition of faux pas that involves social blunders, and the strange stories task that contains non-literal expressions) (Mathersul et al., 2013b).

Based on previous evidence we first hypothesised that adolescents with ASD would have more difficulties than controls at recognising both basic and more complex emotions (hypothesis 1). In particular, we predicted that individuals with ASD would be able to make basic ToM judgments underling sincere interactions, but would show specific impairments at understanding non-literal questions (sarcasm or deception) requiring more advanced ToM (hypothesis 2), as found by Mathersul et al. (2013b). In addition, we aimed to investigate

whether basic emotion recognition in ASD would result in problems understanding more subtle emotions from conversational exchanges. Since the recognition of facial expressions is considered as a first step to understand others' feelings and intentions (Rump et al., 2009), we hypothesised that poorer emotion recognition of basic emotions would be associated with a poorer understanding of more subtle emotions (hypothesis 3).

The second aim was to identify if first and second-order belief (ToM) can be differentiated by the amount of contextual information provided. We hypothesised that individuals with ASD would have more difficulties to infer the intentions of other people when using contextual information (hypothesis 4) as previous studies have shown that children with ASD are unable to use contextual cues to recognise emotions (Da Fonseca et al., 2009). This is also in line with research revealing that social cognition deficits in ASD are more related to deficits in their ability to implicitly integrate mental states with contextual information, rather than to the inability to apply explicit social rules (Baez et al., 2012).

The final aim was to investigate the relationship between abilities on TASIT (used as an ecological measure of ToM), self-reported empathy (i.e., using a well-established measure of empathy known to differentiate between cognitive and affective empathy), and visual perspective taking (i.e., using a computerised task). Based on previous evidence relating empathy to both ToM (Ibanez et al., 2013; Mathersul et al., 2013b) and perspective taking (Gronholm, Flynn, Edmonds, & Gardner, 2012; Ruby & Decety, 2004), we hypothesised that participants' ability to empathize (especially its cognitive component) and to take another person's visuospatial viewpoint would be positively associated with one's emotion recognition, ToM, and understanding of conversational meanings (hypothesis 5).

Method

Participants

The total sample consisted of 24 participants (14 males, 10 females) with an average age of 16.87 ($SD=.92$). Twelve adolescents with ASD (11 males, 1 female) were recruited from schools for which a formal diagnosis of autism was the criterion for entry. Participants had been diagnosed between 3 and 10 years of age ($M_{age}=5.36$; $SD=2.50$), one with a diagnosis of Asperger's Syndrome and 11 with Autism. Three participants had comorbid diagnoses (one dyspraxia, one dyspraxia and ADHD, and one an anxiety disorder); however, none reported language difficulties. The adolescents with ASD were compared to 12 typically developing adolescents with no clinical diagnosis, who were recruited from mainstream schools in the West Midlands. Participant characteristics are displayed in Table 4.1.

Table 4.1

Sample characteristics for both groups of participants: ASD and controls

	Controls (n=12)	ASD (n=12)
Age range (in years)	17-19	15-17
$M (SD)$	17.46 (.69)	16.29 (.73)
Gender (Male: Female)	3:9	11:1
Ethnicity		
White	1 (8%)	10 (83%)
Black/ African-American	3 (25%)	--
Asian-Indian/ Asian-Oriental	5 (42%)	2 (17%)
Mixed	3 (25%)	--
Country of origin: UK	7 (58%)	11 (92%)
Level of education		
Year 10/ Year 11	--	4 (33%)/ 5 (42%)
Year 12	12 (100%)	3 (25%)

Note. Regardless of their country of origin, all participants were fluent in English.

The standard scores of the British Picture Vocabulary Scale (BPVS) (used as a measure of participants' verbal IQ) and the chronological age of the participants were analysed using two independent samples T-test. Results revealed no significant differences in verbal ability, $t(22)=1.54$, $p=.14$, between participants with ASD ($M=81.92$, $SD=8.77$) and control participants ($M=87.91$, $SD=10.21$). However, results showed differences between the groups on chronological age, $t(22)=4.02$, $p<.001$, with individuals with ASD ($M=17.46$, $SD=.70$) being significantly older than the control participants ($M=16.29$, $SD=.73$).

Materials

Participants were asked to complete socio-demographic questions, two behavioural tasks (i.e., the TASIT to measure emotion perception and ToM, and the perspective taking task to assess visual perspective taking) and one self-report questionnaire assessing cognitive and affective empathy. Parents of participants with ASD were also asked to provide information regarding their children's diagnosis of autism. Data were collected by using a protocol developed by the researcher, and this included confirmation of their children having a formal diagnosis of any of the following conditions: Asperger's Syndrome, ASD, or PDD-NOS; age of their children when they were diagnosed; professional who made the diagnosis; and comorbid disorders.

Measure of emotion recognition and ToM. All participants completed The Awareness of Social Inference Test (TASIT; McDonald et al., 2002), which is an audio-visual tool designed for the assessment of social perception through videotaped vignettes depicting everyday social interactions. The TASIT has been previously used in ASD populations (Baez et al., 2012; Mathersul, McDonald, & Rushby, 2013a; Mathersul et al., 2013b) and has shown

adequate psychometric properties as a clinical test of social perception (McDonald et al., 2006).

The Part I, the Emotion Evaluation Test (EET), was used to measure the ability to recognise spontaneous emotional expressions, particularly referred to six basic emotions (happiness, surprise, anger, sadness, fear and disgust), and to discriminate these emotions from neutral expressions, when these are depicted in videotaped scenes. The EET comprises 28 short (lasting between 15 to 60 seconds) videotaped scenes of different actors displaying social cues (e.g., facial expressions, voice tones, gestures) that are consistent with specific emotions. There are four vignettes for each emotion with 12 scenes suggesting a positive emotional state and 16 suggesting a negative emotional state. Participants were firstly asked to watch the videotapes. After each videotape scene, participants were asked to identify the emotion displayed from a list of emotions that contained fear, anger, sadness, revulsion, surprise, happiness, and neutral. In the videotaped scenes with more than one actor, instructions were given to the participants to focus on a particular person. All scripts are neutral in terms of content and do not lend themselves to any particular emotion.

The Part II Social Inference-Minimal (SI-M) and Part III Social Inference-Enriched (SI-E) were used to assess ToM, i.e., participants' ability to make judgments about thoughts, feelings, and meanings from conversational statements expressed by the actors on the videotapes. The SI-M consists of 15 scenes that show dialogues between two actors being either sincere or sarcastic. Five of the scenes show a sincere exchange (referred to as sincere). Another five vignettes show a sarcastic version of an exchange (referred to as simple sarcasm), whereby the actor's comments are meant to be understood non-literally (e.g., "You

have been a great help!”) to be able to infer the opposite. In the five remaining scenes, paradoxical exchanges (referred to as paradoxical sarcasm) are shown (e.g., “Are you sure you have your passport? // Oh, yes... I tore it up and threw it away // Good, that’s okay then”). Here the conversation only has meaning if sarcasm is understood. Participant should detect a sarcastic inference based on the behaviour of the actors, including tone of voice, facial expression, and gestures. After each scene, participants were asked about the speaker’s feelings, beliefs, intentions and meaning (later referred to as think, feel, do and say).

The SI-E includes 16 scenes that give extra information before or after the dialogue to provide more contextual information to the scene, either visually or verbally, and inform about the speakers’ true beliefs. It is important to note that in each scene there is a literally untrue comment. In half of the scenes, the scripts were enacted as a diplomatic lie (referred to as lies); thereby trying to make the best of bad situation (e.g., “Of course you don’t look fat!”). In the other half of the scenes, the scripts were enacted sarcastically, i.e., being referred to as sarcasm (e.g., “Yes, he has finished the dinner”, when he has not finished it). Therefore, this part involves the ability to detect deception in communication (lies) as well as sarcasm. After each scene, participants were again asked about the actor’s feelings, beliefs, intentions, and meaning. The presence of this additional information allows assessing the participants’ ability to integrate and use explicit contextual information about the speakers’ beliefs.

Measures of self-reported empathy. Cognitive and affective levels of empathy were assessed using the Questionnaire of Cognitive and Affective Empathy (QCAE; Reniers et al., 2011). See methods section in chapter 2 for a more detailed description of this measure and its psychometric properties. This questionnaire has shown satisfactory psychometric properties

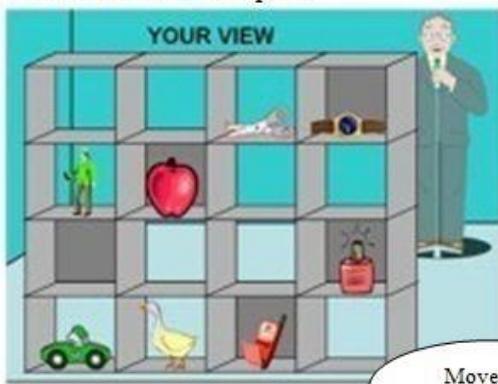
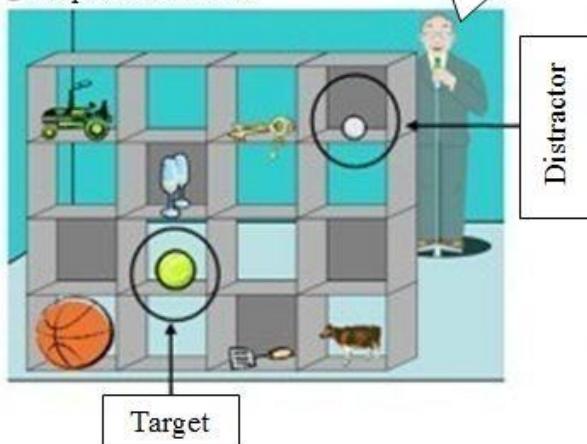
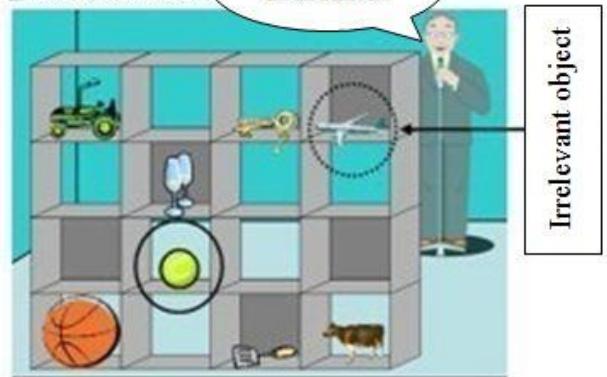
in the present study, with Cronbach's α coefficients of .85 for the subscale of cognitive empathy and .53 for the subscale of affective empathy.

Measure of verbal ability. Receptive vocabulary was measured using a standardised test known as the British Picture Vocabulary Scale-III (BPVS-III; Dunn, 2009). To complete this test, participants were asked to indicate which picture represented the word that the experimenter read aloud from four choices. The words became more complex as the task progressed. This is one of the most commonly used vocabulary measures in the UK and has previously shown excellent reliability properties with Cronbach's α coefficients of .91 (Dockrell & Marshall, 2015).

Measure of visual perspective taking. We presented the Apperly et al. variant (Dumontheil, Apperly, & Blakemore, 2010) of the referential communication task from Keysar, Barr, Balin, and Brauner (2000), to measure participants' ability to take others' perspective, both in terms of accuracy and estimated reaction times of their responses. This computerised task was displayed on a 22.6" monitor and all the data were collected on a laptop running E-Prime 2.0 version 2.0.10.248 (Psychology Software Tools, Inc.). The stimuli consisted of a 4x4 grid containing eight different objects and two cartoon figures representing the two directors. On one side of the grid was placed the male director and on the other side the female character, who had the same point of view than the participant. There were five slots of each grid occluded from the view of the male director, who did not know the content of these slots (see Figure 4.1 for an example of the experiment). Each grid appeared for 5 seconds before the instruction was given. The experiment started with two practice grids followed by 32 grids, with three to five instructions per trial for a total of 128 trials.

Figure 4.1

Online version in colour of the actual stimuli from the perspective taking experiment

A Instructions example 1**B** Instructions example 2**C** Experimental trial**D** Control trial

Note. Image A shows the participants' point of view, while image B shows the director's point of view with four objects in occluded slots that the director cannot see (e.g., nail polish). Image C is an example of an experimental trial. The participant is given the verbal instruction “move the small ball left” from the director. If the participant ignores the director's perspective, the participant would move the distractor object (i.e., golf ball), which is the smallest ball in the grid but the one that cannot be seen by the director, instead of the target object (i.e., tennis ball). Image D is an example of a control trial where an irrelevant object (e.g., plane) replaces the distractor item (Adapted from Dumontheil et al., 2010).

Of the total trials, 96 trials were fillers and thus, these were not included in later analysis. The instructions for the filler trial referred only to objects visible to both male director and participants. The remaining critical trials consisted of 16 experimental (which

included an occluded distractor object) and 16 control trials (which included an irrelevant object). The male director gave all the instructions for the critical trials. The male director and the female character proportionally gave the instructions that appeared immediately before the critical instructions. The experimental and control trials were equally divided into ambiguous and relational trials. The eight experimental relational trials referred to objects that are comparable to each other in either size or location. The eight experimental ambiguous trials contain instructions that referred to two potential objects. For example, when instructing, “*move the glasses one slot to the left*”; the object glasses could refer to either a pair of reading glasses or a pair of drinking glasses. However, only one of these two objects can be seen from the male director’s point of view. The control trial encloses the same information as the experimental trial except that the distractor object is replaced with an irrelevant object. The order of the filler, control, and experimental trials was counterbalanced between subjects.

In order to complete the task, the participants were given detailed instructions on how to complete the task. Then, they were asked to listen to instructions given by the director through computer speakers. In each trial, the director asked the participants to move one of the eight objects in a particular direction (e.g., move the glass up or down, left, or right). Using a computer mouse, participants were required to click on the object they thought the director was referring to and move the mouse cursor to a proper slot on the grid based on the instructions received. Participants were told that the object would not actually move, but that they should act and move the mouse as if it did. The correct response was to select the target object, which could be seen by the male director, and was the best fit for his instruction when his point of view was taken into account.

Procedure

All adolescents gave verbal and written consent to take part in the study. Written consent was also obtained from their parents/guardians before participation. Participants were tested individually in a classroom at the schools where they attended, and were not compensated for their participation. All the participants were fluent in English and all were able to complete the measures without difficulties. Data was collected in two sessions to avoid tiredness. In the first session, which lasted about 15 minutes, participants were presented with detailed information on the study and were asked to complete one questionnaire (i.e., QCAE). The second session was divided in two periods of 35 minutes each with a break in-between. Participants were presented with the visual perspective taking task, the BPVS and the AQ, followed by the TASIT. Full Ethical approval for this research project was granted by the Research Ethics Committee of the University of Birmingham, UK.

Analyses strategy

All analyses were performed using SPSS Version 20 (IBM SPSS Inc., Armonk, NY). A significance alpha level of .05, and two-tailed tests were used for statistical analyses. Post-hoc analyses using Bonferroni corrections were conducted. In the result section, adjusted *p*-values were reported. For the first aim of the present study, differences in both the recognition of basic emotions and the social inference task between the control and the ASD group were investigated using repeated measures analyses of variance were performed (first and second hypothesis). Participants' results from the TASIT Part 1, Emotion Evaluation Test, were used to investigate the recognition of basic emotions (i.e., happy, surprised, neutral, sad, angry, anxious, and revolted). Participants' results from the TASIT Part 2 and 3, Social Inference Tests, were used to analyse complex emotions. To perform statistical analyses, Parts 2 and 3

were broken into their relevant subtests: sincere exchanges, simple sarcasm, and paradoxical sarcasm (Part 2), and lies and sarcasm (Part 3). To analyse the recognition of basic and complex emotions each emotion and social inference task was analysed separately for each group. Furthermore, linear regression analysis was used to investigate the relationship between basic emotion recognition and the ability to recognise more subtle emotions (third hypothesis of the present study). This will allow determining the contribution of the participants' responses in social inferences tasks (i.e., probes questions in the TASIT Parts 2 and 3) to their ability to recognise basic emotions (in the TASIT Part 1).

For the second aim, a repeated measures ANOVA were conducted to investigate the relationship between participants' ToM (i.e., think probes in the TASIT Part 2 and 3) with the absence or presence of contextual cues, i.e., whether the actor's demeanour was presented alone (Part 2), or together with additional contextual cues (Part 3) (fourth hypothesis of the present study). In addition, linear regression analysis was used to investigate the contribution of understanding other peoples' feelings (i.e., probes questions about actors' feelings in the TASIT Parts 2 and 3) and intentions (i.e., ToM: think probes in the TASIT Part 2 and 3) to the participants' understanding of the meaning of conversational exchanges. This was done by using the probes questions about the meaning of the actors' conversational exchanges in the TASIT Part 2 and 3. For the final aim of the present study (fifth hypothesis), linear regression analyses were used to examine the contribution of cognitive and affective empathy to the ability to recognise basic emotions and make social inferences (i.e., ToM and ability to understand the meaning of conversational exchanges). In addition, the contribution of the ability to take others' visual perspective to both the recognition of basic emotions and social inferences tasks (probes in the TASIT Part 2 and 3) was also examined.

Results

All analyses were performed using SPSS Version 22 (IBM SPSS Inc., Armonk, NY).

A significance alpha level of .05, and two-tailed tests were used for statistical analyses.

TASIT Part 1. Emotion Evaluation Test (EET)

In order to analyse each emotion separately for each group, a repeated measures analysis of variance was performed, including a within participants factor (emotion: happy vs. surprised vs. neutral vs sad vs. angry vs. anxious vs. revolted) in the main design. Results showed a significant main effect of emotion, $F(6, 132)=4.99$, $MSE=2.62$, $p<.001$, $\eta_p^2=.19$. Post-hoc analysis using Bonferroni corrections revealed that participants identified happiness, $t(23)=5.82$, $p<.001$, and sadness expressions, $t(23)=-3.98$, $p<.001$, significantly better than neutral expressions. The main effect of group was also significant, $F(1, 22)=13.06$, $MSE=30.01$, $p<.01$, $\eta_p^2=.37$, showing that participants with ASD were significantly worse overall at recognising emotions, $t(22)=3.71$, $p<.01$ ($M=18.50$, $SD=5.23$) than controls ($M=24.67$, $SD=2.43$). See Table 4.2 for descriptive statistics on EET scores.

The emotion x group interaction was also significant $F(6, 132)=2.73$, $MSE=1.44$, $p<.05$, $\eta_p^2=.11$. In the control group, post-hoc analysis using Bonferroni corrections, revealed only happiness to be identified significantly better than neutral, $t(11)=4.69$, $p<.001$. In the ASD group, post-hoc analysis showed only happiness to be identified significantly better than neutral, $t(11)=4.49$, $p<.001$, and anxious, $t(11)=4.31$, $p<.001$, expressions. The analysis was repeated including verbal ability and age as covariates. Results confirmed that neither verbal ability, $F(6, 120)=.84$, $MSE=.44$, $p=.54$, $\eta_p^2=.04$, nor age, $F(6, 120)=.98$, $MSE=.51$, $p=.45$, $\eta_p^2=.05$, were significant predictors of EET scores.

Table 4.2

Means, standard deviations and statistical significance comparing ASD and controls in the total scores from the EET (TASIT part 1)

	ASD		Control		<i>t</i> (22)
	Mean	SD	Mean	SD	
Happy	3.50	.67	3.58	.51	.34
Surprised	2.75	1.29	3.92	.29	3.06**
Neutral	2.25	.75	2.92	.67	2.29*
Sad	3.00	.85	3.33	.49	1.17
Angry	2.58	1.17	3.67	.49	2.97**
Fear/Anxious	2.33	1.37	3.58	.67	2.84**
Revolted	2.08	1.31	3.42	.90	2.90**
Total	18.50	5.23	24.67	2.43	3.71

Note. * $p<.05$, ** $p<.01$.

TASIT Parts 2 and 3: Social Inference tests (SI-M and SI-E)

The overall scores for Part 2 (SI-M) and Part 3 (SI-E) are detailed in Table 4.3. Parts 2 and 3 are broken into their relevant subtests: sincere exchanges, simple sarcasm, and paradoxical sarcasm (Part 2), and lies and sarcasm (Part 3). In order to analyse each social inference task separately for each group, a repeated measures analysis of variance was performed, including a within participants factor (type of sarcasm) in the main design. Results for Part 2 (SI-M) showed no significant main effect of sarcasm, $F(2, 44)=.74$, $MSE=8.29$, $p=.48$, $\eta_p^2=.03$. However, the main effect of group was significant, $F(1, 22)=6.70$, $MSE=159.01$, $p<.05$, $\eta_p^2=.23$, revealing that ASD participants ($M=34.67$, $SD=10.00$) were overall worse than controls ($M=43.58$, $SD=6.50$) at recognising sarcasm, $t(22)=2.59$, $p<.05$.

The sarcasm x group interaction was also significant $F(2, 44)=6.51$, $MSE=72.76$, $p<.01$, $\eta_p^2=.23$. Post-hoc analysis using Bonferroni corrections revealed significant

differences between groups across with paradoxical sarcasm, $t(22)=3.54$, $p<.01$, with the ASD participants ($M=9.67$, $SD=4.01$) performing significantly worse than controls ($M=15.17$, $SD=3.59$). However, there were no significant differences between groups across simple sarcasm (ASD $M=10.92$, $SD=5.14$; controls $M=15.33$, $SD=4.05$) or sincere exchanges (ASD: $M=14.08$, $SD=2.50$; controls: $M=13.08$, $SD=3.75$). In order to confirm that verbal ability and age did not have an effect on the sarcasm scores, the analysis was repeated including verbal ability and age as covariates. Results revealed that verbal ability, $F(2, 40)=5.24$, $MSE=49.11$, $p<.01$, $\eta_p^2=.21$), but not age, $F(2, 40)=1.44$, $MSE=13.46$, $p=.25$, $\eta_p^2=.07$) was a significant predictor of sarcasm scores.

Table 4.3

Overall scores for probes in Parts 2 (SI-M) and 3 (SI-E) of the TASIT of ASD and controls

		Social Inference Minimal (SI-M)				Social Inference Enriched (SI-E)			
		Feel	Think	Mean	Intend	Feel	Think	Mean	Intend
ASD	Max. S	15	15	15	15	16	16	16	16
		9.33	8.25	8.50	8.58	9.08	10.33	8.17	9.00
		(3.09)	(3.17)	(3.00)	(1.62)	(2.23)**	(2.64)*	(1.34)**	(2.09)**
Controls		11.33	10.75	11.08	10.42	12.42	12.50	11.08	12.17
		(1.83)	(1.71)	(2.50)	(1.98)	(1.93)	(2.07)	(2.61)	(1.99)

Note. Max. S: maximum score. Asterisks* indicate that the ASD group was significantly different from the matched control group: * $p<.05$, ** $p<.01$.

Results for Part 3 (SI-E) showed no significant main effect of lies and sarcasm, $F(1, 22)=.01$, $MSE=.19$, $p=.92$, $\eta_p^2=.00$. Participants performed similarly on the lie condition ($M=21.13$, $SD=5.08$) as the sarcasm condition ($M=21.25$, $SD=4.87$). The main effect of group was significant, $F(1, 22)=24.92$, $MSE=402.52$, $p<.001$, $\eta_p^2=.53$, revealing that participants with ASD were significantly worse overall, $t(22)=4.99$, $p<.001$, at recognising sarcasm and

lies ($M=36.58$, $SD=5.35$) than the control participants ($M=48.17$, $SD=5.99$). The interaction sarcasm x group was not significant, $F(1, 22)=.30$, $MSE=.52$, $p=.86$, $\eta_p^2=.00$, showing that the type of condition (sarcasm, lies) did not differentiate the groups of children. Results revealed that neither verbal ability, $F(1, 20)=1.20$, $MSE=21.39$, $p=.29$, $\eta_p^2=.06$), nor age, $F(1, 20)=.01$, $MSE=.13$, $p=.93$, $\eta_p^2=.00$) were significant predictors of sarcasm scores.

Relationship between ability to judge emotions (Part 1) and ability to answer questions about feelings (Parts 2 and 3)

The average scores on the types of probe questions for Parts 2 and 3 of the TASIT are shown in Table 4.3. To assess the relationship between basic emotion recognition and the ability to recognise more subtle emotions, we entered scores for all four questions for Parts 2 and 3 into two simultaneous linear regressions. None of the probes in Part 2 (SI-M) independently predicted emotion recognition. However, the presence of ASD was found to be an independent predictor of emotion recognition (EET), $\beta= -.40$, $t= -2.12$, $p<.05$, suggesting that the difficulties in recognising emotions specifically related to problems understanding emotions (feel probes), beliefs (think probes), meanings (say probes) and intentions (do probes) in Part 2 (SI-M) depend on the presence of ASD diagnosis.

Feel questions in Part 3 (SI-E) were the only probe questions to make an independent contribution to emotion recognition (ETT, Part 1), $\beta=.61$, $t=2.63$, $p<.01$. This suggests that when contextual cues are provided to inform the speaker's true intentions (Part 3), adolescents who were good at recognising basic emotions (ETT) were better at understanding what another person was feeling. The presence of ASD was not an independent predictor of

emotion recognition (EET) when related to problems understanding emotions (feel probes), beliefs (think probes), meanings (say probes) and intentions (do probes) in Part 3 (SI-E).

Relationship between ToM and behaviour of the speaker with/ without contextual cues

A repeated measures ANOVA comparing scores on the think probes (first-order ToM) in Part 3 (SI-E) to those in Part 2 (SI-M), showed no significant group x part interaction, $F(1, 22)=.19$, $MSE=.33$, $p=.67$, $\eta_p^2=.01$. This showed that participants with ASD had difficulty with think questions regardless of whether those judgements were formed based on the actor's demeanour alone (Part 2), or if they were given additional contextual cues (Part 3). A second ANOVA contrasting intend/ do probes (second-order ToM) across Part 2 (SI-M) and Part 3 (SI-E) revealed no significant group x part interaction, $F(1, 22)=2.69$, $MSE=5.33$, $p=.12$, $\eta_p^2=.11$. This suggests that the ASD participants found intend/ do questions on both Parts 2 and 3 equally difficult.

Contribution of understanding of others' feelings and ToM to conversational meaning

To examine the relationship between the understanding of other's feelings, mentalising/ ToM and conversational ability, scores on feeling probes and ToM (think and intend/ do probes) were entered into two simultaneous linear regressions for Parts 2 (SI-M) and 3 (SI-E). Total scores on the appropriate probe questions on speakers meaning (mean/ say probes) were entered as the dependent variable. Only on Part 2, did the ability to answer intend/ do questions significantly predict answers on the mean/ say questions, $\beta=.36$, $t=2.40$, $p<.05$. Combination of these variables were significant predictors in both cases, Part 2: $\Delta R^2=.73$, $F(3, 20)=22.11$, $p<.001$; Part 3: $\Delta R^2=.60$, $F(3, 20)=12.35$, $p<.001$. For Part 3 the ability to understand both intend/ do questions, $\beta=.44$, $t=2.84$, $p<.01$, and how the speaker was

feeling, $\beta=.50$, $t=2.98$, $p<.01$, was able to predict performance on the probe questions on what the speaker meant (say). The presence of ASD was not found to be an independent predictor on either Part 2 or Part 3, suggesting that there are difficulties interpreting the meaning/ say probes that are specifically related to problems understanding emotions (feel probes), beliefs (think probes), meanings (say probes) and intentions (do probes) regardless of having an ASD diagnosis.

Contribution of empathy to emotion recognition, ToM and to conversational meaning

First, we examined the differences in self-reported cognitive and affective empathy across groups. Non-significant differences were found either in cognitive, $t(21)=.13$, $p=.90$, or affective empathy, $t(22)=.51$, $p=.61$. In addition, we investigate the relationship between self-reported levels of cognitive and affective empathy, emotion recognition, mentalising and conversational ability by using linear regressions. Total scores on the appropriate probe questions on emotion recognition (EET), feeling probes, ToM (think and intend/ do probes), and meaning/ say probes (probes scores from Part 2 and Part 3 combined) were separately entered as the dependent variable to determine the contribution of cognitive and affective empathy to these variables. Neither cognitive nor affective empathy significantly predicted any of the probe questions. Table 4.4 shows multiple regression statistics for predictor variables of emotion recognition, feeling probes, ToM, and conversational meaning.

The presence of ASD was not an independent predictor of any of the four probes (Part 2 and 3). However, ASD emerged as an independent predictor of emotion recognition (EET), $\beta= -.59$, $t= -3.19$, $p<.01$, with adolescents with ASD ($M=18.50$, $SD=5.23$) showing poorer abilities at recognising other's emotions than controls ($M=24.67$, $SD=2.43$).

Table 4.4

Multiple regression statistics for cognitive and affective empathy as predictor variables of emotion recognition, feeling, ToM (think and intend), and meaning

	B	SE(B)	β	t	p
Emotion recognition (EET)					
Cognitive empathy	-.00	.14	-.01	-.03	.98
Affective empathy	.20	.27	.19	.73	.48
Feel probe (Part 2 and 3)					
Cognitive empathy	.01	.04	.09	.37	.72
Affective empathy	-.14	.08	-.45	-1.86	.08
Think probe (Part 2 and 3)					
Cognitive empathy	.01	.06	.03	.11	.91
Affective empathy	-.08	.11	-.21	-.79	.44
Intend/ do probe (Part 2 and 3)					
Cognitive empathy	-.01	.04	-.04	-.17	.87
Affective empathy	-.09	.08	-.28	-1.10	.28
Mean/ say probe (Part 2 and 3)					
Cognitive empathy	.03	.06	.14	.53	.60
Affective empathy	-.14	.11	-.32	-1.25	.23

Note. Combined scores from Parts 2 and 3 for each probe were used here. Emotion recognition: $R^2=.04$, $\Delta R^2= -.06$, $F(2, 20)=.36$, $p=.70$; feel probe: $R^2=.17$, $\Delta R^2=.09$, $F(2, 20)=2.03$, $p=.16$; think probe: $R^2=.04$, $\Delta R^2= -.06$, $F(2, 20)=.39$, $p=.68$; intend probe: $R^2=.09$, $\Delta R^2= .00$, $F(2, 20)=1.03$, $p=.38$; mean probe: $R^2=.07$, $\Delta R^2= -.02$, $F(2, 20)=.79$, $p=.47$.

Contribution of visual perspective taking to emotion recognition, ToM, and conversational meaning

First, we examined the errors made in the ambiguous and relational trials. On average, adolescents failed to appreciate the perspective of the director on 31% of the ambiguous experimental trials and on 61% of the ambiguous relational trials. Adolescents with ASD failed on 33% of the ambiguous experimental trials, while controls failed on 29% of these

trials. Both adolescents with ASD and controls equally failed to appreciate the perspective of the director on relational experimental trials. Table 4.5 shows means and standard deviations of proportion of errors made on the perspective taking task by both groups. Consistent with previous findings, participants frequently made more errors on relational and ambiguous experimental trials than on control trials (Dumontheil et al., 2010). However, both groups performed better than the baseline of 0% correct in relational trials and 50% correct in ambiguous trials (see Table 4.5). However, these rates are larger to what has been shown to typically developing adolescents (Dumontheil, Hillebrandt, Apperly, & Blakemore, 2012) and adults on previous versions of the task (Abu-Akel, Wood, Hansen, & Apperly, 2015; Apperly et al., 2010).

Table 4.5

Means and standard deviations on proportion of errors made in the perspective taking task across groups

	Control		ASD	
	Mean	SD	Mean	SD
Ambiguous control trials (AMB CONT)	.12	.29	.06	.09
Ambiguous experimental trials (AMB EXP)	.29	.27	.33	.14
Relational control trials (REL CONT)	.24	.29	.14	.15
Relational experimental trials (REL EXP)	.61	.22	.61	.24

Note. Non-significant differences were found between ASD and controls in any of the trials.

Importantly, there was no relationship between performance on this task and total scores on the TASIT (see Table 4.6 for correlations). Scores on the ambiguous and relational experimental trials of the perspective taking tasks did not predict emotion recognition (EET), or performance on the any of the probe questions (feel, think, intend mean) on Parts 2 and 3 (see Table 4.7 shows multiple regression statistics).

Table 4.6

Pearson's correlations between perspective taking trials and TASIT

	AMB CONT	AMB EXP	REL CONT	REL EXP
TASIT Part 1 (EET)	.06	-.06	.02	.00
TASIT Part 2 (SI-M)	.01	-.07	-.09	-.01
TASIT Part 3 (SI-E)	-.04	-.10	-.03	.08

Note. None of the correlations between perspective taking trials and TASIT components was found to be significant. Overall scores from Parts 1, 2 and 3 from the TASIT were used here.

Table 4.7

Multiple regression statistics for the experimental trials of the perspective taking task as predictor variables of emotion recognition, feeling, ToM (think and intend), and meaning

	B	SE(B)	B	t	p
Emotion recognition (EET)					
Ambiguous experimental trials	-1.53	5.35	-.06	-.286	.78
Relational experimental trials	.31	5.02	.01	.06	.95
Feel probe (Part 2 and 3)					
Ambiguous experimental trials	-1.95	1.48	-.28	-1.32	.20
Relational experimental trials	1.09	1.39	.17	.78	.44
Think probe (Part 2 and 3)					
Ambiguous experimental trials	2.51	1.90	.28	1.32	.20
Relational experimental trials	-1.30	1.79	-.16	-.73	.47
Intend/ Do probe (Part 2 and 3)					
Ambiguous experimental trials	-1.45	1.56	-.20	-.928	.36
Relational experimental trials	1.23	1.46	.18	.84	.41
Mean/ Say probe (Part 2 and 3)					
Ambiguous experimental trials	-1.10	2.18	-.11	-.505	.62
Relational experimental trials	.68	2.05	.07	.33	.74

Note. Combined scores from Parts 2 and 3 for each probe were used here. Emotion recognition: $R^2=.00$, $\Delta R^2= -.09$, $F(2, 21)=.04$, $p=.96$; intend probe: $R^2=.06$, $\Delta R^2= -.03$, $F(2, 21)=.65$, $p=.53$; mean probe: $R^2=.02$, $\Delta R^2= -.08$, $F(2, 21)=.16$, $p=.86$; think probe: $R^2=.08$, $\Delta R^2= -.00$, $F(2, 21)=.98$, $p=.39$; feel probe: $R^2=.09$, $\Delta R^2= .00$, $F(2, 21)=1.01$, $p=.38$.

Discussion

Several studies have focused on social perception of individuals with ASD. However, this is the first study using an ecologically valid measure to assess emotion recognition and ToM within everyday social interactions, while relating these abilities to visual perspective taking and self-reported levels of empathy in a sample of adolescents with ASD. Importantly, considering that both non-verbal and verbal mental age have been found to influence the performance on emotion recognition tasks (see Harms et al., 2010), in the current study both ASD and control participants were matched for chronological age and the effects of verbal ability investigated. Overall, our results showed that participants with ASD were generally impaired in the recognition of basic and complex emotions and had a deficit in ToM, which was not explained by difficulties in empathy or perspective taking.

First, these results demonstrated that adolescents with ASD had difficulties in recognising basic emotions as well as more subtle emotions. In particular, participants with ASD were found to perform worse than controls at recognising basic emotional expressions of surprise, neutral, anger, fear, and revolt. This corresponds with previous research showing that individuals with ASD are only impaired in the recognition of specific emotions, which varies from surprise (Baron-Cohen et al., 1993) to anger (Ashwin et al., 2006; Bal et al., 2010; Teunisse & de Gelder, 2001) and disgust (Baez et al., 2012; Golan et al., 2010; Humphreys et al., 2007; Wallace et al., 2008), with the more consistent finding emerging from fear recognition (Howard et al., 2000; Pelphrey et al., 2002). In addition, our results showed that both groups, ASD and control, were able to better identify happiness than neutral and anxious expressions (the latter only in the case of the ASD group), similar to previous findings (Rump et al., 2009). This could be attributed to the idea that positive expressions are less likely to be

misjudged due to the exhibition of characteristic features, such as a smile, which can be used as precise indicative to identify this emotion (Calvo & Marrero, 2009). Importantly, this finding also corresponds with our results in chapter 5, in which an asymmetry in the accurate inference of others' internal states based on the valence of the expressed emotion was found in typically developing participants, indicating that, likewise in ASD, positive emotions could be considered as visually more distinctive and recognisable than negative emotions.

Second, the TASIT was used in the current study to assess participants' ability to infer others' beliefs, intentions, and emotions in social contexts where sincere interactions and non-literal speeches involving sarcasm and lies were shown. Consistent with our hypothesis, our results revealed that participants with ASD performed generally worse than typically developing controls at understanding sarcasm, showing specific difficulties at recognising paradoxical sarcasm. This finding corresponds with previous research (Mathersul et al., 2013b), and supports the idea that in ASD the inability to infer second-order mental states is associated with a failure to understand counterfactual statements as sarcasm (Happé, 1993). In addition, considering that the ability to use and understand non-literal language have relevant social and communicative functions (Capelli, Nakagawa, & Madden, 1990; Persicke, Tarbox, Ranick, & Clair, 2013), our findings underline the significance of this deficit to explain difficulties in social domains of individuals with ASD.

Our analysis also revealed that lower verbal ability but not chronological age contributed to difficulties at understanding sarcasm. Seeing that sarcasm is considered as a form of verbal irony (Capelli et al., 1990), in which the speaker subjectively states the opposite of what is objectively known to be true (Persicke et al., 2013); it is feasible to think

that lower verbal ability can contribute to deficits in understanding non-literal expressions. However, it is important to note that poor comprehension of sarcasm has been associated with a failure of inferential reasoning rather than with a simple failure to recognise the literal meaning of the speaker's statement (McDonald, 1999) and thus, lower verbal ability could be considered as necessary but not sufficient to explain failures in understanding sarcasm.

In addition to the deficits in emotion recognition, our results demonstrated that adolescents with ASD were less accurate than controls in first-order ToM judgements, i.e., when judging what the speaker is thinking, as well as in more complex (second-order) ToM judgments, i.e., when judging what the speaker intends to say. This is in line with previous evidence showing that individuals with ASD fail to use first-order ToM (Baron-Cohen et al., 1985) and more advanced ToM tasks (Baron-Cohen, 1989a; Happé, 1994), but contradicts research showing intact abilities in ToM (Couture et al., 2010; Ponnet et al., 2004). Our results also disagree with evidence stating that in individuals with ASD the abilities for simple ToM tasks are intact whereas for more advanced ToM are impaired (Baron-Cohen et al., 1999; Happé, 1994). However, the fact that we used a more complex and naturalistic stimuli to assess ToM than previous research could have allowed to obtain more ecologically valid results and observed more subtle deficits in the ToM task.

Contrary to our expectations, the ability to recognise basic emotions in Part 1 was not associated with the ability to recognise more subtle social emotions in the conversational exchanges of Part 2, which contradicts the idea of recognition of facial expressions being a first step to understand others' feelings and intentions (Rump et al., 2009). Previous evidence has however suggested that poor performance on more complex ToM judgements is

independent of the ability to recognise emotions (McDonald, 1999), considering the latter neither sufficient nor necessary for the former (McDonald & Flanagan, 2004), and our results provided further support for this idea. In contrast, recognition of basic emotions in Part 1 was found to be associated with the ability to identify more subtle emotions (i.e., how the speaker was feeling) in conversational social exchanges from Part 3, where the speaker's beliefs were made explicit. This result indicates that in complex social contexts where contextual information is provided, basic emotion recognition may be necessary to interpret the speaker's feelings. Importantly, the presence of ASD did not emerge as a significant contributor when predicting basic emotion recognition (Part 1) from more complex ToM judgements (Parts 2 and 3), suggesting that the contribution of basic emotion recognition to the recognition of subtle emotions is common to both typically developing adolescents and those with ASD.

In addition, we found that the performance of participants with ASD in ToM (first and second-order ToM judgements, i.e., think and intend probes) did not improve when contextual information made explicit the speakers' thoughts and intend meanings (Part 3), compared to the ToM judgments made based on the speakers' behaviour only (Part 2). This corresponds with previous results revealing that individuals with ASD are unable to use contextual cues to recognise emotions (Da Fonseca et al., 2009) and suggests specific deficits in their ability to integrate mental states (intentions, beliefs, emotions) with contextual information (Baez et al., 2012). Taken together, our results suggest that deficits in social contexts may correspond with the inability to spontaneously perceive relevant social elements and interpret these within a given social context (Klin, 2000), due to the difficulties in the implicit inference of contextual clues that may bias the social significance of other's behaviours (Baez et al., 2012; Ibañez & Manes, 2012).

Our results revealed that the ability to interpret the speaker's intentions (second-order ToM) was found to predict the ability to understand what the speaker meant only when the cues in the conversation were those coming from the speakers' behaviour (Part 2). However, when extra contextual cues making explicit what the speaker knew to be true were provided (Part 3), the ability to interpret the speaker's intentions was predicted by both the ability to understand what the speaker's statements meant and the ability to understand the speaker's feelings. As previously shown in populations with impaired social functioning (e.g., people with traumatic brain injury, see McDonald & Flanagan, 2004), in both Part 2 and Part 3 social inference was related to the ability to infer the speakers' intentions whereas the ability to judge the speakers' feelings was only relevant when contextual cues were provided. Here again the presence of ASD did not emerge as a significant contributor when predicting conversational meaning from the ability to interpret the speaker's intentions.

The final aim was to investigate the relationship between abilities on TASIT, self-reported empathy and visual perspective taking. The regression analyses showed that neither cognitive nor affective empathy significantly predicted emotion recognition, ToM, or understanding of conversational meanings. Considering that this result contradicts evidence suggesting an association between empathy and ToM (Ibanez et al., 2013; Mathersul et al., 2013b), and the fact that no significant differences were found between ASD and controls in empathy, this finding seems to be better explained by the small sample size rather than for an actual lack of association. In fact, even though our sample size was comparable to previous studies investigating ToM in ASD (Baez et al., 2012; Zalla, Sav, Stopin, Ahade, & Leboyer, 2009), this was relatively small and hence, it could have diminished the statistical power of

our results. Considering this limitation, chapter 6 will investigate cognitive and affective levels of empathy using a larger sample of individuals with ASD

Our results also failed to demonstrate that the ability to take another person's visuospatial viewpoint visual perspective taking could predict emotion recognition, ToM, and understanding of conversational meanings, despite these components of social perception have been previously related to visuospatial perspective taking (Gronholm et al., 2012; Ruby & Decety, 2004). Furthermore, we did not find significant differences in perspective taking between ASD and controls, in line with previous findings (David et al., 2010; Hobson, 1984; Reed & Peterson, 1990; Tan & Harris, 1991), in which the ability to take others' visuospatial perspective was found to be preserved in individuals ASD. In the current study, individuals with ASD could not be characterised by a deficit in visuospatial perspective taking. However, we found that the mean on the proportion of errors they made was larger to what has been shown in previous studies (Abu-Akel et al., 2015; Apperly et al., 2010; Dumontheil et al., 2012), suggesting that their perspective abilities may be somehow affected. Indeed, it is important to consider that, similar to research by David et al. (2010), our results could have been influenced by the fact that our groups were not matched for gender (i.e., number of females in the control group was significantly higher than in the ASD group). Some evidence has shown that males may have an advantage on visual-spatial perspective taking or mental rotation tasks (Kaiser et al., 2008; Parsons et al., 2004), and this could have biased the results in the ASD group. This is an important limitation of this study and thus, further research should include a larger sample of adolescents with ASD matched for gender and examine the gender differences in perspective taking to confirm our hypothesis.

Another aspect to be discussed is the lack of information from standardised clinical interviews, such as the Autism Diagnostic Observation Schedule (ADOS) or the Autism Diagnostic Interview (ADI) in the present study. However, this should not be considered as a limitation in the present study as all the participants from the ASD group were required to have a formal diagnosis of ASD and to present this information before participation, which ensured their belonging to this group. Finally, it is important to consider the role that other variables, such as alexithymia, could play in explaining deficits in emotion recognition. Some evidence suggests that certain empathy deficits associated with ASD may be better explained by the presence of coexisting alexithymia than by autism per se (Berthoz et al., 2013; Cook et al., 2013; Silani et al., 2008). For example, eye-tracking studies found that attention to the eyes and mouth (eye/mouth fixation) when seeing social stimuli can be predicted according to the degree of alexithymia in individuals with autism (Bird, Press, & Richardson, 2011). Also, an association has been found between the degree of alexithymia and reduced brain activation in the insula (a structure involved in empathetic processes) when both individuals with and without ASD empathised with other's pain (Bird et al., 2010; Moriguchi & Komaki, 2013). Deficiencies in insular activation thus appear to predict deficits in empathy related-activity, and seem to be more related to alexithymia than other ASD traits. Therefore, future research should study whether the degree of alexithymia could also act as a predictor of empathy deficits in individuals with ASD.

Overall, our findings revealed that participants with ASD were generally impaired in the recognition of basic and complex emotions and had a deficit in ToM, which was not explained by difficulties in self-reported levels of empathy or visual perspective taking, which was measured by using a behavioural task. The results support the manifestation of deficits in

social perception in individuals with ASD, while questioning whether empathy difficulties are a key factor for the understanding of social and communication deficits in this population. However, it is important to note that the use of self-reported questionnaires has its limitations, especially in atypical populations due to the limited ecological validity linked to the use of static stimuli to assess emotional features in individuals ASD (Baron-Cohen et al., 1997; Baron-Cohen et al., 2001; Kleinman et al., 2001). Therefore, the next chapter will focus on the development and validation of a behavioural measure of empathy, which will be subsequently used in combination with this self-report questionnaire of empathy in chapter 6.

CHAPTER V

THE DEVELOPMENT OF AN EMPATHY TASK: EMPATHIC ACCURACY TASK

Abstract

The ability to experience empathy is often assessed using self-report measures, although these are not exempt from limitations. A proposed alternative is the use of behavioural tasks, with the empathic accuracy paradigm being the most widely used. The purpose of this study was to develop and validate a behavioural measure of empathy, known as empathic accuracy task, in a sample of 77 British university students. In addition, we aimed to study the effect of participants' characteristics (i.e., gender, self-reported levels of empathy, expressivity, and emotion regulation) on empathic accuracy (i.e. cognitive empathy). Finally, we investigated whether empathic accuracy (i.e. behavioural cognitive empathy) and self-reported levels of both cognitive and affective empathy predicted self-reported levels of indirect aggression. Results revealed no significant differences in empathic accuracy between male and female perceivers, although perceivers were more accurate at assessing male targets' emotions. Whereas perceivers' empathic accuracy was not related to their own cognitive and affective empathy, positive expressivity of targets was found to be a predictor of perceivers' empathic accuracy, with increased empathic accuracy being related to highly expressive targets. Finally, we found that neither cognitive or affective empathy nor empathic accuracy predicted indirect aggression. Overall, the results show that empathic accuracy depends more on specific characteristics of the target than on those of the perceiver, highlighting the significance of understanding empathy within interaction contexts.

Keywords: empathic accuracy, self-reported cognitive and affective empathy, gender, emotional expressivity, emotion regulation, and indirect aggression

Introduction

The ability to experience empathy allows us to understand others' internal states and predict their behaviour, thereby becoming essential for social interactions (Bernhardt & Singer, 2012; Decety & Svetlova, 2012). This ability has been operationalised in many studies using self-report measures due to its easy administration and use, which makes possible data collection from large samples of individuals and facilities the development of normative data (Muñoz & Frick, 2007), and the relatively short amount of time needed to be completed (Batson, 1990). In addition, self-report inventories have in general a long history of use in personality assessment as they allow assessing attitudes and internal emotional states that may not be evident to external observers (Muñoz & Frick, 2007). Although these measures are widely used, they also have limitations. For example, responses to self-report measures of empathy could come under the influence of inaccurate self-evaluations and social desirability bias (Eisenberg & Fabes, 1990; Levenson & Ruef, 1992), and even be contaminated by self-representation concerns, e.g., those related to gender expectations (Batson, 1990). These limitations highlight the concerns regarding the reliability of self-report measures and point out the need for the development of more accurate, more sensitive, and more objective measures of empathy that could make individuals less vulnerable to these biases.

A viable alternative for self-report measures of empathy is the use of behavioural measures. Despite previous attempts to behaviourally measure empathy (Eisenberg & Fabes, 1990; Feshbach & Roe, 1968; Strayer, 1993); to date, the most widely used laboratory measure of empathy is the empathic accuracy (EA) paradigm developed and validated by Ickes and colleagues (for more details see Ickes, 1993; Ickes, 1997). This task involves the use of social stimuli displaying realistic social interactions to investigate EA (i.e. cognitive

empathy). This ability is defined as an intersubjective phenomenon that occurs between two people (Ickes, Stinson, Bissonnette, & Garcia, 1990) and requires the ability to correctly judge or infer other's internal states (Zaki, Bolger, & Ochsner, 2009). More specifically, EA refers to the ability of perceivers (individuals who observe another person) to notice, attend, and correctly interpret the observable behaviours of social targets (individuals who are the focus of the perceivers' attention). These behaviours are transmitted by the targets through facial expressions, voice tone and/or words, and translated by the perceivers into inferences about targets' internal states, i.e., thoughts and emotions (Gleason, Jensen-Campbell, & Ickes, 2009; Zaki & Ochsner, 2011). There are two main aspects involved in EA. The first aspect, known as content accuracy, refers to the degree to which the perceivers' inferences about the content of targets' internal states matches the actual content of targets' internal states. The second aspect, valence accuracy, refers to the degree to which the perceivers' inferences about the emotional tone (positive, neutral, negative) of targets' internal states matches the actual valence of targets' internal states (Ickes et al., 1990).

Although people often attempt to infer others' thoughts and feelings in their daily interactions (a process known as empathic inference), it is the extent to which such attempts are successful that is classified as EA (Ickes, 1997). Therefore, within social interaction contexts, EA is considered as an essential aspect of empathy, as it helps guide social behaviour (Zaki & Ochsner, 2011) and avoid/ reduce conflicts with others (Simpson, Ickes, & Orina, 2001), thereby contributing to successful social interactions and facilitating social adjustment (Gleason et al., 2009). Prior research has shown that perceivers who are more attentive (Zaki, Weber, & Ochsner, 2012) and motivated (Klein & Hodges, 2001) tend to be more accurate when inferring others' internal states (Flury & Ickes, 2006). Furthermore,

males tend to show lower EA than females (Ickes, Gesn, & Graham, 2000; Klein & Hodges, 2001; Laurent & Hodges, 2009), although evidence in this area is mixed. For example, in a qualitative review of ten relevant studies using Ickes and colleagues' EA paradigm, Graham and Ickes (1997) found that seven of these studies failed to show gender differences, while the other three studies revealed that females performed significantly better in EA than males. These inconsistencies were attributed to a task modification in which perceivers recorded their inferences about the target's internal states. Gender differences were found only when perceivers were asked to rate how accurately they thought they had inferred the target's internal states after each inference (Ickes et al., 2000). Perhaps when perceivers became aware that their empathic abilities were being assessed and because their role expectations were prominent (Berman, 1980), this motivated females but not males to try harder in the task. In addition, empathy variations in the traditional roles of the two sexes, i.e., females' tendency to present and see themselves as more empathic, may in fact motivate females to be more empathic, who as a result become more successful in the task (Eisenberg & Lennon, 1983; Klein & Hodges, 2001). A later meta-analysis conducted by Ickes et al. (2000) confirmed these findings and provided further support for the idea that differences between males and females in this task reflect a gender difference in motivation, rather than in their EA per se.

Recent research has revealed however that perceivers' EA may rely more on the extent to which targets' behaviour reflects their internal states, rather than on features of the perceivers (Zaki, Bolger, & Ochsner, 2008). Indeed, evidence has shown that emotional expressivity predicts EA when targets use more intense and frequent facial expressions or affective language, i.e., visually exhibiting more negative affect or verbally expressing more positive affect (Zaki, Bolger, et al., 2009). This may be because targets with higher levels of

emotional expressivity provide clearer social and affective salient cues (Zaki, Bolger, et al., 2009; Zaki et al., 2012), perceivers may be more attentive to these informational cues while targets' internal states may become easier to be perceived and correctly understood. This may consequently improve perceivers' accuracy to decode and infer targets' internal states (Snodgrass, Hecht, & Ploutz-Snyder, 1998; Zaki et al., 2008; Zaki & Ochsner, 2011). Furthermore, targets' emotional expressivity is considered especially relevant, as it appears to influence the relationship between perceivers' self-reported trait empathy and their EA. In particular, evidence has revealed that perceivers' affective empathy predicts their EA only when targets show increased emotional expressivity, as this allows their thoughts and feelings to be more accurately read (Zaki et al., 2008).

The main purpose of this study was to develop a behavioural measure of empathy, which focuses on its cognitive component, to investigate the ability of healthy young adults to appropriately evaluate others' internal states through naturalistic social stimuli, based on the EA task protocol previously used by Zaki and colleagues (Zaki et al., 2008; Zaki, Weber, Bolger, & Ochsner, 2009). It is important to note that there was also a need to develop our own EA task because the original EA task developed and tested by Zaki and colleagues was not available. In this task, perceivers' EA was measured as a performance variable (see Ickes et al., 1990; Levenson & Ruef, 1992) by asking perceivers to continuously rate the affective states experienced by different targets in different videos. Perceivers' ability to judge others' expressive behaviour relied on targets' facial expressions, voice tone and words, which increases the ecological validity of the task (Hall & Schmid Mast, 2007). This laboratory task has been used in community samples (Devlin, Zaki, Ong, & Gruber, 2014; Zaki, Weber, et

al., 2009), showing good reliability and validity for the procedure (Ickes, 2001, 2003; Marangoni, Garcia, Ickes, & Teng, 1995).

According to the literature reviewed, whether EA depends on characteristics of the perceivers, targets, or both is still unclear. Therefore, our first aim was to examine the effect of three main characteristics of perceivers and/ or targets (i.e., gender, self-reported levels of empathy, and self-reported levels of emotional expressivity) on perceivers' EA by using our own task. Seeing that previous evidence suggests a lack of gender differences when perceivers are not asked to rate how well they think they have inferred the target's internal states after each inference (participants from our study were not asked to do it), we expected to find no significant differences between male and female perceivers in EA (hypothesis 1).

Secondly, according to evidence showing that perceivers' affective empathy can predict their EA when targets show increased emotional expressivity (Zaki et al., 2008), and considering the fact that this task is a behavioural measure of cognitive empathy, we hypothesised that higher levels of both cognitive and affective empathy of perceivers would predict increased EA (hypothesis 2). Based on previously mentioned evidence (see introduction section) we also expected that higher levels of emotional expressivity of targets would predict increased EA of perceivers (hypothesis 3). Furthermore, we aimed to explore whether other characteristics of perceivers and targets (i.e., emotion regulation) could predict EA. We hypothesised that higher levels of emotion regulation would be associated with higher levels of EA (hypothesis 4). This is based on the impact that emotion regulation has on emotional expression and behaviour (Gross, 2002; Lopes, Salovey, Côté, Beers, & Petty, 2005) and evidence indicating that individuals who can appropriately regulate their own

emotions are more likely to experience empathy (Eisenberg et al., 1996; Murphy et al., 1999).

Finally, considering the significance of empathy for interpersonal relationships and social adjustment (Bernhardt & Singer, 2012; Gleason et al., 2009; Zaki & Ochsner, 2011), our last aim was to investigate whether EA as well as self-reported levels of cognitive and affective empathy significantly predicted indirect aggression. This is important because it would determine whether a behavioural measure of cognitive empathy could predict indirect aggressive behaviour, as self-reported levels of cognitive empathy were found to do in Chapter 2, thereby increasing our understanding on the association between empathy and behaviour. Since evidence has revealed a significant negative relationship between empathy and indirect aggression (Kaukiainen et al., 1999; Yeo et al., 2011) (for further details on this proposed relationship see chapter 2), we hypothesised that increased levels of cognitive empathy would predict lower levels of indirect aggression (hypothesis 5). Furthermore, seeing that EA helps avoid or reduce conflicts with others (Simpson et al., 2001), we expected that higher levels of EA would predict lower levels of indirect aggression (hypothesis 6).

Method

Participants

A total 77 university students (18 males, 59 females; $M_{age}=21.02$ years, $SD=3.23$) participated in this study. Eighteen participants completed the first part of the study, the so-called target phase, although two participants withdrew from the study. The remaining 16 participants were aged between 18 and 20 (7 males, 9 females; $M_{age}=19.02$ years, $SD=.61$), with the vast majority being white (87.5%, $n=14$; Asian-Indian=12.5%, $n=2$) and reporting having been born in the United Kingdom (75%, $n=12$). The rest of participants reported having being born in other European countries (25%, $n=4$). Fifteen participants (94%) were studying a Bachelor's degree at the time of the study, and one was doing a Master's degree (6%). In what follows, individuals who participated in this phase will be referred to as targets.

For the second part of the study, the so-called perceiver phase, the sample consisted of 59 participants aged between 18 and 32 ($M_{age}=21.57$ years, $SD=3.43$), and 85% ($n=50$) were female. A high percentage of these participants were white (78%, $n=46$) and reported having been born in the United Kingdom (71%, $n=42$). Other countries of origin included European countries such as Germany, Ireland, France, Albania, Austria, Spain, Portugal, Greece, and Romania (15%, $n=9$); Asian countries including China, Malesia, Singapore, and Brunei Darussalam (9%, $n=5$); African countries, i.e., Nigeria (2%, $n=1$); and USA (3%, $n=2$). Participants with Black-African (3%, $n=2$), Asian-Indian or Asian-Oriental (17%, $n=10$) and mixed (2%, $n=1$) ethnicities also took part. Incomplete data from one participant, who had less than 10% (i.e., one item) of missing data in a subscale of the questionnaire of cognitive and affective empathy (QCAE), were imputed by substituting the missing data for the mean of the subscale score. Data for one participant who had more than 10% of incomplete data in a

subscale of the indirect aggression scale (IAS-A) were not substituted. Data from this participant were only excluded in analyses involving the indirect aggression scale. In what follows, participants who took part in this phase of the study will be referred to as perceivers.

Differences between targets and perceivers on demographics characteristics were examined. There was a significant effect for age, $t(75) = -5.4$, $p < .001$, with perceivers being significantly older ($M_{age} = 21.57$) than targets ($M_{age} = 19.02$). However, looking at the means of both groups these differences seems to be better explained by the size differences between the target group ($n = 16$) and the perceiver group ($n = 59$), rather than by the actual differences in age. Perceivers and targets also differed by gender, $\chi^2(1, N = 75) = 6.09$, $p < .05$, with the number of females being significantly higher in the group of perceivers (50 females out of 59 participants) than in the group of targets (9 females out of 16 participants). Participants did not differ by ethnicity, $\chi^2(1, N = 75) = 3.1$, $p = .54$.

Development of the empathic accuracy task

The researcher programmed an experiment using E-Basic language with the software tool E-Prime 2.0 (Psychology Software Tools Inc., 2012). This computerised task was programmed to present visual stimuli in a computer screen and auditory stimuli over headphones (i.e., videos recorded by the researcher with a digital camcorder), and to collect participants' responses, which were given using the keyboard. Stimuli were displayed on a 22.6" monitor and data were collected on a computer running E-Prime 2.0 version 2.0.10.248.

In order to develop the EA task, participants from the target phase were asked to complete the EA protocol, which was adapted from Zaki et al. (2008); Zaki, Weber, et al.

(2009) as follows. Targets were asked to recall and list four positive and four negative autobiographical events that they were comfortable describing and willing to discuss in front of a camera. They were asked to write a brief description about these events, in addition to providing them with a title (a maximum length of five words), and to rate the emotional valence and intensity of each event by using a 9-points Likert scale that ranged from 1 (*very negative*) to 9 (*very positive*). Only events with certain grade of emotional burden, i.e., those rated by the target as having an emotional intensity above the scale's midpoint, were included in the subsequent stage. It is important to note that 15 events out of 128 were rated by targets as having an average emotional intensity, and were therefore not discussed. For each participant, the researcher pseudorandomised the order of the events to be discussed, alternating events with positive valence with those with negative valence, as previously described by Zaki et al. (2008). Targets were then given the list of events to be discussed and were seated facing the camera directly, with the frame capturing them from the shoulders up.

Targets were videotaped while discussing these events. For each event, targets were instructed to read the description of the event, and to spend about a minute evoking the sensory and emotional experiences associated. Then, targets were asked to describe the event and discuss the details and emotions experienced. A total 113 events were recorded. Some examples of the events discussed were the death of a relative, breaking up with a partner, traveling, or starting university. Targets discussed these events for an average of 1 minute and 13 seconds, with the longest video lasting 3 minutes and 40 seconds and the shortest lasting 20 seconds. After discussing each event, targets were asked to rate the valence and intensity of the emotions they had experienced while discussing each event, and not during the event itself, using a Likert scale ranging from 1 (*very negative*) to 9 (*very positive*). These ratings

were used as inclusion criteria to constitute the final pool of videos for the EAT task (see details on the selection process below). All the measures were completed in a quiet room during one-to-one session with the researcher that lasted about 90 minutes.

For the EA task that was used in the perceiver phase, a set of 16 videos were selected. The selection of these videos was done as follows. A total 30 videos were excluded because the targets rated (after discussing the events) their own emotions as having an averaged or neutral intensity, 5 videos were excluded due to poor sound quality, and 24 videos were excluded because the targets were not directly facing the camera when discussing the events. The final 16 videos were chosen taking into consideration: (1) the valence of the videos, with half of the videos describing negative events and the other half describing positive events; (2) gender of the targets (8 males; 8 females); (3) length of the videos ($M=64.94$; minimum video length= 20 seconds, maximum video length= 1 minute and 46 seconds) and (4) the content of the videos, in order to avoid repetition of topics. Table 5.1 shows descriptive statistics for the videos selected. It is important to note that there were no significant differences in the length of the videos selected based on the gender of the targets, $t(14) = -.621$, $p=.55$, or the valence of the events discussed, $t(14) = -.863$, $p=.40$. Finally, the ten participants who corresponded to the selected 16 videos were asked to attend a short session with the researcher that lasted about 5 minutes to complete the EA task. Here, targets were asked to watch their own videos (only those selected for the task) and to continuously rate how positive or negative they felt while watching these videos using a 9-points Likert scale ranged from 1 (*very negative*) to 9 (*very positive*). These ratings will be referred to as affective ratings in what follows. These data were collected using the E-Prime programme. Both affective ratings and reaction times

between responses were recorded and used later to calculate perceivers' EA (see analyses section for a more detailed description on how EA scores were calculated).

Table 5.1

Descriptive statistics for the videos selected for the development of the EA task

Targets' gender	Valence of the event	Title of the event (topic discussed)	Video length (in seconds)	Mean (<i>SD</i>) of affective ratings
Female	Positive	Seeing a boyfriend	50	6.43 (1.51)
Female	Positive	A level grades	37	7.00 (1.00)
Female	Positive	Traveling	64	3.00 (.82)
Male	Positive	Weight loss	47	7.00 (1.00)
Female	Positive	Birth of youngest brother	52	6.50 (.71)
Male	Positive	Rome with Benedict	106	5.00 (1.00)
Male	Positive	Emily's Birthday	61	7.00 (1.00)
Male	Positive	Kittens	62	6.80 (0.84)
Female	Negative	Granddad's death	63	4.50 (1.29)
Female	Negative	Losing the pub/home	78	4.17 (.75)
Female	Negative	Break up	52	5.30 (1.34)
Male	Negative	Death of baby brother	20	4.00 (.00)
Female	Negative	Visiting grandma	94	4.43 (.98)
Male	Negative	The NewCom fallout	97	3.83 (1.47)
Male	Negative	Parent's divorce	91	3.00 (1.00)
Male	Negative	Beatty's ill health	65	3.00 (1.00)

Note. Affective ratings refer to the continuous ratings made by targets when watching their own videos about how positively or negatively they had felt while discussing these events. Although the video "Travelling" was initially classified by the target as a positive video, the target rated the video below 5 when re-watching it. "Losing the pub/home" refers to an event in which the participant explained why her mother lost the pub where she worked and in which the whole family was living. The video "Break-up" was initially classified by the target as a negative video. However, the ratings made by the target varied between 3 and 7 because part of the content of the video reflected positive aspects.

The final sample of targets corresponding to the selected 16 videos consisted of 10 undergraduate students aged between 18 and 20 (5 males, 5 females; $M_{age}=18.96$ years, $SD=.58$), with 80% being white and 20% being Asian-Indian. Overall, participants showed higher levels of cognitive reappraisal ($M=30.40$, $SD=6.02$) than expressive suppression ($M=15.30$, $SD=6.18$). Levels of positive ($M=5.65$, $SD=.93$) and negative expressivity ($M=4.02$, $SD=1.12$) as well as impulse strength ($M=5.32$, $SD=.69$) were similar compared to each other. No significant differences were found in levels of cognitive reappraisal, expressive suppression, or expressivity between male and female targets (see Table 5.2).

Table 5.2

Means (standard deviations) and p values on measures of emotion regulation and emotional expressivity comparing both male and female targets

	Male targets	Female targets	p
Cognitive reappraisal (ERQ)	30.80 (6.53)	30.00 (6.20)	.85
Expressive suppression (ERQ)	14.00 (6.82)	16.60 (5.94)	.54
Emotional expressivity (BEQ)	5.22 (.92)	4.77 (.45)	.35
Negative expressivity	4.50 (1.43)	3.53 (.46)	.19
Positive expressivity	5.90 (.94)	5.40 (.94)	.43
Impulse strength	5.27 (.69)	5.37 (.76)	.83

Note. Statistical differences between groups correspond with separate T-test analyses. No significant differences were found in emotion regulation or emotional expressivity across genders in the group of targets.

Materials

Measures of Emotion. Two questionnaires were used to assess different aspects of emotional processing: the Berkeley Expressivity Questionnaire (BEQ; Gross & John, 1997) and the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). See methods section in chapter 2 for a more detailed description of this measure and its psychometric properties.

Both questionnaires have shown satisfactory psychometric properties in the present study, with Cronbach's α coefficients of .82 for cognitive reappraisal and .78 for expressive suppression (both assessed by the ERQ), and Cronbach's α coefficients of .74 for the BEQ.

Measures of Empathy. Cognitive and affective levels of empathy were assessed using the Questionnaire of Cognitive and Affective Empathy (QCAE; Reniers et al., 2011). See methods section in chapter 2 for a more detailed description of this measure and its psychometric properties. This questionnaire has shown satisfactory psychometric properties in the present study, with Cronbach's α coefficients of .88 for cognitive empathy and .83 for affective empathy.

Measures of Aggression. The Indirect Aggression Scale-Aggressor version (IAS-A; Forrest et al., 2005) was used to assesses social exclusionary behaviour, malicious humour, embarrassment or direct verbal aggressions, and guilt induction. See methods section in chapter 2 for a more detailed description of this measure and its psychometric properties. This questionnaire has shown satisfactory psychometric properties in the present study, with a Cronbach's α coefficient of .82 for the total score.

Procedure

The study consisted of two separate phases. In the target phase, male and female young adults were recorded while discussing several autobiographical events. Then, participants were asked to watch their own videos and make continuous ratings of how positively or negatively they had felt while discussing these events. Importantly, participants who took part in the target phase were not allowed to participate in the second phase. In this

phase (perceiver phase), unrelated participants known as perceivers were asked to watch the videos from the targets, and continuously rate how positive or negative they believed the target of each video was feeling. To assess perceivers' EA, correlations between the affective ratings made by the perceivers and those made by targets were calculated. All participants were psychology undergraduate and postgraduate students recruited from the University of Birmingham, who were compensated with course credits for their participation. Ethical approval for this research project was granted by the Research Ethics Committee of the University of Birmingham.

Target phase. Before participation, detailed information on the aim and methodology of the study was provided, and informed consent was obtained. In addition, targets gave permission to use their videos in both the subsequent perceiver phase and further research studies as part of the EA task. Targets knew therefore that they would watch their own videos after discussing all the selected events, and that these videos would be shown to other individuals in further research studies. After consent was granted, targets were asked to complete the socio-demographic questions and two self-report questionnaires in a fixed order (ERQ, BEQ). Subsequently, targets were asked to complete the EA protocol (outlined above).

Perceiver phase. Detailed information on the aim and methodology of the study was given, and informed consent was obtained prior to participation. All the measures were presented in a fixed order, and were completed in a quiet room during one-to-one sessions with the researcher that lasted approximately one hour. Perceivers were firstly asked to complete the socio-demographic questions and four self-report questionnaires, i.e., ERQ, QCAE, IAS-A, and BEQ. Importantly, no significant differences were found between

perceivers and targets in self-reported levels of cognitive reappraisal, $t(67) = -.48$, $p = .63$, expressive suppression, $t(67) = -.33$, $p = .74$, or emotional expressivity, $t(67) = 1.17$, $p = .25$.

Subsequently, participants were asked to complete the EA task with a computer that ran the E-Prime experiment, using the keyboard to give their responses. More specifically, participants were presented with videos of social targets experiencing real emotions where both auditory and visual information was available, and asked to continuously rate how positive or negative they believed the target of each video was feeling at each moment by using the left or right arrow keys to move along the 9-points scale. Each video started with the number 5 selected and highlighted in red. Whenever perceivers pressed the sticker with the left arrow, which was located over the number two on the key board, the highlighted number moved to the left, towards the negative values (i.e., the number 5 stopped being highlighted and the number 4 became highlighted). When perceivers pressed the sticker with the right arrow, which was located over the number four, the highlighted number shifted to the right, towards the positive values. The selected number on the scale was always highlighted in red so that participants could monitor their ratings. Detailed instructions on how to complete the task were verbally provided prior to the completion of the task (see Figure 4.1 for details on these instructions).

Then, perceivers were asked to watch and rate two practice videos (one with positive valence, female target, and a length of 57 seconds; and one with negative valence, male target, and a duration of 31 seconds) to allow the researcher to verify that participants correctly understood the task. These two videos did not form part of the pool of videos included in the EA task. However, both practice videos matched the videos from the EA task on length and

affective ratings. There were no significant differences in the length of the videos (including the practice videos) based on targets' gender, $t(16) = -.33$, $p = .75$, or the valence of the events, $t(16) = .55$, $p = .59$, nor in targets' affective ratings based on their gender, $t(16) = .56$, $p = .59$.

After this, perceivers were presented with the set of videos included in the EA task. This involved watching 16 videos (8 positive and 8 negative) in a pseudorandomised order that ensured that the visualisation of the positive videos was alternated with that of the negative ones, and that the order of the presentation for the videos was different for each participant. Furthermore, the presentation of the videos was split across four runs, which allowed participants to rest between each run. The time to rest was not limited. In each run, short instructions were presented in the middle of the screen. Subsequently, the videos were displayed in the centre of a black screen, one after the other. At the same time, in the upper area of the screen, a cue orienting perceivers toward their task was presented, while at the bottom of the screen, a 9-point rating scale was shown. Figure 5.1 shows the EA task design of the actual stimuli from this computerised task.

Figure 5.1

Online version in colour of the actual stimuli from the Empathic Accuracy task



Note. Instructions provided before the videos: "Welcome to the experiment. Next you will watch several videos. Your task is to continuously rate how positive or negative you believe the target of each video is feeling by using a nine point rating scale (1, very negative; 5, neutral ; 9, very positive). After each video press the spacebar to continue with the following video. Do not press the spacebar until the video has finished. You will be presented with a rating scale. Press the right arrow located over the number '4' key to move the scale right. Press the left arrow located over the number '2' key to move the scale left. Please press the spacebar to begin". Final message presented in the centre of the screen to confirm that the run was finished: "You have completed this part of the experiment".

Analyses strategy

All analyses were performed using SPSS Version 20 (IBM SPSS Inc., Armonk, NY). A significance alpha level of .05, and two-tailed tests were used for statistical analyses. Data

reduction, i.e., extraction of targets' and perceivers' reaction times and affective ratings, were done using E-prime (Hodgins & Janson, 2002). Time-series correlations were performed as follows. Continuous affective ratings were converted into a time-series of sequential values, with one value for each second period. These values served as data points in subsequent time-series analyses. Targets and perceivers affective ratings were z -transformed across the entire session to correct for interindividual variation in the use of the rating scale. In order to calculate the EA of participants, perceivers' continuous affective ratings were correlated with the targets' own continuous ratings, by using Pearson's correlations. The resulting correlation coefficient (r) between two time-series was the measure of EA. This coefficient was calculated separately for each perceiver-video combination. Correlation coefficients were r -to- z transformed by performing Fisher transformations in preparation for subsequent analyses.

In order to investigate gender- differences on EA in both videos with female and male targets, two-separated T-test analyses were conducted (hypothesis 1). Furthermore, we performed separated linear regression analyses to investigate whether characteristics of both targets and perceivers could predict perceivers' EA. First, we examined the effect of perceivers' self-reported levels of cognitive and affective empathy on their EA (hypothesis 2). Then, statistical analysis was conducted at the target level to explore whether targets' levels of emotional expressivity contribute to perceivers' EA, performing regressions separately according to the valence of the videos (hypothesis 3). The contribution of both perceivers and targets' levels of cognitive reappraisal and expressive suppression to perceivers' EA was also investigated (hypothesis 4). Finally, a linear regression analysis was conducted to examine whether perceivers' self-reported levels of cognitive empathy (hypothesis 5) as well as levels of EA (hypothesis 6) could predict perceivers' self-reported levels of indirect aggression.

Results

Perceivers were accurate when rating targets' affect ($M=.62$, $SD=.12$), with EA coefficients ranging between .21 and .92. On average, perceivers were more accurate when assessing targets' affect from videos describing negative events ($M=.62$, $SD=.12$; EA range: .20-.81) than from videos describing positive events ($M=.60$, $SD=.14$; EA range: .06-.74). However, these differences were not statistically significant, $t(116) = -.60$, $p=.55$. Since initial analyses showed a great variation between EA coefficients (see range values above), we also examined how much of this variance was predicted by perceivers and targets characteristics.

Effect of gender on EA

Statistical analysis revealed that there were no significant differences in EA between male ($M=.60$, $SD=.16$) and female ($M=.62$, $SD=.11$) perceivers, $t(57)=.41$, $p=.68$, although female perceivers showed in general higher EA. There were not significant differences between male and female perceivers when assessing videos either with male or female targets (see Table 5.3). In contrast, significant differences were found in perceivers' EA based on targets' gender, $t(116) = -5.85$, $p<.001$, $d=1.08$, with perceivers being more accurate when assessing males targets' affect ($M=.67$, $SD=.16$) than females targets' affect ($M=.53$, $SD=.09$).

Table 5.3

Means, standard deviations and p values comparing EA according to perceivers' gender

		<i>M</i>	<i>SD</i>	<i>p</i>
Videos with female targets	Female perceivers	.54	.09	.80
	Male perceivers	.53	.11	
Videos with male targets	Female perceivers	.68	.14	.75
	Male perceivers	.66	.23	

Note. Two-separated T-test analyses based on the gender of the targets were conducted to investigate gender- differences on perceivers' EA.

Effect of self-reported empathy on EA

We first investigated whether perceivers' levels of cognitive and affective empathy predicted perceivers' EA. Results showed that there was no effect of perceivers' self-reported levels of cognitive empathy ($\beta = -.06$, $t = -.39$, $p = .70$) or affective empathy ($\beta = .15$, $t = 1.05$, $p = .30$) on their EA, $R^2 = .02$, $\Delta R^2 = -.02$, $F(2, 56) = .55$, $p = .58$. To further explore the sources of this variation, cognitive and affective empathy were used as predictors separately for positive and negative videos. Linear regression analysis showed that neither levels of cognitive empathy ($\beta = .02$, $t = .12$, $p = .90$) nor levels of affective empathy ($\beta = .15$, $t = 1.06$, $p = .29$) significantly predicted perceivers' EA for videos with positive valence, $R^2 = .03$, $\Delta R^2 = -.01$, $F(2, 56) = .70$, $p = .50$. Likewise, for videos with negative valence, neither cognitive empathy ($\beta = -.004$, $t = -.03$, $p = .98$) nor affective empathy ($\beta = .07$, $t = .46$, $p = .65$) were found to be significant predictors of perceivers' EA, $R^2 = .00$, $\Delta R^2 = -.03$, $F(2, 56) = .11$, $p = .89$.

Effect of emotional expressivity on EA

In addition, linear regression analysis conducted at the target level also revealed that targets' levels of negative expressivity ($\beta = .14$, $t = .35$, $p = .74$) did not significantly predict perceivers' EA for videos with negative valence, $R^2 = .02$, $\Delta R^2 = -.14$, $F(1, 6) = .13$, $p = .74$. In contrast, for videos with positive valence, targets' levels of positive expressivity ($\beta = .88$, $t = 4.54$, $p < .01$) were found to be a significant predictor of perceivers' EA, $R^2 = .78$, $\Delta R^2 = .74$, $F(1, 6) = 20.65$, $p < .01$. Targets' levels of emotional expressivity were not significantly correlated with the intensity of the affect they reported, i.e., mean of affect ratings that targets gave for their own videos, $r(16) = .17$, $p = .54$. This shows that the effect of targets' expressivity does not simply reflect emotional experience becoming stronger as targets' expressivity increased.

Effect of emotion regulation on EA

Furthermore, we investigated whether perceivers' levels of $\Delta R^2 = -.03$, cognitive reappraisal and expressive suppression predicted perceivers' EA. Results showed that neither cognitive reappraisal ($\beta = -.05$, $t = -.41$, $p = .69$) nor expressive suppression ($\beta = .06$, $t = .43$, $p = .67$) significantly predicted perceivers' EA for videos with positive valence, $R^2 = .01$, $F(2, 56) = 1.19$, $p = .82$. For videos with negative valence, neither levels of cognitive reappraisal ($\beta = -.05$, $t = -.37$, $p = .71$) nor expressive suppression ($\beta = -.23$, $t = -1.76$, $p = .08$) were found to be significant predictors of perceivers' EA, $R^2 = .05$, $\Delta R^2 = .02$, $F(2, 56) = 1.57$, $p = .22$.

Finally, we also examined whether targets' levels of cognitive reappraisal and expressive suppression predicted perceivers' EA. Results showed again that neither cognitive reappraisal ($\beta = .34$, $t = .80$, $p = .46$) nor expressive suppression ($\beta = -.19$, $t = -.44$, $p = .68$) significantly predicted perceivers' EA for videos with positive valence, $R^2 = .20$, $\Delta R^2 = -.12$, $F(2, 5) = .63$, $p = .57$. For videos with negative valence, neither cognitive reappraisal ($\beta = .34$, $t = .80$, $p = .46$) nor expressive suppression ($\beta = -.22$, $t = -.53$, $p = .62$) were found to be significant predictors of perceivers' EA, $R^2 = .20$, $\Delta R^2 = -.12$, $F(2, 5) = .64$, $p = .57$.

Prediction of indirect aggression from empathy variables

A linear regression analysis was conducted to examine whether perceivers' self-reported levels of cognitive and affective empathy as well as EA predicted indirect aggression. Results showed that neither levels of cognitive empathy ($\beta = -.23$, $t = -1.68$, $p = .10$), levels of affective empathy ($\beta = -.11$, $t = -.75$, $p = .46$), EA from videos with positive valence ($\beta = -.16$, $t = -1.09$, $p = .28$) nor EA from negative videos ($\beta = -.01$, $t = -.10$, $p = .92$) significantly predicted indirect aggression, $R^2 = .12$, $\Delta R^2 = .05$, $F(4, 53) = 1.75$, $p = .15$.

Discussion

The present research aimed to develop a behavioural measure of empathy to investigate the ability of healthy young adults to accurately assess others' internal states, using social stimuli that depicted male and female targets experiencing real emotions. Furthermore, the study aimed to investigate the effect of perceivers and targets characteristics on EA. Four key findings were obtained. First, there were not significant differences in EA between male and female perceivers, although females tended to show higher EA than males. Unexpectedly, targets' gender was found to be as significant predictor of perceivers EA, with perceivers being more accurate at assessing male targets' emotions. Second, perceivers' EA was not related to their own self-reported levels of cognitive and affective empathy. Third, positive expressivity of targets was found to be a significant predictor of perceivers' EA, showing the perceivers an increased EA for highly expressive targets. In contrast, negative expressivity of targets did not predict perceivers' EA. Lastly, contrary to our expectations, levels of emotion regulation (either from targets or perceivers) were not associated with perceivers' EA.

Taken together, our results suggest that EA depends more on specific characteristics of the target (i.e., gender and positive expressivity) than on those of the perceiver (i.e., gender, trait cognitive and affective empathy). The literature has previously shown no significant differences between male and female perceivers in EA, suggesting that in normally developing individuals the gender of the perceiver is not a predictor of EA (Graham & Ickes, 1997; Ickes et al., 2000; Klein & Hodges, 2001), and our results provided further support for this idea. Furthermore, the lack of gender differences we found also corresponds with the hypothesis suggesting that the differences found between males and females in EA are better

explained by differences in motivation related to gender roles rather than by actual differences in their EA (Klein & Hodges, 2001). Early evidence has shown that gender differences in EA only occur when participants are aware that they are being assessed on an empathy task (e.g., when perceivers are asked to assess their own empathic abilities before taking part in the EA task), and/or when their gender role expectations about empathy are made noticeable (Berman, 1980; Eisenberg & Lennon, 1983; Klein & Hodges, 2001). It is important to note that even though gender differences between targets and perceivers were found in our study, with the group of perceivers having significantly more females than males; our findings suggest that these differences did not affect our results. Interestingly, our results also showed that perceivers (both males and females) were more accurate at assessing male targets' affect than female targets' affect. This finding seems to contradict previous evidence suggesting that because females are more expressive than males (Gross & John, 1995), their emotions should be easier to be inferred compared to those from male targets (Klein & Hodges, 2001). However, the fact that females usually report themselves as being not only more expressive, but also more ambivalent in their emotional expressions compared to males (King & Emmons, 1990) could explain why emotional expressions from males were more accurately inferred.

Evidence has also failed to reveal a consistent relationship between trait measures of affective empathy and behavioural measures of cognitive empathy, i.e., EA (Hall, 1979; Ickes et al., 1990; Levenson & Ruef, 1992; Zaki et al., 2008), and our analysis provided further support for this lack of association. In addition, our study showed that self-reported levels of cognitive empathy (i.e., the belief about one's own capacity to understand others' feelings) were unrelated to EA (i.e., how well perceivers understood the internal states of targets),

extending the inconsistencies between trait and behavioural measures of empathy to its cognitive component. Our findings support evidence that has questioned the validity of self-report measures as source of information about our own inner states, and suggest that the actual ability of individuals to be aware of and accurately inform about their own emotional processes, including empathy, should be treated with caution (Borrie, 1998; Nisbett & Wilson, 1977; Silvia & Gendolla, 2001). In addition, the inconsistencies between EA and trait measures of affective empathy could be attributed to the fact that having an accurate understanding of another person's thoughts and feelings (cognitive aspect of empathy) does not necessarily involve that the person shares and vicariously experiences others' emotions (affective aspect of empathy) (Rauers, Blanke, & Riediger, 2013). Indeed, evidence has revealed a dissociation between affective and cognitive components of empathy (Dziobek et al., 2008; Shamay-Tsoory et al., 2009) that supports the idea that having one of this abilities does not imply that the other has also being developed (see chapter 1 for a more extended discussion on the dissociation between cognitive and affective empathy). Furthermore, previous attempts to associate EA with experience sharing have also obtained poor results (Hall, 1979; Ickes et al., 1990; Levenson & Ruef, 1992; Zaki & Ochsner, 2011). However, it is important to mention that more recent evidence has found that self-reported levels of affective empathy are associated with EA when targets are highly expressive (Zaki et al., 2008). It could therefore exist an indirect relationship between self-reported levels of affective empathy and EA mediated by characteristic of the target, such as emotional expressivity, rather than a complete lack of association (Zaki & Ochsner, 2011).

In line with this idea, our results demonstrated the significance of emotional expressivity for EA, showing that targets' positive emotional expressivity predicted EA when

perceivers assessed targets' affect from positive videos. Our findings suggest that emotions from targets with higher levels of positive expressivity are easier to be perceived and accurately inferred by perceivers. This supports, to some extent, prior work indicating that targets' emotional expressivity predicts perceivers' EA (Zaki et al., 2008), and extends it to the study of both aspects of expressivity (positive and negative) separately. Our results suggest an asymmetry in the accurate inference of others' internal states based on the valence of the expressed emotion, indicating that positive emotional expressions could be considered as visually more distinctive and recognisable than the negative ones. In fact, evidence has revealed an advantage in the processing of positive facial expressions compared to negative expressions. In terms of speed of recognition, positive facial expressions (e.g., happiness) have been found to be recognised faster than negative expressions (e.g., disgust or sadness) (Calvo & Marrero, 2009; Leppänen & Hietanen, 2004). Considering the accuracy of emotion recognition, happy facial expressions have been more accurately recognised than negative expressions (i.e., disgust, anger and sadness), even when positive expressions have a relatively low intensity (Hess, Blairy, & Kleck, 1997), or when these are presented unexpectedly under conditions in which negative facial expressions are unnoticeable (Mack & Rock, 1998). Furthermore, positive expressions are less likely to be misjudged as neutral expressions due to the manifestation of characteristic features, such as a smile, that can be used as precise indicative cues (Calvo & Marrero, 2009).

Importantly, research has also proposed that the common occurrence of positive facial expressions in everyday life, compared to the lower frequency of negative expressions, may also explain the potential advantages in the processing of positive emotional expressions (Öhman, Lundqvist, & Esteves, 2001). Although Gross, John, and Richards (2000) suggested

the opposite, indicating that positive expressivity may not be a clear sign of targets' internal states because positive expressions, such as a smile, could be used to conceal negative feelings in real social contexts (Ansfield, 2007; Hecht & LaFrance, 1998; Jakobs, Manstead, & Fischer, 2001); this is unlikely to happen in our study. Taken into account that the design of our task ensured that targets could freely describe positive autobiographical events and considering that no social interactions were involved, it is feasible to say that the positive emotions expressed by the targets were authentic and were not influenced by the effects of social rules.

Finally, we found that neither self-reported levels of cognitive or affective empathy nor EA predicted indirect aggression, suggesting that being able to correctly judge others' internal states, understand and vicariously experience others' emotions does not necessarily lead to reduced levels of aggression. Although evidence has shown a negative relationship between empathy and a wide range of aggressive behaviours (for a review see Jolliffe & Farrington, 2004; Lovett & Sheffield, 2007), including indirect aggression (Kaukiainen et al., 1999; Yeo et al., 2011), and has considered cognitive aspects of empathy as an inhibitor of aggression (Richardson et al., 1994), our results failed to support this idea. In contrast, our results correspond with findings from a recent meta-analysis showing that not only the relationship found between empathy and aggression was weak, but also that the variance in aggression explained by empathy was minimal (see Vachon, Lynam, & Johnson, 2014).

In terms of EA, our results agreed with previous research revealing that EA is not a significant predictor of externalising problems, i.e., aggression, rule-breaking behaviour and conflicts with other people, in adolescents (Gleason et al., 2009). Interestingly, the authors

suggested that even though adolescents with externalising problems may have intact EA, their ability to understand others' internal states could not be sufficient to restrain the effects of their impulsive behaviour, because of their deficits in self-regulation. In line with this assumption, further studies should explore the relationship between EA and aggression, when this is mediated by emotion regulation. Although this line of research seems promising, it is important to mention that our analysis showed no significant association between emotion regulation (from either targets or perceivers) and perceivers' EA. Perhaps because healthy individuals tend to have appropriate levels of emotion regulation, this variable may not be a significant mediator in the relationship between EA and aggression in typically developing individuals. Finally, it is worth saying that although research on interpersonal functioning has consistently associated EA with effective communication, successful relationships and adjustment (Gleason et al., 2009; Ickes et al., 1990), the current study is, to our knowledge, the first attempt to examine the effects of EA and self-reported levels of cognitive and affective empathy on social behaviour. In particular, being this focused on the prediction of indirect aggression, as opposed to other studies that have more often directed their attention to the prediction of positive social outcomes, such as prosocial behaviour or social adjustment.

Although the current study expands on previous knowledge about EA, it also has some limitations. Firstly, our targets' sample was heterogeneous in terms of ethnicity, education, and age, and hence, it is not representative of the population at large. Future studies should include a wider age range to analyse EA across the life span, and more diversity in terms of ethnicity to study the effect of culture on EA. In addition, recruitment should not be limited to universities to avoid homogeneity regarding educational background. However, considering that the limitations in recruitment were difficult to overcome, examining these improves the

quality of our research and helps us better understand the generalizability of our findings. In addition, it is important to mention that the modest sample size of perceivers in the present study ($n= 59$) may have played a role in limiting the significance of some of the regressions analyses conducted. Nevertheless, a power analysis revealed that based on an anticipated effect size of 0.35 a sample size of approximately 31 (for two predictors) to 36 (for three predictors) participants would be needed to obtain statistical power at the recommended .80 level (Cohen, 1992a). In fact, the sample sizes of both targets ($n=16$) and perceivers ($n=59$) in the present study are similar to the sample sizes used by Zaki et al. (2008) ($n=14$ and $n=44$, respectively), in which the same methodology was used to investigate EA. In addition, although the EA protocol is a well-known ecologically valid assessment within social contexts, its use also implies limitations concerning causality. Finally, future research would also benefit from investigating whether other emotional and social abilities, e.g., emotional intelligence, impulsivity, or assertiveness, influence the relationship between empathy and behaviour.

Despite these limitations, it is important to note that the current study successfully developed a behavioural measure of cognitive empathy, and this will be used in the following chapter to investigate the ability of adolescents with ASD and those with behavioural difficulties to assess others' internal states through naturalistic social stimuli. The use of this task will allow measuring EA as a performance variable, thereby providing our research with a viable alternative to avoid the limited ecological validity associated with the use of pictures tasks in the assessment of empathy features in ASD populations.

CHAPTER VI

SELF-REPORTED EMPATHY AND EMPATHIC ACCURACY IN ADOLESCENTS WITH AUTISM SPECTRUM DISORDERS AND BEHAVIOURAL DIFFICULTIES

Abstract

Individuals with ASD have been commonly found to struggle with their ability to empathize cognitively with other people, whereas difficulties in their affective empathy seem to be less affected. Importantly, neurocognitive models suggest that this double dissociation on cognitive and affective empathy is also present in individuals with disruptive behaviours, especially in those who manifest CU traits. However, these individuals are thought to have the opposite profile, showing clear deficits in affective empathy but not in cognitive empathy. The main aim of this study was to compare empathic abilities and CU traits in 27 individuals with ASD, 17 with behavioural difficulties, and 27 controls to extend the limited research within these two populations. Furthermore, we aimed to examine the differences in cognitive and affective aspects of empathy in a large sample of individuals with ASD, using both an experimental task and a self-report questionnaire on empathy, to extend our results from Chapter 4. Findings showed significant differences in cognitive empathy across the three groups, with levels of online simulation being significantly lower in the group with BD than controls. No differences were found in either affective empathy or empathic accuracy. In addition, individuals with ASD performed worse in the empathy experimental task and reported significantly lower scores in perspective taking (cognitive empathy) than controls. The group with BD reported significantly higher levels in antisocial and CU traits than ASD and controls. The results support the existence of a deficit in cognitive empathy in ASD, and suggest the preservation of their affective empathy. Furthermore, our findings provide evidence of a cognitive deficit in empathy, and clearly show the manifestation of high levels of antisocial and CU traits in individuals with BD.

Keywords: ASD, cognitive and affective empathy, self-report questionnaire, experimental task, and behavioural difficulties

Introduction

Despite being an important human ability, individuals with certain clinical conditions have been found to struggle with their ability to empathize with other people (Decety & Moriguchi, 2007), including for example individuals with ASD. Both perceptual and social difficulties are considered core characteristics of these disorders (Schultz, 2005), and have been associated with a deficit in ToM and certain aspects of empathy (see chapter 4 for a more detailed description). Research has often shown deficits in ToM in ASD (Baron-Cohen et al., 1985; Hill & Frith, 2003), with neuroimaging studies showing functional alterations in the mentalising (ToM) network regions (see Castelli et al., 2002; Happé et al., 1996). However, the degree of such deficits it is, to date, unclear. Even more advanced ToM tasks (i.e., Reading the Mind in the Eyes Test) has provided mixed results (see chapter 1 for a more detailed description), reporting subtle ToM deficits in some studies (Baron-Cohen et al., 1997; Baron-Cohen et al., 1997), and failing to find differences between adults with ASD and controls in others (Ponnet et al., 2004).

One important criticism of the ToM tasks is the limited ecological validity associated with the use of static stimuli (such as pictures) to evaluate the socio-emotional understanding of individuals ASD (Baron-Cohen et al., 1997; Baron-Cohen et al., 2001; Kleinman et al., 2001). In fact, evidence suggests that the mind-reading (ToM) deficit of individuals with ASD may only be apparent when a complex naturalistic task is used (Roeyers et al., 2001). For example, some studies have used silent animations of geometric shapes moving around the screen to measure mentalising abilities, and have found that individuals with autism show less activation than the control group in all mentalizing network, except for the extra-striate cortex, where no differences in activation were

observed, thereby suggesting deficits in ToM (Castelli et al., 2002). However, other evidence has found that even though individuals with ASD are worse at inferring mental states from facial stimuli than controls, there are no differences in accuracy scores between dynamic and static faces (Back, Ropar, & Mitchell, 2007).

A more naturalistic approach to the assessment of cognitive aspects of empathy has been developed by Zaki and colleagues (2008; 2009) in an attempt to measure individuals' accurate inferences about the specific content of others' thoughts and feelings (Ickes, 1993; Ickes et al., 1990). This is known as EA task. A strong link between EA and autism has been proposed within the ToM framework, where individuals with ASD are considered as being mind-blind or unable to accurately infer others' thoughts and feelings (Baron-Cohen, 1997; Ickes, 2009). This corresponds with empirical studies showing that both adolescents and adults with PDD or ASD are able to infer others' thoughts and feelings when the situation observed is more predictable and less complex (i.e., structured conversation). However, they perform worse than controls when greater communicative and social abilities are required (i.e., less structured conversation) (Demurie, De Corel, & Roeyers, 2011; Ponnet, Buysse, Roeyers, & De Clercq, 2008; Ponnet et al., 2004; Roeyers et al., 2001).

It is also widely accepted that individuals with ASD have deficits in cognitive empathy (Grove et al., 2014; Mathersul et al., 2013b; Rueda et al., 2015), including lower levels of self-reported perspective taking (Hirvelä & Helkama, 2011) and poorer performance than typically developing adolescents on perspective taking tasks (Reed & Peterson, 1990; Tibbetts & Rehfeldt, 2005). Although evidence has generally shown a deficit in the processing of facial emotions (see Harms et al., 2010 for a review), a recent meta-analysis has

highlighted substantial inconsistencies between studies (Uljarevic & Hamilton, 2013). For example, some studies have revealed deficits in the recognition of negative facial expressions, such as fear (Howard et al., 2005) and disgust (Golan et al., 2010), while others have shown deficits for all negative basic emotions (Ashwin et al., 2006). In contrast, there is evidence suggesting that recognition of basic emotions (i.e., anger, fear, disgust and happiness) is less affected (Adolphs et al., 2001; Tracy et al., 2011), while it is the recognition of complex social emotions (i.e., pride and embarrassment) that is impaired (Capps et al., 1992; Heerey et al., 2003).

In terms of affective empathy, evidence is still mixed. Some studies have reported lower levels of cognitive and affective empathy (Grove et al., 2014; Mathersul et al., 2013b; Shamay-Tsoory et al., 2002), with deficits in the former component being more prominent than in the latter (Mazza et al., 2014). Others have found however deficits in cognitive empathy but not in affective empathy (Dziobek et al., 2008; Rogers et al., 2007; Rueda et al., 2015). Alternative theories have suggested that affective empathy is not impaired but heightened, and that it is this intensified ability which leads individuals with ASD to see the social world as more challenging and overwhelming (Markram et al., 2007; Smith, 2009b) (see chapter 1 for a more detailed description of empathy deficits in ASD).

Neurocognitive models suggest that the double dissociation on cognitive and affective aspects of empathy observed in ASD, is also present in other clinical disorders characterised by the manifestation of disruptive behaviours, such as CD (Schwenck et al., 2012), a more general group known as DBD (de Wied et al., 2005), and psychopathy (Blair, 2008). In individuals with these conditions, a basic dysfunction in the affective component of empathy

represents a core feature. For example, individuals with CD show poor capacities for affective resonance towards others' emotions and lack of concern for others' welfare (de Wied et al., 2005; Green et al., 2000; Schwenck et al., 2012). Reduced vicarious arousal (Anastassiou-Hadjicharalambous & Warden, 2008b; de Wied et al., 2010; Herpertz et al., 2005), abnormalities in the regulation of motivation and affect (Rubia, 2011) and lower levels of self-report affective empathy (Cohen & Strayer, 1996; Lovett & Sheffield, 2007) have also been associated with CD. Likewise, individuals with DBD have been found to exhibit lower levels of affective empathy as well as deficits in facial reactivity to angry expressions (de Wied et al., 2006) and reduced heart rate reactivity in response to sadness (de Wied et al., 2009; de Wied et al., 2012). A lack of empathy is also considered as a distinctive characteristic of individuals with psychopathy/ psychopathic tendencies (Blair et al., 2005), with impairments in its affective component (see Blair, 2005) that include: reduced physiological response to others' distress or sad expressions (Blair, 1999; Blair et al., 1997), atypical neural responses to others' pain (Decety et al., 2013; Lockwood, Sebastian, et al., 2013; Marsh et al., 2013) and reduced affective responses to fearful faces (Seara-Cardoso et al., 2012). Furthermore, lower self-reported levels of affective empathy have been reported in this population (Wai & Tiliopoulos, 2012).

Although individuals with CD (Schwenck et al., 2012) and psychopathy (Blair et al., 1996; Dolan & Fullam, 2004; Richell et al., 2003) are thought to have intact cognitive empathy, evidence is still mixed. For example, Bons et al. (2013) underlined in their review the mixed results in relation to emotion recognition (cognitive aspect of empathy), bringing into question whether cognitive empathy is truly preserved in CD. Some studies have reported reduced emotion recognition, especially for fear, anger, and disgust (Fairchild et al., 2010),

while others have failed to find impairments in this ability (Pajer et al., 2010). Research has also found that children with psychopathic tendencies exhibit deficits in the recognition of sad and fear expressions (Blair et al., 2001; Stevens et al., 2001), with a recent meta-analyses reporting evidence that extends those deficits to the recognition of several emotions (i.e., not only fear and sadness) in both adults and children/adolescents (Dawel, O’Kearney, McKone, & Palermo, 2012). In contrast, this ability has often been found to be intact in adults with psychopathy, with the exception of fear recognition (see Blair, 2007), although few studies have also reported certain difficulties in the recognition of disgusted expressions (Blair et al., 2004; Kosson et al., 2002).

It is important to mention that among individuals with CD, those with high levels of CU show a more severe and stable pattern of antisocial behaviour (Frick et al., 2014; Frick & White, 2008), with a number of distinct social-cognitive deficits (see Pardini, Lochman, & Frick, 2003). While some studies have revealed a negative relationship between CU traits and both affective and cognitive empathy (Muñoz et al., 2011; Pardini et al., 2003; Pasalich, Dadds, & Hawes, 2014), other have associated CU traits with deficits in cognitive but not affective empathy in females (Dadds et al., 2009). However, in this study, differences were found between males and females, with CU traits being associated with deficits in affective empathy across all ages for males. In individuals with CD/ psychopathic tendencies and high levels of CU traits, evidence has more consistently shown deficits in affective but not in cognitive empathy (Anastassiou-Hadjicharalambous & Warden, 2008a; Jones et al., 2010; Schwenck et al., 2012). More recently, research by Pasalich et al. (2014) found that the association between CU traits and affective empathy in children with conduct problems was moderated by ASD symptoms, suggesting that their atypical empathy functioning could be

explained, at least to some extent, by CU traits and ASD symptoms. See chapter 1 for a more detailed description of empathy deficits in individuals with disruptive behaviours.

Although both ASD and the above-mentioned disruptive behaviours are commonly referred to as empathy dysfunction disorders (Blair, 2005), evidence reveals that difficulties in empathy differ qualitatively among individuals with these conditions and hence, it should not be viewed simply as a global deficit. However, limited studies have investigated cognitive and affective empathy of adolescents with disruptive behaviours compared to those with ASD, and thus, the extent to which specific forms of empathy are associated with each disorder remains unclear. The available evidence, although still limited, has shown that boys with ASD only exhibit deficits in cognitive aspects of empathy (i.e., perspective taking), while those with psychopathic tendencies only show deficits in areas associated with affective empathy (e.g., reduced concern about the consequences of their aggressive behaviours towards others) (Jones et al., 2010). In agreement with these results, Schwenck et al. (2012) found that boys with ASD had impairments in perspective taking and showed a delayed in the recognition of sad expressions, whereas children with CD and high CU were less emotionally affected when watching the scenes of the video sequences task, thereby reflecting a deficit in affective empathy. In this study, no deficits were observed in CD either for emotion recognition or for perspective taking. The same pattern of empathy deficits was found in a community sample of adults in relation to ASD symptoms and psychopathic traits, with reduced affective resonance being associated with higher psychopathic traits and lower levels of cognitive perspective taking being related to higher ASD traits (Lockwood, Bird, Bridge, & Viding, 2013). In addition, Bons et al. (2013) found in their review that individuals with ASD also had impaired, or at least delayed, facial mimicry in response to static expressions for basic

emotions (i.e., deficit in affective empathy), while adolescents with CD and high CU traits showed impaired emotion recognition for sad expressions (i.e., cognitive empathy deficit).

The first aim of the present study was to extend the limited research in empathy deficits between ASD and populations with disruptive behaviours by examining levels of cognitive and affective empathy and CU traits in both clinical populations when compared to a control group. Cognitive and affective aspects of empathy were examined by using an experimental task (EA task) as well as a self-report questionnaire that assesses separately both components. Due to the limited access to adolescents with a formal diagnosis of any of the clinical conditions above mentioned, a broader group of adolescents with emotional and behavioural difficulties were recruited for the present study. This group will be referred to as the behavioural difficulties (BD) group. Both ASD and BD were expected to have lower levels of EA than controls (hypothesis 1), with difficulties in this task being specific to the inference of negative emotions, as shown by previous studies focused on emotion recognition (Bons et al., 2013; Fairchild et al., 2010). Based on previous studies (Jones et al., 2010; Schwenck et al., 2012), we also hypothesised that individuals with ASD would report lower levels of cognitive empathy (hypothesis 2), with difficulties in perspective taking being specific to the ASD group. In contrast, individuals with BD would show lower levels in affective empathy (hypothesis 3). Finally, the BD group was expected to have higher levels of CU traits than both ASD and controls (hypothesis 4).

The second aim of the present study was to further analyse the differences in cognitive and affective aspects of empathy in a large sample of individuals with ASD and matched controls, to extend our result from Chapter 4. The use of the EA task was especially relevant

considering the limited ecological validity of static stimuli to assess social perception in ASD (Baron-Cohen et al., 1997; Baron-Cohen et al., 2001; Kleinman et al., 2001) and evidence showing that deficits in emotion recognition could be diminished in laboratory settings (Bons et al., 2013). In this experimental task, adapted from Zaki and colleagues (2008; 2009), participants were asked to accurately identify real emotions experienced by people in different videos, depicting contexts as closely as possible to real-life situations. We also examined whether participants' EA vary according to the valence of the emotions depicted. Based on previous studies (Demurie et al., 2011; Ponnet et al., 2008; Ponnet et al., 2004; Roeyers et al., 2001), individuals with ASD were expected to have lower levels of EA than controls (hypothesis 5), especially for videos with negative valence (Ashwin et al., 2006; Golan et al., 2010; Howard et al., 2005). As shown by previous research (Hirvelä & Helkama, 2011; Rogers et al., 2007; Rueda et al., 2015), we hypothesised that individuals with ASD would report lower levels of cognitive empathy than controls, especially in perspective taking (hypothesis 6).

Method

Participants

The sample comprised a total 79 participants (41 males, 38 females) aged between 12 and 17 years ($M_{age}=15.24$ years, $SD=1.32$). Three groups of participants were recruited from secondary schools in the West Midlands. For the first group, the control group (CG), 28 typically developing individuals (7 males, 21 females) were recruited from one academy sponsor-led ($n=3$) and two comprehensive ($n=25$). For the second group, ASD, a total 31 participants (26 males, 5 females) with ASD were included. Participants were recruited from one specialist foundation for individuals with special educational needs (SEN) ($n=10$); one specialist school for individuals with SEN, in which a formal diagnosis of autism was the criterion for entry ($n=7$); and one independent day school for people with a formal diagnosis of High Functioning Autism or Asperger's Syndrome ($n=4$). In addition, 10 students from one school for people with formal diagnosis of autism referred by the Child and Adolescent Mental Health Service were also included.

For the third group, a total 20 participants with BD (8 males, 12 females) were included. Participants were recruited from one specialist foundation for individuals with diagnosis of social, emotional and mental health needs ($n=2$); one pupil referral unit for students who have been permanently excluded from school ($n=5$); one community centre that for adolescents experiencing social, behavioural and emotional difficulties ($n=4$); and one converter academy for girls with SEN ($n=9$). Incomplete data from 15 participants with less than 10% of missing data (i.e., one item) in a questionnaire's subscale were imputed and included for later analysis. Data from eight participants (i.e., one participant from the control group, 4 from the ASD group and 3 from the BD group) with more than 10% of incomplete

data in any subscale were excluded. The final sample consisted of 71 participants (37 males, 34 females) aged between 12 and 17 ($M_{age}=15.26$ years, $SD=1.28$), with the vast majority being British (87%, $n=62$). Participant characteristics are displayed in Table 6.1.

Table 6.1

Sample characteristics for the three groups of participants: ASD, BD and controls

	CG (n=27)	ASD (n=27)	BD (n=17)
Age range (in years)	14-17	14-17	12-17
$M (SD)$	15.39 (1.22)	15.67 (1.05)	14.39 (1.38)
Gender (Male: Female)	7:20	23:4	7:10
Ethnicity			
White	9 (33%)	24 (89%)	12 (71%)
Black/ African-American	5 (19%)	1 (4%)	--
Asian-Indian/Asian-Oriental	9 (33%)	1 (4%)	3 (18%)
Mixed	4 (15%)	1 (4%)	2 (12%)
Country of origin: UK	19 (70%)	27 (100%)	16 (94%)
Level of education			
Year 7 and 8	--	--	2 (12%), 4 (23%)
Year 9	8 (30%)	6 (22%)	8 (47%)
Year 10	5 (18%)	8 (30%)	1 (6%)
Year 11	8 (30%)	6 (22%)	--
Year 12	6 (22%)	6 (22%)	2 (12%)

Note. In the CG, one participant reported being from a European country other than UK, and seven participants reported being from non-European countries. In the BD group, one participant also reported being from a European country other than UK. One participant from the ASD group failed to report the level of studies.

Differences between groups on demographics characteristics were examined, revealing a significant between group effect on age, $F(2,68)=6.21$, $p<.01$, with participants with BD being significantly younger ($M_{age}=14.39$) than both participants with ASD

($M_{\text{age}}=15.67$, $p<.01$) and controls ($M_{\text{age}}=15.39$, $p<.05$). No significant differences were found in age between participants with ASD and controls ($p=.67$). The three groups also differed by gender, $\chi^2(1, N=71)=20.07$, $p<.001$, with the number of females being significantly higher in the control group (7 males, 20 females) and BD group (7 males, 10 females). In the ASD group, the number of males was significantly higher than the females (23 males, 4 females).

Materials

Participants were asked to complete socio-demographic questions, one behavioural measure of empathy and three self-report questionnaires assessing empathy and deviance features of psychopathy. In addition, information regarding the formal diagnosis of autism was collected from participants of the ASD group to confirm their belonging to this group. The participants' parents provided us with this information using a protocol developed by the researcher. This protocol was also used in the previous study and a detailed description is given in the chapter 4.

Measure of behavioural empathy. A computerised experiment adapted from Zaki et al. (2008); Zaki, Weber, et al. (2009) was used to assess participants' EA, which is defined as the ability to judge others' expressive behaviour based on their facial expressions, voice tone and words. For the purpose of this study, the EA task we developed in chapter 5 was adapted to create a shorter version, and this administered to all the participants. For this short version, 12 videos were chosen taking into consideration valence of the events (6 positive; 6 negative), gender of the targets (6 males; 6 females), and length of the videos ($M=65.5$; Range= 37 seconds; 1 minute and 37 seconds). See Table 6.2 for descriptive statistics on the videos selected. Although there were no significant differences in the length of the videos based on

targets' gender, $t(10) = -.86$, $p=.41$, significant differences were found in the length of the videos based on valence of the events described, $t(10) = -3.39$, $p<.01$. The negative videos were found to be significantly longer ($M=79.5$, $SD=17.97$) than the positive videos ($M=51.5$, $SD=9.31$).

Table 6.2

Descriptive statistics for the videos selected for the development of the EA task-short version

Targets' gender	Valence of the event	Title of the event (topic discussed)	Video length (in seconds)	Mean (SD) of affective ratings
Female	Positive	Seeing a boyfriend	50	6.43 (1.51)
Female	Positive	A level grades	37	7.00 (1.00)
Male	Positive	Weight loss	47	7.00 (1.00)
Female	Positive	Birth of youngest brother	52	6.50 (.71)
Male	Positive	Emily's Birthday	61	7.00 (1.00)
Male	Positive	Kittens	62	6.80 (0.84)
Female	Negative	Losing the pub/home	78	4.17 (.75)
Female	Negative	Break up	52	5.30 (1.34)
Female	Negative	Visiting grandma	94	4.43 (.98)
Male	Negative	The NewCom fallout	97	3.83 (1.47)
Male	Negative	Parent's divorce	91	3.00 (1.00)
Male	Negative	Beatty's ill health	65	3.00 (1.00)

Note. Affective ratings refer to the continuous ratings made by targets when watching their own videos about how positively or negatively they had felt while discussing these events. "Losing the pub/home" refers to an event in which the participant explained why her mother lost the pub where she worked and in which the whole family was living. The video "Break-up" was initially classified by the target as a negative video. However, the ratings made by the target varied between 3 and 7 because part of the content of the video reflected positive aspects.

Participants completed the task as follows. First, detailed instructions on how to complete the task were verbally provided prior to the completion of the task. Participants were asked to continuously rate how positive or negative they believed people (referred to as targets) from different videos were feeling at each moment by using the left or right arrow keys of the keyboard to move along the 9-points scale. Then, participants were asked to watch and rate two practice videos (one with positive valence, female target, and a length of 57 seconds; and one with negative valence, male target, and a duration of 31 seconds) to allow the researcher to verify that participants correctly understood the task. Subsequently, participants were presented with the EA task that consisted of 12 videos (6 positive, 6 negative; $M=65.5$; minimum length= 37 seconds, maximum video= 1 minute and 37 seconds). The videos were presented in a pseudorandomised order, combining positive and negative videos, and ensuring that the order of the presentation for the videos was different for each participant. The presentation of the videos was split across 2 runs, which allowed participants to rest between each run. The time to rest was not limited. Stimuli were displayed on a 14.5" monitor and all the data were collected on a computer running E-Prime 2.0 version 2.0.10.248 (Psychology Software Tools Inc., 2012). Previous studies have shown good evidence for the reliability and validity of the procedure (Ickes, 2001, 2003; Marangoni et al., 1995).

Measures of self-reported empathy. Cognitive and affective levels of empathy were assessed using the Questionnaire of Cognitive and Affective Empathy (QCAE; Reniers et al., 2011). See methods section in chapter 2 for a more detailed description of this measure and its psychometric properties. This questionnaire has shown satisfactory psychometric properties in the present study, with Cronbach's α coefficients of .68 for affective empathy .83 and for cognitive empathy.

Furthermore, we used the Inventory of Callous–Unemotional Traits (ICU; Frick, 2004) to evaluate participants' lack of empathy as CU traits are relatively stable behaviours characterized by a lack of guilt, absence of empathy, and shallow affect (Frick & White, 2008). The ICU is a 24-items self-report questionnaire rated on a four-point scale from 0 (*not at all true*) to 3 (*definitely true*) that assesses three aspects of CU traits: uncaring, callous, and unemotional traits. These traits reflect, in addition to the lack of empathy, lack of guilt and poverty in emotional expression. Although the parent, teacher, and self-report versions of the ICU are available, only the self-report version of the ICU was used in the current study due to the limited access to participants' parents, as some of them came from home backgrounds where parental non-response was considered highly likely. This questionnaire has shown evidence for the generalizability of its factor structure, and has demonstrated moderate to good reliability (with Cronbach's α coefficients ranging from .45 to .88 for its three subscales) and good construct validity in schools (Essau, Sasagawa, & Frick, 2006) and among adolescent offenders (Kimonis et al., 2008; Roose et al., 2010). This questionnaire has shown satisfactory psychometric properties in the present study, with a Cronbach's α coefficient of .58, .75, and .81 for the unemotional, callousness and uncaring subscales respectively.

Measure of deviance features of psychopathy. The Antisocial Process Screening Device (APSD; Frick & Hare, 2001) is a 20-items brief report questionnaire rated on a three-point scale: 0 (*not at all true*), 1 (*sometimes true*); 2 (*definitely true*) that assesses several aspects of psychopathic behavior, including narcissism, CU, and impulsivity traits. These three dimensions represent the interpersonal, affective and social deviance features of psychopathy respectively (Frick, Bodin, & Barry, 2000). The combination of the ICU and APSD provides a comprehensive assessment of callous and unemotional traits, which is

important to define a distinct subgroup group of antisocial and aggressive youth, thereby allowing for the classification of participants within a subgroup of individuals with behavioural difficulties in the present study. A self-report version of the APSD has been developed for older youths (between 12 and 18 years), and this has been suggested to be a more reliable and valid measure of antisocial features among adolescents, considering that these tendencies may not be observable to parents during this developmental period (Frick, Barry, & Bodin, 2000). In addition, this questionnaire has been shown to have good reliability and validity (Frick, Bodin, et al., 2000; Frick & Hare, 2001), with Cronbach's α coefficients of .77, .66, .48, and .57 for the APSD total score, and its subscales narcissism, CU and impulsivity, respectively, in samples of adolescent offenders (Lee, Vincent, Hart, & Corrado, 2003). This questionnaire has shown satisfactory psychometric properties in the present study, with an overall Cronbach's α coefficient of .78.

Furthermore, participants from the BD group were asked to complete the Youth Psychopathic Traits Inventory (YPI: Andershed, Kerr, Stattin, & Levander, 2002) to confirm the presence of BD. The YPI is a 50-item self-report questionnaire that assesses traits of psychopathic personality on interpersonal, affective, and behavioural domains by using a four-point scale from 1 *does not apply at all* to 4 *applies very well*. It consists of ten subscales measuring: dishonest charm (i.e., glibness and superficial charm), grandiosity (grandiosity/egocentricity aspects of the psychopathic personality constellation), lying (i.e., tendency to lie frequently and with ease), manipulation traits, callousness (including the lack of empathy), un-emotionality (i.e., shallow affect or poverty in affective reactions), remorselessness (i.e., lack of remorse and guilt), impulsivity, thrill-seeking (i.e., need for stimulation and proneness to boredom) and irresponsibility. This questionnaire has shown good internal consistency with

Cronbach's α coefficients ranging between .66 and .88 for the YPI total and subscales scores in adolescent community samples (Andershed et al., 2002). This questionnaire also showed satisfactory psychometric properties (Cronbach's α coefficient of .93) in the present study.

Procedure

Only participants who met basic inclusion criteria were given the opportunity to participate in the study. Eligibility criteria included capacity to provide informed consent and fluency in English to be able to complete all the measures. For the CG, inclusion criteria included the absence of autistic traits and behavioural problems. For the ASD group, only individuals who had a formal diagnosis of any of the following conditions: Asperger's Syndrome, ASD, or PDD-NOS, were able to take part. For the BD, selection criteria included (1) no-presence of co-morbid clinical diagnosis of autism and (2) attendance to specialist institutions to which entry was dependent upon the manifestation of BD.

Data collection was done as follows. Parental consent was obtained in advance for all participants. Participants were presented with detailed information on the study, and informed consent was obtained before the completion of the measures. Participants were then presented with the questionnaires in a fixed order (i.e., QCAE, ICU and APSD), and these were completed in a quiet room during one-to-one sessions with the researcher of approximately 20-35 minutes, giving them extra time to complete the measures if required. Subsequently, participants were asked to complete the EA task, which lasted approximately 15 minutes. Participants were not compensated for their participation in this study. Ethical approval for this research project was granted by the Research Ethics Committee of the University of Birmingham, UK.

Analyses strategy

All analyses were performed using SPSS Version 22 (IBM SPSS Inc., Armonk, NY). A significance alpha level of .05, and two-tailed tests were used for statistical analyses. For the EA task, data reduction was done using E-prime (Hodgins & Janson, 2002) and time-series correlations to calculate EA coefficients were performed as detailed in chapter 5. First, descriptive statistics on psychopathic features of participants with BD and diagnosis characteristics of participants with ASD were calculated to explore the distribution of each variable. Secondly, correlations between self-reported levels of cognitive and effective empathy and levels of EA were investigated.

Finally, we examined differences in empathy (both EA and self-reported levels of cognitive and affective empathy) and antisocial/ CU traits between ASD, BD, and controls using multivariate analysis. Post-hoc analyses using Bonferroni corrections were conducted. In the result section, adjusted *p*-values were reported. Considering the significant between group effect found on age, $F(2,68)=6.21$, $p<.01$, and gender, $\chi^2(1, N=71)=20.07$, $p<.001$, between the BD group, participants with ASD and controls; both age and gender were used as a covariate of interest. Differences in cognitive and affective aspects of empathy (in both EA and self-report) were further explored using the analysis of variance to compare individuals with ASD and controls. Seeing the significant gender differences found between ASD and controls, $\chi^2(1, N=54)=19.20$, $p<.001$, gender was used as a covariate of interest in these analyses. No significant differences were found in age between participants with ASD and controls ($p=.67$) and thus, age was not used as a covariate in these comparisons.

Results

Psychopathic features of participants with BD

Participants from the BD group reported, in general, increased levels of psychopathic features ($M=2.64$, $SD=.55$, minimum= 1.84, maximum= 3.44), with 8 out of 12 participants scoring in the YPT above the proposed cut-off (i.e., 2.5 out of 4) to define the high psychopathy group (Skeem & Cauffman, 2003). In addition, self-reported levels of YPT (total scores) were found to correlate positively with levels of callous traits (as measured by the callousness subscale of the ICU) and the APSD (total scores). Table 6.3 shows correlations between total scores for YPT, ICU and APSD and each of their subscales.

Table 6.3

Correlations between measures of psychopathy, CU, and antisocial traits for the BD group

	ICU				APSD			
	Total	Call	Unc	UnEm	Total	Nar	Imp	CU
YPI total score	.57	.74**	.27	-.19	.61*	.55	.48	.38
Dishonesty	.54*	.47	.51	-.17	.64*	.56*	.21	.66**
Charm								
Grandiosity	.35	.62*	.13	-.35	.49	.61*	.43	.14
Lying	.52	.74**	.16	-.15	.51	.46	.59*	.21
Manipulation	.63*	.68*	.46	-.22	.80**	.77**	.42	.56*
Remorselessness	.11	.42	-.22	-.09	.04	.15	.18	-.21
Un-emotionality	.16	.65*	-.24	-.32	.05	.13	.35	-.19
Callousness	.64*	.71**	.48	-.32	.49	.45	.36	.49
Thrill-seeking	.63*	.18	.83**	.13	.69**	.40	.14	.77**
Impulsiveness	.65*	.44	.45	.39	.60*	.31	.59*	.50
Irresponsibility	.54*	.64*	.28	-.10	.60*	.64*	.63*	.17

Note. * $p<.05$, ** $p<.01$. Call refers to callous traits; Unc refers to uncaring traits; UnEm refers to unemotional traits; Nar refers to narcissism; Imp refers to impulsivity; CU refers to callous-unemotional traits. Five participants failed to complete the YPT.

Diagnosis characteristics of participants with ASD

All the participants from this group reported having been diagnosed with either ASD (85%, $n=23$) or Asperger's Syndrome (15%, $n=4$). Participants were aged between 3 and 15 ($M_{age}=7.52$ years, $SD=3.65$) when diagnosed, and these diagnosis were made by psychiatrists (41%), the Child and Adolescent Mental Health Service (CAHMS) (26%), psychologists (18%), or paediatricians (15%). Ten participants reported the co-occurrence of one or more co-morbid disorders, including ADHD ($n=3$), obsessive-compulsive disorder ($n=2$), dyspraxia ($n=4$), dyslexia ($n=1$), dyscalculia ($n=1$) and general learning difficulties ($n=1$).

Empathic Accuracy and self-reported empathy

Correlations between self-reported levels of cognitive and effective empathy (i.e., QCAE) and levels of EA (i.e., behavioural measure of empathy) were investigated in our sample. While EA and cognitive empathy were significantly and positively correlated, $r(67)=.33$, $p<.01$; no significant correlation was found between EA and affective empathy, $r(67)= .08$, $p=.51$. Examining the subtypes of EA, it was found that only EA for videos with positive valence, $r(67)=.36$, $p<.01$, and those with female targets, $r(66)=.38$, $p<.01$, were significantly and positively correlated with cognitive empathy. Participants who failed to complete all the trials of the EA task were excluded from this correlational analysis.

Empathic Accuracy in ASD and BD

One-way MANCOVA analyses were conducted to investigate the differences between ASD, BD, and controls in EA and each of its subtypes. Multivariate analysis showed no overall effect on EA and each of its subtypes, $F(10, 114)=1.48$, $p=.15$; Wilk's $\Lambda=.78$, $\eta_p^2=.12$, after controlling for age and gender. No significant differences were found in either EA or any

of its subtypes in subsequent univariate ANOVAs analyses. Participants who failed to complete all the trials of the EA task (CG: $n=1$, ASD: $n=4$) were excluded from this analysis.

Comparisons between ASD and controls in Empathic Accuracy. Further analyses were performed to examine the differences between participants with ASD and controls in EA and each of its subtypes. Separated analysis of variance only revealed a significant difference in EA for videos with female targets between ASD and controls, $F(1, 46)=4.20$; $MSE=.21$; $p<.05$; $\eta_p^2=.08$, after controlling for gender. Participants with ASD showed lower levels of EA for videos with female targets than controls (see Table 6.4 for descriptive statistics). Differences in EA coefficients were also analysed separately for each group. We found significant differences in EA based on targets' gender only in the control group, $t(50)=4.22$, $p<.001$, with controls being more accurate when assessing males targets' affect than females targets' affect. Significant differences were found in EA based on type of the event described in both controls, $t(50)=4.18$, $p<.001$, and ASD, $t(46)=2.73$, $p<.01$. All the perceivers were more accurate at assessing positive than negative events. Table 6.4 shows descriptive statistics for total EA and its subtypes by groups.

Table 6.4

Ranges, means, standard deviations and p values on EA coefficients on ASD and controls

	CG			ASD				<i>p</i>
	Range	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>		
EA total score	.37-.69	.57	.09	.09-.71	.53	.16	.06	
EA videos negative valence	-.07-.72	.48	.15	-.44-.77	.40	.26	.09	
EA videos positive valence	.25-.79	.63	.11	.16-.80	.58	.18	.09	
EA videos female targets	.17-.65	.49	.12	-.58-.76	.40	.31	<.05	
EA videos male targets	.28-.80	.63	.13	-.58-.76	.56	.28	.18	

Note. Statistical differences between groups correspond with ANCOVAs analysis.

Self-reported empathy in ASD and BD

One-way ANCOVA analyses were conducted to study the differences between ASD, BD, and controls in self-reported levels of cognitive and affective empathy, after controlling for age and gender. Significant differences were found between the three groups of participants in cognitive empathy, $F(2, 66)=3.05$; $MSE=219.42$; $p<.05$; $\eta_p^2=.09$, but not in affective empathy, $F(2, 66)=2.23$; $MSE=66.55$; $p=.12$; $\eta_p^2=.06$. Differences between ASD, BD, and controls in all the subcomponent of cognitive empathy were further investigated. Multivariate analysis showed an overall significant effect on both perspective taking and online simulation (components of cognitive empathy), $F(4, 134)=2.60$, $p<.05$; Wilk's $\Lambda=.86$, $\eta_p^2=.07$. Subsequent univariate ANOVAs analysis showed significant differences in online simulation, $F(2, 68)=3.63$; $MSE=95.29$; $p<.05$; $\eta_p^2=.10$, but not in perspective taking, $F(2, 68)=2.84$; $MSE=65.05$; $p=.07$; $\eta_p^2=.08$. Bonferroni post hoc analysis with adjusted significance revealed that levels of online simulation were significantly lower in BD than controls ($p<.05$). No significant differences were found between adolescents with ASD and those with BD ($p=.66$) or controls ($p=.37$). See Table 6.5 for descriptive statistics.

Table 6.5

Means (standard deviations) on cognitive and affective empathy, and their subscales, in ASD, BD and controls

	CG (n=27)	ASD (n=27)	BD (n=17)
Cognitive empathy (QCAE)	56.30 (7.67)	51.11 (7.11)	49.76 (10.91)
Perspective Taking	30.96 (4.46)	27.96 (3.48)	28.65 (6.73)
Online Simulation	25.33 (5.19)	23.15 (4.79)	21.12 (5.52)
Affective empathy (QCAE)	33.15 (6.11)	31.07 (4.23)	29.12 (6.26)
Emotion Contagion	10.41 (2.99)	10.11 (1.93)	10.00 (4.24)
Proximal Responsivity	11.81 (2.80)	11.33 (2.13)	10.29 (2.89)
Peripheral Responsivity	10.93 (2.06)	9.63 (2.12)	8.82 (2.90)

Comparisons between ASD and controls in self-reported empathy. One-way ANCOVA analyses were conducted to further study the differences between participants with and without ASD in self-reported levels of cognitive and affective empathy, while controlling for the effect of gender. Significant differences were found in cognitive empathy, $F(1, 50)=7.10$; $MSE=395.01$; $p<.05$; $\eta_p^2=.12$, with participants with ASD reporting lower levels of cognitive empathy than controls (see Table 6.5). No significant differences were found in affective empathy, $F(1, 50)=.00$; $MSE=.01$; $p=.99$; $\eta_p^2=.00$.

One-way MANCOVA analyses were carried out to investigate the differences between participants with and without ASD in all the subcomponents of cognitive empathy. Results showed an overall significant effect on both perspective taking and online simulation, $F(2, 50)=3.96$, $p<.05$; Wilk's $\Lambda=.86$, $\eta_p^2=.14$. Subsequent univariate ANOVAs analysis revealed a significant difference in perspective taking, $F(1, 51)=7.09$; $MSE=114.54$; $p<.01$; $\eta_p^2=.12$, with ASD reporting lower levels than controls (see Table 6.5). No significant differences were found in online simulation, $F(1, 51)=3.34$; $MSE=83.59$; $p=.07$; $\eta_p^2=.06$.

CU and antisocial traits in ASD and BD

One-way MANCOVA analysis revealed an overall significant effect on CU traits (callousness, uncaring and unemotional), $F(6, 128)=2.74$, $p<.05$; Wilk's $\Lambda=.79$, $\eta_p^2=.11$, across groups, after controlling for age and gender. Subsequent univariate ANOVAs analysis showed significant differences in callousness, $F(2, 66)=6.99$; $MSE=171.69$; $p<.01$; $\eta_p^2=.18$, and uncaring, $F(2, 66)=3.57$; $MSE=75.54$; $p<.05$; $\eta_p^2=.10$, but not in unemotional traits, $F(2, 66)=1.90$; $MSE=16.26$; $p=.16$; $\eta_p^2=.05$, with BD reporting significantly higher levels than ASD and controls. Bonferroni post hoc analysis revealed that only levels of callous traits were

significantly higher in BD than ASD ($p<.05$) and controls ($p<.01$). No significant differences were found between ASD and controls ($p=1.00$). See Table 6.6 for descriptive statistics.

Table 6.6

Means (standard deviations) on CU and antisocial traits, and their subscales, in ASD, BD and controls

	CG (n=27)	ASD (n=27)	BD (n=17)
CU traits (ICU)	24.33 (7.83)	24.74 (8.61)	35.06 (11.54)
Callousness	7.22 (4.06)	9.19 (4.80)	12.76 (6.40)
Uncaring	8.26 (3.56)	8.00 (4.52)	12.94 (6.28)
Unemotional	8.85 (3.33)	7.56 (2.24)	9.35 (3.18)
Antisocial traits (APSD)	11.41 (4.73)	13.37 (5.83)	18.65 (4.69)
Narcissism	3.37 (2.56)	4.22 (2.61)	5.18 (2.23)
Impulsivity	3.78 (1.37)	4.44 (1.70)	6.12 (1.45)
CU traits	3.37 (1.55)	3.70 (1.88)	5.65 (2.18)

A second one-way MANCOVA analysis also showed an overall significant effect on antisocial traits (narcissism, impulsivity and CU traits), $F(6, 128)=4.29, p<.01$; Wilk's $\Lambda=.69$, $\eta_p^2=.17$, across groups, after controlling for age and gender. Following univariate ANOVAs analysis confirmed the significant differences in narcissism, $F(2, 66)=3.09; MSE=18.90; p<.05$; $\eta_p^2=.09$, impulsivity, $F(2, 66)=10.89; MSE=23.58; p<.001; \eta_p^2=.25$, as well as CU traits, $F(2, 66)=6.36; MSE=21.83; p<.01; \eta_p^2=.16$. Bonferroni post hoc analysis with adjusted significance revealed that levels of narcissism ($p<.05$), impulsivity ($p<.001$) and CU traits ($p<.01$) were significantly higher in BD than controls. Post hoc analysis showed that levels of impulsivity were significantly higher in ASD than controls ($p<.05$). No significant differences were found between ASD and BD ($p=.13$). Levels of CU traits were significantly lower in ASD reported than BD ($p<.05$). No significant differences were found between ASD and controls ($p=1.00$). Table 6.6 shows descriptive statistics on antisocial traits across groups.

Discussion

The first aim of the current study was to compare levels of EA, self-reported cognitive and affective empathy, as well as CU traits in adolescents with ASD, BD and controls. This is the first study that investigates empathic abilities by using both a behavioural measure and self-report questionnaires, in a clinical sample of adolescents with ASD, individuals with BD and controls. First, we found no significant differences between groups in EA. The lack of significant differences could be attributed to the small size of our sample, which could have limited the statistical power of our analysis (a power analysis revealed that a sample of approximately 25 participants per group would have been necessary for an effect size 0.80, $p < .05$). However, it is important to highlight that our results are consistent with previous research revealing that individuals with ASD or PDD show deficits in EA only if the task is complex enough (Ponnet et al., 2004; Roeyers et al., 2001). In a more recent study, Ponnet et al. (2008) specifically studied the differences in valence accuracy as an aspect of participants' EA, and found that controls were significantly better at inferring both negative and positive thoughts/ feelings of targets than individuals with ASD. This difference was found only in complex EA tasks in which the situation observed is less predictable and requires greater communicative and social abilities. Therefore, it is possible that the lack of significant differences in the present study is more related to the easiness of the task, i.e., our participants were asked to infer how positive or negative people from the videos were feeling but not to identify the emotion displayed, rather than to the sample size.

Furthermore, in the present study, empathic abilities of adolescents with ASD were investigated more in detail in order to extend results from chapter 4. As expected, individuals with ASD performed worse in the EA task than matched controls, although these differences

were statistically significant only when measuring EA for videos with female targets. Our results also showed that participants from the control group were more accurate at assessing male targets' affect than female targets' affect. This finding is in line with the results from our study 4 in chapter 5, where perceivers (male and female university students) were also found to have higher EA for videos with males' targets. Consistently, the fact that females usually report themselves as being not only more expressive, but also more ambivalent in their emotional expressions compared to males (King & Emmons, 1990) could explain why emotional expressions from males were more accurately inferred. Likewise, differences in EA based on type of the event described were found in both control and ASD participants, with both groups of perceivers assessing more accurately positive than negative events. As mentioned in chapter 5, our results suggests that positive emotional expressions are more easily inferred than negative expressions because positive expressions seem to be visually more distinctive and recognised faster than negative expressions (Calvo & Marrero, 2009; Leppänen & Hietanen, 2004).

Based on this evidence, the lack of significant differences we found in the overall EA scores could be attributed to the abilities of our sample. Some evidence suggests that in individuals with ASD the recognition of complex social emotions (i.e., pride and embarrassment) is impaired (Capps et al., 1992; Heerey et al., 2003), while the recognition of basic emotions (i.e., anger, fear, disgust and happiness) is less affected (Adolphs et al., 2001; Tracy et al., 2011). Perhaps the fact that the events described by the targets included more basic emotions (especially happiness and sadness) than complex emotions could have facilitated the accurately inference of others' thoughts and feelings in individuals with ASD. However, considering the deficit in the recognition of basic and more subtle emotions found

on the previous chapter, it seems more feasible to attribute the lack of differences to the fact that our participants were asked to infer how positive or negative people from the videos were feeling (i.e., valence accuracy), rather than identify the emotion displayed. As mentioned before, it is possible that the simplicity of the task helped individuals with ASD infer others' unexpressed thoughts and feelings. Further experimental studies with variations in the difficulty and type of emotions expressed within a larger ASD population will be of interest to help clarify whether there are difficulties in EA, and understand if these difficulties rely on the type of emotion expressed.

In addition to the behavioural measure of empathy, a self-report questionnaire was administered to further assess cognitive and affective components of empathy. Our results revealed that levels of self-reported affective empathy did not differ across groups. Although surprising, this result is in line with those by Robinson and Rogers (2015), who also failed to find differences in affective empathy when comparing three groups of offenders with different levels of psychopathic traits. However, this finding disagrees with previous evidence showing lower levels of self-reported affective empathy in individuals with disruptive behaviors, including CD (Cohen & Strayer, 1996; Lovett & Sheffield, 2007), DBD (de Wied et al., 2006) and psychopathy (Wai & Tiliopoulos, 2012).

In contrast, significant differences were found in cognitive empathy across groups, with individuals with BD reporting significantly more difficulties than controls. Our results contradict previous studies that have failed to find difficulties in cognitive empathy in individuals with disruptive behaviours compared to controls (Dolan & Fullam, 2004; Schwenck et al., 2012). They also disagree, to some extent, with the proposed double

dissociation of empathy, in which individuals with ASD tend to display more deficits in cognitive than affective empathy (Dziobek et al., 2008; Mazza et al., 2014; Rogers et al., 2007; Rueda et al., 2015), while those with disruptive behaviours show the opposite profile (Blair, 2008; de Wied et al., 2005; Jones et al., 2010; Schwenck et al., 2012).

Examining the differences across groups in the subcomponents of cognitive empathy we found that levels of online simulation (i.e., an attempt to put oneself in others' place by imagining what that person is feeling) (Reniers et al., 2011) were lower in individuals with BD than in both controls and individuals with ASD. Differences between ASD and BD were, however, not statistically significant. This is, to some extent, consistent with findings by Robinson and Rogers (2015), who found that offenders with high psychopathy traits display lower levels of online simulation than offenders with medium and low psychopathy traits. The authors suggested that the fact that online simulation measures the active effort to put oneself in another's place through their imagination rather than using a more analytic perspective, such as the self-assessment of their own ability, could explain their finding.

Considering that online simulation often refers to future intentions (e.g., "Before criticising somebody, I try to imagine how I would feel if I was in their place"), difficulties within this ability could also be explained by the frequent co-occurrence between impulsivity/behavioural disinhibition and disruptive behaviour disorders (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Milich, Hartung, Martin, & Haigler, 1994; Waschbusch, 2002). Perhaps the impulsive behaviour associated with these conditions (Avila & Parcet, 2001; Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001) leads individuals to precipitately respond to a given situation rather than to evaluate (e.g., by using online simulation) this situation first, and

consequently decide how to act. Indeed, our results showed that impulsivity (as measured by the APSD) was higher in individuals with BD when compared to both ASD and controls (although the differences between BD and ASD were not statistically significant). In addition, there is a negative correlation between chronological age and impulsivity, with the latter declining significantly from childhood through adolescence and into adulthood (Galvan, Hare, Voss, Glover, & Casey, 2007; Leshem & Glicksohn, 2007). Seeing that our sample included participants aged between 12 and 17, it may be the case that the deficits observed in cognitive empathy (i.e., online simulation) will not be present in the group of participants with BD in later developmental stages. This corresponds with research revealing that boys with psychopathic traits tend to exhibit analogous levels of cognitive empathy than their peers, suggesting that the observed deficits in this ability may not persist after adolescence (Dadds et al., 2009).

In addition, self-reported levels of cognitive and affective empathy of adolescents with ASD were examined more in detail to extend results from chapter 4. As predicted, adolescents with ASD reported significantly lower scores on cognitive empathy than typically developing adolescents, while no differences were found in affective empathy between both groups. Our finding is in agreement with previous studies that found evidence to support a dissociation between cognitive and affective empathy by using self-report questionnaires (Rogers et al., 2007; Rueda et al., 2015) or other empathy tests (e.g., Multifaceted Empathy Test; MET) (Dziobek et al., 2008). However, this is not a universal finding as other evidence has found lower levels of both cognitive and affective empathy (Grove et al., 2014; Mathersul et al., 2013b; Mazza et al., 2014), or even increased affective empathy (at least in its component personal distress) (Rogers et al., 2007) in ASD when compared to controls. Furthermore, the

literature has consistently shown the existence of a perspective taking deficit in ASD (Castelli et al., 2002; Hirvelä & Helkama, 2011; Kaland et al., 2002), and our results provide further support for this idea. Taken together, our results show a cognitive deficit in ASD that seems to be specific to the subcomponent of perspective taking, and suggests that adolescents with this condition seem to have, at least to certain extent, insight into their poor perspective taking abilities (Ponnet et al., 2004).

Finally, we found that individuals with BD reported higher levels of CU traits than those with ASD and controls. In particular, its subcomponent callousness were found to be significantly higher in BD than ASD and controls, reflecting a lack of guilt and empathy within those with BD (Frick & Viding, 2009). These results provide, to some extent, support for evidence revealing that individuals with disruptive behaviours have a basic dysfunction in affective empathy that is characterised by poor capacities for affective resonance towards others' emotions and lack of concern for others' welfare (de Wied et al., 2005; Green et al., 2000; Schwenck et al., 2012). Corresponding with previous research (Leno et al., 2015), individuals with ASD reported an increase in callousness traits compared to controls (although these differences were not statistically significant), suggesting a potential selective deficit in affective domains that includes the ability to care about others' feelings. It is worth noting that according to literature, the presence of CU traits in ASD seems to be more associated with behavioural features characteristic of ASD, such as lack of sensitivity to the feelings of others, rather than with the manifestation of conduct problems (Leno et al., 2015; Lockwood, Bird, et al., 2013). In fact, our results showed that levels of CU traits were significantly lower in individuals with ASD when compared to those within the BD group. Findings on CU traits were further supported by the significant differences found in antisocial

traits between BD than controls, with the former reporting significantly higher levels of narcissism, impulsivity, and CU traits than the latter.

Taken together, the lack of significant differences in affective empathy across groups could be attributed to several reasons. Perhaps, individuals with BD were influenced by social desirability when answered the empathy questionnaire (QCAE), reflecting a biased level of their affective ability. In fact, previous research has reported correlations between social desirability measures and empathy scales (Baldner & McGinley, 2014) and supported the idea of the vulnerability of empathy measures, suggesting that certain populations (e.g., offenders) could easily simulate high levels of empathy (Robinson & Rogers, 2015). However, this bias did not seem to affect participants' responses to the remaining self-report questionnaires administered (i.e., ICU and APSD). It is also possible that the statistical power was not sufficient to compare groups due to the reduced sample size of the group with BD. Indeed, the group of participants with BD scored lower in two subcomponents of affective empathy (proximal responsivity and peripheral responsivity) than controls, bringing into question whether a significant effect could be observed within a larger sample. Finally, the lack of differences in affective empathy could be related to the type of items used in each questionnaire. While the affective items from the empathy questionnaire (QCAE) focused more on the experience of emotions and affective responses, the items assessing lack of empathy as part of CU traits (ICU) seem to be more related to behaviours. Seeing that individuals with disruptive behaviours show poor capacities for affective resonance towards others' emotions, it is possible that they misjudge their own affective responses in the QCAE (e.g., "It pains me to see young people in wheelchairs"), but accurately assess their behavioural responses when completing the ICU ("I apologise to persons I hurt").

Although these findings are promising, there are also some limitations to be noted. First, the sample size of the three groups of participants was relatively small, and this could have reduced the statistical power of our results. Although our sample was enriched by the inclusion of adolescents with behavioural problems and clinically diagnosed individuals with ASD, the results should be replicated in further studies using a larger sample of participants with behavioural difficulties. Another important limitation of the current study is the lack of a vocabulary measure to assess verbal ability across participants (i.e., to be used as a measure of intellectual ability), as previously done in chapter 4. Due to time limitations, the collection of vocabulary measure was, however, not feasible. This would have allowed investigating whether participants verbal ability affect our results.

Furthermore, there were gender differences across groups. Due to low prevalence of ASD among females, we mainly included males in the ASD group, whereas in the BD group the number of females included was higher than the number of males. Although the effect of gender was statistically controlled in all the analysis, girls and boys with ASD and BD should be compared in future studies to determine whether gender differences in empathy are present in these two clinical populations as previously found in typically developing individuals (Reniers et al., 2011). Finally, it is important to mention that we were not able to recruit individuals with a formal diagnosis of CD, BDB, or related conduct problems. However, all the participants with BD attended special schools, which ensured a pattern of behavioural problems and allowed us to restrict the participation to individuals with BD difficulties and no co-morbid diagnosis of ASD. It would be of interest to extend this research to clinical samples of adolescents with BD clinically diagnosed and without comorbid ASD.

Overall, our findings revealed the existence of a deficit in cognitive empathy in ASD, which seemed to be specific to the perspective taking subcomponent, and suggest the preservation of their affective empathy, thereby supporting the double dissociation proposed for both components of empathy. In addition, our findings provide evidence of a cognitive deficit in empathy in individuals with BD that seems to be explained by the demographic characteristics of our sample (i.e., age of participants with BD). Finally, results clearly show the manifestation of high levels of antisocial and CU traits in individuals with BD, which characterises the group of adolescents with BD.

CHAPTER VII

GENERAL DISCUSSION

Introduction

The concept of empathy is to date unclear, not only in terms of its definition (Cuff et al., 2014) but also in how difficulties in this ability can alter social and emotional functioning of typically developing individuals in general, and in clinical populations in particular. Despite the extensive research on this area, the contributors to this important human ability are still unknown. Whereas it is known that some specific features can enhance or reduce empathy, e.g., emotion regulation (Eisenberg et al., 1996; Murphy et al., 1999), the degree of such influence is, in most cases, unclear.

Through the whole thesis, empathy is understood as a multicomponent construct in which cognitive empathy refers to the ability to build a working model of others' emotions and mainly encompasses the ability to recognise others' emotions and to take others' perspective, whereas affective empathy involves being sensitive to and vicariously experiencing others' feelings (Reniers et al., 2011). By adopting this view we overcome the limitations of both assessments and study both components separately, aiming to demonstrate that even though both are involved in the ability to experience empathy, cognitive and affective empathy are independent from each other. Several emotional and social variables are investigated as potential contributors of empathy in an attempt to increase our understanding of empathy and its impact on behaviour. The thesis has presented a series of studies whose results are summarised in what follows.

Summary of findings

Chapter 2 demonstrated cross-cultural differences in emotional expressivity and emotion regulation, with Spanish individuals reporting higher levels of emotional expressivity

than British individuals, who in contrast reported increased emotion regulation. Cognitive and affective empathy and indirect aggression were not found to differ between cultures. Furthermore, our results provided evidence on the role of emotion regulation and emotional expressivity as potential mediators in the relationship between empathy and indirect aggression, which differed across cultures.

Chapter 3 allowed us to achieve a better understanding of the emotional and social characteristics of individuals with SAP and criminal behaviour. First, findings demonstrated a lack of significant differences in cognitive and affective aspects of empathy and CU traits between the two groups of substance abusers (with and without criminal behaviour). These individuals showed more difficulties in their ability to empathize with others than offenders without SAP, and reported higher levels of uncaring traits. Interestingly, offenders who reported higher levels of CU traits were found to have greater probabilities of recidivism. Our results showed expressive suppression as a potential protective factor for substance use initiation.

Chapter 4 and 6 investigated empathy in a clinical population of adolescents with ASD. Chapter 4 showed that participants with ASD were generally impaired in the recognition of basic and subtle emotions, and had a deficit in first and second order ToM, which were not explained by difficulties in empathy or perspective taking. In chapter 5, a behavioural measure of empathy was developed and used to investigate the ability to assess accurately others' internal states. This is known as EA task. The results showed that EA depends more on specific characteristics of the target (i.e., gender and positive expressivity) than on those of the perceiver (i.e., gender, trait cognitive and affective empathy).

Chapter 6 investigated the dissociation between cognitive and affective empathy by comparing two “empathy disorders” in which empathy deficits have been considered to have opposite profiles. Our results showed significant differences between ASD, BD, and controls in self-reported levels of cognitive empathy. However, no significant differences were found in either EA or self-reported affective empathy. This chapter further examined differences between individuals with ASD and controls. Individuals with ASD were found to perform worse in the EA task than controls. These differences were statistically significant only when measuring EA for videos with female targets, suggesting a potential effect of the ambiguous presentation of emotions on the correct identification of others’ mental states. Adolescents with ASD reported significantly lower scores on perspective taking (cognitive empathy) than typically developing adolescents, while no differences were found in affective empathy.

Taken together, there are several key conclusions that can be drawn from these results in the field of empathy. First, there was a negative relationship between cognitive empathy and self-reported indirect aggression, with lower levels of cognitive empathy predicting higher levels of indirect aggression in typically developing individuals, as previously shown by Yeo et al. (2011). However, this association was evident when using self-report questionnaires only if the sample size was big enough. This finding provides further support for the impact of empathy on behaviour (Jolliffe & Farrington, 2004; Kaukiainen et al., 1999; Lovett & Sheffield, 2007; Richardson et al., 1994; Yeo et al., 2011) and highlights the significance of the sample size and the statistical power associated in statistical analysis (Cohen, 1992b), while supporting the validity of self-report measures as reliable sources of information.

Second, there was a positive association between empathy (cognitive and affective components) and both emotional expressivity and emotion regulation, which supported previous evidence in this area (Eisenberg et al., 1996; Murphy et al., 1999; Roberts & Strayer, 1996). On one hand, our findings supported the idea that emotions from individuals with higher levels of positive expressivity are easier to perceive and accurately infer by other people, similar to findings by Zaki et al. (2008). This advantage in the identification of positive emotions was not only observed in typical populations, but also in individuals with ASD, who were able to better identify happiness than neutral and anxious expressions, thereby supporting previous results (Calvo & Marrero, 2009; Hess et al., 1997; Leppänen & Hietanen, 2004; Mack & Rock, 1998) and extending these to atypical populations. On the other hand, our results consistently found that cognitive reappraisal is an adaptive strategy to regulate emotions (as shown by Gross & John, 2003) that has a positive effect on empathy, whereas expressive suppression emerged as a maladaptive strategy (in line with findings by Gross & John, 2003; Gross & Levenson, 1997) that is positively associated with indirect aggression.

It is important to mention that our results showed that in individuals with SUP, the use of expressive suppression could serve as a self-protective mechanism against negative emotional experience emotions, as argued by Gross and John (2003). However, considering our previous results within typically developing individuals and evidence from the literature on the negative consequences of an extended use of this strategy (Gross & John, 2003; Sheldon et al., 1997), it could be argued that a recurrent use of expressive suppression could eventually become a maladaptive strategy. Indeed, this could predispose individuals to choose other strategies, such as substances use, to further cope with these negative emotional states.

Third, through this thesis our findings have also provided evidence on the dissociation between cognitive and affective components of empathy, suggesting that having an accurate understanding of another person's thoughts and feelings (cognitive aspect of empathy) does not necessarily involve that the person shares and vicariously experiences others' emotions (affective aspect of empathy). This supports the idea that having one of these abilities does not imply that the other has also been developed (Dziobek et al., 2008). In line with this idea, our results showed the existence of a deficit in cognitive components of empathy in ASD as well as in social perception, supporting previous research (Mathersul et al., 2013b; Rogers et al., 2007; Rueda et al., 2015).

Taken together, our results showed a cognitive deficit in ASD that seems to be specific to the subcomponent of perspective taking, and suggested that adolescents with this condition seem to have, at least to certain extent, insight into their poor perspective taking abilities (Ponnet et al., 2004), as shown by results in chapter 6. This corresponds in fact with evidence showing the existence of a perspective taking deficit in ASD (Castelli et al., 2002; Hirvelä & Helkama, 2011; Kaland et al., 2002). Although there were no significant differences in the visual perspective taking task administered to participants in chapter 4, this could have been attributed to the small sample size used in this chapter, and most probably, to the low prevalence of males in the ASD group compared to the control group, as previously argued by David et al. (2010). In chapter 4, perspective taking was measured through a behavioural task that required visual-spatial perspective taking or mental rotation tasks, in which males seem to have an advantage (Kaiser et al., 2008; Parsons et al., 2004). Considering that in chapter 6, perspective taking was measured through a self-report

questionnaire, and that the effect of gender was statistically controlled, this finding supports the idea of a deficit in perspective taking being crucial in ASD.

Strengths, limitations, and future research directions

The advantages and disadvantages of our design will be discussed in the following section, presenting recommendations for future studies. However, it is important to note that all the chapters of this thesis are written as manuscripts in themselves and thus, a more detailed discussion of the findings, limitations and future directions are included in the discussion section of each chapter.

The first study in chapter 2 establishes for the first time a comparison between British and Spanish cultures that focused on empathy and interpersonal functioning, and provides with novel evidence on the role of emotion regulation and emotional expressivity as potential mediators in the relationship between empathy and indirect aggression. In addition, this study translated and validated the questionnaire of cognitive and affective empathy (QCAE: Reniers et al., 2011) to the Spanish language, showing satisfactory psychometric properties and contributing to the existent literature with a new tool to assess cognitive and affective components of empathy. This is especially relevant considering the lack of valid and reliable psychometric measures, particularly among individuals from different ethnicities and linguistic communities. One of the strong points of this study is the inclusion of a large sample of adolescents and young adults from both countries. This target population is key to investigate the effect of emotions on interpersonal relationships, as during adolescence and young adulthood developmental changes stimulate increased independence and social

interaction (Dahl, 2004; Scherf, Behrmann, & Dahl, 2012; Steinberg, 2005), making evident the effect of emotions on social behaviour.

In addition, the study analysed separately cognitive and affective components of empathy, thereby allowing extending previous research that was limited due to the use of one single component of empathy, or the use of subcomponents such as perspective taking or empathic concern, rather than cognitive and affective empathy per se. In contrast, it is important to mention that seeing the complexities with regard to individualism/collectivism manifestations across British and Spanish cultures, the design of this study could have been improved by including another European country representing a more traditional collectivist culture (e.g., Turkey). Future studies should use this approach to examine cultures with different degrees of overlap in terms of key cultural dimensions, and provide with a wider conceptual picture to verify the role of culture in empathy and interpersonal functioning.

The three studies conducted within clinical populations provide a better understanding on the functioning of empathy in atypical populations. Mental health professionals clinically diagnosed individuals included in these studies (i.e., with Substance Abuse Disorders or ASD), which strengthens the reliability of our results. In the study of individuals with substance abuse problems and criminal behaviour, our results suggested that special attention should be paid to their social environment, as this may play a key role in substance use initiation. Their interpersonal relationships should rely on acceptance and motivation while working on the establishment of social networks that provide them with positive social support and prevent substance abuse. For this reason, more studies should investigate the impact of emotion deficits on thought processes, behaviour, and interpersonal functioning.

Further research is also needed to understand whether deficits in the processing and regulation of emotions predispose to substance abuse and criminal recidivism, or if the reverse relationship is also possible. Within this context, the use of longitudinal studies to investigate emotion deficits in populations at higher risk of abusing substances (e.g., children of alcohol and drug abusers) would be of interest. In addition, it would be beneficial to include follow-up measures after long periods of abstinence to explore whether the effects of substances of abuse on the processing and regulation of emotions are long lasting or temporary, and to include larger populations in terms of sample size that allow the generalisability of the results.

Finally, it would be of interest to consider the role that other variables, such as alexithymia, may play in emotion recognition deficits in these within clinical populations. In fact, evidence shows that emotion recognition could be predicted according to the degree of alexithymia in individuals with autism (Bird et al., 2011). Alexithymia has also been suggested to increase vulnerability for substance abuse (Li & Sinha, 2006), with an estimated prevalence between 39% and 54.5% in individuals with drug abuse problems (Dorard et al., 2008; Taylor, Bagby, & Parker, 1997), that is even higher in those with alcohol dependence (45%-67%) (Thorberg, Young, Sullivan, & Lyvers, 2009). Furthermore, some studies have found an association between a high degree of alexithymia and deficits in facial emotion recognition (Jongen et al., 2014; Parker et al., 1993), while others have found no differences in emotion recognition between healthy participants with low and high alexithymia levels when taking verbal IQ into consideration (Montebarocci, Surcinelli, Rossi, & Baldaro, 2011). Despite its relevance, the examination of alexithymia and its association with emotion recognition was beyond the scope of the present thesis. Therefore, future studies should

consider alexithymia as a variable of interest in its association with emotion recognition in both clinical and non-clinical populations.

It is also important to highlight that the current results increase our knowledge about the usefulness of CU traits, specifically in its self-report form, suggesting the inclusion of CU traits in adult assessment batteries, especially within risk-assessment contexts such as prisons, as a reliable instrument to evaluate potential risks after release. However, it is worth noting that despite having included a clinical population, our study failed to differentiate participants according to the type of substance abused due to recruitment and time limitations. According to the literature reviewed in chapter 1, the key of emotional deficits within this population could be in the different types of substance used and thus, further research should separately investigate the effect of each substance of abuse on empathy and other related emotional and social abilities.

Another important advantage of this research is the combination of both self-report and behavioural measures, as well as the inclusion of ecologically valid measures to assess empathy, emotion recognition, and ToM within everyday social interactions. Considering that the literature has shown the limitations of using static stimuli within ASD population, the battery of measures used in this thesis strengthens our conclusions. Of importance is the rigorous matching between ASD and control participants for chronological age and the effects of verbal ability, as it allows assigning the differences between groups to a poor performance on emotional and social perception ability, rather than to a lower intellectual ability. We must however highlight that due to recruitment restrictions, we failed to control for verbal ability in our last chapter, which makes necessary further replication of this study.

Clinical implications

This thesis investigated the functioning of empathy and its impact on social abilities in two clinical disorders. First, our results suggest that in individuals with ASD, deficits in social perception and empathy, and specifically in emotion recognition and ToM, are crucial to understand their social difficulties. This clearly highlights the necessity of having treatments focused on the improvement of these abilities. Indeed, the idea of individuals with ASD using these features to recognise others' emotions, seems to support evidence showing that this ability is liable to being improved (see Golan et al., 2010, for an example of an intervention showing the improvement of emotion recognition in ASD). However, it is also important to stress there is a necessity of implementing treatments that focus their attention beyond the identification of cognitions and affects in order to achieve better outcomes in individuals with difficulties in these areas that cannot be overcome.

Further research in emotional and social abilities is also crucial to develop effective programmes focused on the prevention of substance abuse, and to ensure the success of clinical treatments. While cognitive and behavioural therapies could allow a change in the unhealthy and risky behaviours associated with substance abuse, specific strategies focused on the enhancement of emotional and social skills could improve the interpersonal functioning of these individuals. This could include, for example, treatment models focused on distress tolerance, psychological mindfulness and emotion regulation skills, that help patients to learn how to identify their own emotions without becoming overwhelmed and to strengthen their abilities to manage distress without losing control or acting impulsively, so they can cope better with negative affective states (McKay, Wood, & Brantley, 2010). Indeed, considering that the ability to cope effectively with negative affective states helps maintain

abstinence (Hopwood et al., 2015; Marlatt & Donovan, 2005) and that emotion regulation are associated with treatment persistence (Hopwood et al., 2015), both should be considered as important factors for treatment success. Having a multidisciplinary approach not only would facilitate that these individuals stop abusing substances, but also would provide them with healthy strategies to cope with interpersonal difficulties and to help them reconstitute their social relationships in order to reduce the risk of relapse.

Conclusion

This thesis encompasses many areas of interest, including empathy, emotion, behaviour, social perception, and culture, thereby enriching the current literature in several aspects. First, the methodological approaches used within this thesis allowed testing specific hypothesis on the relationship between empathy and behaviour in clinical and non-clinical populations. Second, the findings increased our understanding of the inter-individual differences in those abilities deemed essential for social functioning. Third, our results encourage further assessment of empathy abilities and its potential contributors in both clinical and control groups, and additional investigation about the impact of empathy on behaviour. Importantly, the current results will be especially useful for the conceptualisation of new target treatments focused on the improvement of the emotional and social functioning of individuals with certain clinical disorders, aiming at helping them to overcome and deal with these emotional difficulties while improving the quality of their social life.

Appendix A. QCAE-SV: Cuestionario de Empatía Cognitiva y Afectiva

		Muy de acuerdo	Ligeramente de acuerdo	Ligeramente en desacuerdo	Muy en desacuerdo
Las personas sienten de manera diferente en distintas situaciones. A continuación te presentamos una lista de características que pueden, o no, aplicarse en tu caso. Lee cada característica e indica tu grado de acuerdo o desacuerdo con cada una de ellas, marcando la casilla correspondiente. Responde de manera rápida y honesta.					
1	A veces me resulta difícil ver las cosas desde el punto de vista de otra persona.	1	2	3	4
2	Normalmente soy objetivo cuando veo una película u obra de teatro y no suelo quedar completamente inmerso en ella.	1	2	3	4
3	Intento ver el punto de vista de todos los involucrados en un desacuerdo antes de tomar una decisión.	4	3	2	1
4	A veces trato de entender mejor a mis amigos imaginándome cómo se ven las cosas desde su perspectiva.	4	3	2	1
5	Cuando estoy molesto con alguien normalmente intento “ponerme en su lugar” por un momento.	4	3	2	1
6	Antes de criticar a alguien intento imaginarme cómo me sentiría yo si estuviese en su lugar.	4	3	2	1
7	Con frecuencia me involucro emocionalmente en los problemas de mis amigos.	4	3	2	1
8	Tiendo a ponerme nervioso cuando los que están a mí alrededor parecen estar nerviosos.	4	3	2	1
9	Las personas con las que estoy tienen una fuerte influencia en mi estado de ánimo.	4	3	2	1
10	Me afecta mucho cuando uno de mis amigos parece disgustado.	4	3	2	1
11	Suelo involucrarme profundamente con los sentimientos de un personaje en una película, obra o novela.	4	3	2	1
12	Me disgusta mucho cuando veo a alguien llorar.	4	3	2	1
13	Me siento feliz cuando estoy con un grupo alegre y triste cuando los demás están decaídos.	4	3	2	1
14	Me preocupa cuando otras personas están preocupadas y asustadas.	4	3	2	1
15	Puedo darme cuenta fácilmente si alguien quiere participar en una conversación.	4	3	2	1
16	Puedo darme cuenta con rapidez si alguien dice una cosa pero quiere decir otra.	4	3	2	1
17	Me resulta difícil ver por qué algunas cosas disgustan tanto a las personas.	1	2	3	4
18	Me resulta fácil ponerme en el lugar de otra persona.	4	3	2	1
19	Soy bueno prediciendo cómo se sentirá otra persona.	4	3	2	1
20	Soy rápido para detectar cuando alguien se siente incómodo en un grupo.	4	3	2	1

21	La gente me dice que soy bueno entendiendo cómo se sienten y qué están pensando.	4	3	2	1
22	Puedo darme cuenta fácilmente si alguien está interesado o aburrido con lo que estoy diciendo.	4	3	2	1
23	Mis amigos me cuentan sus problemas porque dicen que soy muy comprensivo.	4	3	2	1
24	Puedo sentir si me estoy entrometiendo, incluso si la otra persona no me lo dice.	4	3	2	1
25	Puedo fácilmente hacerme una idea sobre lo que puede querer hablar otra persona.	4	3	2	1
26	Puedo saber si alguien está escondiendo su verdadera emoción.	4	3	2	1
27	Soy bueno prediciendo lo que otra persona hará.	4	3	2	1
28	Normalmente aprecio el punto de vista de otra persona, incluso si no estoy de acuerdo con ello.	4	3	2	1
29	Normalmente permanezco emocionalmente distante cuando veo una película.	1	2	3	4
30	Siempre trato de considerar los sentimientos de otros compañeros antes de hacer algo.	4	3	2	1
31	Antes de hacer algo intento tener en cuenta cómo reaccionarán mis amigos ante ello.	4	3	2	1

Note. The QCAE-SV is copyrighted by the authors.

Empathy (sub)scale	Item numbers
Cognitive empathy	
Perspective taking	15-16-19-20-21-22-24-25-26-27
Online simulation	1-3-4-5-6-18-28-30-31
Affective empathy	
Emotion contagion	8-9-13-14
Proximal responsivity	7-10-12-23
Peripheral responsivity	2-11-17-29

The subscale items are summed to produce the scores on the subscales. The two cognitive subscales are summed to produce the score on the cognitive empathy scale and the three affective subscales are summed to produce the affective empathy score.

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