

Internal State Language and Emotion Understanding
in Children Attending Mental Health Services

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Declaration

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Audrey Sheridan
31st December 2018

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Summary

This research examines emotion understanding and talk about internal states as two dimensions of awareness of self and other among a group of children who have difficulties in regulating emotion. Parent use of internal state language (ISL) is associated with young children's understanding of emotion and mind but it is not known if this association extends into middle childhood. Furthermore, it is not known if parents and children with emotional and behavioural difficulties (EBD) use ISL in similar ways to parents from a community control group. The goal of this research is to examine firstly, if parent ISL is linked to children's emotion understanding (EU) among a group of children who are experiencing difficulties with emotions and behaviour. The second aim is to compare mental state/ internal state language in the two groups. The third aim is to examine EU abilities among children with EBD through comparison with the control group. The final goal is to compare several different measures of EU among children with EBD. The research was conducted in the family home and parent-child conversation was recorded, transcribed and analysed for use of ISL with 20 children and their parents who recently attended mental health or psychological services. Forty children recruited from the community comprise the control group.

This study found that parent ISL was associated with children's emotion understanding for some children on some of the measures. Parent discussion of mental states during book reading and boys' abilities on emotion vocabulary were significantly associated. For children in the community group, parent discussion of mental states was linked to children's ability to identify facial emotion expressions and the associations were independent of child ability and parent education. This finding indicates that parent discussion about mental states may continue to be an important mechanism for

teaching and learning about emotion understanding during later childhood for some children.

The two groups of children performed equally well on all three measures of emotion understanding. Child characteristics of expressive language ability, attention difficulties and mood states predicted emotion understanding skills. Greater difficulties in expressive language were linked to problems in emotion vocabulary. Attention difficulties were associated with quicker response times and greater errors in naming “happy” and “surprised” facial emotion expressions. This finding suggests that the presence of comorbid difficulties in expressive language skills or in attention or mood states may impact the emotion understanding skills of children with EBD. Therefore, it may be helpful to fully assess emotion understanding capabilities alongside other aspects of development to support children’s emotional development. The present study indicates that both parent use of internal state language and children’s own characteristics are important in supporting understanding of emotion. Parents from the two groups used similar amounts of internal state talk. The three studies of emotion understanding correlated differently for children in the EBD group compared with the community group which raises questions about the best way to measure a complex construct such as “emotion understanding.”

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Chapter 1 Theoretical Foundations of Emotional Development

Overview

Healthy emotional development requires that children develop skills in a triad of “competencies” which involve the ability to understand, respond to and deliberately regulate the experience of emotion in the self and in social contexts (Denham, 1998; Halberstadt, Denham & Dunsmore, 2001). The present study focuses on a group of children with emotional and behavioural difficulties (EBD) who by definition have problems with one component of the triad; namely, difficulties with regulating emotion and behaviour. Children’s ability to recognize, understand and discuss their own and others’ emotional and mental states is one of the key social skills that helps them interact effectively with their peers, parents and teachers each day (Denham, 2001). There is accumulating research evidence that parents use of language relating to mental or internal states is linked with children’s emotion understanding. Young toddlers with limited expressive abilities easily become overwhelmed by emotional reactions but as children develop and progress into the preschool and school years teachers and parents expect that children will effectively manage more of their emotional experiences. Effective management of emotion may involve discussion or negotiation with others and coping with surges of emotional experience. As children progress through childhood and adolescence these skills develop gradually. For a portion of children, the management of emotions remains a challenge and they develop difficulties with regulating surges of emotion or respond to emotions arising internally with behavioural responses that challenge others.

There is increased interest in emotion processes among children with typical development as well as among children with EBD or mental health difficulties (Suveg, Southam-Gerow, Goodman & Kendall, 2007). Research with typically developing children suggests that the triad of competencies in emotional development are inter-related. Difficulty with these components of development are considered to have downstream social and academic consequences independent of intelligence. Difficulty regulating emotional experiences has been linked with problems in emotion expression and understanding and all three are associated with children's social and academic outcomes (Cook, Greenberg & Kusche, 1994; Denham, 2001; Denham, Blair, de Mulder, Levitas, Sawyer, Auerbach-Major & Queenan, 2003; Garner & Waajid, 2012; Izard, Fine, Schultz, Mostow, Ackerman & Youngstrom, 2001).

Markers for problems in emotions and behaviour include differences in intensity, context and predictability of emotional or behavioural responses (Cole, Martin & Dennis, 2004). Theoretical accounts of EBD propose a role for biased orientation towards emotion in the development of both externalizing and internalizing difficulties (Crick & Dodge, 1994). For example, over-attentiveness to signals of anger is theorized to be a mechanism in the development of anxiety. There is an emerging literature on the socio-emotional processing difficulties among children and teenagers with mental health difficulties and children who have experienced maltreatment (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg & Van Ijzendoorn, 2007; Luke & Banerjee, 2013). The present study focuses on a group of children attending clinical services because of difficulties with emotions and behaviour (EBD). The goal of the present study is to extend the research literature on the relationship between internal state language and emotion understanding by focusing on a group of children with EBD and their parents

during a narration task undertaken in the naturalistic setting of the family home. The aim is to examine if parent use of internal state talk is associated with children's understanding of emotion in this group of children who are experiencing EBD.

Internal state language has been associated with children's theory of mind and emotion understanding for almost three decades, since Brown and Dunn (1991) first emphasized the role of parent mental state talk in children's social and emotional development. There is now a substantial body of research which supports the view that a mentalistic frame of reference, evidenced by parent language about mental or internal states is associated with young children's understanding of mind and emotion in typical development (Tompkins, Benigno, Kiger-Lee & Wright, 2018). As emotion understanding is a complex and multifaceted construct, several different dimensions are evaluated in this study. These include emotion recognition, comprehension and vocabulary and all come under the heading of "emotion understanding." The present study aims to contribute to theoretical knowledge of emotion understanding by examining associations between these three different aspects of the construct.

The research literature on mental state or internal state language (ISL) suggests that access for parents to a broad general vocabulary and the ability to use grammatically complex sentences plays a part in the tendency to use internal or mental state language during conversation. Theoretical accounts of the role of language complexity and syntax in parental ISL suggest that both may be relevant for discussion of mental states (Harris, 2005). This research aims to contribute to the debate on the role of general language abilities versus syntax in ISL use by conducting a detailed examination of language used by children and parents in this group. The ultimate goal is

to contribute to the emerging body of research into emotion understanding processes among children with EBD by examining if or how parent language plays a supporting role. Although internal state language and emotion understanding are theoretically and empirically linked, there is a paucity of research on the associations between parent internal state language (ISL) use and emotion understanding skills in children with EBD. Because of their inherent vulnerabilities in emotion regulation, it is perhaps even more important to study this group of children. Researching emotion understanding in children with EBD has the ultimate aim of increasing therapeutic efficacy through informing assessment or designing intervention programmes. Examining the construct of emotion understanding alongside other component parts of emotional development may provide a greater understanding of how such difficulties impact children's regulation of emotion.

The definition of emotion understanding for the present study utilizes the work of Castro, Halberstadt and Garrett-Peters (2016) who in order to unify the conceptual field, proposed a succinct definition of emotion understanding as comprising *recognition of emotion and understanding of emotion* (Castro et al., 2016; Castro, Chen, Halberstadt & Gruhn, 2016; Izard, 2010) and this is the definition of emotion understanding that will be used in the current study. Understanding of emotion may also be divided into “simple” and “complex” emotion understanding (Castro et al., 2016; Pons, Harris & de Rosnay, 2004). At the end of this chapter, Figure 1 presents a schematic diagram for the interrelationships within emotional development and emotion understanding and outlines some of the distinctions between the terms relating to emotion understanding, expression and regulation.

Theoretical orientations informing the present study include a developmental psychopathology perspective which focuses on the border between typical and atypical development and how atypical conditions can reveal essential characteristics of developmental processes (Cicchetti, 1984). Emotion understanding and emotional development are considered to be intertwined abilities that arise from children's neurobiology and may be considered to be "biopsychosocial" in origin (George & Engel, 1980). In the theoretical field of developmental psychology, the interaction of development and temperament with social and environmental contexts is of primary interest (Baltes, Reese & Nesselroade, 1977) and as children are viewed as active participants in meaning making, deriving information from their social context, the research is also socio-cultural and constructivist in orientation (Bruner, 2001; Vygotsky, 1978).

To review the existing literature, database searches of peer-reviewed articles were conducted using Google Scholar to identify relevant articles and Trinity College Dublin's online "Stella" search engine to identify and access articles. Trinity College's Stella search engine accesses a large number of Psychology and Social Science databases including Academic Search Complete, JSTOR, PsychArticles, PsycInfo, PubMed and Science Direct. Peer reviewed research articles relating to child emotion understanding and parent internal state language were the primary target for the literature review. No time constraints on search terms were applied but a large number of published articles centred on the period from 1990 to 2013. Search terms used to identify peer reviewed articles on emotion understanding included "*emotion understanding*," "*emotion knowledge*," and "*emotion recognition*." For clinically-focused studies, search terms included "*clinical*," "*child*," "*children*," "*adolescents*,"

“dysregulation,” “emotional and behavioural difficulties/ disorders” and “emotion regulation.” Parent internal state language articles were identified using search terms such as *“internal state language,” “mental state talk,” “narrative,” “mentalizing,”* and *“mind-mindedness.”* For the overarching topic of children’s emotional development, where this literature review begins, the search terms included *“emotion theory,”* and *“emotional development.”*

The literature review that follows has four chapters. Chapter one examines theories of emotion that are relevant for the present study and then reviews theories of emotional development. In chapter two, we look at the development of emotion understanding in typical development. In chapter three the developmental pathways to emotional and behavioural difficulties are reviewed and studies of emotion understanding in adolescent mental health are examined. Chapter four of the literature review turns to the topic of internal state language (ISL) examining theory and research and then examining typical emergence of ISL. In the first instance, chapter one begins with an attempt to explain a question that has many different answers, namely, “what is emotion?”.

Theoretical Foundations

“How can we tell the dancer from the dance?”

(Yates, 1928)

Emotion is complex, multifaceted biologically and psychologically and a comprehensive definition requires explanations at multiple levels of analysis. Scherer (2005) suggests that the term “emotion” involves a coordinated biological and cognitive response which includes five elements including subjective feeling; cognitive appraisal; motor expression; motivation; and a neurophysiological component. Cole, Martin and Dennis (2004) describe emotion as fluid response-ready systems which “construct and carry meaning across the flow of experience” (p. 319). Cole et al. (2004) highlight that emotion and emotion regulation are not clearly distinct from each other as the experience of emotion is inherently regulatory because neural and physiological changes occur alongside appraisals, thereby changing the nature of emotion even as it occurs. This review describes five different theories of emotion and while it does not attempt to solve the complex issues noted in defining emotion and emotion regulation, there is an acknowledgement of the complexity of the task of emotion understanding for children with difficulty in emotion or behaviour management.

What is Emotion?

Several contrasting theories of emotion are described in this section, which are important in understanding the difficulties experienced by children with EBD and these provide the conceptual backdrop for some of the tests and measures of emotion understanding currently in use. This section reviews the *functionalist* view of emotions,

the *basic emotions theory* and the *constructionist model* of emotions. Two other models, the *computational model* of emotions and finally the *dimensional feeling model* are described briefly.

According to the *functionalist* approach, emotion involves biologically primed action tendencies or “sets” which serve an evolutionary function aimed towards survival of the species and meeting the goals of the organism (Le Doux, 1996; 2001; Panksepp, 2000). In the functionalist view, emotion is adaptive and plays a significant role in shaping and organizing human experience (Damasio, 1994; Fox, 2008; LeDoux, 2001; Shiv, Loewenstein, Behcara, Damasio & Damasio, 2007). For modern humans, who experience a different environment to the mammals from which we evolved, the goals may include a variety of motivations including social/ evaluative functions (Klinnert, Campos, Sorce, Emde & Svedja, 1983) or hedonic goal attainment goals such as pain or pleasure avoidance/ seeking (Frijda, 1986). In young children, the motivating forces may include safety or proximity needs such as desiring access to positive interactions from caregivers, proximity seeking for reassurance, avoidance of fearful objects or situations, attempts to avoid social exclusion, or competition for resources. Campos, Frankel and Camras (2004), describe emotion as a process of registering “*the significance of . . . an event*” where the “*degree of perceived significance determines the magnitude and urgency of the response*” (p. 379). This viewpoint raises interesting questions where children with EBD exhibit or experience intensified emotional reactions that are disproportionate to known precipitating events. Presentations of difficult behaviour in children challenge the idea that the functions of emotions are adaptive because negative behaviour posed by children may conceal original motives.

Ekman (1972) emphasized universality of human emotions in proposing that emotions are pre-set responses involving recognition, experience and expression in his “*Basic Emotions Theory*” or BET. The BET asserts that humans experience a set of primary or “basic” emotions which are readily identifiable across cultures through expression of facial affect. These include; happiness, sadness, fear, anger, disgust, and surprise. The premise of BET is that facial and vocal emotion expressions have a primacy for humans and in child development, which enables them to recognize and categorize affect with relative ease and thereby fast-tracking recognition. Verbal labels are a layer of semantic overlay that is superimposed on the basic recognition of emotion. This idea is contained in the works of several theorists and researchers such as Barrett and Campos (1987), Denham (1998) and Izard (2007) and facial affect researchers such as Hoehl (2014) and Tomkins (1962) with clinical applications in diagnostic groups increasing in recent decades. The underlying premise of universality in human emotions is widely favoured but not universally accepted among emotion theorists particularly those who favour a “constructionist” approach suggesting that emotional knowledge is gradually acquired (e.g., Barrett, 2017a).

Research evidence is emerging that certain groups of children experience greater difficulties in specific facial emotion processing where emotion processing factors are impacted, such as the ability to label emotions or to understand social-emotional interactions. Several reviews of children in different diagnostic groups have identified deficits in facial emotion processing among diagnostic groups with attention deficit-hyperactivity disorder (ADHD), autism spectrum disorder, and bipolar disorders (de Almeida Rocca, van den Heuvel, Caetano & Lafer, 2009; Collin, Bindra, Raju, Gillberg & Minnis, 2013; Harms, Martin & Wallace, 2010; Jusyte, Gulewitsch & Schonenberg,

2017; Uekermann, Kraemer, Abdel-Hamid, Schimmelmann, Hebebrand, Daum, et al., 2010). These studies will be reviewed in the final section of the present chapter.

The *Constructionist* theory of emotion (Barrett, 2017b; Lindquist, Wager, Bliss-Moreau, Kober & Barrett, 2012; Strand, Downs, Barbosa-Leiker, 2016) rejects the view of emotion phenomena as uniquely programmed into human neural networks, proposing instead that facial emotion recognition is one of a range of recognition phenomena involved in processing emotion and non-emotion related perceptual processes, albeit one that develops slightly earlier. Emotion categories are seen as gradually acquired perceptual, linguistic, and cognitive processes that are learned over time and which emerge from culturally constructed concepts in the recognition of emotion signals alongside other aspects of learning (Barrett, 2017a; Lindquist, Wager, Bliss-Moreau, Kober & Barrett, 2012; Strand, Downs, Barbosa-Leiker, 2016).

While the constructionist theoretical approach emphasises developmental increments in children's abilities to recognize emotion, the BET model has garnered much interest and a number of theorists focusing on children's emotional development have developed measures of emotion recognition and understanding that give preference to "basic" emotions of happiness, sadness, fear, anger, disgust and surprise (e.g., Denham, 1998; Izard, 2007). Functionalist theorists view emotions as having a socially constructed "flavour" where expressions of certain emotions are amplified in some cultures over others (Camras, Kolmodin & Chen, 2008; Saarni, 1999).

There are two final approaches to the study of emotion, as discussed by Grandjean, Sander and Scherer (2008). The first is an appraisal based componential

model, of which Scherer's (2009) Computational Process Model (CPM) is an example. This model outlines a detailed analysis of the implicit and explicit appraisals that may occur at a biological level and a neural level. The CPM places *appraisals* as central to the experience of emotion. The model states that individuals appraise events in terms of their relevance to that individual; the consequences of the event for the person; the ability to cope with the consequences and the significance for self-concept or social values for the individual. Scherer (2009) suggests that both *implicitly* primed tendencies and *explicit* calculation of outcomes are set against a backdrop of personal goals and values in the formation of appraisal. The final model to describe emotion, categorized by Grandjean, Sander and Scherer (2008) are *dimensional feeling models*, which emphasize emotional valences of positive/ negative affect and arousal along axes of high/ low arousal, plotting emotions on these dimensions. The multiplicity of theories and definitions of emotion proposed has meant a tower of Babel-style confusion regarding the definition and operationalization of emotion (Barrett, 2017b). Panksepp (2007) argues that our everyday emotional milieu is such a combination of primary emotions and responses to our experience and ongoing appraisals that it is nearly impossible to distinguish which part of the process is the original and which are the overlays in emotional responding. Panksepp (2007) writes:

Most of our everyday emotions are such complex mixtures of primary (feeling) secondary (learning and thinking) and tertiary (thought about thought) processes, that we can barely see the primary process emotions and affects that contribute to the cognitive jungle of our lives, (p. 281).

Le Doux (1996) and Grandjean, Sander, and Scherer (2008) discuss the idea that non-conscious emotion processing and appraisals may occur just as frequently as conscious awareness of emotion. In these cases, the subjective appraisal of emotion-eliciting events often occurs below the threshold of conscious awareness or verbal access and may be partly constructed by emotion schemata, which are “ready to go” emotion scripts or social representations (Grandjean, et al., 2008). Identifying aspects of emotion below conscious threshold is beyond the scope of this research but highlights how recognition and understanding emotions may be more complex than it sounds at first and in particular for children where emotion management is a problem. A number of ideas in the theories of emotion discussed above have relevance for children in clinical groups which include the idea of emotion knowledge as socially constructed; facial emotion as a fast track; the notion of appraisal; concepts of positive and negative affect; and the idea of different levels of emotion processing with associated differences in awareness that an emotional response is occurring. The constructionist view of emotion emphasizes that socially constructed knowledge about emotions is important. For children with EBD learning may be a significant part of acquiring both adaptive and maladaptive strategies of emotion management. The BET theory proposes a fast-track for basic emotions and emphasizes facial affect in research methods. Research into recognition of emotion has shown that certain groups may have an overreaction or perceptual set towards certain emotions, for example temperamentally anxious children may be more reactive towards negative facial affect (Reeb-Sutherland, Rankin-Williams, Degnen, Perez-Edgar, Chronis-Tuscano & Liebenluft, 2015). Certain clinical groups have been shown to experience greater difficulties in facial emotion recognition over a wide range of emotions. For example, in a meta-analysis of studies on facial affect recognition among in children and adults with callous-unemotional traits, Dawel,

O Kearney, McKone, and Palermo (2012) found widespread problems in identification of emotion rather than specific problems in certain negatively valenced emotions. If identification of emotion is challenging, there may be significant knock-on effects for emotion understanding and effective emotion responding may be much more difficult to achieve. For these reasons, researching emotion recognition among children with EBD is particularly important.

Summary

This section has introduced several theories of emotion which highlight that the difficulty in defining the construct of emotion may relate to its multifaceted, elusive and subjective nature. Emotion is felt internally and often considered difficult to control. It is experienced as complex not only in its physiological expression but also in the subjective experience of emotion. Regulation and emotion processes are difficult to separate (Cole, Martin & Dennis, 2004) and appraisal processes may shift interpretation of felt emotion. For children with clinical range emotion management problems, the multileveled and indistinct borders of the experience of emotion are interwoven with the challenge of regulating that emotion, making the latter more difficult to achieve.

Panksepp (2007) calls the confusion a “jungle” and it must seem to be so for children with intense subjective experiences that are difficult to control. Theories of emotion discussed in this section have referred to emotions in terms of physiological “action sets” which relate to goal attainment in biological terms. Other theories of emotion emphasize psychological aspects of the experience of emotion by discussing learning, appraisals and conscious awareness of emotion. The latter are particularly relevant for children with emotion regulation difficulties. Despite the profusion of theories, only a few of which are addressed above, many have valuable insights to offer for the complex and intricate experience of emotion experienced by children. The attempt to bring

clarity to the subject of “Emotion” continues to be important, in order to integrate research and clinical practice and particularly as emotion science continues to expand our knowledge about the underlying processes (Campbell, Denham, Howarth, Jones, Whittaker, Williford et al., 2016).

What is Emotional Development?

The study of emotional development in children has been dominated in recent decades, by an emphasis on adaptive emotional functioning within social relationships (e.g., Denham, 1998; 2001; Halberstadt, Denham & Dunsmore, 2001). There are good reasons to locate emotional development within this frame, as it is central to children's social engagement, peer relationships and school success. The most thorough examinations of children's emotional development have come from developmental theorists and researchers who have focused on *socio-emotional competencies* and a significant portion of this chapter examines those theories. Emotional development has also been studied through the lens of *temperament* (e.g., Buss & Plomin, 2014; Chess & Thomas, 2013). A full discussion of the role of temperament in children's emotional development is beyond the scope of this chapter but as temperament plays a crucial role in children's ability to regulate emotion, it will be discussed briefly.

The study of temperament has provided an empirical basis from which children's own characteristic response styles are incorporated into models of emotional development. Rothbart's (2007) study of infants highlighted the individual differences between children which contribute to later outcomes in emotion and behaviour. These insights have been particularly important in understanding how temperament contributes to psychopathology. Rothbart demonstrated, for example, how an infant's reactivity to arousing situations impacts their emotional development, or how their tendency towards experiencing negative mood states (called temperamental negative affectivity) contributes to their emotional developmental profile. Although this study does not examine temperament, it is an underlying feature of some presentations in certain subgroups attending clinical services and is particularly relevant among a small

group of children who experience significant amounts of negative affect during childhood or among those with high “surgency” representing a tendency to go out to meet novel stimuli, which is often seen among impulsive children. Temperament is an additional lens that can contribute much to examination of an individual’s response style and to clinical presentations (Muris & Ollendick, 2005).

The next section presents several different models of emotional development. Arguably, one of the most comprehensive definitions of emotional development is described by one of these models; the Affective Social Competence Model (ASC) proposed by Halberstadt, Denham and Dunsmore (2001). This theoretical model is helpful in considering research and intervention approaches due to its comprehensiveness and because it distinguishes between regulation and other dimensions of emotional development; a necessary distinction when conducting research among children with emotional and behavioural difficulty. One of the most influential models of emotional development, which formed the building blocks for subsequent theoretical models, was first described in the theoretical work of Saarni (1999). Saarni first used the terms “emotion competencies” (EC) in a model which highlighted emotion understanding and regulation or management of emotional signals in interpersonal contexts. Other influential models of emotional development include Abe and Izard’s “differential emotions theory” (or DET, Abe & Izard, 1999) and Crick and Dodge’s (1994) model of social information processing. These theories have made important contributions to understanding children’s emotional development and each will be reviewed in the section that follows.

Theories of Emotional Development

Emotional Competence model. One of the first models of “social competence” to include emotion was Saarni’s model of “emotion competence” (Saarni, 1999). Saarni (1999) proposed that emotion competence (EC) is crucial to the development of relationship with others and the development of self-concept. According to Saarni, EC comprises competencies in emotion understanding, regulation, and social expression (among others). Her focus is emotion regulation. For example, she defines “emotion competence” as “the demonstration of self-efficacy in the context of emotion-eliciting social transactions” (Saarni, 1990, p. 116). A key component in Saarni’s model is what she calls “self-efficacy” which has a duality in the construct as it implies *awareness* of emotional experience and *regulation* of emotional experience within the goal of an emotional/social transaction.

Saarni’s work was important for laying the groundwork for theories that came later. Her model could be described as aspirational because it proposes an idealized model of emotion processing that is not easily achievable by most adults. Saarni does not focus much on developmental dynamics within the model. The mention of conscious versus unconscious emotion is important and since this work was published there is more understood about unconscious emotion. Her work also mentions emotions of mixed valence and the internal/ external expression of affect in different contexts. These have been incorporated into subsequent measures of emotion understanding for children and are now seen to represent important milestones in children’s emotional development. The “Test of Emotion Comprehension” or TEC (Pons, Harris & de Rosnay, 2004) which we discuss later is an example of this. One of the positive aspects of Saarni’s model is that it places a great deal of importance on understanding emotion at multiple

levels. For example, she identifies emotion recognition, complex emotion understanding and cultural dimensions of emotion knowledge as well as concealment in emotion understanding, though she does not operationalize these. A critique is that Saarni's model has a Western social-cultural value system embedded in the approach. The eight-part model of emotion competence is outlined in Table 1.

Table 1
Stages in Saarni's (1999) model of emotion competence

1.	Awareness of emotions including multiple emotions and non-conscious emotion.
2.	Identify emotions of others using culturally based expressive and situational cues.
3.	Use of culturally relevant expression of emotion in conjunction with social role.
4.	Capability for affective sympathy and empathy and emotional involvement.
5.	Awareness of differences in inner/ outer expression of emotion and impact of emotion expression on others.
6.	Ability to regulate distressing emotions.
7.	Knowing that relationships are defined by degree of emotional/ affective reciprocity.
8.	Ability to experience emotional balance and self-efficacy in emotional experience.

The Affective Social Competence (ASC) model. The Affective Social Competence (ASC) Model proposed by Halberstadt, Denham and Dunsmore (2001) describes how children's emotional development is intricately involved in every social encounter, through the expression, regulation and understanding of emotion in social interaction. The model appears to have grown from theoretical approaches of the time into a comprehensive developmentally-focused theory that manages to incorporate developmental dynamics between emotion processes.

The authors define emotion competence as comprising *communication* (sending) and *interpretation* (or receiving) emotion and the ability to *recognize, manage and accept* (experiencing) the experience of one's own affective experiences (Halberstadt, Denham & Dunsmore, 2001). Within each of these three competencies, there are four stages described; awareness of emotion, identification of emotion, responding to and managing emotional signals. These four stages and three competencies interact continuously with each other, influencing each of the components in a dynamic way. Throughout development, the authors propose that these stages and competencies change as children grow and together, they permit a dynamic interplay in the social-emotional communication of a given individual in any social encounter. The model is highly detailed and a little of this detail is presented below because it maps on to subsequent evaluations of children's emotion understanding. The idea behind many of these models of emotional development is one of optimal functioning in emotional development. The first level that the ASC model describes is the *awareness* of emotion during sending/ receiving or regulation of an emotional message. The starting point is the ability to be aware of the fact that an emotional message has been sent/ should be sent/ has been experienced. The second level is the *identification* of one's own feelings in a message received and identification of the appropriate message to send. The third level of the progression is the child's *understanding* of what is experienced; what should be sent or what has been received within the given context. The fourth level involves the *management* of emotional experience or managing of sending emotional signals or managing receipt of emotional signals. Management of sending messages within the social context involves decoding of signals and their significance and choosing between different actions or responses. Management of emotional experiences

involves rapid evaluations which may include awareness of the intentions of others and adapting responses to those perceived intentions, or regulating the degree of arousal.

In the ASC model the three components of expression, receiving and experiencing emotion must be integrated seamlessly for optimal social and emotional functioning. The ASC model also incorporates some caveats relating to individual differences within the model for example, in suggesting that a child's world view can affect their ability to flexibly send and receive messages. Negative attributions can influence children's appraisals and ability to receive emotional messages clearly. This issue is discussed further in Crick and Dodge's model of social information processing (SIP) later in this section. Additional stumbling blocks in the receiving/ sending/ experiencing of emotion communications, according to this model, include a child's demeanour or body language, child's self-concept, temperament, and ability to process information in an "ebb and flow" manner rather than in categorical or black and white terms (Halberstadt, Denham & Dunsmore, 2001). The ASC model has been highly influential among developmental researchers, as it provides a comprehensive framework within which to examine socio-emotional competencies using a developmental perspective. The model offers a range of potential mechanisms for the experiencing of emotion and does not define the source of that experience too much. This makes the ASC a versatile model for focusing on the experience of emotion at cognitive, physiological or affective levels, for example. The model also allows for emotion processing in the receiving of emotion. For children with emotional and behavioural difficulties who potentially have some disruptions to emotion processes, this is a particularly helpful distinction. The model also allows for a developmental examination of emotional development which could be operationalized to define typical

and atypical trajectories. Children may experience problems in emotional development in any one of the competencies or at any of the stages of receiving or experiencing, for example. Thus, it is a comprehensive and fluid model that suits the multileveled nature of emotional experience. One criticism is that despite the versatility of the model, it has remained largely theoretical as there is little information regarding the incorporation of the ASC model into systematic examinations of children's emotional development in clinical settings. The ASC model has potential to inform a comprehensive assessment among children with emotion and behavioural difficulty if operationalized adequately.

Differential Emotions Theory. Izard's work on the emotions in childhood has been influential in conceptualizing an integrative and functional approach to emotion. In the discrete emotion theory, he ascribes universality to human emotion expression and presents his model of emotion competence and emotion knowledge. In Abe and Izard's (1999) "differential emotions theory" the authors set out the broader model of the function of emotions as both evolutionary and developmental in nature. Abe and Izard's (1999) and Izard's (1978; 2010) model of "emotional competence" emphasizes innate, socialization and functional aspects of emotion understanding. The theory proposes that emotional experiences drive cognitive acquisition by placing emotion centrally as part of human motivation. Emotion knowledge includes "receptive emotion knowledge," "expressive emotion knowledge" and "emotion situation knowledge" and together these form the key components of emotion understanding. Emotion knowledge that emerges in infancy and toddlerhood involves receptive understanding of the expression of emotion in others, for example, understanding the emotional facial expressions or understanding vocal tone in emotion. Early emotion expressions in infancy may be identical to early receptive understanding or experiencing (e.g., the

crying of an infant sends a strong message that is simultaneously experienced by the infant), whereas later emotion signalling may include verbal labels to describe felt emotion.

Izard (2010) and Abe and Izard (1999) have been hugely influential in emotion research. One of many influential contributions by Izard (2010) is his emphasis on the distinction between emotion recognition and emotion understanding, which has tended to be blurred in other definitions of emotion understanding. This distinction though perhaps oversimplified, allows the perceptual and cognitive dimensions of emotion understanding to be more readily differentiated. Izard's description of the maturation of early emotion experiences into emotion understanding processes resonates well with the findings that emotion understanding and regulation are interlinked. Similarly, his views on emotion as a driver of cognitive acquisition are important in highlighting how emotion motivates or moves one towards a goal. Both of these ideas may be helpful for understanding children with emotional and behavioural difficulties, who may have greater difficulty in identifying that an emotion is occurring. One criticism of Izard's theory is that conceptual clarity within the proposed components of emotional development may be confused or blurred with several constructs overlapping, or different terms used for the same construct. Barrett (2009) has criticized Izard's view on the primacy of facial affect recognition, that the model is not sufficiently comprehensive compared to others in explaining different aspects of emotion.

Information Processing model. Theoretical discussion of appraisal biases in social information processing discussed by Crick and Dodge (1994) are essential in

understanding the multiplicity of ways in which the emotion process can go awry and this will be described next.

Crick and Dodge (1994) and Dodge (1986) developed an information processing model that has been influential in developmental psychopathology and in models of affective social competence, particularly in their emphasis on biased processing or interpretation of information about emotion among children. One of the key features in Crick and Dodge's model is the emphasis on the interpretation of affective cues in social information processing or SIP. In the SIP model, the child perceives cues within the social environment, using sensory and perceptual apparatus; integrates these perceptual cues with their existing data base through applying decision rules, feedback, encoding and interpretation and then generates and applies appropriate responses. The child must do this efficiently, without misperceiving cues and in a dynamic and rapid manner. These achievements can be hampered by failures or errors in encoding certain key pieces of information, for example, by making mistakes in interpretation of emotional cues or through a failure to evaluate the most appropriate response. In this way, response biases, attention biases and encoding failures can contribute significantly to behavioural outcomes in social situations. The information processing model is an extremely useful model in understanding the range and accumulation of problems that some children with impulse control or attention problems may experience in selecting an appropriate social or emotional response. The model points towards over-attentiveness to certain cues (which we will discuss later in the case of anxious children) and under-attentiveness to cues (which we will discuss in relation to children with attention or impulse control problems) as well as problems in interpretation of those cues such as are seen in children with empathy problems.

Emotional Intelligence model. Beyond the scope of the present study is the examination of the construct of “emotional intelligence” or EI; arguably, one of the best-known models of emotional development which typically studies adult populations and was initially proposed by Mayer, Salovey and Caruso (2004). Mayer et al. emphasise the innate abilities represented by emotion understanding and emotion regulation by comparing them to other intelligences. EI is seen as enhancing other abilities. The authors define EI as “the ability to perceive, access and generate emotions so as to assist thought, to understand emotions and emotional knowledge and to effectively regulate emotions so as to promote emotional and intellectual growth” (Mayer & Salovey, 1997, p. 5). The idea of emotion as an intelligence, equivalent to IQ, garnered much interest in the popular culture. Emotional intelligence has been associated with workplace outcomes, with some studies finding a link between emotional and social function in managing conflict and relationships within work settings (Caruso, Bhalerao & Karve, 2016). However, emotional intelligence as a construct has been criticized as self-report because objective measures of emotional intelligence seldom converge; identification of the construct has been challenging and meta-analyses of the link between transformational leadership and emotional intelligence have been found to be weaker than theorized (Caruso, et al. 2016). In a recent revision of the model, Mayer, Caruso and Salovey (2016) have identified “hot” intelligences – i.e. social and personal intelligences as well as emotional intelligences and are broadening and refining the construct further. Ybarra, Kross and Sanchez-Burks (2014) have critiqued the model suggesting that seeing “emotional intelligence” as an intelligence/ ability means that it fails to differentiate between automatic processing factors, deliberate processing factors, and person/ situational and motivational aspects of processing which may influence outcomes. The key overlap between emotion

understanding and emotional intelligence is the ability to perceive, access and understand emotions in everyday interaction. Some of the components which make up the construct of “emotional intelligence” are identical to components of “emotion understanding.” Rather than overlaying an additional interpretation of these skills as an “intelligence” it may be more useful to separate the diverse abilities in perception, encoding and interpretation of emotional signals as these may occur at different levels within the individual – e.g. perceptual abilities may be more advanced than interpretative abilities (or vice versa) in a given individual and these may warrant separate consideration rather than being treated as a single “ability”.

Summary

This section has discussed some of the main theories of emotional development in children. The ASC model (Halberstadt, Denham & Dunsmore, 2001) presents a comprehensive, developmentally focused conceptualization of emotional development that is adaptable to both children attending clinical services and typically developing populations which best describes the overarching construct of emotional development by emphasizing the components of emotion regulation, expression and understanding. This overview is lacking in all of the other models, with the exception perhaps of Barrett’s (2017a) idea of emotion as physiologically grounded conceptualizations. Izard emphasizes emotion as a motivational driver and notes conscious understanding of emotion. Both of these concepts are particularly important among children where emotion regulation is a difficulty. The information processing model by Crick and Dodge (1994) permits a fine-grained analysis of the perceptual and psychological issues that shape encoding of emotion signals and is consistent with the research from children with clinical diagnoses which indicates biases in perceptual processes towards certain emotions. This topic will be revisited in a later section.

The Construct of Emotion Understanding

Defining Emotion Understanding

Definitions of emotion knowledge emphasize slightly different aspects of this multifaceted and complex construct. Emotion “*knowledge*” is the term used by Izard and colleagues for expressive and receptive understanding; “*comprehension*” is used by Pons, Harris and de Rosnay (2004); Harwood and Farrar (2006) use “affective perspective taking” whereas other authors discuss the *processes* involved in emotion knowledge (Crick & Dodge, 1994) involving *appraisal* or *evaluation* of emotional signals as well as *attributions of intention* (Crick & Dodge, 1994; Izard, 2009; Lemerise & Arsenio, 2000).

The task of understanding emotion often requires simultaneous appraisals of the emotion and the immediate situation. The range of situations the child may need to interpret is highly variable, from simple cause and effect in a single individual (e.g., Julie is sad because she cannot find her favourite teddy) to understanding of nuanced emotions in self and other simultaneously such as in the statement “I am hurt and embarrassed because my friend laughingly told my secret and didn’t seem to care”. Simple emotion knowledge involves understanding of typical reactions or scripts, understanding of desires and the ability to attach verbal labels to feelings. These will be defined first.

Emotion scripts. Izard describes emotion understanding as comprising “*expressive emotion knowledge*” (Izard, et al., 2001; 2010; Morgan, Izard & King, 2010). This involves attaching verbal labels to emotions and understanding which kinds of situations result in which types of emotions (Izard, et al., 2001; Morgan, Izard &

King, 2010). Predicting emotional reactions in others is called “*simple causal emotion understanding*” (Castro, Chen, Halberstadt & Gruhn, 2016) or understanding of “*emotion scripts*” (Lewis, 1991). This form of emotion understanding is learned by children as part of larger script - type knowledge about how the world works (Lewis, 1991). Emotion scripts allow a child to predict how someone may behave given relatively little information about a situation, e.g., the death of someone’s mother may elicit a script based on sadness and loss and would give information about the kinds of emotions expected. Some authors view emotion scripts as having a behavioural knowledge dimension, involving knowledge and expectations about behaviour or even dress during such situations (Lewis, 1991).

Simple and complex emotion understanding. Emotion understanding may be viewed as having a number of different components. A simplified version gives emotion understanding two factors; *simple* understanding of emotion and *complex* understanding of emotion (Castro et al., 2016). Pons, Harris and de Rosnay (2004) view emotion understanding as involving early *causal* understanding of emotion, *script-based* understanding of emotion (Harris, 2008) and *complex emotion knowledge* (Castro, Chen, Halberstadt & Gruhn, 2016; Castro, Halberstadt & Garrett-Peters, 2016; Halberstadt, Denham & Dunsmore, 2001; Harris, 2008; Morgan, Izard & King, 2010; Pons, Harris & de Rosnay, 2004).

Pons, Harris and De Rosnay (2004) following a comprehensive review of emotion understanding studies among children, developed an outline of the types of emotion knowledge acquired during childhood which identified nine stages of emotion understanding, split across three broad developmental “stages” and corresponding to

early, middle and later phases of emotion understanding in childhood. The early stages of their model describe simple causal emotion understanding and recognition. The middle phases of their model incorporate “desire” and “belief” understanding which is closely linked to “Theory of Mind” (TOM, Premack & Woodruff, 1978). Pons et al., describe another phase as knowledge of “reminders,” i.e., that reminders of sad or happy events can trigger dormant emotions. The sixth phase is described as “knowledge of regulation” – i.e. that certain types of activities (actions or thoughts) can influence or change how one feels. The final three phases or *components* of emotion knowledge they call “hiding”, “mixed” and “morality”. These three aspects are discussed further as aspects of complex emotion knowledge (Castro et al., 2016).

Castro et al. (2016) used factor analysis to examine the structure of emotion knowledge in middle childhood and identified simple causal understanding as emerging in early life and up to preschool years, followed by the emergence of “complex emotion knowledge.” Castro et al.’s (2016) analysis has strong parallels with Pons, Harris and de Rosnay’s (2004) description of the stages of emotion understanding or emotion “comprehension.” Simple emotion understanding, they refer to as “knowledge of external cause” of emotion, while complex emotion understanding begins to move beyond the obvious and use greater interpretation of thoughts and beliefs.

One of the early and frequently distinguished aspects of emotion understanding is “desire knowledge,” which is the understanding of the influence of desires on emotional outcomes. A script-based understanding of desire may expect outcomes based upon repeated observations of cause and effect in social encounters (Lewis, 1991). An unexpected emotion reaction by a peer to receiving a gift, for example, may

force the observer to revise their emotion script. Script revisions, one can imagine, could be more challenging for individuals low on empathy or cognitive flexibility. Complex emotion knowledge is the understanding of emotion causes and consequences which goes beyond the obvious (Pons et al., 2004; Castro et al., 2016) and involves concealment of emotion, understanding of mixed emotions and understanding of the emotional consequences of an action, e.g., moral violations. Concealment of emotion (or *hiding*) is proposed by Pons, Harris and de Rosnay (2004) as one of the later stages of emotion knowledge in childhood. This is the knowledge that external and internal manifestations of emotions are not always the same. Mixed emotion understanding is the ability to comprehend emotions of contrasting valences occurring simultaneously. This involves reasoning about the causes of several different emotions simultaneously and potentially integrating these contrasting rationales into a coherent integrated response (Zadajel, Bloom, Fireman & Larsen, 2013). For some authors, complex emotion also involves knowledge and skills in regulating emotions (Thompson & Lagatutta, 2006).

Some definitions of emotion knowledge emphasize behaviour after the emotion is comprehended, i.e., the reactions to the emotion. Thompson and Lagatutta (2006) describe emotion understanding as the ability to understand emotion causes and to choose an appropriate response. Saarni's (1979) focus on knowledge of "display rules" in emotion describes the amplification of emotion and the concealment of emotion within the context of achieving social goals. This early emphasis by Saarni on display is very similar to what we now call "emotion regulation" and mirrors the emotion regulation processes described by Gross and Thompson (2007). However, not all studies investigating "display rule knowledge" in children are directly examining their abilities

to regulate their emotions. Some examine children's abilities to discern motives for emotional display (e.g., Gnepp & Hess, 1986; Misailidi, 2006), while others focus on children's awareness of the existence of display rules for different emotions (e.g. McDowell & Parke, 2000). Before finishing this section on the theory of emotion understanding, a number of associated constructs should be mentioned in clarifying the boundaries of the constructs, these are: "Theory of Mind" (TOM), "Mentalization" and "Emotion Schemas."

Theory of mind. Emotion understanding can be understood as falling within the rubric of "Theory of Mind" (TOM) (Premack & Woodruff, 1978) and as the construct has so much overlap with the study of emotion understanding, the borders of the construct need some delineation. Theory of mind may be described narrowly or as a generic term for self-other understanding. In its generic form, TOM is a broad term covering a range of abilities in understanding and knowledge of others' mental states including intentions, beliefs, false belief and visual perspective taking, and incorporates the term *emotion understanding* as a narrower slice of the construct focusing solely on understanding of emotion related aspects as defined above. The narrow definition of TOM is typically used when assessing the specific developmental milestone that occurs at 4 to 5 years of age, when children become able to demonstrate their understanding of false belief in others. The familiar TOM perspective-taking task involving the Sally-Ann scenario (Baron-Cohen, Leslie & Frith, 1985) is an example of this narrow definition. Emotion understanding is linked to a broader definition of "theory of Mind" which in its broad definition may be characterized by flexible perspective taking, knowledge of the emotions of others and a psychological understanding of unexplained motives. Emotion understanding may also be viewed as a clinically relevant component

of TOM (Sprung, 2010) and one of the salient aspects of emotion processing involved in healthy emotional development.

Emotion schemas. “Emotion schemas” are clusters of behavioural and psychological processes involved in the appraisal and management of emotion which become increasingly important in childhood emotion understanding as children age (e.g., Izard, 2007; Ellsworth & Scherer, 2003). *Emotion schemas* act as rapid-fire emotion response “sets” and involve emotion perception and motivation that joins up with cognitive dimensions of affect, such as scripts, appraisals, thoughts or images that the child has formed based on their own experience to form an emotional “set” that is ready to go. This process occurs rapidly and dynamically. When adaptive, emotion schemas may enhance regulation. Emotion schemas are important in understanding how biases or inaccuracies in the appraisal of emotion may foster difficulties in social understanding. Schemas can be thought of as “habits” which with some difficulty perhaps, may be updated or changed if maladaptive. Children with emotional and behavioural difficulties may experience negative emotion schemas which maintain perceptual or cognitive habits of responding. Understanding emotion response tendencies as schemas highlights the importance of conscious verbal or explicit emotion understanding in order to disentangle aspects of negative or counterproductive emotion schemas.

Mentalization. The definition of mentalization is closely aligned to the construct of emotion knowledge/ emotion understanding and theory of mind. Ensink and Mayes (2010) define mentalization as the ability to understand the feelings and intentions of others. Bateman and Fonagy (2006) define mentalization as a focus on

mentalistic explanations for the behaviour of self or others, i.e., seeing the other person as an intentional or psychological agent rather than describing a person in behavioural terms. In chapter four we return to this construct when discussing mentalistic thinking and internal state language use in parenting experiences. “Mentalizing,” “emotion understanding” and “theory of mind” share the characteristic that they refer to the endeavour of introspection and the capacity to consciously examine self-other mental and emotional states.

Summary

The above review of theories of emotion understanding reveals commonalities in the literature regarding the distinction between recognition and comprehension of emotion, between simple overt emotion recognition versus more complex or nuanced recognition processes. The diversity of labels and conceptual refinements of “emotion understanding” means that synthesis is needed to unify the theoretical divisions. The ASC model of emotional development (Halberstadt, Denham & Dunsmore, 2001) is the most comprehensive model of emotional development that provides an overarching structure for regulation and understanding of emotion, two key areas in the present study. Other models which inform this study are Castro et al.’s (2016) division of simple and complex emotion knowledge; Izard’s (2010) distinctions between recognition and knowledge/understanding; and Crick and Dodge’s (1994) idea of information processing in emotion understanding.

In order to unify the theory presented, Figure 1 presents a schematic diagram of some of the key components in emotional development and emotion understanding in the present review. Some studies have used a composite emotion knowledge score

which combines recognition and comprehension aspects of emotion (e.g., Bennett, Bendersky & Lewis, 2005) whereas other studies treat these components separately (Luke and Banerjee, 2013; Izard, 2010). As can be seen, the overarching term of “emotion understanding” is divided into recognition of emotion and simple/ complex emotion understanding in Figure 1. Different conceptions of emotion view “emotion vocabulary” as either expressive emotion skills or emotion understanding skill, and in the present case, it is incorporated into the latter construct in the schematic model. These constructs are discussed in the next section when examining developmental processes in emotion understanding, namely, the development of emotion recognition and the development of emotion understanding.

Schematic Diagram of Emotion Understanding as part of Emotional Development



Figure 1. Schematic diagram of emotion understanding outlining a schematic model of the subcomponents of emotional development in children using the distinctions in emotional development proposed by Halberstadt, Denham and Dunsmore (2001) which includes understanding, expression and regulation of emotion.

Chapter 2 Development of Emotion Understanding

Overview

In this section, the developmental building blocks of children's emotion understanding are examined. Proximal-to-distal influences on the development of emotion understanding are described. Firstly, research is presented which describes how preferences for different types of facial emotion changes during infancy. This type of preferential looking is considered to be a precursor to facial emotion recognition. Emotion recognition in other sensory modalities is also briefly reviewed. Then the discussion turns to the construct of emotion understanding beginning with known stages in children's understanding of emotion. Children's social-cognitive and emotional developments are inevitably intertwined and some of the research findings regarding emotion understanding and children's temperament and social development are reviewed. Following this, the research literature investigating familial/ contextual factors are examined. In the last section, distal influences on emotion understanding are examined when studies examining the cultural factors that shape emotion processes and language are discussed.

Development of Emotion Understanding

As indicated in the diagram in the previous section, this review divides emotion understanding into recognition phenomena and emotion understanding. This section reviews the construct of emotion understanding firstly, by examining emotion recognition and then emotion understanding will be discussed more broadly.

Development of Emotion Recognition

Emotion recognition is one of the building blocks in emotion understanding (Morgan, Izard, & King, 2010) and depends on the ability to interpret information coming from sensory modalities such as vision and hearing. The ability to recognize emotion is thought to develop gradually from a stream of perceptual phenomena that requires interpretation (Barrett, 2017). In their early lives' infants encounter a range of visual, auditory, physiological and other stimuli that they must identify and interpret in order to begin to make sense of their world. Infants attend to faces from birth and quickly begin to develop an awareness of the different kinds of stimuli in their visual field. The beginning of emotion recognition in infancy includes the infant gradually developing awareness of the facial emotion expressions of the adults in their environment. There is a large body of research on the abilities of infants to “categorize” facial emotion recognition which is beyond the scope of the present work but a few points stand out such as the findings of the early emergence of discrimination of facial affect.

Facial emotion is conveyed through the contraction of muscles in the face – the eyes, nose, eyebrows, mouth and cheeks (Ekman, Friesen & Hager, 2002). The eyes

scan the features particularly the eyes and nose. Some emotions can be easily categorized by the eyes alone (Matsumoto, 1989) for example, fear, anger and sadness in particular show greater muscle contractions in the upper face (eyes, nose and brows), whereas happiness and disgust show greater muscle contraction in the lower half of the face (Calvo & Nummenmaa, 2011). Facial emotion recognition research has identified systematic preferences to different types of emotion at different developmental stages in infancy (Grossman, Striano & Friederici, 2007; Farroni, Menon, Rigato & Johnson, 2007; Hoehl, 2014; Young-Browne, Rosenfeld & Horowitz, 1977) using a range of measurement techniques such as eye gaze tracking and event related potential (ERP) studies. Findings from this research indicates that children from the age of 7 months, begin to discriminate facial emotion and take contextual factors such as gaze or objects into account.

When very young, i.e., under the age of three months, infants like to look at happy faces (Farroni, Menon, Rigato & Johnson, 2007). The preference for happy faces begins to change at approximately 3 months, when infants begin to discriminate a little more and can differentiate between smiling/ frowning and surprise expressions (Young-Browne, Rosenfeld & Horowitz, 1977). Until they are approximately 7 months of age, infants prefer to look at happy faces compared with neutral faces (Grossman, Striano & Friederici, 2007) but this preference changes, beginning from the ages of between 5 and 7 months, when infants start to pay more attention to fearful faces (de Haan & Nelson, 1998; Leppänen & Nelson, 2006; 2009). By the age of 9 months, typically developing infants begin to use cues to interpret facial emotion in photographs. Hoehl and Pauen (2011) examined eye gaze direction in facial emotion with infants. Using pictures of fearful faces directed away from an object, versus fearful faces directed towards an

object (a colourful toy) 9-month-old infants responded differently from younger infants. Nine-month-old infants in this case, did not continue to stare at the object but instead were able to use contextual cues such as gaze direction in the photograph and nature of object to direct their own gaze whereas younger infants were unable to discriminate effectively using directional cues.

Visual recognition. Evidence from the 9-month olds' ability to disregard an irrelevant decoy (the colourful toy) suggests the ability to interpret both emotion expression and the relevance of gaze direction in these studies by the age of 9 months among typically developing children. These studies do not depend on the infants' language abilities. Visual abilities, including understanding the significance of the emotional expression and the contextual information such as directional cues may be essential foundation blocks in the understanding and interpretation of emotion causality later on.

The findings give support to the idea of visual recognition phenomena as foundational in emotion understanding processes. However, perception of emotion occurs across sensory modalities requiring integration of visual processes with perception of body posture, vocal cues, and of physiological and somatosensory processes in one's own body. Emotion may be perceived from within through internal or interoceptive awareness of emotion or perceived in others such as recognizing facial emotion or stance. These cues need to be interpreted simultaneously in a dynamic and rapidly changing social context. Impairment in a sensory modality resulting in reduced perception can impact the development of emotion understanding because information is not easily integrated, leading to developmental delay in social and emotional

understanding. Two examples which tell us much about how developmental timing can affect emotion understanding are where children experience hearing and visual impairments. Children who are deaf have reduced access to auditory emotional cues making identification and interpretation of emotion and other verbally expressed ideas more difficult to comprehend within that sensory modality and causing delays in emotion understanding and theory of mind (e.g., Mancini, Giallini, Prosperini, Dincer, D'allesandro, Guerzoni, et al., 2016). Peterson, Peterson and Webb (2000) also found that a majority of 6-year-old children with visual impairment failed theory of mind tests that are typically passed by 4 and 5-year-olds. Some of the children in their study continued to have significant difficulty in passing complex theory of mind tasks up to the age of 12. The role of language in emotion understanding and theory of mind for children who are deaf is discussed more in the next chapter.

Implicit vs explicit awareness. The focus of the present study is conscious emotion awareness but a substantial amount of emotion information may occur outside of conscious control. Examining emotion recognition that is below conscious threshold is beyond the scope of the present study but merits mention because of the potential impact upon regulation demands on a child when affect is not presented to conscious awareness. Both anecdotal and research evidence indicates that it is likely that not all emotion is consciously understood. Anecdotal reports of triggers for a trauma survivor often mention reminders of traumatic events that remain below conscious awareness until after a phobic episode. For example, trauma survivors often describe sounds or visual stimuli that were reminders of a traumatic event. Experimental tasks involving visual stimuli that are below the threshold of conscious awareness has identified that phobic adults experienced emotional reactions to pictures that they did not know they

had seen. Using a “backward masking” technique, Öhman (2005) showed pictures of spiders very briefly e.g., for 30 milliseconds to adults who experienced a spider phobia followed by presentation of a neutral stimulus for 100 milliseconds. The first stimulus was not conscious and the second would be seen by most. Although the participants did not consciously register the briefly presented stimulus their galvanic skin responses showed increased stress levels following the backwardly masked stimulus indicative of non-conscious processing of the information.

Interoceptive awareness. Recognition phenomena involve not only visually presented material but also the ability to identify emotion arising from within. The ability to name emotional states in the self requires a reliable feedback loop from the body to parts of the brain that govern speech. Feldman-Barrett (2017b) proposes that affect is grounded in physical and neurobiological experiences and that our models for emotion processing are wholly inadequate currently for capturing the multi-levelled phenomenon we call “emotional experience”. The subjective elements of emotion are particularly important, and beyond the scope of the present work, but a few constructs merit a mention.

As discussed in the section on emotion theory, Grandjean, Sander and Scherer (2008) propose that the “feeling” or subjective element of experience which is accessible to verbal communication is inevitably limited as much of the emotion process occurs below the threshold for awareness. Awareness of body-based sensations of emotions have been termed “somatosensory” or “interoceptive” awareness of emotion. Emotion recognition in the self inevitably involves the monitoring and interpretation of physiological affective signals. Damasio (2000) proposes that such

internal awareness arising from the body is associated with information coming from perceptual “maps” or “somatic markers” within the body which provide additional feedback in decision making. The ability to perceive interoceptive information is emphasized in theories of “grounded cognition,” which proposes that somatic information processing influences affective and cognitive experience (Barsalou, 2008). Neuropsychological studies have identified neural structures involved in interoception. At a neural level, the Anterior Cingulate Cortex (ACC) and the Insula are linked to the ability to recognize internal physiological states arising from subjective experience (Critchley, Weins, Rothstein, Ohlman & Dolan, 2004). Interoceptive awareness has been found to be inversely linked with Alexithymia in studies with adults (Herbert, Herbert & Pollatos, 2011) indicating that poor awareness of subjective information from the body is a predictor for difficulties associated with Alexithymia. Greater interoceptive awareness is also linked with empathy for the emotional experience of others. Empathy is the ability to experience the emotions of other people “as if” the person is experiencing them directly (Goldie, 1999). Grynberg and Pollatos (2015) found that greater ability to identify changes in bodily experienced affect, was associated with adults’ cognitive and affective empathy for the pain of others. Difficulty in identifying one’s own pain, it seems makes it challenging to identify the pain of others too.

Emergence of Emotion Understanding During Childhood

Throughout the course of childhood, children’s ability to understand emotion increases gradually moving from recognition, to simple and to complex emotion understanding (Meins, Fernyhough, Johnson & Lidstone, 2006; Pons, Lawson, Harris & de Rosnay, 2003; Southam-Gerow & Kendall, 2002). The transition is from the

perceptual experience, to the verbal concept. By the age of 18 months, children's capacity to recognize their own bodily feelings is increasingly evident in what they say, for example, infants typically report on feeling hungry or if they are in pain (e.g., Dunn, Brown & Beardsall, 1991). Early references to mental states show us that by the second year of life, along with referring to physiological states, infants also begin to refer to mentalistic words such as "want," (Bretherton & Beeghly, 1982). Between the age of 2 and 3 years, young children can identify that satisfied or unsatisfied desires can generate emotions such as "happy" or "sad." Thus, in the earliest stages of emotion understanding, children achieve an understanding that external occurrences have an impact on emotion (Pons, Harris & de Rosnay, 2004; Southam Gerow & Kendall, 2002).

Pons, Harris and de Rosnay (2004) identified that between the ages of 3 and 4 a number of important developments in emotion understanding are taking place. Recognition processes are becoming consolidated as verbal labels become matched with prototypical facial emotion and understanding of cause and effect or "external" causality in emotion is emerging. For example, children at this stage can typically identify "happy" or "angry" facial emotions and provide labels for them. Children of this age also understand that an event that arises externally to them, may cause an emotion to arise and by the age of 5 years, many children can identify that beliefs or attitudes can provide different reactions to the same event (Pons, et al., 2004). Termed "belief-desire reasoning" this is often a core feature in theory of mind (TOM) research and is an important developmental milestone in understanding that the perspectives of others are different from our own.

In middle childhood, most children have a good understanding of typical emotional scripts and begin to understand the experience of mixed emotions (Pons, Harris & de Rosnay, 2004, Smith, Glass & Fireman, 2015). Even if very young children do not have the ability to verbally express mixed or opposite valence emotions, they may still have the capability to experience them (Smith, Glass & Fireman, 2015). Previously, it was believed that children did not understand complex mixed emotions until they were 10 or 11 years of age (Harter & Buddin, 1987). Other studies have found that 4-year-old children were able to use emotion words to describe both basic and mixed emotional states (Kestenbaum & Gelman, 1995). Smith, Glass and Fireman (2015) studied mixed emotional valences in very young children aged from 3 to 5 years and in contrast to previous research findings, found that some of the youngest in the group at age 3, were able to identify mixed feelings in a movie protagonist. Pons et al. (2004) on the other hand, found that a fuller understanding of mixed valenced emotion usually begins around the age of 8 years, when children can hold two conflicting reactions to the same event in their mind. The variation in findings of emotion understanding between different studies is consistent with the work of Meins, Fernyhough, Johnson and Lidstone (2006) and with Pons, Lawson, Harris and de Rosnay (2003) who found significant individual variation in emotion language and emotion understanding with some very young children understanding mixed emotion clearly, whereas other older children were significantly slower. There is evidence that language and cognition play a role in variation in mixed emotion understanding. Examining contextual factors, Bennett, Bendersky and Lewis (2005) found that maternal verbal IQ predicted children's emotion understanding among pre-schoolers and Pons et al. (2003) identified that verbal ability and age jointly predicted a majority of the variation in emotion understanding in their study of 80 children.

Mixed emotions of opposite or contrasting valences were examined by Huebeck, Butcher, Thorneywork and Wood (2016) who noted that from the age of 6 years, children were able to identify contrasting - valenced emotions using a semi structured interview method. Their skills in reporting mixed emotions increased up to age 12 years, although even at this stage their ability to report on mixed emotions was still developing. Given the range of findings regarding children's ability to identify mixed emotions it is likely that potential confounding factors such as verbal ability or measurement artefacts are influential in some studies.

Younger children may lack the cognitive or verbal perspectives to keep contrasting emotion valences in mind. Arsenio and Kramer (1992) found that young children were unaware of guilt at moral transgressions. Four-year olds believed the protagonist would be happy if they jealously pushed another child off a swing, whereas 8-year olds were more likely to describe a mixture of both negative and positive emotions. With adults, Murgatroyd and Robinson (1993; 1997) found that if the rule violations are undetected and cause little harm to others, the transgressor is less likely to experience negative emotions associated with the moral code violation. Pons, Harris and de Rosnay (2004) treat moral code emotion reactions as a distinct category rather than as mixed emotions per se. Pons et al., found that emotional reactions such as feeling good when we adhere to the moral code and guilt when we transgress, arise because of internalization of cultural values by the child rather than from expected consequences. Pons, Harris and de Rosnay (2004) also focus on the mentalistic aspects of emotion understanding at this stage which is emerging at 4 to 5 years of age, around the same time as children begin to pass standardized "theory of mind" tests.

Later stages in emotion understanding move causality of emotion from the external to the internal, with increases in subtlety of causality. It is likely that language ability and cognitive development play a significant role in this shift. Southam Gerow et al. (2002) describe a child's reaction to a broken toy at different levels of complexity. At each level of complexity of emotion, the elements within the emotion are more nuanced and complex and require a greater quantity of language to express the idea. Not only that, but the number of grammatical elements within the sentence increases as the relations of the nouns/ clauses to each other need clarification, ownership and place-marking. We can compare the simple "I am mad because the toy is broken" to the nuances of "I am mad because I thought that the person who broke my toy was my friend" (Southam-Gerow et al., 2000, p. 201). The last phrase contains far more grammatical elements than the first, and this is seen in more complex syntax and morphemic structure, which we will come back to later in the discussion on emotion understanding in the following section and in the next chapter on cognition and language.

Social development. Children who are happy express positive emotions more readily and are less likely to present negative mood states during interactions with their peers. Angry children on the other hand, are more likely to respond with hostility during peer conflict and their social interactions can become challenging (Denham & McKinley, 1993). Emotion understanding has been associated with positive peer relationships commencing at preschool level (Denham, Blair, De Mulder, Levitas, Sawyer & Auerbach-Major, 2003; Hughes, Dunn, & White, 1998; Karstad, Wichstrøm, Reinfjell, Belsky & Berg-Nielsen, 2015). Garner (2010) points out that this association between emotion understanding and peer relations holds regardless of the kind of

measurement used, e.g., puppet's emotions, real people's emotions, photographs or line drawings of emotions will elicit the same associations with social relations in this age group.

School-related difficulties are a frequent source of referral to children's psychological support services (Greenberg, Kusche, Cook & Quamma, 1991). One of the factors in such difficulties that has been systematically identified is the relationship between children's "affective competence" and their social and academic engagement (Denham, Blair, De Mulder, Levitas, Sawyer & Auerbach-Major, 2003). One of the key tasks in adapting to school involves the effective management of children's own emotions in social interaction and their responses to peer emotional displays and social initiatives. When children manage these tasks effectively, they tend to perform much better socially and academically (Denham et al., 2003). Several studies have examined emotional development as a factor in educational competence and found associations independent of verbal ability (Garner, 2010; Garner & Wajiid, 2012; Izard, Fine, Schultz, Mostow, Ackerman & Youngstrom, 2001). Children's emotion understanding has been consistently associated with their social and academic outcomes (Denham et al., 2003; Garner, 2010; Garner & Wajiid, 2012; Izard et al., 2001; Leerkes, Paradise, O'Brien, Calkins & Lange, 2008).

As discussed in the theoretical section of the present chapter, the affective social competence model (ASC) places emotion regulation and emotion expressive abilities alongside emotion understanding as three essential competencies which comprise children's emotional development (Halberstadt, et al., 2001). The relative roles of emotion regulation and emotion understanding in social and academic competence are

not always clearly distinguished from each other and there may be a tendency to treat the differences between these aspects of child development as if they are part of the same skill-set though there may be key differences between them. It is clear that some of the associations between emotional development and children's academic outcomes relate to young children's abilities to regulate their emotions within the classroom. School and peer relations comprise a large part of the day for many children and the quality of their social encounters have important outcomes. It is also possible that some of the variation in social-emotional outcomes in the classroom relate to children's abilities to pay attention to appropriate or socially desirable stimuli. Knowing what aspects of the school day to pay attention to and which to ignore may be a particularly important dimension of emotion knowledge for effective functioning in school which may involve withdrawal of attention from some emotionally arousing occurrences.

Not all of the associations between emotion competence and academic outcomes are related to regulation skills as emotion understanding itself may play a role in effective academic and social functioning. Izard, Fine, Schultz, Mostow, Ackerman and Youngstrom (2001) found that emotion knowledge mediated the relations between verbal ability and academic attainment for economically disadvantaged children by comparing children's emotion knowledge at age 5 years, with teachers' rating of their social functioning four years later, when in third grade. Early identified problems were associated with later development of emotional difficulties and academic performance; Similarly, Denham et al. (2003) found that pre-schoolers' emotion understanding was associated with children's later social competence when they attended school. Children's ability to understand emotion was a better predictor of social competence than their emotion regulation skills (Denham et al., 2003) The findings point towards

the relationships between regulation, social competence and emotion understanding in pre-schoolers, however, the relative roles of emotion regulation and attention regulation in the above studies are unclear.

The ability to voluntarily direct attention is one of the hallmarks of executive function and is one of the key building blocks of cognition and learning, helping children filter relevant from irrelevant stimuli. Executive functioning is implicated in a wide range of developmental difficulties such as dyslexia, dyspraxia as well as in diagnoses such as bipolar disorder. Executive function and theory of mind have robust associations in the research literature with Devine and Hughes (2014) reporting a medium to large effect size of executive function on false belief understanding, a component of theory of mind. Theory of mind is associated with emotion understanding, and it follows that there may be associations between emotion understanding and executive functioning. Trentacosta, Izard, Mostow and Fine (2006) found a significant association between children's attentional control, verbal ability, emotion knowledge and peer relations. The authors highlight the importance of emotion knowledge in attention control, but the reverse conceptualization was not made in this instance, i.e., the role of attention in emotion understanding was not factored in. This section examined the development of emotion understanding, focusing on individual child factors. Next, the discussion turns to the influences on children's emotional understanding from the family and context in which they live.

Family and context. There are a broad range of influences on children's emotional development. This research concentrates primarily on parent use of language relating to internal states, but other factors play an important part. These include; attachment and parental responsivity, family emotion communication styles, emotional

climate and factors related to the parents themselves. Children's attachment to their parents is a reciprocal process that influences the emotional development of the child in important ways and is often considered one of the essential cornerstones of emotional development. Family relationships, attachment styles, and emotion expression practices are particularly important in helping children's emotional expression, regulation and understanding. These aspects of parenting influence parents' own responses to children's emotional expressions, responses to child behaviour through modelling and attunement and how parents utilize emotion talk and mental state talk to encourage and support mentalistic understanding of emotions and behaviour.

Parental tendency to respond in warm versus hostile ways to toddler behaviour and to manage emotionally laden situations during toddler years, predicts later childhood behaviours when the children are 5 years old (Graziano, Keane & Calkins, 2010). In Graziano et al., warm and responsive parenting style was associated with increased effortful control when the children were 5 ½ years old and associated with emotion regulation. While both mothers and fathers provide important soothing and regulating behaviours for the young infant, as children grow older maternal coaching becomes more salient in many cases and has a role in helping children regulate behaviour (Kiel & Kalomiris, 2015). Family emotional climate is also important in how children can access appropriate models for self-regulation, emotion understanding and empathy (Morris, Silk, Steinberg, Myers & Robinson, 2007). Both parent and child factors were found to contribute to emotion regulate in the early developmental period. For example, reciprocal interactions between children's capacity to self – regulate and parental psychopathology have been shown to predict outcomes for offspring of depressed parents (Silk, Shaw, Forbes, Lane, & Kovacs, 2006).

Family discussion of mental states and exposure to conversation, particularly that of older siblings, influences children's socio-cognitive reasoning and emotion understanding, perspective taking and children's own use of mental state terms and there is an increasingly robust body of research that supports this evidence (e.g., Devine & Hughes, 2018; Dunn, Brown & Beardsall, 1991; Ensor, Devine, Marks & Hughes, 2014; Kucirkova & Tompkins, 2014; Slaughter, Peterson & Mackintosh, 2007; Taumoepeau & Ruffman, 2008; Tompkins et al., 2018). Dunn, Brown and Beardsall (1991) identified that significant variation in the degree of family use of mental state terms was linked to their 3 to 5-year olds' abilities to understand the feelings of others. Some children used as many as 25 mental state terms within an hour, while others used none at all and this variability was mirrored in the quantity of maternal mental state talk in these families.

Harris (2000) suggests that there may be several different mechanisms which account for the association between family talk about mental states and children's emotion understanding. Variation in the *quantity* of exposure to mental state talk may influence children's socio-cognitive understanding. A detailed and elaborative *reminiscing* style by parents may help children structure their own narrative about cause and effect and finally the *coherence of maternal language* may influence affective processes. Although not a universal finding, some authors have found that sibling size has an influence on the level of emotion understanding children achieved (e.g. Jenkins & Astington, 1996; Lewis, Freeman, Kyriakidou, Maridaki-Kassotaki, & Berridge, 1996; Perner, Ruffman, & Leekam, 1994). Jenkins & Astington (1996) found that family size, including the number of siblings, was important in children's understanding of others' perspectives. Cutting and Dunn (1999) on the other hand, did not find that

differences in emotion understanding depended on family size. The following chapter examines these questions in more detail, when discussing child and parent use of internal state language.

There is evidence to suggest that the early developmental period may be particularly sensitive, for example institutional rearing of young children appears to have an impact on the development of emotion understanding that goes beyond the influence of language development. Tarullo, Youssef, Frenn, Wiik, Garvin and Gunnar (2016) carried out a longitudinal study with adopted children, some of whom were adopted early and some later adopted children. Those who were adopted early in life, before going to institutions had different language outcomes from children adopted from an orphanage. Early adopted children made good progress in language development and caught up with their non-adopted peers by aged 3 years. Post-institutionalized children showed reduced understanding of emotion compared with their peers and their scores on tests of emotion understanding were more influenced by parental mental state talk. In addition, emotion understanding scores predicted behaviour scores more consistently for the adopted children. These findings add to the literature on parental mental state talk, indicating that for vulnerable children, parental mental state talk may be particularly important in fostering adaptive outcomes.

Distal influences. By far the greatest influences on the development of children's emotion understanding are proximal, such as children's own genetics, experiences and family socialization processes including parent language and discussion of mental states. Some studies have examined more distal cultural influences on emotional expression and found evidence of different types and quantities of use of

mental state terms in different cultures. Russell (1991) reviewed research into emotion talk used by different cultures which had been gathered by anthropologists studying various tribes and cultures across the globe. While there were many similarities in the range of negatively and positively valenced emotions expressed by the different tribes, there were also differences in “flavours” and accents of emotion, underscoring that there are certain aspects of emotion understanding that may relate to the culture in which a young person lives.

Summary

This review has described briefly the development of emotion understanding by discussing studies of early emotion recognition and studies of early conceptual understanding of emotion. Some of the themes in the literature on emotion recognition in childhood such as children’s social and emotional development, the ability to tune in to physical manifestations of emotion. Familial and contextual socialization factors in emotion socialization were also noted. The review highlighted research which implicates both individual perceptual factors and socially constructed factors in the development of emotion understanding. Some studies presented were with infants, whereas others related to youth with mental health difficulty such as Alexithymia. The research literature on emotional development is particularly disparate with relatively little overlap between methodologies or age range between different research areas. In the present study, the goal is to focus on the emotion understanding and language correlations of children who are experiencing problems in emotions and behaviour to bridge some of the gaps in the literature. The next section returns to this group of children by discussing individual and family characteristics in the emergence of emotional and behavioural difficulties.

Chapter 3 Emotional and Behavioural Difficulties in Children

Overview

This section discusses some of the underlying factors that are understood to contribute to the development and maintenance of emotional and behavioural difficulties (EBD) in children. The review describes the incidence and predictors for EBD; discusses dimensional and categorical systems for classification of these concerns and then examines individual differences in children who experience EBD relating to temperament and language. Then parenting and contextual influences on the development and maintenance of disorders are discussed, in particular parenting practices and adverse life events which may compound predispositions to the development of EBD.

Emotional and Behavioural Difficulties (EBD) in Children

Many of us develop patterns or habits of emotional responding linked to temperament and experiences. When these are adaptive there are few concerns; children can experience difficult events without developing protracted or habitual ways of reacting that cause difficulty for themselves or generate negative feedback from others. Patterns of negative or challenging behaviour (such as prolonged crying, aggressive behaviour or anxiety) can hinder optimal emotional functioning for children. Tendencies to respond in these ways can have significant adverse consequences for the child themselves in their capacity to effectively engage socially and can elicit negative reactions from parents and peers. Emotional response patterns have potentially long-term consequences for many aspects of children's lives, affecting peer relationships, mental health and academic outcomes (Denham, 2003; Egger & Angold, 2006; Rothbart, 2007; Schore, 2009; Sroufe, 1997; Sroufe & Rutter, 1984).

Presentations of difficult behaviour in children challenge the idea that emotions are adaptive. Campos, Frankel and Camras (2004), for example, describe the functionalist view that the magnitude of an emotional response is related to the urgency of an emotion-provoking situation. Children experiencing emotional and behavioural difficulties (EBD) do not adhere to this principle, as reactions may be disproportionate to the stimulus by definition, with extreme or prolonged emotional responses at lower thresholds of challenge. The definition of emotional and behavioural difficulties (EBD) in this study uses that of Egger and Angold (2006) who describe EBD as atypical responding differs in *severity or intensity, duration, pervasiveness or impairment*.

Difficulties in emotions and behaviour during development are common. Prevalence rates of mental health difficulties in children and adolescents are estimated at 10% to 13% for all disorders at any one time (Costello, Egger & Angold, 2005; Egger & Angold, 2006; Polanczyk, Salum, Sugaya, Caye & Rohde, 2015) with approximately one in nine children experiencing significant difficulties in management of emotions or behaviour at a single time point and a lifetime prevalence of 1 in 3 children aged from 11 to 13 years experiencing any disorder (Cannon, Coughlan, Clarke, Harley & Kelleher, 2013). Global estimates of mental health disorders in children showed that 6.5% of children have anxiety, 2% have depression and 5.7% have disruptive behaviour disorders (Polanczyk, Salum, Sugaya, Caye & Rhode, 2015).

Pathways to emotion and behavioural disorders identify temperament and biology as significant predictors (Egger & Angold, 2006) and family studies find multiple associations with stressful life events, family stressors and socialization practices (Cicchetti, 1984; Cicchetti & Valentino, 2006). Child maltreatment, parent mental health difficulty, life events and socialization all have a role to play in interaction with child temperament and genetics for child mental health outcomes (Cicchetti & Valentino, 2006; McGill & Zoghbi, 2013). Transactions between the child and their environment may be viewed as reciprocal and dynamic mutually influential exchanges which change over time and in conjunction with children's development (Sameroff, 2010). Individual factors that contribute to children's difficulties in emotion management include temperament, ability to regulate emotional arousal, presence of negative affectivity and expressive language abilities (Cook, Spinazzola, Ford, Lanktree, Blaustein, Cloitre et al., 2017; Dvir, Ford, Hill, & Frazier, 2014; Girard, Pingault, Doyle, Falissard, & Tremblay, 2016; Gross & Thompson, 2007; Rothbart,

2007; Shields & Cicchetti, 1998). Some of the factors which determine the magnitude of a child's emotional or behavioural response may be linked to other previously occurring factors including child or family stress and life events interacting with aspects of child temperament and family functioning (Kawabata, Alink, Tseng, van IJzendoorn, & Crick, 2011; Roberts, English, Thompson & White, 2018; Turner, Finkelhor & Ormond, 2006). Familial factors that contribute to children's emotional and behavioural outcomes include parenting practices, boundaries, communication and mental health (Cook, Spinazzola, Ford, Langtree, Blaustein, Cloitre et al., 2017; Norman, Byambaa, De, Butchart, Scott & Vos, 2012; Shields & Cicchetti, 1998; Young & Widom, 2014). Contextual factors also provide a backdrop to many child and familial situations of distress, and adverse life events have predicted both parent and child stress (Merrick, Ports, Ford, Afifi, Gershoff & Grogan-Taylor, 2017). Both individual and familial factors will be reviewed briefly in this section.

Children with emotional and behavioural difficulties experience a range of problems which may be described as “internalizing” or “externalizing” difficulties in emotion and behaviour (Achenbach, Ivanova, Rescorla, Turner & Althoff, 2016). When children internalize emotional distress, problems are experienced internally as low mood, self-blame or anxiety, with resulting challenges in emotional intensity, expression and management. Children who externalize their experiences present with disruptive behavioural disorders, acting out their emotional disturbance through behaviour or often displaying aggressive or oppositional behaviour.

Diagnostic frameworks to classify children's emotional and behavioural difficulties include the fifth edition of the *Diagnostic and Statistical Manual* or *DSM V*

(APA, 2013) or the 10th edition of the World Health Organization's international classification of diseases (ICD 10, WHO, 1993) which divide difficulties in emotion and behaviour into discrete clusters of emotional and behavioural symptoms. While both diagnostic and dimensional approaches have an important function in delineation of specific features, one of the difficulties with both types of categorization is the question of comorbidity. Comorbidly occurring difficulties in emotions and behaviour are typical among children attending mental health services and children with EBD. Internalizing and externalizing symptoms frequently co-occur and it is not unusual for a young person to have features of several diagnoses simultaneously (Steinberg & Drabick, 2015). For example, almost half of children who are diagnosed with attention-deficit-hyperactivity disorder (ADHD) experience clinically significant difficulties in another domain (Angold, Costello & Erkanli, 1999).

The study of emotion processes is one of a number of foci for transdiagnostic approaches to mental health (Kring & Sloan, 2009), which have begun to focus on the commonalities in treatment provision for emotional difficulties which include the role of attentional or emotional processes in the maintenance and treatment of disorders such as the presence of negative affect and attention biases towards stimuli eliciting negative emotion (Ellard, Fairholme, Boisseau, Farchioni & Barlow, 2010). Barlow, Allen and Choate (2004) propose that similarities in underlying structure of emotional disorders such as anxiety or depression may be greater than their difference. The focus in emotion research from a transdiagnostic perspective examines the underpinning aspects of emotion processing such as attention or emotion regulation processes in the development and maintenance of emotional disorders (Kring & Sloan, 2009; Sloan, Hall, Moulding, Bryce, Mildred & Staiger, 2017). Two frequently arising issues in the

treatment of EBD or other mental health difficulty include children's ability to self-regulate and difficulties with expressive language. These individual child factors will be discussed as they present in children with EBD and following this, parenting practices and contextual factors in the maintenance of EBD are reviewed.

Regulation difficulties. Individual differences in regulation of physiology are theorized to impact children's regulation of emotion and attention. One of the theorized ways that general regulation of physiology is considered to impact emotion regulation, is when executive processes (such as attention control) and levels of autonomic arousal are poorly regulated because of neurobiological vulnerability or adverse experiences (Schore, 2009) with downstream reduction of the child's ability to control the physiology of stress (Bell & Deater-Deckard, 2007; Calkins & Keane, 2009; Cole, & Deater-Deckard 2009; Thompson, Lewis & Calkins, 2008). The inability to regulate internal states of physiological arousal or attention for example, is thought to lead to a cascade type pattern of deficits in other internal regulatory processes, such as emotional arousal or altering cognition or appraisals, leading to abnormal processes (Cole, & Deater-Deckard 2009). These processes may cause a child to stay longer in a highly-aroused state, or to fail to return to a baseline positive mood through impacted attention or physiology, potentially leading to patterns of information processing which ultimately lead to disorders in mood or behaviour.

"Effortful control" is seen as a dimension of temperament and personality that is reasonably stable across time and contexts which allows the individual dampen a dominant response and augment a subdominant response and is linked to control of attention and sometimes described as "attentional control" or "behavioural inhibition"

(Eisenberg, Smith & Spinrad, 2011; Rothbart, 2007). Effortful control requires the mobilization of attention, planful behaviour and facilitates correction of assumptions and remediating actions (Posner & Rothbart, 1998). Eisenberg et al. (2011) contrasts effortful control from involuntary processes – such as inhibition (often seen in temperamentally shy or inhibited children) where the withdrawal from stimuli, novel or aversive is so automatic it isn't considered to be under voluntary control. Effortful control, in contrast, is the ability to voluntarily shift or alter emotional states or attention processes, to do something that is useful but unpleasant (Eisenberg et al., 2011) akin to conscious regulation of affect or behaviour. For children experiencing significant emotional or behavioural difficulties, the construct of effortful control is particularly important as it may mediate the associations between emotion understanding and social functioning through its influence on self-regulation.

These temperamental features, have been identified by Denham, Blair, De Mulder, Levitas, Sawyer and Auerbach-Major (2003) and by Garner (2010) and Garner and Wajiid (2012) as critical in the effective regulation of emotion and in social and academic outcomes alongside neurobiological factors. Garner (2010) suggests that the cognitive load involved in managing emotion for children with emotional and behavioural disorders may tax children in the classroom setting independently of difficulties with attention control. Skills in emotion understanding may help children who experience emotional or behavioural difficulty to select the appropriate response under stressful circumstances, thereby protecting against negative social or academic consequences.

Language difficulties. Children who attend mental health services often display delayed verbal expression and language comprehension compared with their typically developing peers. In a meta-analysis of children with EBD, Hollo, Wehby & Oliver (2014) established that 81% of children who were attending child mental health services across 22 studies of 5 to 13-year-olds recorded below average performance on standardized tests of language. Cohen, Farnia and Im-Bolter (2013) found that 45% of children referred to local mental health clinics experienced higher-order language delays. While it is well established that language difficulties are frequently comorbid with EBD and may have a role in their expression, direction of causality is not assumed between them. Nonetheless the association between EBD and language is of considerable importance for communication of emotional and mental states. Difficulties in communicating internal states may amplify emotional distress in children leading to associations between different kinds of expressive language difficulties and sequelae in emotions and behaviour (Van Daal, Verhoeven & Van Balkom, 2007).

Parenting practices. Dimensions of parenting which influence children's emotions and behaviour include parental boundaries (consistency versus unpredictability), communication styles (warmth versus hostility), and parent mental health (Belsky, 1984; Taraban & Shaw, 2018). Where problems of regulation exist because of neurobiological vulnerability in the child, parent behaviour may compound or ameliorate those difficulties. Negative parenting strategies may include the withdrawal of affection, the use of harsh punishment or inconsistent responses to children's behaviour, such as threatening a child with harsh sanctions and failing to follow through (Durbin, Darling, Steinberg & Brown, 1993; Merrick, Ports, Ford, Afifi, Gershoff & Grogan-Taylor, 2017). Steinberg and Drabick (2015) propose a

transactional model involving child emotion regulation and parenting behaviours in the maintenance of emotional and behavioural difficulties associated with ADHD. Their model proposes that for children with ADHD, factors such as temperament and low effortful control play a role in the maintenance of emotional disorders. Impulsivity and effortful control are considered to play a role in maintaining behavioural disorders. The authors further propose that parenting behaviours influence the expression of these temperamental features in children with ADHD thus accounting for a portion of comorbidity amongst the emotional disorders, commonly seen in children with ADHD. Temperament in children can elicit negative parenting responses thereby placing children with difficult temperaments at greater risk of maltreatment at the extreme end of the continuum. Conversely, child abuse and neglect are also associated with significantly poorer outcomes for children in terms of emotions and behaviour (Cook, Spinazzola, Ford, Langtree, Blaustein, Cloitre et al., 2017; Shields & Cicchetti, 1998) and have long term impacts through disruption of attachment, regulation and relationships (Young & Widom, 2014).

Boundaries and discipline. Parenting practices that have overly severe or lenient boundaries or which are characterized by overly critical or harsh parenting are problematic for children (Hoeve, Dubas, Eichelsheim, van der Laam, Smeenk & Gerris, 2009). Some children are highly sensitive to criticism or negative feedback about behaviour, whereas other children are relatively insensitive to feedback and require more explicit consequences (Johnson, Hawes, Eisenberg, Kolhoff & Dudeney, 2017). Transactions between child sensitivity level and family characteristics can lead to escalations of hostile interactions and foster maladaptive behaviour further (Durbin, Darling, Steinberg & Brown 1993; Hoeve, et al., 2009).

Family communication styles. Family communication styles that are characterized by warmth and supportive emotional responses from parents are associated with better outcomes for children (Yap & Jorm, 2015; Durbin, Darling, Steinberg & Brown, 1993; Hoeve, et al., 2009). When these processes are impacted by parent mental health difficulties such as depression, the reciprocity in affective exchange between parents and children may be impacted. Children's experiences of direct responses from a parent may be attenuated and reduced positive feedback may compound daily challenges for the child in managing mood (Cuijpers, Weitz, Karyotaki, Garber, & Andersson, 2015; Cummings & Davies, 1994; Lovejoy, Grackyk, O Hare & Neuman, 2000).

Parent mental health. Parental mental health has a significant impact on children's mental health. The presence of clinically significant parent anxiety is significantly predictive of children's anxiety and depression in childhood (Goodman, Rouse, Connell, Broth, Hall, & Hayward, 2011; Micco, Henin, Mick, Kim, Hopkins, Biederman & Hirschfield-Becker, 2009). Children with depressed parents are at greater risk of experiencing mood disorders and depression has knock-on effects on parenting, leading to greater negative or coercive parenting styles, reduced engagement and positive interactions (Lovejoy et al., 2000). Greater internalizing and externalizing symptoms are found among children of depressed parents and experiences of positive affect are reduced, thereby limiting opportunities for reparative emotional experiences (Goodman, Rouse, Connell, Broth, Hall, & Hayward, 2011).

Adverse life events. Chronic adversity has a greater impact compared with single episode or early adverse experiences (Thompson, Flaherty, English, Litrownik, Dublowitz, Kotch & Runyan, 2015). A number of large studies examining mental health outcomes among adults, identified that adverse life events during childhood were associated with later mental health difficulties (e.g., Chapman, Whitfield, Felitti, Dubea, Edwards & Anda, 2004; Merrick, Ports, Ford, Afifi, Gershoff & Grogan-Taylor, 2017). Adverse life events included parent mental health difficulty, harsh punishment during childhood or the presence of substance misuse or abuse in the family home. Adverse life events in childhood were associated with increased lifetime incidence of depression (Chapman et al., 2004) with the quantity of adverse experiences increasing in a “dose-relationship” with the likelihood of current or lifetime depression in children. Similarly, Merrick et al. (2017) identified pathways to mental health difficulties and substance misuse in adulthood from adverse childhood life experiences which included physical and sexual abuse and parent mental health difficulty and substance misuse. The likelihood of children developing long-term problems in drug use, tobacco and alcohol use, depression and suicidal behaviour or ideation were significantly raised when cumulative life events were considered. Harsh parenting, including “spanking” was a significant risk factor and predictive of future mental health difficulties (Merrick et al., 2017). In the latter study, the three adverse situations which resulted in greatest likelihood of future mental and substance abuse problems included psychiatric illness in a family member, substance misuse in a family member and child-directed emotional abuse. Given the self-report nature of these large studies, it is difficult to separate out contextual from biological or genetic factors involved in the transmission of mental health difficulties (e.g., Pike & Plomin, 1996). Nonetheless, it is evident that the burden of mental health difficulty for children who have experienced a number of adverse life

events is greater than for children who do not experience similar difficulties.

Additionally, it is clear that for many children, exposure to an accumulation of adverse life events has profound long-term outcomes for children (Brown, Anda, Tiemeier, Felitti, Edwards, Croft & Giles, 2009; Shonkoff, 2011).

Summary

This section has discussed the prevalence and causes of emotional and behavioural difficulties in children. It has highlighted a range of factors associated with the development of EBD including proximal/ individual factors such as the role of physiological and emotional regulation, temperament and children's own abilities interacting with children's life experiences and their environmental circumstances which includes the influence of parental mental health and parenting styles. Chronicity and severity of contributory factors are highly variable and link to individual child temperament and neurobiological vulnerabilities in the emergence of disorder, resulting in wide differences in the experiences of children with EBD. In the next section, we return to the question of emotion understanding in children with clinical diagnoses by examining some of findings on emotion understanding in diagnostic groups.

Emotion Understanding Research Studies

The literature on emotion understanding is divided into two with one type of study examining developmental literature among parent-child dyads. This type of research focuses on socially constructed knowledge and interactional processes in understanding of mind and emotion among children. The second body of research tends to focus on older adolescents and adults, often examines youth with a mental health or clinical diagnosis and tends to examine emotion recognition using neuropsychological or eye tracking techniques, for example. Some studies fall in between these two extremes. It could be argued that the present research lies in the middle between these two kinds of studies. Examination of research with children with emotional and behavioural disorders (EBD) leads to a review of the literature on emotion recognition among children with clinical diagnoses much of which is focused on group differences.

In the last decade a number of reviews and meta-analyses were conducted focusing on emotion recognition in children with mental health diagnoses such as anxiety or depression and among children with developmental diagnoses such as Autism. This section reviews some of the larger scale studies of this kind, which involve emotion recognition. Where the focus of a particular study is emotion understanding, this will be noted specifically. Transactions between the child's temperament and environment are of particular interest and this section reviews the roles of clinically significant presentations that influence not only the development of emotional/ behavioural or intellectual disorders but which also influence children's emotion understanding in diverse ways. The review will examine the roles of temperamental anxiety as well as anxiety that has arisen from maltreating contexts in order to consider the relationship between emotion recognition and emotion regulation.

In the discussion of mood and children's emotion understanding, the relevance of parent mood is explored. Finally, in the case of deaf children, the importance of child language, emotion understanding and mental health are discussed.

Recognition Studies

Several large-scale studies have been conducted on emotion recognition and understanding among children from different diagnostic groupings, such as conduct disorder or in a specific context (e.g., maltreatment). Marsh and Blair's (2008) meta-analysis of emotion recognition in adolescents and adults with diagnoses of psychopathy and conduct disorder identified significant differences in young people's abilities to identify fearful faces. Luke and Banerjee (2013) conducted a meta-analysis on emotion knowledge in children who had experienced maltreatment and found that of the nineteen studies included in the review, sixteen of those showed that children's emotion knowledge was significantly reduced when compared with children from a control group. Trentacosta and Fine's (2010) meta-analysis of the socio-emotional correlates of emotion recognition, in which 6 of the 26 studies in the final synthesis concerned children with specific diagnoses, found a significant association between internalizing and externalizing difficulties and children's ability to identify emotions. Harms, Martin and Wallace (2010) examined the literature on emotion recognition in ASD and concluded that while eye tracking differences were inconsistent across studies, a majority had found differences in facial emotion recognition skills among people with ASD and controls on neuropsychological examination. Collin, Bindra, Raju, Gillberg and Minnis (2013) in a review of facial emotion recognition across a range of diagnoses found evidence for differences in facial affect recognition in each of the 8 diagnostic categories examined. Amygdala disruption was commonly found among studies

involving fMRI examination alongside facial emotion recognition and sensitivity. The kinds of facial emotion tasks involved included face matching, facial emotion recognition, and subjective reports of emotional arousal in response to facially presented affect. From the larger scale studies two findings stand out: firstly, that a majority of published studies identify that children with a clinical diagnosis experience greater difficulty in recognizing emotion and secondly; the results frequently identify differences in negatively valenced facial emotion recognition between children from a diagnostic group versus those without a diagnosis.

Emotional and behavioural disorders (EBD). Most studies of emotion understanding with children with emotional and behavioural difficulties (EBD) have examined understanding rather than recognition of emotion. In a meta-analysis of emotion understanding and children experiencing EBDs, Trentacosta and Fine (2010) examined 19 studies where internalizing difficulties were identified and 34 studies where externalizing difficulties were identified. Trentacosta and Fine found that emotion knowledge was significantly associated with both internalizing and externalizing difficulties and the magnitude of effect sizes were in the small to medium range. The authors note that no differences in association were found for children with emotional and behavioural difficulty compared with those without. Social competence was a key variable in this study and was linked with emotion knowledge and with internalizing/ externalizing domains.

In the meta-analysis reported above, a majority of studies included in this sample did not examine children with mental health diagnoses specifically and of those that did, a mixture of emotion understanding and recognition processes were included

leading to a somewhat mixed picture. Nonetheless, associations were significant across studies and no mediators or moderators of emotion understanding/ knowledge were identified for the study. Studies which used teacher report or DSM classifications showed a greater effect size for the associations between emotion understanding and child emotional and behavioural difficulties. It appears that clearer associations between emotion understanding and internalizing/ externalizing behaviours were identified when more reliable classifications were used. The authors suggest this finding may result from severity of symptoms children's social and emotional functioning.

Hughes, Dunn and White (1998) examined emotion understanding, theory of mind and executive function in 40 pre-schoolers who were rated as having more challenging temperaments. Compared with controls, the "hard-to-manage" pre-schoolers experienced delays on all three areas evaluated. Hughes et al., chose a high threshold at which to evaluate the children who presented as hard to manage, i.e., using a 90th centile cut-off based on the Avon Longitudinal Study data (ALSPAC, Golding, 1996) indicating symptom severity equivalent to that of children who may be referred to clinical services (Hughes et al., 1998). The target group in Hughes et al.'s study had greater difficulty identifying subtler emotion causes but performed equally well on tasks requiring unambiguous emotion knowledge. The study aimed to examine if young children with challenging behaviours were better at understanding negative intentions and this hypothesis was partially supported as children with difficult behaviour were better at theory of mind if the surprise was an unpleasant "trick." The findings highlighted that executive functioning was negatively associated with emotion understanding for children in the challenging group. Children's language development was positively associated with emotion understanding for children in the control group

of pre-schoolers. While the study was not clear about the role of context or experience, the authors noted that executive function and verbal ability were particularly important in theory of mind for this age group.

Fine, Trentacosta Izard, Mostow and Campbell (2004) followed up kindergarten children from 152 families from economically disadvantaged social backgrounds over a period of two years. In this study, gender differences were found on follow-up that were linked to emotion understanding during the initial testing phase. Fine et al., found that accurate anger perception was associated with lower levels of aggressive behaviour in girls two years later, though not at the time of initial assessment. Boys' perception of anger on the other hand, did not relate to their subsequent aggressive behaviour. When parent report of physical discipline was included, emotion understanding and physical punishment jointly predicted behavioural aggression in the classroom two years later. This study highlighted the interaction of gender and parenting in their results which pointed to a different role for emotion perception between boys and girls on this occasion.

Martin, Boekamp, McConville and Wheeler (2010) found that pre-schoolers with depressed mothers were significantly poorer at identifying emotion and viewed faces as "sad" more often. Severity of symptoms was associated with degree of emotion understanding difficulty. The study points to a bias in emotion recognition among very young children who have experienced significant pathology in their families. The study was compelling in drawing links between children's emotion understanding and maternal depression in a very young group. However, the research left many

unanswered questions regarding the exposure of this very young group of children to adverse experiences and little of this information was reported.

In a further study with a different group of pre-schoolers with EBD, Martin, Williamson, Kurtz-Nelson and Boekamp (2015) investigated emotion perception biases and child language in preschool children aged 3 to 5 years, who were admitted to a psychiatric day hospital for emotional and behavioural disorders. They found that that maternal depressive history was linked with children's emotion perception bias and that boys were more likely to perceive anger for non-angry faces. Once again, children's language was important for emotion recognition accuracy.

The above studies strongly support that emotion understanding and EBD have important associations. A consistent thread through most of the studies is a link between emotion understanding and children's language. Other important aspects of children's development included executive functioning which differentially predicted performance on emotion understanding tasks for very young children (e.g., Hughes et al., 1998). Some gender differences in emotion perception were found among very young children which suggest the presence of different trajectories for some children at preschool age. The role of executive functioning, gender and language may all contribute to these findings. The findings hint at intriguing mechanisms of interaction between family functioning, parent psychopathology and children's emotion understanding as well as highlighting the importance of children's executive functioning and language skills.

Anxiety. In recent years there has been an increased interest in how anxious children recognize and understand emotion. Findings from studies with adults indicate

processing biases in adults with anxiety (e.g., Yiend, 2010). Studies of facial emotion recognition in children with anxiety have also identified differences compared to those without anxiety. A significant proportion of studies with children show that children who experience anxiety often display greater sensitivity to threat associated with negatively valenced facial emotion such as anger (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, van Ijzendoorn, 2007; Collin, Bindra, Raju, Gillberg and Minnis, 2013; Easter, McClure, Monk, Dhanani, Hodgdon, Leibenluft et al., 2005; Krain-Roy, Vasa, Bruck, Mogg, Bradley, Sweeney, et al., 2008). Some studies have found no differences on emotion recognition for children with or without anxiety. In a study of almost one hundred children with anxiety looking at sensitivity to facial emotion, Ewing, Dash, Thompson, Hazell, Hughes, Lester and Cartwright-Hatton (2016) found no differences in threat responsivity or sensitivity to facial affect on angry/happy faces, which is in contrast to a majority of findings. Over-reactivity to threat, evidenced by faster reaction times in identifying angry faces is proposed by some authors to account for the development and maintenance of maladaptive cognitive schemas. When attention becomes fixed upon a negative emotion or stimulus, this may generate attributions of hostility or lack of safety which in turn feed back into maintenance of attention and further heightened anxiety (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van Ijzendoorn, 2007). Increased sensitivity to threat may in other words, become a self-fulfilling prophecy. Other studies have identified a different trajectory, proposing social anxiety as either a cause or a consequence of emotion understanding difficulty. Simonian, Beidel, Turner, Berkes, and Long (2001) identified children and teens with social anxiety had greater difficulty in recognizing facial expressions of happiness, sadness and disgust. The proposal made by Trentacosta and Fine (2010) may be appropriate for some, i.e., that emotion recognition difficulty and

anxiety interact in the maintenance of anxiety for some children. The authors suggest that negative schemas may play a significant role in the maintenance of perceptual biases in emotion regulation with children who find emotion difficult to decipher on a daily basis. It is likely that both these trajectories operate for different children with anxiety problems.

Studies of emotion understanding have also found that anxiety is associated with differences between anxious children and control group children on a number of aspects of emotion understanding such as their emotion comprehension and ability to report on emotion. Bender, Pons, Harris, Esbjorn and Reinholdt-Dunne (2015) found differences from controls in understanding of emotion using the Test of Emotion Comprehension (TEC) with children who had severe anxiety (such as Obsessive-Compulsive Disorder or *OCD* and Post-Traumatic Stress Disorder or *PTSD*) but not when children had generalized anxiety. In an early study of anxiety in children, Suveg and Zeman (2004) found that children experiencing anxiety had greater difficulty with emotion intensity and coping skills and these facets of emotional development were associated with difficulty in responding appropriately and flexibly. Similarly, Southam-Gerow and Kendall (2002) found inappropriate use of display rules in emotion among anxious children. In a later study, emotion understanding in anxious children was examined by Suveg, Hoffman, Zeman and Thomassin (2009) who jointly examined understanding and regulation of emotion. Suveg et al. (2009) found poor self-reported awareness of emotion and differences in emotion regulation among school children with anxiety. For the anxious group in their study, they experienced greater amounts of physiological reactivity during emotional arousal and experienced emotional arousal more frequently. Carthy, Horesh, Apter, Edge and Gross (2010) found that teenagers suffering from

anxiety were more reactive to emotive stimuli than controls on a study of emotion understanding and regulation. The young people in the study had greater difficulty on reappraisal tasks which required participants to alter their interpretation of the evocative stimulus (Carthy et al., 2010). This study is particularly interesting because of the overlap between physiological reactivity and meaning-making/ interpretation as it found that even controlling for baseline negative affect, that youth with anxiety had greater difficulty in regulating mood and in cognitive reappraisal of mood following presentation of an emotion inducing stimulus. The above studies which have examined potential processing difficulties in the development of anxiety give support to the Affective Social Competence theory (ASC Halberstadt, Denham & Dunsmore, 2001) that difficulties with emotion related processes for anxious children may include a triad of skills in comprehension, expression and regulation of emotion.

Child temperament. One of the theorized pathways to the development of anxiety disorders is through an over-reactivity/ sensitivity or bias to emotion signals which arises from the child's innate temperament and genetics, as is the case with behaviourally inhibited children (Gartstein, Putnam, Aron & Rothbart, 2016; Niditch & Valera, 2018). Child temperament factors have been long associated with the development of problematic emotional responding (Thomas & Chess, 1974) with recent theoretical approaches enhancing our understanding of the dimensions of temperament that place children at risk (Nigg, 2001; Rothbart, 2007; Rothbart, Ahadi & Evans, 2000). Vulnerabilities to mental health difficulties have been identified among children with withdrawn, depressed and anxious behaviour (Rubin, Crehan, Althoff, Rettew, Krist, Harder, et al., 2017). Reeb-Sutherland, Rankin-Williams, Degnen, Perez-Edgar, Chronis-Tuscano and Liebenluft (2015) examined a group of teenagers who had been

rated as having behaviourally inhibited temperaments in early childhood. These young people were followed up as adolescents and the authors found that those with behavioural inhibition, i.e., anxious temperaments displayed increased sensitivity to facial affect, needing fewer cues to identify fearful faces. In an attempt to explain the possible mechanisms involved, Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg and Van Ijzendoorn (2007) suggest that for already anxious children, biases in attention may increase the belief that the environment is dangerous and therefore increase or maintain the subjective feeling of anxiety and perpetuate attention to the threat, thereby generating negative cognitive schemas which operate as fast-track perceptual apparatus (Stallard, 2014).

Child experiences. In cases of maltreatment, accurate or early perception of anger signals of a maltreating carer may protect a child from negative consequences (Cicchetti & Ng, 2014). There is strong evidence that children who have experienced maltreatment display increased sensitivity to facial affective signals of threat (Briggs-Gowan, Pollack, Grasso, Voss, Mian Zobel, et al., 2015; Cicchetti & Ng, 2014; Curtis & Cicchetti, 2013; Da Silva Ferreira, Crippa & de Lima Osorio, 2014; Luke & Bannerjee, 2013; Pollack, Cicchetti, Hornung & Reed, 2000; Young & Widom, 2014). These differences have been identified on various measures of sensitivity including ERP and behavioural tasks of emotion recognition and on longitudinal studies of maltreatment impact.

Children who have experienced abusive or hostile environments show particular sensitivity to expressions of anger, threat and hostility on facial emotion measures. Da Silva Ferreira, Crippa and de Lima Osorio (2014) found differences between groups of

children who had/ had not experienced maltreatment in their ability to recognize threat. Briggs-Gowan, Pollack, Grasso, Voss, Mian Zobel, et al. (2015) found that children who witnessed child-directed violence were significantly more responsive to angry facial expressions. Curtis and Cicchetti (2013) identified different neural reactivity among infants who had experienced maltreatment compared with non-maltreated infants, evident on event related potential (ERP) studies of neural activity which showed hyper-responsivity to angry facial affect at this early stage (c. 15 months). Pollack, Messner, Kistler and Cohn (2009) and Pollack, Cicchetti, Hornung and Reed (2000) found that mistreated children need fewer anger cues to identify angry faces on emotion recognition tasks. In a longitudinal evaluation of the impacts of child abuse and neglect, across the spectrum of the types of abuse that the young people were documented as experiencing, sexual abuse and physical abuse were associated with significantly reduced facial emotion recognition compared with neglect (Young & Widom, 2014).

Temperament/ experience interaction. Cicchetti and Ng (2014) and Luke and Bannerjee (2013) suggest that a range of child-related factors to do with information processing of threat signals in conjunction with parenting and life experiences, may contribute to deficits in emotion perception seen in children with histories of maltreatment. Individual differences in attention to emotion signals have been shown in early life. Children who have fearful or inhibited temperaments are more likely to react aversively to novel stimuli. Research has shown that these children pay more attention to negative affect in facial expressions (Reeb-Sutherland, Rankin-Williams, Degnen, Perez-Edgar, Chronis-Tuscano, Liebenluft et al., 2015) and when exposed to domestic violence, behaviourally inhibited children are more likely to develop anxiety disorders (Briggs-Gowan, Pollak, Grasso, Voss, Mian, Zobel et al., 2015). Intellectual abilities

may influence children's susceptibility to the development of greater sensitivity to threat. Young and Widom's longitudinal study (2014) identified intellectual ability as one of the key factors which mediated the impact of childhood maltreatment on subsequent socio-emotional processing.

This review highlights the role of child abuse experiences on children's emotion recognition processes and shows that increased sensitivity to negative affect has been identified among children who have experienced abuse and neglect on physiological measures such as ERP and on stimulus presentation. Emotion recognition is shaped by children's temperament, intellectual ability and perceptual "set" or tendency. Maltreating circumstances highlight that for these children, angry signals are especially salient, and apparent over-sensitivity is in fact, adaptive in certain contexts. When maltreating contexts are no longer present, the long-term pattern of emotional responding remains, thus rendering these children vulnerable to long term emotion processing patterns that place them at risk of developing emotional and behavioural disorders long after the adverse context has passed.

Mood disorders. Mood based difficulties such as depression have been associated with problems in emotion understanding among adults. Major depressive disorder, which is characterized by significant changes in mood, thought patterns and rhythmicity was linked to poorer verbal labelling of emotion but not poorer facial matching among adults with first episode depression (Van Winger, Van Eijndhoven, Tendolkar & Buitelaar, 2011).

Bipolar disorder. For children with bipolar disorder or those with a parent with bipolar disorder, de Almeida Rocca et al. (2009) found differences in facial affect processing compared with controls on a majority of studies published. Further examination of those in remission or at risk of bipolar disorder showed differences in neurological evaluation (fMRI) which were associated with subtle differences in recognition of facial emotion. Recognition of overt or exaggerated facial affect was preserved. Seymour, Pescosolido, Reidy, Galvan, Kim, Young and Dickstein (2013) found that youth with bipolar disorder were significantly poorer than children with ADHD at recognizing “happy” emotions, particularly those of low intensity. Collin et al. (2013) examined studies of bipolar disorder among children, and citing Brotman, Guyer, Lawson, Horsey, Rich and Dickstein et al. (2008) found that children with bipolar disorder had greater difficulty in identifying emotion accurately compared with children with depression or ADHD. With the same cohort, Brotman et al. (2008) found children with bipolar disorder were over-reactive to threat signals (angry faces) and misinterpreted neutral faces.

Family factors. When parents experience depression, children’s responses to facially presented emotion may be biased towards sad mood. Joorman, Talbot and Gotlib (2007) and Kujawa, Torpey, Kim, Hajcak, Rose, Gotlib and Klein (2011) in two separate studies, found that daughters of depressed or previously depressed parents showed significant attention biases towards sad faces. Joorman et al. (2007) presented happy and sad faces to 21 girls aged between 9 and 14 years following a mood induction task. Selective attention to sad faces was consistently seen in the at-risk group and entirely absent in the control group. The at-risk group did not attend to happy faces in the same way, leading the authors to suggest that the at-risk group had difficulty

shifting attention away from negative facial affect. Kujawa et al. (2011) also found biased attention towards sad faces in a younger group of 5 to 7-year-old girls whose mothers had suffered from depression. The same processing bias was not seen in male offspring of depressed mothers at this age.

ADHD. A number of review studies have found that children with ADHD have difficulties in emotion knowledge both on emotion recognition tasks and on tasks involving use of contextual cues in emotion (Da Fonseca, Segnier, Santos, Poinso & Derulle, 2009; Jusyte, Gulewitsch & Schonenberg, 2017). While not all studies found a relation between symptoms of ADHD and emotion recognition problems (e.g., Pitzianti, Grelloni, Casarelli, D'Agati, Spiridigliozzi, Curatolo & Pasini, 2017) there is increasing evidence that facial emotion in particular may be impacted among children who experience ADHD and in other clinical syndromes. Dan and Raz (2018) found that adolescents who were diagnosed with combined type ADHD which incorporates both inattentive and hyperactive symptoms, had greater emotion recognition difficulties than children with either inattentive-type or hyperactive-type only. In a review of papers of social information processing and ADHD, Uekermann, Kraemer, Abdel-Hamid, Schimmelmann, Hebebrand, Daum, Wiltfang and Kis (2010) concluded that children with ADHD diagnoses experienced significant difficulties in processing social information, including facial affect recognition problems. Uekermann et al. (2010) identified that empathy and theory of mind were impacted as well in children with diagnoses of ADHD.

There are mixed findings regarding the association between emotion understanding and ADHD in children, with clear findings in some studies and no

findings on others. Da Fonseca et al. (2009) found that children with ADHD had difficulty with emotion recognition but not with object recognition, leading the authors to conclude that the problems in emotion understanding may not simply be related to attention control. Jusyte, Gulewitsch and Schonenberg (2017) found that children with ADHD had difficulties in emotion recognition on all types of facial emotion but differences were not associated with the perceptual aspects of the task. Testing for perceptual sensitivity, Jusyte et al. (2017) presented morphing pictures of facial emotion to children with and without ADHD predicting that perceptual sensitivity would be reduced for negative affective expressions. The authors found that this was not the case; children with ADHD were equally adept at recognizing that an emotion was occurring but their accuracy for the specific emotion that was occurring was poorer. The authors conclude that their findings may be indicative of a social-emotional processing difficulty in ADHD rather than a perceptual problem. Pitzianti, Grelloni, Casarelli, D'Agati, Spiridigliozzi, Curatolo and Pasini (2017) found no differences in emotion knowledge between children with ADHD compared with control group children, but "soft" neurological signs differentiated performance between the groups instead.

Airdrie, Langley, Thapar and van Goozen (2018) found that youth with ADHD and conduct disorder were poorer at emotion recognition compared with children who did not have diagnoses and compared with children with ADHD only. The authors found that both groups displayed scanning difficulties on eye tracking tasks but only recognition of fearful and neutral faces were impacted; happy and sad faces were differentiated equally well. On discrimination/ intensity tasks, Airdrie et al., found that young people with ADHD and conduct disorder did not require greater intensity of emotion expression to recognize emotion, but reduced time spent looking at the eyes in

fear recognition was driven by attention difficulties. Yuill and Lyons (2007) examined emotion understanding in young children with ADHD and found that despite support for attention processes during the task, that children with ADHD were poorer on emotion recognition aspects of the task than unaffected peers. Cadesky, Mota and Schachar (2000) also found that combined ADHD and conduct difficulties were associated with the greatest difficulty in recognizing facial emotion compared with when there was no comorbidity. The findings on emotion recognition and emotion understanding in ADHD suggest that a mixture of factors may be occurring; i.e., that for some children, recognition of emotion is impacted by attention processes and that for other children they fail to pay attention to the specific emotion, suggesting a combination of emotional and perceptual factors in the findings. Presence of comorbidly occurring difficulties appears to have greater impact on children's emotion recognition.

Antisocial groups. One of the more consistent findings of bias in facial affect processing is the difficulty in accurately categorizing fearful faces that is experienced by youth with psychopathic tendencies or those in institutions. Marsh and Blair (2008) identified differences in fear recognition across youth with psychopathic and antisocial diagnoses in a synthesis of 38 studies, with approximately half of the studies focusing on adolescents. The results showed a highly significant difference in fear recognition between young people who were diagnosed with conduct disorders or psychopathic traits and controls but no differences in recognition of the five other emotions of happiness, sadness, anger, disgust or surprise between the groups. This difference was independent of age, gender and nature of antisocial behaviour diagnosis.

A search for markers of callous-unemotional (CU) traits in early development led researchers to examine the preferences of infants for facial scanning patterns associated with subsequent development of problems in emotion recognition. Bedford, Wagner, Redher, Propper, Willoughby and Mills-Koonce (2017) found that infants with reduced facial attention who had mothers with reduced sensitivity, were found to display higher overall levels of CU traits at 7 years. Emotion recognition at six years independently and directly predicted CU traits at 7 years. Callous-unemotional traits at 7 years were predicted by the interaction of maternal sensitivity and infant gaze. The authors concluded that the combination of reduced infant gaze to faces in conjunction with reduced maternal sensitivity may be a risk factor for CU traits and the subsequent development of psychopathic traits, but the direction of causality was not confirmed – i.e., infants with reduced facial looking may have been reacting to maternal insensitivity (Tronick, Als, Adamson, Wise & Brazelton, 1978).

Autism. A group of children whose emotion understanding has been evaluated in a more systematic way are children who have autism spectrum disorder (ASD). A diagnostic feature of ASD is that children's social communication is atypical rather than simply delayed featuring reduced socio-emotional reciprocity. Investigations of emotion understanding among children and adolescents on the autism spectrum have identified differences in patterns of facial scanning for youth on the Autism Spectrum (Senju & Johnson, 2009), and differences in understanding beliefs and desires (Broekhof, Ketelaar, Stockmann, van Zijp, Bos & Rieffe, 2015).

Language and emotion understanding. Reduced exposure to conversation about mental states has a significant impact on children who are deaf, leading to

differences in the quantity of discussions about mental states with associated misinterpretation of others' intentions and manifest in a range of pragmatic and social difficulties in interaction with peers (Peterson & Slaughter, 2006; de Villiers & Pyers, 2002; Peterson, Wellman & Slaughter, 2012; Rieffe, Netten, Broekhof & Veiga, 2015). The challenges for children with hearing impairments to access opportunities for discussions about mental states highlights the role of discussion about mental states in the emergence of emotion understanding. Reductions in discussions about others' thoughts or intentions has implications for learning about the thoughts and feelings of others and may impact conversational pragmatics and peer interactions (Peterson & Slaughter, 2006; Peterson, Wellman & Slaughter, 2012). Consequently, many children with hearing problems have difficulties in socialization and emotion understanding (Rieffe, Netten, Broekhof & Veiga, 2015) and it has been shown that children who are deaf or hard of hearing experience greater mental health difficulties than matched groups of children (Theurissen, Rieffe, Soede, Brierie, Ketelaar, Kouwenberg & Frijns, 2015). In families where children and parents all sign from early in life, the opportunity for exposure to internal state/ mental state discussion is greater and theory of mind skills are relatively intact (de Villiers & Pyers, 2002). Identifying associations of mental health difficulties for this group of children has shown that cochlear implantation particularly when children are younger, and early exposure to mental state language (whether signed or spoken) is associated with better mental health outcomes (Theurissen, Rieffe, Soede, Brierie, Ketelaar, Kouwenberg & Frijns, 2015) and improvements in socio-cognitive understanding (Mancini, Giallini, Prosperini, D'allessandro, Guerzoni, Murri et al., 2016). The timing of remediation of hearing problems during development may have important consequences for children's understanding of mind and social outcomes. Mancini, Giallini, Prosperini,

D'allessandro, Guerzoni, Murri et al. (2016) examined the associations of emotion understanding among 72 school going children with cochlear implants compared with hearing children using the test of emotion comprehension (TEC, Pons, Harris & de Rosnay, 2004). Their study found a significant association between the age of diagnosis and child age at the time of implantation and children's emotion understanding and theory of mind. Implantation before 18 months was significantly predictive of normative emotion understanding at age 8 years. In a small sample of school aged children, cochlear implantation before 27 months was associated with normal theory of mind for children with hearing impairment (Sundqvist, Lyxell, Jonsson & Heimann, 2014). Later implantation was significantly associated with reduced theory of mind compared with children from a control group (Sundqvist et al., 2013). Thus, a significant role for talk about emotions, desires and other mental states is highlighted by the differences between these subgroups of children with hearing impairment. Rieffe and Wiefferink (2017) note that children with hearing and language impairments experience a dual impairment in social functioning because of pragmatic language factors, i.e., difficulty in keeping up when several speakers are simultaneously engaged in conversation or if an activity or conversation takes an unexpected detour.

Examinations of the language abilities of signing versus oral communicators among children who are deaf have identified pathways to socio-emotional communication which propose a role for 1) exposure to mental state conversation in emotion understanding as already discussed in this section; 2) general vocabulary development in emotion understanding and theory of mind development and 3) propose a role for complementation syntax in the emergence of emotion understanding and

theory of mind (de Villiers, 2005; de Villiers & Pyers, 2002; Peterson & Siegal, 2000; Woolfe, Want & Siegal, 2002).

There is evidence that general language ability/ vocabulary knowledge and expression has significant associations with emotion understanding (Harris, 2008; Hughes, Dunn and White, 1998; Trentacosta, Baird, Mostow & Fine, 2006). The ability to comprehend and manipulate grammatically complex sentences is also proposed to have a role in the development of theory of mind (de Villiers & Pyers, 2002; Harris, 2008). Complementation syntax refers to the grammatical structures that surround a verb that requires an object or complement to complete it. For example, “I ran” requires nothing further to make sense of that sentence, but “I think” takes a complement, i.e., the sentence makes more sense when one thinks *about* something. Children with hearing problems’ abilities to process grammatically complex statements about belief was associated with greater ability to reason about thoughts and mental states (de Villiers & Pyers, 2002). The following example of a “false complement” requires a high level of syntactic understanding and ability to manipulate clauses of belief/ fact to answer correctly;

“Mary said there was a spider on the floor but it was only a button.”

What did Mary say was on the floor?

To answer correctly, the child needs to realise which idea is false (it was a spider) and which idea was correct (it was a button) and to choose appropriately. To pass the test which measures knowledge of a grammatical structure called a “false complement”, the child needs to hold both in mind and understand the sequencing of the

clauses. Children with expressive language delay and deaf or hard-of-hearing children have particular challenges in learning the “false complement” structure, which J. de Villiers argues is a pre-requisite for the development of theory of mind. Studies have identified that children’s ability to process false complement grammatical structures is as important as their general language abilities in understanding mind and emotion, regardless of whether children are deaf or hearing (P. de Villiers, 2005; J. de Villiers & Pyers, 2002; Harris, 2008).

The specific case of children who are deaf or hard of hearing gives rise to questions about emotion understanding among hearing children, particularly regarding discussion about internal states or reasoning about mental states. If such children have reduced exposure to mental state and emotion discussion, is this similar for other groups of children with emotion and behavioural difficulties and does child language ability come into the equation? Do children with emotional and behavioural difficulties for example, hear as much conversation about mental states as other children? If they have equal exposure to discussions about internal states or emotions, are they equally able to process more complex grammatical structures and discuss mental states compared with typically developing children. If language delays are present, how does this impact children’s emotion and behavioural profile? Some of these questions frame the research methods utilized in the present study.

Summary

This review has examined research into emotion recognition and understanding among children who are identified with emotional and behavioural difficulties and mental health/ psychiatric difficulties. Most studies indicate the presence of differences in emotion recognition and understanding between children in clinical/ diagnostic groups and control groups. A small number of non-significant findings were reported in the literature. Thus far, among children with emotional and behavioural difficulties, relatively few studies have been conducted to date. The review has identified linkages between emotional symptoms and emotional functioning and a goal of this study is to examine if these hypothesized associations extend to children with emotional and behavioural difficulties.

Clearest findings on the presence of differences in children's facial emotion recognition are to be found among children who have the greatest degree of neurological or psychological impairment. In recent times, more studies have been conducted on ADHD and facial emotion recognition which has increased knowledge of the role of attention in emotion understanding. The findings suggest thus far, that attention plays a highly significant role in emotion understanding particularly in emotion recognition. It is expected that children with attention difficulties in the EBD group will have greater difficulties in attending to the salient features of the assessments and therefore may have greater difficulties in identifying emotion across measures.

The present review highlighted the different mechanisms involved in emotion understanding for children experiencing anxiety. Based on the findings in this review, it

is expected that presentations of anxiety may be related to difficulty in accurately identifying facial emotion with an over focus on threat or negatively valenced emotions.

A main goal of the present study is to examine the case of emotion understanding among children with emotional and behavioural difficulties, to understand the challenges they experience, so that appropriate prevention and intervention programmes can continue to be developed through a fuller understanding of the mechanisms involved. Thus far, the review has focused on individual and familial emotion-related mechanisms and processes. An important mechanism that is minimally addressed thus far is the role of language and communication about mental states and it is to this we turn next in the coming chapter which examines how parent internal state language may support the development of emotion understanding.

Chapter 4 Internal State Language

Overview

Research evidence supports the view that children's understanding of emotional and mental states is associated with factors within their environment, such as parent or family talk about internal states, (Devine & Hughes, 2016) and with individual factors relating to children's own abilities such as expressive language skills (Farrar, Benigno & Tompkins, 2017; Tompkins, Logan, Blosser & Duffy, 2017). This chapter focuses on internal state language by drawing the links between parent use of ISL and children's outcomes in socio-emotional understanding. The first part of this review examines the function of parent ISL as a parenting and socialization mechanism. Parent use of ISL has been studied in a variety of different parenting contexts such as attachment with their infants, reminiscing following distressing events, emotion coaching and parent use of ISL in everyday language as teaching theory of mind and emotion understanding. There is an ongoing debate about the importance of language skill and language exposure in the tendency to produce words relating to mental states which addresses issues of language complexity and quantity in diverse socio-economic groupings. These links and associations are discussed in the latter part of this chapter. In the third part of the chapter, children's ISL is examined. The developmental progression of ISL is described and cultural variation in expression of ISL noted. Theoretical aspects of child language and cognition are alluded to, particularly those theories that discuss how children's representational capacity and internally directed speech may help cognition. The chapter concludes with some thoughts about the role of language and the potential value in discussing emotions for children with EBD.

Introduction

Internal state language (ISL) refers to language that children or parents produce about mental states. The term is used synonymously with “mental state talk” and includes cognitive, emotion and desire talk. Cognitive talk is expressed when children or parents refer to thoughts in conversation by using words such as “think,” “guess” or “pretend”. “Emotion talk” refers to discussions about affective states such as love, happy or disappointed and desire talk refers to wishes and wants. Parental ISL has experienced more than two decades of research interest from developmental and sociocultural researchers (e.g., Dunn, Brown, Slomkowski, Tesla & Youngblade, 1991) who have examined its’ association with children’s perspective taking and emotion understanding. The resulting body of research has greatly increased the empirical literature on the development of children’s understanding of emotion and theory of mind.

Theoretical frameworks for studying ISL among parents and children include social constructivism (Bruner, 1990) and socio-cultural theory (Vygotsky, 1978) both of which emphasize the roles of social interaction and socially constructed knowledge or meanings in children’s developing understanding of mind (Bruner, 1990; Damianova & Sullivan, 2011; Nelson, 2017). As family context and child developmental factors also play significant roles in the emergence of EBD, theoretical contributions from developmental psychopathology (Cicchetti, 1984) and ecological theory (Bronfenbrenner, 1994) provide important frameworks for understanding the present research context. Starting with the second theme: the role of context in ISL development, this review will focus first on parent use of internal state language discussing function of ISL, theoretical and research approaches and reviewing the

empirical literature on the role of parent ISL in children's understanding of the mental states of others.

Functions of Parental Internal State Language

Parents use internal state language (ISL) for a variety of functions with children; to teach them about mental states (Yuill & Little, 2018) to coach them to manage emotional states (Gottman, Katz & Hooven, 1996; Vine, Bernstein & Nolen Hoeksema, 2018) or to strengthen attachment bonds by connecting their subjective experience with that of their child (Eisenberg, Cumberland & Spinrad, 1998; Greenberg, 2007). Socio-constructivist and socially constructed research traditions focus on how the cultural “stew” of ideas and mental state concepts acts as an induction for children into their emotional and conceptual community. Viewed in this frame, ISL research emphasizes the didactic aspects of parental ISL in fostering cognition and learning where parents potentially become socializers and teachers in their children's development (Maccoby, 1992). This aspect of ISL may be implicit or explicit within the research.

ISL may be used to teach children about mental states and empathy explicitly and therefore has a didactic function (Yuill & Little, 2018). Emotion coaching parenting styles are actively engaged in teaching youngsters to identify and manage emotional states and as such may be considered didactic both affectively and cognitively. Other conceptualizations of ISL use have a more passive view of the mechanism of transmission. Nelson (2005; 2017) describes the use of internal state language as facilitating entrance into a “community of minds” where shared conventions and concepts form the basis of how things are done, while Clark (1986) uses the term “common ground”, to refer to information that is known to be known between two

speakers. Children are “bathed in verbal stuff” in a complex modern culture (Nelson 2005, p. 32) gradually becoming part of the community wherein mental content is exchanged.

The use of ISL may be alternatively considered as parental readiness or ability to view the child as a psychological agent. The use of ISL potentially is an external manifestation perhaps of unseen psychological processes in the parent, whereby words relating to mental states reflect a tendency to think about behaviour and emotions in psychological terms or as driven by psychological factors. This tendency to *reflect* (Slade, 2005) *mentalize* (Fonagy, Steele, Steele, Moran & Higgitt, 1991) or take a *mind-minded* approach (Meins, Centifanti, Fernyhough & Fishburn, 2013) is often viewed as operating in service of attachment and psychological intimacy. This will be returned to shortly as it relates to the emotional aspects of children’s development. First, the review examines the socialization of emotions by parents and how “emotion coaching” may influence behaviour. The third part discusses mentalizing and finally the role of language and elaboration in communication is discussed as a function of reminiscing.

Socialization and teaching functions. The role of parental ISL in fostering children’s emotion understanding through providing support for cognition and language is firmly located within a Vygotskian frame where, in an ideal scenario, the parent “scaffolds” the child’s development by providing just the right word at the right time (Fernyhough, 2008; Vygotsky, 1978; Yuill & Little, 2018) thereby facilitating the child’s own construction of meaning (Bruner, 1990). Parental language provides the conceptual ground for information, constructs or perceptions to be internalized by the child and offers a lexicon from which to communicate personal experience. Parent ISL

may help children's emotion understanding, cognition and learning through labelling emotions (Baumeister, Vohs, DeWall & Zhang, 2007) and through helping shape their perceptions (Boutonnet & Lupyan, 2015). ISL use by parents and children may facilitate memory and autobiographical details (Salmon & Reese, 2015); joint attention (Devine & Hughes, 2018) and underscore the kinds of thinking that support the development of cause and effect narration (Cutting & Dunn, 1999; Quigley, 2001; Taumoepeau & Ruffman, 2006).

One of the common ways to classify parent ISL is to divide parent use of mental state terms into “cognitive”, “emotion” and “desire” language (Taumoepeau & Ruffman, 2008; Tompkins et al., 2018). In line with a Vygotskian model of influence, some parents have been found to naturally adapt their use of mental state terms in conversation with their children. This occurs in synchrony with their child's stage of development, with responsive and timely use of desire or cognitive terms shown to link to children's milestones in self /other knowledge (Bretherton & Beeghly 1982). These kinds of conversations provide a lexicon and a context for mental states, foster a representational understanding of mind, permitting reflection on thought and language which extends beyond immediate physical properties of objects/ action into metalinguistic and metacognitive knowledge. Feldman, Bruner, Renderer and Spitzer (1990) call this the “landscape of consciousness” which they contrast with the “landscape of action”. Internal or mental state talk, is replete with the landscape of consciousness.

Socio-emotional development. Since the 1990's, a number of studies began to consistently identify that parental use of cognitive, emotion or desire talk to their young

children predicted their babies' and toddlers' subsequent theory of mind, emotion understanding and perspective taking abilities, (specifically, false belief understanding or FBU). There are a number of recent meta-analyses which have identified that a small but significant proportion of the variance in children's ability to understand mind and emotion is associated with concurrent and prospective use of ISL by parents (Devine & Hughes, 2016; Tompkins et al., 2018). Typically, studies on children's socio-cognitive development utilize one dimension of children's understanding of mind. Unusually, Tompkins et al. (2018) in a meta-analysis of the relation between parent ISL and children's socio-cognitive understanding examined both theory of mind and children's emotion understanding. Among typically developing children, arguably, TOM is the more commonly examined competency, whereas for children with clinical diagnoses, the investigation of social and emotion understanding is more common.

The constructs of emotion understanding and theory of mind have similar foundations and multiple overlaps (Banerjee, 1997) and are often used as a proxy for each other (e.g., Bosacki & Astington, 1999). Both emotion understanding (EU) and theory of mind (TOM) have been found to be associated with parental use of mental state talk in the early developmental period (Ensor, Devine, Marks & Hughes, 2014; Ensor & Hughes, 2008; Kucirkova & Tompkins, 2014; Meins et al., 2012; Rosenblum, McDonough, Sameroff & Muzik, 2008; Slaughter, Peterson & Mackintosh, 2007; Taumoepeau & Ruffman, 2008). Tompkins et al.'s (2018) meta-analysis of the association between parent ISL and child EU is the focus of the next section which discusses findings from the meta-analyses relevant to the present study.

Original work by Dunn, Brown, Slomkowski, Tesla and Youngblade, (1991) identified significant associations between parent ISL and children's understanding of others intentions and since then, links between the two constructs have been identified many times, particularly when children are very young. More than twenty-five years later, Tompkins et al. (2018) examined those same processes in a meta-analysis looking at both emotion understanding (EU) and theory of mind (TOM) among young children. In all, 18 studies of children below the age of 7 years were included in Tompkins et al.'s (2018) meta-analysis of the association between parent ISL (mental state talk) and children's understanding of emotion. The study found that parent ISL was predictive of child EU and the size of the effect was small but significant. The strength of the association between parent ISL and child EU was moderated by type of parent ISL used and by children's age. Among infants and toddlers, cognitive talk by parents was significantly associated with emotion understanding. However, the examination of child age as a moderator of parent ISL type was not possible during the preschool age because there were too few studies. The context of ISL was important: questions and simple mentions of mental states, showed the strongest associations with children's EU. When ISL was embedded within explanations and appropriate comments, the meta-analysis data showed significantly greater associations with children's TOM but not with children's emotion understanding. Examination of moderators of the parent ISL-child EU association was hindered by the relatively few studies of each moderator, which included as few as two studies for many variables. The inclusion of "grey literature" such as conference papers and dissertations in the meta-analysis, aimed to address publication bias is commendable and the scope of the studies in the meta-analysis covered a significant time span. However, there were no studies of children over the age of 7 years and a greater understanding of the role of parent ISL in

children's EU needed within this age group. Does parent ISL display significant associations with EU among 8 to 12-year olds for example, or among adolescents? Future meta-analyses may benefit from a greater differentiation of the types of parent ISL that may be relevant at different developmental stages. For example, by asking if associations between parent ISL and children's EU remain the same through older childhood, or if they moderate as children become adolescents. Finally, the examination of mediators/ moderators of the strength of any associations between parent ISL and child EU across childhood would benefit from further evaluation.

The role of parent ISL in children's TOM was also subjected to a meta-analysis by Devine and Hughes (2016) who examined parent and child language, sibling size and socio-economic factors as predictors for children's TOM. This study examined different theorized sources of variation of parent's social influence on children by examining the relative roles of parent ISL, parent mentalizing and "mind-mindedness." Twenty-eight studies comprising 1914 children of preschool age were included in the meta-analysis of mental state talk on false belief in childhood which found a modest effect size of parent mental state talk on children's false belief. Just under half of those studies (12) had controlled for children's own language ability.

While the focus in Devine and Hughes' (2016) meta-analysis was upon theory of mind, (TOM) there is often significant methodological overlap between EU and TOM. For example, "hidden emotions" task is categorized as both TOM and EU depending on the study involved (Tompkins et al., 2018, p. 230-231) and many studies of TOM use Denham's (1986) "affective perspective taking" techniques which examines pre-schoolers understanding of others' emotions.

While both meta analyses found that the relation between parent ISL and child EU/ TOM remained small but significant even when children's language ability was considered, in the absence of adoption studies, potential confounding factors include shared genetic influences on underlying factors such as empathy and language ability. For several of the moderators of the association between parent ISL and child EU, in Tompkins et al. (2018) there were just two studies, and the relative impact of those studies on the overall meta-analysis results may be disproportionate. In the empirical literature on ISL and EU, including the two meta-analyses described above, a large majority of children were of preschool age, when the association of parent language and child understanding may be strongest. Fewer studies have examined the association between parent language and child understanding of emotion beyond the preschool period and further studies of older children should be included in meta analyses. There is little research on the relationship between emotion understanding and parent ISL among children who have emotional and behavioural difficulties and arguably, this is a much-neglected area. A meta-analysis on this topic would be particularly interesting from a theoretical and practical perspective. The factors that support children with emotion and behavioural difficulties to understand and regulate emotions is of particular interest. For example, does parent ISL help children with EBD use their understanding of emotion to inform their ability to relate to others? The two meta-analyses alongside the decades of research literature preceding these, give indications that for children in community groups a significant association persists between parent ISL and children's emotion understanding. Parent use of ISL has been neglected among children with emotional and behavioural difficulty to date. The particular challenges for children with

emotional and behavioural difficulties in managing emotion makes knowing what helps them understand emotion more crucial.

Emotion coaching. ISL use by parents may be viewed as an emotion coaching and socialization mechanism whereby children's ongoing emotional responses are acknowledged, labelled and contextualized during a stressful encounter. Optimal parental "coaching" of emotion has been shown to have significant benefits for children when they experience difficulties with emotions (Gottman, Katz & Hooven, 1996; Johnson, Hawes, Eisenberg, Kohlhoff, Dudeney, 2017). These include actions such as responding in a child-focused way to the child's emotional signals, by addressing problems when the child's emotional arousal is lower rather than higher and through acceptance and empathy when emotions are expressed. These behaviours are termed "emotion socialization" (ES) behaviours, which is an overarching term referring to *active* processes in ES including emotion discussion, emotion coaching and parental reactions to children's emotions (Eisenberg, Cumberland & Spinrad, 1998; Johnson, Hawes, Eisenberg, Kohlhoff & Dudeney, 2017). As the term ES denotes, emotion socialization incorporates ISL use by definition, and is distinct from more passive methods of socialization such as general parental tendency towards emotional expressiveness (Johnson et al., 2017). ES behaviours by parents have been associated with small but significant differences in children's behaviour over time. In a meta-analysis of 49 studies of parental emotion socialization behaviours and children's adjustment studies, involving over 6,200 children. Johnson et al. (2017) found that ES behaviours in parents were negatively associated with children's externalizing behaviours both concurrently (49 studies) and prospectively (14 studies). Both positive (encouraging or supportive) emotion behaviours and negative (discouraging, dismissive

or unsupportive) parent behaviours towards children's expressions of emotion were significantly associated with children's externalizing behaviours. Negative emotion socialization parenting strategies, showed a greater effect size on children's conduct problems, indicating the importance of less "visible" parenting strategies. For example, ignoring or dismissing children's emotional displays, avoiding emotion discussion and failing to react to lower threshold signals of emotion may contribute to the development of an externalist or behavioural style of problem-solving emotions for children. In the meta-analysis, factors negatively associated with emotion socialization outcomes included lower parent age, male child gender and lower SES (Johnson et al., 2017). This large analysis reflects an important finding that has recommendations for parenting interventions about the importance of targeting both negative and positive parenting emotion coaching strategies. The study could not rule out child effects on the data and few clinical studies were reported.

Mentalizing and attachment. There is an emerging empirical literature on the link between parents' tendency to discuss emotional and mental states and children's socio-emotional outcomes including attachment security and behavioural difficulties. Parental ability to tune into children's mental states has been termed "reflective function or RF" (Rosenblum, McDonough, Sameroff & Muzik, 2008; Sharp & Fonagy, 2008; Slade, 2005) has been called "mentalizing ability" (Fonagy, Steele, Steele, Moran and Higgitt, 1991; Sharp, Fonagy & Goodyer, 2006) or "mentalistic reasoning" (Luo & Baillargeon, 2010) or "mind-mindedness" (Meins, Centifanti, Fernyhough & Fishburn, 2013; Meins, Fernyhough, De Rosnay, Arnott & Leekam, 2012). While some authors propose that these constructs are distinct, for example, Rosenblum, et al. (2008) describe affect tolerance as a core feature of RF, others have failed to identify

significant differences between them (Zeegers et al., 2017). In the present study, the focus is on the socializing and didactic functions of ISL, however, the importance of the construct of mentalizing has relevance as an alternative theoretical approach in the associations with attachment.

Regardless of the term used, the above constructs refer to a parent's capacity to be psychologically minded, to infer intentionality and tune into the mental, and affective state of the infant or child resulting in needs-focused or sensitive behaviours. Internal state language, "mind-minded" comments or "attuned" comments are manifestations of this parental tendency. The combination of ISL use by parents co-occurring with responsive or sensitive parenting has been proposed as the mechanism involved in promoting secure attachment. It is this secure attachment that is proposed to influence children's socio-cognitive development (Bretherton, Bates, Benigni, Camaioni & Volterra, 1979; Luyten & Fonagy, 2014), because cognitive development thrives from a secure base from which the child can explore and learn. Mind-minded comments are thought to facilitate secure attachment by reducing the mis-attunements that can arise in interaction (Longobardi, Spataro & Colonessi, 2018; Meins, 2013; Meins, Centifanti, Fernyhough & Fishburn, 2013; Meins, Fernyhough, de Rosnay, Arnott, Leekam & Turner, 2012; McMahon & Bernier, 2017). There is evidence that parental use of ISL/ mental state talk may be associated with differences in children's attachment security (Becker Razuri, Hiles Howard, Purvis & Cross, 2017; Laranjo, Bernier, Meins, 2008; McMahon & Bernier, 2017; Meins, Fernyhough, de Rosnay, Arnott & Leekam & Turner, 2012; Sharp & Fonagy, 2008). Compared with insecurely attached children, Becker Razuri et al. (2017) found consistent differences in mental state talk of mothers of securely attached toddlers and pre-schoolers over time with greater references to

cognitive terms such as “know”. Meins, Fernyhough, de Rosnay, Arnott, Leekam and Turner (2012) found that accuracy of parental “mind-minded” comments predicted children’s attachment security and in Meins, Fernyhough, Wainwright, Clark-Carter, Das Gupta, Fradley, and Tuckey, (2003), parental mentalizing accuracy was negatively associated with disorganized attachment.

The mechanisms purported to underpin the associations between mind-minded comments and child attachment security are manifold and often poorly specified. For example, *reflective function* (RF) is described as the capacity to tolerate, regulate and reflect on mental states (Sharp & Fonagy, 2008) which steers away from references to both parental actions and child behaviour. Ainsworth, Bell and Stayton (1972) proposed *maternal sensitivity* was the mechanism in increased attachment security for infants which proposes a role for decreased infant stress arising from parental predictability. The construct of “*mind-mindedness*” emphasizes both increased mind-reading of children’s needs through both behavioural and mental processes, i.e., more contingent responding to child needs as well as the parental tendency to comment appropriately in mentalistic terms about their infant or child’s experiences (Meins, Fernyhough, de Rosnay, Arnott, Leekam & Turner, 2012). The associations between parent tendency to use ISL and child attachment security may be related to factors other than mentalistic reasoning. Socio-economic stressors and genetic variation may account for some of the variation in attachment and parenting. Thus, the link between sensitive parenting and child outcomes such as attachment security may be evident in parent language about mental states but not wholly explained by the above models. The next section examines the role of parent ISL in emotion coaching or helping children regulate behaviour.

Narrative context. The role of ISL in reminiscing and memory is the fourth area of investigation into children's affective development that is examined. Steele, Steele, Croft and Fonagy (1999) found that maternal "coherence" (i.e., structured narrative) and realistic emotional expression during pregnancy was linked with child later understanding of mixed emotional valences at 5 - 6 years of age. Steele et al. (1999) proposed an attachment model as the mechanism, i.e. that maternal sensitivity evidenced during pregnancy promotes secure attachment in infancy, which creates an environment that fosters acceptance of child emotion and subsequent child emotion understanding. Harris (2000) suggests that it may not be necessary to have a two-step explanation as proposed by Steele: a verbally skilled parent who provides coherent narrative about a stressful event may also foster the linguistic environment and narrative structure that promotes children's emotion understanding, (Harris, 2000). There is increasing evidence to suggest that Harris's view is correct. Maternal coherence during narration has been investigated during reminiscing tasks with children and findings suggest that the domestic environment associated with coherent and child-centred discussion produces outcomes for the child that are different to narratives which are dominated by parents or where no adequate structure to the narrative is provided (Salmon & Reese, 2015).

Permission to discuss mental and emotional states may be reflected in regular ISL use possibly reflecting different attitudes towards emotion within the family. An attitude of openness towards discussing emotion may be associated with emotional and behavioural outcomes, thereby confounding issues relating to attachment and ISL use. During an investigation of dinnertime conversations, Bohanek, Fivush, Zaman, Lepore, Merchant and Duke (2009) found that mothers and children who engaged in

reminiscing about past shared events had children with significantly fewer internalizing problems. Furthermore, fathers who were more engaged in requesting information had children with fewer internalizing and externalizing problems. Openness to emotion discussion may reflect family attitudes towards emotion expression which are particularly salient when difficult events or negative experiences are discussed. One aspect of reminiscing that has been extensively studied is the role of reminiscing in helping children form autobiographical memory and parent ISL and encouragement of reminiscing has a role to play in this. ISL during narrative discourse with children facilitates young children's emergence of self and identity through facilitating comparison between the thoughts and ideas of a younger version of self with the present self ("me then versus me now"; Fivush and Nelson, 2006). Reasoning processes like these, the authors suggest, allow comparisons between different self-states, contributing to the emergence of autobiographical memory, (McDonnell, Valentino, Comas & Nuttall, 2016).

Parent-child discussion of emotionally difficult events or negative experiences has been shown to contain greater references to internal states compared with positive events (Labile, 2011). In such contexts an open attitude to discussing emotions may be particularly important. Salmon and Reese (2015) discuss narratives about conflict, stress and traumatic experiences. They highlight how parents may amplify or ignore aspects of the child's experience which may have consequences for the child's emotional wellbeing. In optimal circumstances, parents with greater sensitivity during conversation are more likely to focus on details salient to the child. Providing a structure to narrative may help when difficult events need to be discussed. McDonnell, Valentino, Comas and Nuttall (2016) found that the mixture of attachment style and

reminiscing style jointly predicted poor autobiographical memory in children among “at risk” families. Where structural elaboration was used in reminiscing tasks, autobiographical memory was better. Structural elaboration by mothers is described as eliciting or providing additional details in conversation while emotional elaboration elicits or references detail about specific emotions (McDonnell et al., 2016). When emotional talk/ elaboration occurs in the absence of context, fewer positive outcomes were found (McDonnell, Valentino, Comas & Nuttall, 2016), i.e., emotion talk in the absence of structured reminiscing was linked to poorer recall of events in the children, especially when maternal avoidance of emotional events was seen. Reese and Newcombe (2007) used an experimental coaching paradigm to train mothers of toddlers to use coherent, elaborative language during conversations and found that children’s recall increased when their mothers used more elaborative discourse and this effect was significantly greater for children who already had strong self-concepts and narrative skills. While not conclusive, it seems that affective, linguistic and cognitive factors may underlie some of the associations between parent use of ISL and child outcomes in domains of attachment security and recall during reminiscing and emotion understanding in children from community samples.

Summary

In summary, this section has discussed the various functions of parent ISL supporting children’s social, cognitive and emotional development by providing a vocabulary for internal mental states in everyday conversation. Parent ISL has been studied with various theoretical lenses including contexts of mentalizing and attachment, emotion socialization and reminiscing. While all of these are important, the present study investigates the role of parent ISL as a potential contributory factor

specifically in children's understanding of emotion. Thus, asking if parent use of ISL creates a backdrop whereby children's performances on standardized tests of emotion understanding are better or worse depending on the degree to which parents use ISL? The answer for young children in typically developing groups appears to be "yes." Parent ISL appears to be particularly important as an emotion-socializing mechanism, but much more needs to be understood about these processes. Some of the meta-analyses noted account for language ability but not all studies do. One of the questions that arises in ISL asks if the association between parent ISL and language is simply a reflection of parent intellectual ability. Can the differences in children's outcomes be predicted by parent language use alone, for example? Do outcomes associated with constructs such as mentalizing or supportive emotion discussion for example, simply reflect a combination of parenting sensitivity and parent education or IQ? In the next section, the association between ISL and parent language is explored including the role of SES in language quantity and complexity and how this may influence what parents say. Then the review examines contextual factors on parent ISL including parental characteristics and ISL and the role of gender and cultural differences.

What Influences Parent Talk About Internal States?

This section addresses several facets of parent language that relate to talk about mental states. This includes the role of socio-economic related differences in language production and other language factors such as the role of language complexity and coherence in discussions. The review also examines parent's own attributes such as gender, sensitivity and contextual factors such as the conversational setting and the role of subtle cultural differences in vocabulary about mental states.

Quantity. The relationship between socio-economic factors and the quantity and diversity of language spoken by parents was brought into focus by Hart and Risley's (1995) longitudinal study exploring daily language and interaction between families and their young children over the course of approximately three years. Their study identified an exponential divergence in young children's language exposure depending on the socio-economic status of the child and family, with children on welfare hearing approximately half of the quantity of language than children from lower socio-economic groups, who in turn heard far fewer different types of words per hour than children from higher socio-economic groups. While their study has been critiqued on a number of theoretical, methodological and ethnocentric grounds (e.g., Dudley-Marling & Lucas, 2009), the results hint at the complex underlying issues involved in economic differences and point to the gap in language exposure for children at the socio-economic margins. Greater parent language complexity and quantity is associated with higher SES and greater use of spoken language and vocabulary during daily interaction with children, than lower SES groups (Hart & Risley, 1995). Parental use of internal state language, like other aspects of parenting behaviour, is intricately connected with other

factors such as parent language, culture, gender, experience, beliefs about parenting, child development and learning (Bornstein & Bradley, 2014). In Hart and Risley (1995) and in Rowe (2012) SES related language differences involved both quantity and quality of language exposure for lower SES children, with quality representing diversity of vocabulary. Rowe (2012) found that both quantity and complexity of parent language were associated with variation in toddler language on 1 year follow up. Parent language factors found to be associated with variation in children's understanding of emotion have included diverse lexicon, narrative style and quantity of language use, (Carpendale & Lewis, 2006; Harris, de Rosnay & Pons, 2005).

Parent language quantity has been associated with children's language on reminiscing tasks, with parent use of ISL linked to children's use of ISL. For example, children's engagement with a reminiscing task and their recall on a conversation or reminiscing task has been associated with greater quantity of parent speech (Labile & Song, 2006; Morris, Baker Ward & Bauer, 2010; Labile, Panfile Murphy & Augustine 2013; Ornstein & Haden, 2001). Greater quantity of ISL spoken in the home has also been associated with increased ISL use by children in some studies (Jenkins, Turrell, Kogushi, Lollis & Ross, 2003). Jenkins et al. (2003) found that 11% of the variance in children's internal state talk at 4 years was attributable to the quantity of family use of ISL. Exposure to quantity of language and type of language it seems may be associated with children's use of ISL.

Quality. The quality of parent language may be considered in a number of different ways, for example, it may relate to the type of language or breadth of vocabulary used or parent language quality may relate to coherence or structure of their

narrative during storytelling or reminiscing. This section examines these two different aspects of quality.

Language and child development. As alluded to in an earlier section, there is evidence to suggest that parents may be developmentally sensitive to their children's needs when using ISL. The acquisition of the milestone representing theory of mind (TOM) which occurs in children around four years of age, is associated with changes in parent use of cognitive terms. Brown and Dunn (1991) and Taumoepeau and Ruffman (2006, 2008) found increased references by mothers to thoughts and beliefs around children's third birthdays before the standard theory of mind tasks are passed. At the time of another developmental milestone; the emergence of joint attention skills, which typically occurs between the ages of 9 and 12 months, Slaughter, Peterson and Carpenter (2008) found that the type of mental state talk used by mothers during free play changed just after the infant began to engage in joint attention. In Slaughter et al.'s (2008) study, once children began to reliably engage in joint attention, parental use of perceptual terms decreased and their use of terms relating to the characteristics of the object of joint attention increased significantly. These two studies indicate changes in parent language occur just before or at the point of acquisition of a significant cognitive developmental milestone. In a study of ISL and child developmental stage, parental ISL use was associated with the mean length of utterance (MLU) of toddler and preschool age children (Jenkins, Turrell, Kogushi, Lollis & Ross, 2003) with parents using different categories of ISL depending on their children's MLU. Collectively these findings support the suggestion that parents may alter the complexity of their language including the type of ISL they use in accordance with emerging cognitive milestones in their children. One of the questions that arises from these studies asks if all parents respond to their children's developmental milestones in this way. Do these processes

operate for all parents across typically developing and non-typical groups? For children with emotional and behavioural difficulties, for example, is there a difference in the quality of parent ISL, or in the type of ISL used by parents in either group?

Language quality and coherence. In an earlier section, language coherence and attachment were discussed. Here the question of story structure and affect are the concern. As noted earlier, highly elaborative parents may tell more coherent stories (Harris, 2000; Salmon & Reese, 2015) and ongoing exposure to this kind of narrative structure may then train children to construct stories in similar ways when they are encoding events. Fivush, Hazzard, McDermott Sales, Sarfati and Brown (2003) interviewed 29 children between the ages of 5 and 12 years who had grown up in violent communities, about their experiences of positive and negative events and found that ISL use during highly stressful or negative events was greater. In addition, narrative recall was more coherent for stressful events. Fivush and colleagues suggest that the narrative structure of negative events helps to generate a more coherent story, as the negative events present a problem to be solved. There is suggestion that a tipping point might arise in narrative coherence for stressful events. Terr (1991) and McDonnell, Valentino, Comas and Nuttall, (2016) suggest that narrative for stressful events becomes increasingly fragmented with increased stress. If this is the case, then emotional narration in the absence of a coherent structure, may serve to amplify the emotion experienced during the reminiscing and fail to integrate the narrative into autobiographical memory. For children who experience high levels of physiological emotional arousal, the question of narrative structure in supporting reminiscing or problem solving is of particular importance but beyond the scope of the present study.

Complexity. The third dimension of parent language that relates to ISL production is complexity of language. There is an ongoing debate about the relevance of syntax and ISL versus the importance of general language ability such as having a broad vocabulary not only for parent ISL but also as “complements to cognition” i.e., as components of grammatical structure that support both theory of mind and emotion understanding (J. de Villiers and Pyers, 2002). The arguments for the “complement” structure in theory of mind is the most debated and will be presented here for comprehensiveness. However, the main concern of the present study is emotion understanding and ISL rather than theory of mind.

De Villiers and de Villiers (2000) and Tager-Flusberg and Joseph (2005) argue that in order to comprehend false belief statements, children need to understand complementation syntax. The argument for the importance of complementation syntax at its simplest, proposes that understanding of this syntactical structure is crucial in order to locate or place mark who owns which belief and thereby assisting the decision about which idea is false and which is true on theory of mind tasks. Complementation syntax has been consistently linked to internal state language use, to false belief understanding and is associated with more lengthy sentences as well as “place marking” the status of the belief. J. de Villiers (2005) suggests that this requires specific syntax as well as knowledge of semantics and thirdly that the completion of the knowledge and also requires an understanding that something may not be true. What is clear is that at the simplest level of analysis, sentences requiring complement syntax are longer because one says or thinks “about” something. So, for example, “I think” as a stand-alone statement would perhaps not be counted as an instance of ISL, but “I think it’s a dog” is. Methods of calculating ISL are intricately linked with increase in sentence

length because of the complement structure; sentences must be longer to contain the additional grammatical units required.

Perner, Zauner and Sprung (2005) suggest that children master the notion of difference in points of view independently of syntax. Evidence for this, he suggests comes from implicit understanding of the perspectives and mental states of others. Children can attribute different preferences and perspectives to people at the age of 3 years (e.g., “you like pickles and I do not”). Perner et al. suggest that syntactic structures and increases in vocabulary allow the fuller theory of mind to emerge. Perhaps there are many roads to understanding mind and emotion in others. De Villiers (2005) suggests this in her discussion, as do Harris (2006) and Lohmann and Tomasello (2005) who conclude that both syntax and semantic or conceptual understanding of other’s minds are different roads to the same place. Milestones in linguistic expression such as syntax, de Villiers suggests, might get us there faster.

Why discuss syntax in the context of emotion understanding? The issue of syntax and grammatical complexity is relevant for emotion understanding and parent ISL because it supports the ability to placemark belief, to think about abstracts and to “wonder if.” These forms of thought all require additional grammatical markers for the insertion of the propositional clause and a more dimensional perspective of the belief and thoughts of others. Therefore, it is likely that parents with greater complexity of language may be better able to use ISL, but whether this happens routinely is a different matter. This question is of particular interest when considering a group of children with emotional and behavioural difficulty. It is as yet unclear if parents of children with EBD use similar quantities of ISL compared with community parents or if language structures such as syntax and grammar are associated with ISL in the same way for

parents in both groups. In the next section, we return to the contexts in which ISL is used by parents and children.

Contextual Influences on ISL

Setting. Children's exposure to ISL or mental state talk tends to occur during routine interactions with parents and family members, during play and conflict interactions with peers and siblings, during narrative discourse as well as during special time such as book reading. Routine discussion of emotions or motives during typical caregiving interactions in the home provides opportunities for children to learn about their own and others' mental states and to use this information to assist them in social interaction with their peers. During book reading, storytelling and troubleshooting typical interactions, toddlers and pre-schoolers are exposed to considerable debate by parents regarding mental states, which includes discussions of real versus imagined events or the difference in perspective between the self and other (e.g., Dunn, Brown, Beardsall & Slomkowski, 1991; Harris, 2000; Nelson, 2005). Conversational settings with families often include dinnertime discussions of emotion and mental states, as well as narratives about the child's day (Bohanek, Fivush, Zaman, Lepore, Merchant & Duke, 2009).

Parent and child shared book reading with young children typically occurs several times per week among middle and upper SES families in Western societies, and is a valued source of language learning and reflection, (Burgess, 2011; Bus, Van Ijzendoorn, & Pellegrini, 1995; Hindman, Skibbe & Foster, 2014). Shared book reading has been shown to have an association with child language and subsequent literacy (Hindman, et al., 2014; Senechal, le Fevre, Thomas & Daley, 1998) and provides

opportunities for the child to consolidate language and share meanings about how things work. These conversations may encompass more complex ideas and vocabulary than normal conversation (Hindman, et al., 2014). In a large, ethnically diverse sample in the USA, Hindman, Skibbe and Foster (2014) found that clarifying and discussion of meanings was a primary focus for parents in shared reading with their young children and meaning-related talk was associated with consistent differences in children's oral language abilities. In line with findings on the association between language complexity and SES (Hoff, 2003), higher parent educational level was associated with greater quantity of meaning related talk. The findings indicate that book reading may be an effective means of eliciting ISL in parent-child dyads in middle income families.

Longitudinal versus cross-sectional studies. In Devine and Hughes (2016) and Tompkins et al. (2018) research, study context mediated the relation between parent ISL and child EU however, the findings varied according to the two meta-analyses, with longitudinal studies showing stronger associations between parent ISL and child TOM in Devine and Hughes' (2016) meta-analysis, whereas in the meta-analysis by Tompkins et al. (2018) effect size was not related to the length of time of follow up. Greater effect size was shown on naturalistic and self-report studies (compared with play or reminiscing contexts) and on longitudinal studies of more than 1 year. It is not clear if underlying methodological differences in the scale of studies undertaking longitudinal follow up were present which may account for such findings.

Intra-cultural differences. In Western European culture, infants as young as 16 months are exposed to an ongoing stream of internal state language production by parents (Becker Razuri, Hiles Howard, Purvis & Cross, 2017) which increases in complexity during the toddler years. Cultural factors may play a significant role in

parental tendency to use mentalistic language or emotion talk (Hughes, Devine & Wang, 2017; McMahon & Bernier, 2017; Pintar-Breen, Tamis-La Monda, Kahana-Kalman, 2018), and supportive parent behaviours in one context may not be appropriate in others (Pintar Breen et al., 2018). In a study that integrates the discussions regarding language, culture and the relative influence of context over individual differences, Garrett-Peters, Mills-Koonce, Adkins, Vernon-Feagans, Cox et al. (2008) examined emotion talk among 1111 ethnically diverse parent-child dyads in the USA. The children were infants, aged 6-8 months and the focus was parent emotion talk using a free play procedure. This large study identified that cultural context and maternal qualities were the most important correlates of ISL production by mothers at this early stage of child development, with no findings associated with child characteristics. The infants in the study were very young, so child characteristics were still emerging. Socio-economic factors were highly significant in this study. Mothers with African-American ethnicity used more positive and negative emotion talk than other ethnic or cultural groups. High needs to income (i.e., greater poverty) was associated with more negative talk and wealth associated with more positive talk, consistent with other research findings that negative parenting behaviours are associated with higher economic needs identified elsewhere (e.g. Conger, Conger, Elder & Lorenz, 1992). Poverty and financial difficulties affect family stress levels which may influence children's exposure to mental state talk in diverse ways. The authors propose that these cultural differences may stem from underlying differences in experiences of different ethnic groups and that emotion talk may be valuable for minority group within the US socio-cultural context. Doan and Wang (2010) investigated ISL in Chinese immigrant and European Immigrant American families and found greater use of behavioural description in Chinese Immigrant language and greater use of ISL in European American families. In a study

comparing hearing impaired and hearing children's internal state language exposure, examination of British and Swedish families' use of internal state language with their hearing children showed that British families used more references to mental states than Swedish families, although there was an age difference in the samples of British and Swedish children that may have accounted for this (Morgan, Meristo, Mann, Hjelmquist, Surian & Siegal, 2014). Taken together, these findings suggest that cultural differences seen across nationalities and ethnicities contribute significantly to the variation in ISL/MST production by parents and the relative importance of MST varies according to cultural outlook.

Parent Characteristics Associated with ISL

Attitudes to learning. One study that taps into underlying factors aside from SES is a study by Hutchins, Bond, Silliman and Bryant (2009) which examined parental attitudes. Parental beliefs about knowledge acquisition have been linked to the production of mental state talk in a study of parents and children which categorized beliefs about knowledge acquisition or "epistemological beliefs" based on statements the parents of young children made about knowledge and learning (Hutchins, Bond, Silliman & Bryant, 2009). Using Belenky, Clinchy, Goldberger and Tarule's (1986) classification of "ways of knowing," Hutchins et al. (2009) endeavoured to establish if the frequency of mental state talk, by parents during conversations with their children, was related to expressed attitudes and beliefs about learning and knowledge. They found that passive and less conscious knowledge acquisition styles were associated with less ISL and less child directed speech. An example of passive learning style (called "silenced knowing" in the study), typically expressed a view that knowledge is something that is known or is. On the other end of the continuum of engagement with

knowledge, within the sample described by Hutchins et al. (2009), the highest level of complexity in beliefs was “procedural knowledge.” Procedural knowledge was associated with an active engagement with information and an understanding that knowledge may be acquired in a variety of ways. Active/ engaged learning beliefs (procedural knowledge beliefs) were associated with higher maternal receptive language scores, greater verbosity and with increased use of mental state talk across all MST categories. While maternal language scores, lexicon and quantity of talk were all important in this study, beliefs about knowing also contributed to the variation in mental state talk used by the parents in the study. Furthermore, parents and children’s’ quantity of MST was correlated. While there were a number of critiques that might be levelled at this study (e.g. the numbers in this study were small, with just four participants in some of the subgroups of knowledge styles, and there was a small socio-economic range); it is one of the few studies to attempt to represent some of the psychological factors contributing to mental state talk use by parents although the self-report nature of the study may confound factors.

Gender. A previous research emphasis towards the study of mother- infant dyads in the study of emotion socialization has shifted in recent years, towards a focus on older children and both parents, with increased focus on the importance of differential socialization of emotion by fathers and mothers across children’s stages of development. There are strong indications that differences exist between fathers and mothers regarding the quantity of ISL/ emotion talk in conversation with their children. With toddlers and older children, both on one to one, dyadic interaction (parent and child) and two to one, triadic interaction (both parents and child), mothers tend to talk more than fathers about emotion and internal states; typically having slightly longer and

more in-depth conversations than fathers (e.g. Kornhaber & Marcos, 2000; Jenkins, Turrell, Kogushi, Lollis & Ross, 2003, Van der Pol, Groenevald, van Berkel, Endendijk, Hallers-Haalboom, Bakermans-Kranenburg, & Mesman, 2015; Zeman, Perry Parrish & Cassano, 2010).

Examining discussion of specific emotions by parents with sons and daughters has identified differences in the ways in which fathers and mothers talk with their children about different emotions. Zeman, Perry-Parrish and Cassano (2010) showed that both mothers and fathers have longer conversations about anger than about sadness. Fathers were identified as labelling “sad” feeling states more with their middle childhood aged daughters than with sons (Zeman et al., 2010) and mothers used more emotion coaching techniques with older daughters.

In addition to differences between mothers and fathers in the quantity of emotion/ ISL talk, whether parents use the same amount of ISL/ emotion talk with their children of either gender is not completely clear. Many studies of ISL/ emotion talk and gender have found no differences in the quantity of such talk that mothers employ with sons or daughters (e.g. Hughes, Fujisawa, Ensor, Lecce & Marfleet, 2006; Jenkins et al., 2003; Recchia & Howe, 2008; and Zeman et al., 2010) although some contradictions to this are also found. Roger, Rinaldi and Howe (2012), for example, found that mothers used more ISL with their toddler sons than daughters. In Zeman et al. (2010), mothers generally used similar quantities of emotion words with daughters and with sons; however, the proportion of positive to negatively valenced emotion words differed if the offspring were sons as opposed to daughters. Looking at a younger cohort, Van der Pol, et al. (2015) studied 317 toddlers during conversation about emotion with mothers and fathers and followed up again one year later. They concluded that mothers talk for

longer about emotion than fathers; that both parents discuss anger more frequently with their sons than with daughters and suggested that emotion discussion that happened in families was related to the child's level of emotion understanding.

Summary

The above section highlights the parental, contextual and cultural experiences associated with ISL use and language. Parent ISL is linked to gender, to parent's own characteristics as well as to socio-economic factors and language complexity. These all set the scene for ISL. There is much yet to be known about how ISL works in various contexts. A majority of studies have concentrated on diverse community groups with a range of theoretical orientations. Findings are therefore difficult to integrate using different models. Two important meta-analyses examining parent ISL have identified a small but significant link between parent ISL and children's socio-emotional competencies which include emotion understanding and theory of mind. Though the associations of genetic influences cannot be ruled out, these studies provide important continuity in the association between these constructs which has been found over more than two decades. While those studies have been conducted with younger children in the main, they provide important information about the correlates of children's emotion understanding which include children's own language development and parent ISL. The influence of parent ISL beyond the preschool years is less examined and the role of parent ISL in children with emotional and behavioural difficulties is less well understood. Based on findings in the present review, the importance of examining ISL among parents of children who are experiencing clinical range difficulties is of particular importance. Does the language of parents who have children with emotional and behavioural difficulty (EBD) for example, display the same quantity of references

to mental states as that of parents where children do not have such difficulties? We expect that parent ISL and child emotion understanding will be associated for children with typical development, but how does this operate where children have difficulty with emotions and behaviour? Is the small but significant effect of parent ISL on children's emotion understanding to be found among children with mental health or emotional difficulties? This review has highlighted the importance of parent talk about mental states in a variety of contexts, including attachment and in providing contextualized or elaborated information for children. The relevance of parent ISL in discussing negative emotional states has been highlighted also. In the present review, these aspects are not examined, but the question of primary interest is how parent ISL shapes the emotion understanding of children with emotional and behavioural difficulties. The research has highlighted the relevance of language complexity and socio-economic status in the production of language so controlling for SES and other factors associated with language development such as educational level, is an important task in any endeavour investigating ISL.

This section has focused primarily on parent use of ISL. Next, the discussion turns to children's use of ISL terms and its emergence in development and in doing so, theories about how children internalize information from the context and language that surround them are reviewed.

Child ISL

Overview

This section examines children's internal state language, taking a look at the emergence of ISL during childhood, individual and contextual predictors of ISL and ISL among specific subgroups of children.

Emergence of Internal State Language

When they first appear in infancy, references to internal states usually involve comments about physiological states, perceptions and desires, such as “look” or “I want” (Adrian, Clemente & Villanueva & Rieffe, 2005; Becker Razuri, Hiles Howard, Purvis & Cross, 2017; Bretherton & Beeghly, 1982; Poulin-Dubois, Chiarella & Polonia 2009; Slaughter, Peterson & Carpenter, 2007). Bretherton and Beeghly (1982) were the first to systematically examine internal state language emergence and their findings have been replicated by researchers since (e.g., Becker Razuri et al., 2017). They identified six categories of references made by very young children to physical, perceptual, volitional, cognitive and moral/emotion words. Young children aged 16 months do not typically produce references to mental states whereas by the time they are 26 months old, more than half will typically begin to use some references to physiological states (Becker Razuri et al., 2017). During the toddler years, internal state language becomes increasingly complex and begins to include language relating to cognitions. Bartsch and Wellman (1995) identified two types of mental state talk between the ages of 18 months and 5 years; namely language relating to desires or wants (“desire talk”) and language relating to thoughts or beliefs; (“cognition talk”). Poulin- Dubois et al. (2009) identified a progression from perceptual words emerging first in infancy, (such as “look “or “see”), followed by physiological and emotion words and lastly by cognitive terms. Emotion words are seen with greater frequency in the 2 to

3-year age range. Cognitive terms emerge initially at approximately 2 years of age (Jenkins, Turrell, Kogushi, Lollis & Ross, 2003) and increase significantly from the age of 3 to 4 years (Poulin-Dubois, et al., 2009; Shatz, Wellman & Silber 1983). Poulin-Dubois et al. (2009) point out that use of cognitive internal state language terms such as “I think” or “know” increase in frequency at around four years when standard theory of mind tasks are passed and between the ages of 4 and 6 years, cognitive terms are the predominant type of ISL used; (Bartsch & Wellman, 1995; Brown & Dunn, 1991).

ISL in different languages. Cross-linguistic studies have established that ISL use by children appears to develop similarly across languages. Kristen, Sodian, Licata, et al. (2012) followed approximately 70 toddlers for a year and examined the developmental progression of internal state language in the toddlers’ native German. The findings were consistent with other studies in English and French – that desire language emerges before cognitive talk in a majority of children. Kristen et al., found that the progression of “desire talk” to “cognitive talk” did not apply in approximately 12% of the sample at 24 months of age, but at 30 and 36 months this decreased to 8% and 4% of children who did not fit the pattern of “desire talk then cognition talk”. The typical pattern of “desire talk” emerging before “cognition talk”, initially identified by Shatz, Wellman and Silber (1983) was also found in Kristen et al. (2012). The study also showed that frequency of different types of internal state language were related to each other, and that ISL increased at each of the time points of the study overall; as children grew older, the proportion of “cognition talk” increased and ISL increased across all areas. Using prompts to elicit spontaneous narratives about psychological and physical events, both positive and negative, Gobbo and Raccanello (2011) found that nine-year-old children were increasingly psychological in their descriptions of physical

events than 7 or 5-year olds, but when negative events were being discussed, children of all ages had a broader psychological lexicon.

Individual differences in ISL. There is considerable evidence that production of ISL terms is stable over time (Ensor, Devine, Marks & Hughes, 2014) and that significant differences exist between individuals in the production of ISL (Meins, Fernyhough, Johnstone & Lidstone, 2006). Therefore, examining parent and child ISL jointly may provide important information about parental tendency to use ISL during a typical conversation. Although ISL by parents of young infants appears to be correlated with parental characteristics rather than with the infant's (e.g., Garrett-Peters et al., 2008) it is likely that some child effects exist in ISL production by parents. During a "describe a picture" task with 17 to 35-month-old toddlers, parents of deaf children used significantly less language relating to internal states than parents of hearing children (Morgan, Meristo, Mann, Hjelmquist, Surian & Siegal, 2014). Without assuming direction of effects, it is of note that parents use significantly more cognitive terms with their securely attached children, than when children are insecurely attached (McElwain, Booth-La Force & Wu, 2011) and children with intellectual disabilities experience conversations that are reduced in internal state language compared with controls (Fenning, Baker & Juvonen, 2011). As discussed previously, there is compelling evidence to suggest that parental language is frequently tailored to their children's developmental stage, where younger children hear developmentally appropriate discussion of perceptual and mental states, while their older siblings do not (Meins, Fernyhough, Arnott, Leekham, de Rosnay & Turner, 2012).

Gender differences. While it appears that there is a gender difference in the quantity of ISL used by adults, how early this appears it is unclear. For example, is this difference seen in preadolescents or teenagers? There is evidence to suggest that it is. Gender differences in the narratives of adolescents have been identified using a story-telling technique with teenage boys and girls. Zaman and Fivush (2011) found that adolescent girls narrated longer stories regarding their own and parents' experiences, using more elaboration and more affective content than boys. Stories about mothers tended to have greater affective content and contain greater emotion words than stories about fathers. Hughes, Lecce and Wilson (2007) also found that preschool girls used more emotion talk than boys during a free play task, both with siblings and with friends. Fivush, Hazzard, McDermott Sales, Sarfati and Brown (2003) found that 5 to 12-year-old girls gave greater descriptions of both negative and positive events than boys during a reminiscing task recalling positive and stressful events. Collectively, these findings suggest that differences in the quantity of ISL production, may be evident early in development which are linked to the gender of the child and the parent as well as to the kinds of emotions and events under discussion.

Peers and siblings. Brown, Donellan McCall and Dunn (1996) found that sibling and peer conversations were particularly replete with mental state talk compared with young children's conversations with their parents. Sibling and peer relationships have been hypothesized as having a significant role in ISL development and recent meta-analysis by Devine and Hughes (2016) found a modest association between the presence of similar aged siblings in the family home and children's theory of mind, indicating that family composition may have an important role in exposing children to appropriate levelled discussions about mental states. Cutting and Dunn (2006) found

that children's relationship quality was important in the kind of pretence and conflict the children could engage in readily, with siblings enacting a broader range of interactions with each other. Similarly, in the study by Hughes, Lecce and Wilson (2007) differences in the amount of ISL used by children were associated with whom the child was talking, with more intimate sibling relationships associated with greater ISL and emotion talk. However, this was conducted with a very young age group and it is of interest to consider if later differences in the proportion of ISL with siblings compared with friends might change later in childhood, or in early adolescence.

ISL in children with diverse diagnoses. ISL has been little studied among groups of children with particular diagnoses but has not been studied among children with emotional and behavioural difficulties (EBD). Groups where ISL has been investigated include children with hearing problems, children with known socio-emotional difficulties and children with intellectual disabilities. As there is a specific difficulty with social information processing and language in Autism, it is expected that ISL use may be reduced among these children and this is a consistent finding in the studies that have examined this. Kristen, Vouri and Sodian (2015) found that reduced ISL among a group of children with Autism was significantly delayed relative to controls and was closely correlated with their theory of mind (TOM). Siller, Swanson, Serlin and Teachworth (2014) found that children with Autism displayed reduced ISL compared with a group of peers matched for language abilities. When Siller et al., controlled for the volume of spoken language, children with Autism used fewer references to emotions compared with their language matched peers and theory of mind was significantly linked to ISL production. In a study of children with intellectual disabilities, Pochon and Declercq (2014) found that children with Downs Syndrome

(DS) experienced greater difficulties in understanding emotion words compared with children of similar intellectual ability, possibly indicating a specific difference in emotion vocabulary for children with DS. For children who are deaf and children who were hearing, TOM was linked to production of mental state terms with more imaginative and elaborated talk linked to higher levels of TOM (Peterson & Slaughter, 2006).

Face to face versus phone context. Pinto, Tarchi, Gamannossi and Bigozzi (2016) examined children's use of mental state terms during phone narration and during a face to face narration by 115 children aged 5 to 7 years and found that telephone narrations, although shorter in length, included a significantly greater proportion of mental state terms. Two conditions were included, face to face condition and one when the observer was in an adjoining room and unable to view the shared picture prompts. The authors found that the telephone condition used greater proportion of internal state terms and children used volitional terms, cognitive terms and moral terms (good/ bad) most often. Using an adaptation of Bretherton and Beeghly's (1982) coding scheme which includes perceptual and physiological states, as well as mental state terms, the authors found that the speech produced by children in this age range contained approximately 4.5% mental and physiological state terms and spoke 10,000 words per face to face narration versus 7,500 words during a telephone narration. They concluded that children "recontextualized" their language with additional mental state terms during the phone narration as their interlocutor was unable to see the picture prompts. Absence of context, they concluded, may have given children permission to increase use of mental state terms. It may be that when children were less constrained by the presence of the other person that greater mentalization was not only possible, but also required

because they were unable to see their conversational partner. Perhaps greater requirement for mentalization in the phone context was reflected in greater quantity of ISL.

Labelling effects. One of the features of language is its ability to represent and draw attention quickly to elements of experience. Called “verbal pointing” by some authors language has a dual benefit, in drawing the attention of the listener and in aiding the speaker to share what they are thinking (Boutonnet & Lupyan, 2015). Both Vygotsky (1978) and Piaget (1964) emphasized the role of internal or private speech in clarifying thoughts. Lupyan and colleagues have considered this in their experiments on object recognition and sound recognition. There is some evidence that using internally directed speech may help shape thinking (Lupyan & Bergen, 2016) and may help detect perceptual features of an object quicker than other visual or auditory cues (Lupyan & Bergen, 2016). Labelling has been found to shape perception so that the representation chosen becomes more categorical and the effect of verbal labelling heightens this tendency in a way that other forms of representation do not. Prototypical characteristics of an object are elicited by a verbal label compared with a different auditory cue (e.g., a sound of the same object) (Lupyan & Bergen, 2016). Access to verbal labels for objects, Lupyan and colleagues suggest, not only speeds up the perceptual process, but also makes the representation more categorical or stereotypical. While these studies are conducted with pictures and sounds in the main, there may be some interesting studies in the area of emotion or mental state identification that could shed some light on these processes.

Internalizing new information. There is much written on the relationship between cognition and language which is beyond the scope of the present review. The

importance of language as a medium for transmitting constructs and knowledge has been emphasized by Vygotsky (1978) and Bruner (1990). In this tradition, socially constructed knowledge is learned from interaction with others and language plays a crucial role in the transmission of constructs from expert (parent) to novice (child). As language develops in young children, their ability to represent cause and effect in the world is viewed through “private speech” or a process of “internalization” which Vygotsky sees as a re-working of concepts learned from their social environment into internal working models which form the architecture for subsequent independent learning (Damianova & Sullivan, 2011; Vygotsky, 1978). External props or auxiliary aids (words or objects) are linked to the mental action and fall away once the mental action has been mastered. The use of self-talk or private speech as the primary mechanism is emphasized, “this type of speech is the ultimate expression of the inner operation of the mind as a whole” and forms “the internal psychological foundation upon which the mediation and internalization of other higher mental functions evolve” (Damianova & Sullivan, 2011, p. 348). The view which is oversimplified here, is that parent language surrounds the child and acts as prompts and scaffolding until the child acquires the new cognitive structure in their own mind. Private speech or self-talk is considered to be a key part of the acquisition of new information. The present study of ISL does not examine private speech in children, but does follow the Vygotskian tradition of viewing the spoken environment that surrounds the child as laying foundations for future cognition, depending on the conditions. In the present study, those conditions may include children’s own language development, socio-economic constraints, attention and emotional factors that impinging on the ability of the child to take up the information on offer, which in the present case is parent language about mental states. Language allows a parent direct a child’s attention towards the salient

features of an object, so it is of interest if labelling of emotions or cognitions by parents during narration with their children may draw children's attention to the emotional or cognitive aspects of a feature. The assumption is that if parents habitually engage in reasoning about psychological states, people's motivations, desires and thoughts that their children will be surrounded by a linguistic environment that emphasizes these kinds of mentalistic features and children will begin to produce those terms themselves and to understand mentalistic features of a situation better. Parent ISL is considered to be the ground from which children's abilities to understand the minds of others may emerge.

Summary

This review has examined some of the major research themes in the study of parent and child internal state language (ISL). In an earlier section, parent ISL was reviewed and key associations were outlined, such as SES, gender, setting and the child's developmental stage. The present review of ISL in children has highlighted the developmental progression of ISL, discussed individual factors associated with production and use of ISL among children with known difficulties in specific areas of development such as Autism. This review examined features of language, such as its ability to direct attention of the speaker to salient features and briefly discussed the process of internalization of new information by children. In the review on parent ISL, the discussion referenced how complexity, quantity and quality of language spoken in the family home are linked to ISL production. These features of language shape the way in which ISL may be used by families and there is evidence to suggest that parent and child ISL are often correlated. Socio-economic differences are expected to result in language differences between families which may be related to ISL production. Differences in family size and individual differences such as gender may influence ISL

and emotion understanding among typically developing groups, so it is of particular interest how these factors influence ISL or emotion understanding among a group of children with EBD. Are these factors important or do other features of the child's language or of their environment matter more for ISL and emotion understanding. Given the importance of expressive language in presentations of EBD it is also of particular interest how such children use language relating to internal states because a significant proportion of children with EBD experience difficulties with language. Children with EBD by definition experience significant concerns relating to emotion management and their abilities to understand and express emotion and mental states is of particular importance and a relatively neglected topic to date. The absence of studies of ISL among children with EBD highlights the need for increased understanding of how parents of children with emotional and behavioural difficulty (EBD) use words and language relating to internal states. The primary focus of this study is the association between parent ISL and children's understanding of emotion in a group of children with EBD. It is expected that parent language and child language will be associated with both ISL and with emotion understanding in children. So, examination of factors such as the complexity and quantity of parent language, alongside children's own language complexity and development is of interest. The goal of the study is to shed light on emotion processes among children with EBD, in order to inform what is needed for intervention or further research among children with EBD.

Hypotheses

This study examines a group of children with emotional and behavioural difficulties (EBD) in middle to late childhood through comparison with a community control group. The overarching hypothesis tested in this thesis is that parent (and child) internal state language will be associated with children's emotion understanding (EU). First, ISL hypotheses are presented. Then emotion understanding hypotheses follow. A series of related sub-hypotheses are outlined under each main heading.

Parent ISL and Children's EU

The socially constructed model of emotion understanding (EU) underlying the main hypothesis in this study, proposes that the everyday linguistic environment facilitates children's EU. If children hear lots of words about internal or mental states on a day-to-day basis, their understanding of emotion may be enhanced. For example, they may be able to verbalize emotion in a more fluent manner thereby helping them manage social situations or emotional arousal more readily. They may be able to recognize emotion in another person more quickly or they may comprehend mixed or ambivalent emotions in themselves or others faster. EU skills may help children's emotional wellbeing by helping to prevent negative social consequences arising from misunderstandings.

It is hypothesized that parent use of mental state or internal state language (ISL) will predict children's performance on tests of emotion understanding (EU). There is evidence to suggest that parent use of internal state/ mental state talk is consistent over time and that book narration tasks elicit this kind of talk. Parent use of mental state terms (such as think, imagine, want) are expected to be associated with children's

ability to provide verbal descriptions of emotions and their causes. It is expected that parent ISL will predict children's emotion understanding for children in the community group and exploratory analyses will examine this for children with emotional and behavioural difficulties. Factors associated with ISL are expected to include parent education which is predicted to associate with parent ISL in the first instance, but also to relate to children's general language abilities. To examine these hypotheses, parent-child dyads will be asked to engage in an everyday task such as a picture book narration aimed to elicit typical conversation and the resulting discourse will be analysed.

- Parent ISL will be associated with children's emotion vocabulary skills.
- Parent ISL will correlate with children's understanding of emotion causes.
- The associations between parent ISL and children's EU will be similar for children in both groups.

Children's ISL and Emotion Understanding (EU)

It is expected that children's own ISL use in a narrative task will predict their EU skills and abilities, particularly on emotion vocabulary tests and comprehension of emotion. As the present study investigates a group of children, who may experience delays in language development, exploratory analyses to examine children's quantity, complexity and quality of language will be conducted. It is predicted that children with EBD may display less well-developed language abilities reflected in reduced quantity, complexity and diversity of spoken language.

- Child ISL will predict EU abilities on emotion vocabulary and causal emotion understanding.
- Children with EBD will display reduced ISL use.

Language quantity, quality and complexity and ISL. It is hypothesized that parent internal state language (ISL) use during conversation with their children will be associated with parent language. It is expected that children's level of language development will predict their ISL use. Greater quantity and complexity of spoken language is expected to be associated with ISL production for both children and parents. It is further predicted that a reduced quantity of spoken language, lexicon and a less complex syntactic structure will be associated with reduced ISL expression.

- Greater language complexity reflected in syntactic complexity is expected to be associated with ISL for children and for parents.
- Greater language *quantity* counted in mean number of utterances will correlate with greater use of ISL.
- Language *quality* indexed by more diverse lexicon will be associated with greater use of ISL.

Group differences in ISL use. It is expected that parent language complexity and quantity and quality will be associated with ISL among community group parents but it is not known how these factors operate for parents of children with EBD. The present hypothesis states that there will be no differences in parent ISL between the two groups of parents.

- Parents of children with and without emotional and behavioural disorders will use similar quantities and type of ISL.

ISL associations between parents and children. It is hypothesized that parent use of ISL will be associated with children's ISL and that the type of ISL will be correlated for parents and children. For participants in the present study, cognitive ISL is expected most commonly at this stage of development.

- Parent ISL quantity will be associated with child ISL quantity.
- Proportion of parent ISL will predict child ISL proportion.
- Parent ISL wordcount will predict child ISL wordcount.
- Cognitive ISL will be most commonly used by both parents and children.

Gender and group differences in child ISL. The null hypothesis guides the prediction that parent ISL will predict child ISL for both groups, i.e., that there will be no differences in the association between parent and child ISL of either group. It is expected that boys will use less ISL than girls for children in the community group and though it is unclear if this will apply for children who are experiencing EBD, the prediction made is that gender differences if present, will appear in both groups.

- It is hypothesized that parent ISL will correlate with child ISL use in both groups.
- It is hypothesized that girls will use more ISL than boys in both groups.

Child Emotion Understanding Hypotheses

The hypotheses guiding the investigation of emotion understanding (EU) ask firstly if the performance of children with emotional and behavioural difficulties (EBD) perform equally well as children in a community group on tests of EU and secondly aim to examine associations between measures of EU.

Group Differences in EU

Children with EBDs are expected to show greater difficulties on tests of emotion vocabulary, emotion comprehension and on facial emotion recognition. These difficulties are expected to be linked to the severity of their symptoms and also to their level of language and intellectual abilities. It is expected that children with more severe EBD symptoms will display greater EU difficulties and that difficulties in recognizing emotion will be associated with internalizing problems such as anxiety or low empathy levels. Anxiety is expected to be linked to problems with recognizing negatively valenced emotion facial expressions.

Children's own neurobiology plays a key part in the emergence of emotion understanding skills, so child age, verbal and nonverbal abilities are assessed for their relative contribution of developmental and innate characteristics on EU. Verbally skilled children are hypothesized to perform better on emotion understanding measures which tap into children's expressive language abilities. Children with poorer language skills are expected to find this type of task more difficult. Children's language abilities are expected to predict their emotion vocabulary and their emotion comprehension abilities. Facial emotion recognition tasks require rapid processing of visual information

so it is hypothesized that children with good non-verbal abilities will perform more strongly on measures of emotion recognition.

- Children with emotional and behavioural difficulty will perform more poorly on a test of emotion vocabulary, emotion comprehension and on facial emotion recognition.
- Greater internalizing difficulties will be associated with poorer performance on EU measures particularly on facial recognition for negatively valenced emotional expressions.
- Greater externalizing difficulties will be associated with poor performance on EU measures and the severity of symptoms will be linked to EU abilities.
- EU abilities will be linked to both verbal and nonverbal IQ, with verbally-laden test scores predicted by verbal IQ and visually-laden tasks predicted by nonverbal IQ.

Family Size and Emotion Understanding (EU)

- Larger family size will predict children's EU.

Emotional and Behavioural Status

The literature regarding adversity and mental health within families where children have emotional behavioural difficulties identify greater stress and adversity and mental health difficulties. It is expected that there will be significant differences between the two groups on symptoms of child stress, behaviour difficulties and emotion difficulties. It is expected that there will be greater adverse life events for families of children experiencing EBD and accordingly, greater parent mental health difficulty and greater child emotional and behavioural difficulties.

- Children with EBD will experience greater adversity than those from a community group.
- Parents of children with EBD will display greater mental health difficulties.

Chapter 5 Method

Study Design/ Overview

This study is a cross-sectional design which proposes to examine associations between parent and child use of language relating to internal mental states and children's emotion understanding on three diverse measures of the construct in a group of children with emotional and behavioural difficulties (EBD). The study uses an observational technique to assess internal state language (ISL) by recording parent and child conversation during a book narration in the family home. Family demographic measures, parent stress and child IQ information are collated. Child emotion recognition and emotion understanding (EU) tasks are completed with the child. The primary goal of the present study is to examine if parent or child ISL is associated with EU skills of a group of 8 to 11-year-old children who are attending clinical services for emotion and behavioural difficulties. For shorthand, this group will be referred to as the "clinical group" or "EBD group" during the method and results section to differentiate from the "community" sample. A community sample of children and their parents provide the comparison group.

Recruitment

Children with emotional and behavioural difficulties and their families were recruited from mental health and psychology clinics in suburban and urban areas of Dublin, Ireland. Children from the clinical group were referred to the study by the treating clinician in the mental health/ psychology service. One child group was attending a private therapist and two were attending Primary Care Psychology Services. The remaining children from the clinical group were recruited from three different Child and Adolescent Mental Health Service (CAMHS) Teams. The lead researcher

was previously employed as a senior clinician in two of the CAMHS teams who referred to the study, but none of the research participants were current clients of the lead researcher or known to her previously.

Clinical group recruitment.

Creating awareness of the study. Following ethical approval from Trinity College Dublin, School of Psychology, Research Ethics Committee (SPREC, see Appendix E) and the Research Ethics Committee of the Health Service Executive (HSE, see Appendix F) North Dublin, permission to advertise the study and recruit participants was sought from service managers. Recruitment took place from Child and Adolescent Mental Health Services (CAMHS) and Primary Care Psychology Services of North Dublin. Recruitment posters (see Appendix A) were placed in clinic waiting rooms of several mental health teams. The lead researcher visited CAMHS team meetings and met with team coordinators to identify potential candidates, to discuss the research and provide information leaflets to treating clinicians. Clinicians were asked to identify suitable child candidates from their existing caseloads who were aged between 8 and 11 years with emotional and behavioural difficulties, to invite participation and provide information leaflets and contact details. Permission for the lead researcher to contact the family was sought to inform potential candidates about the purpose of the research and explain procedures such as video recording and incentives for participation.

Exclusion Criteria. Children with Autism spectrum disorder and known intellectual disability were excluded from the study. Diagnosis of Autism spectrum involves socio-emotional understanding difficulties so this group were excluded on this basis. Due to difficulty recruiting matched controls from a community group for

children with intellectual disability, children with these difficulties were excluded from the present study. Children whose parents were undergoing a conflictual separation were excluded due to the potential for issues relating to consent to cause stress to the child. Fostered children were excluded because the nature of the hypotheses under investigation meant that children would have long-standing interaction and discussion with a parent and the potentially shorter-term nature of fostering meant this longer-term interaction would not be guaranteed.

EBD/ clinical group recruitment. Twenty-five parents initially agreed to participate in the research who resided in suburban Dublin, Dublin City, Wicklow, Kildare and North County Dublin. In two of those cases, parents became aware of the study from poster advertisements and one case was referred through word-of-mouth. The rest of the participants were referred to the research through their treating clinician. In two cases, for family or mental health reasons, it was not suitable to proceed with the research and appointments were cancelled. In three cases, during the early stages of testing, the child refused to participate/ continue so testing was stopped. Following this, changes in recruitment procedures were made and referring clinicians were asked to 1) explicitly seek child consent prior to the referral 2) to ensure fully informed child and parent consent was obtained for the researcher to contact the family and 3) to ensure participants were not currently in crisis, i.e., that children's mental health was sufficiently stable and not in an acute phase.

EBD/ clinical group composition. The final sample for the clinical group comprised twenty children (six girls and fourteen boys) referred for emotional and behavioural problems who completed the research with their parents. Mean child age in

this group was 9.8 years (range 8.0 years to 11.7 years). Families were either currently attending services for their child with EBD or had attended in the recent past (e.g., the last two months) and were recently discharged/ discontinued attending. Typical reasons for referral to the service included anxiety and behavioural difficulties and attention or concentration problems in conjunction with life events and functioning difficulties e.g., school refusal, sleeping or eating problems. Ethnicity of the sample reflected national trends with a majority of the clinical group comprising Caucasian, English-speaking children, parents of Irish nationality and some mixed ethnicity and bilingual children. Demographic information for the clinical sample is presented in chapter 6. Several families had mixed nationality with one Irish parent and another parent born outside Ireland. Two of the children in the target group had been adopted. A majority of parents had attended third level education.

Community group recruitment.

Creating Awareness of the Study. Recruitment of the community group was primarily through advertising in schools in local communities. Poster advertisement (see Appendix A) were distributed in school classrooms of target aged children (8 to 11 years). Recruitment was conducted by the lead researcher (present author) and by two research assistants who were conducting research as part of an M.A. in Applied Psychology with the School of Psychology, Trinity College Dublin. In total 8 schools were contacted in North City and West County Dublin, Kildare, Leixlip, Tralee and Waterford. Families who were interested in the study made direct contact with the researcher to arrange a home visit at a time suitable to the family. The lead researcher conducted four community interviews and two research assistants completed the remaining 36 community interviews in the study.

Community group composition. The community group participants resided in suburban and urban areas of North and West Dublin and in three large rural towns (Kildare, Waterford and Tralee). Demographic information for the community sample is presented in chapter 6. In total 49 community participants completed the assessments and interviews however due to missing elements in some testing procedures the final dataset was trimmed to include complete data sets only. The final community sample comprises 40 children (24 girls and 16 boys) with a mean age of 9.2 years (range 8.0 to 10.8 years) and their parents. All of the community sample were biological children of the parents; nationality was Irish and ethnicity was Caucasian with the exception of one family of North African ethnicity. Socio-economic grouping of the community sample was mixed but comprised primarily middle income, educated families with some lower socio-economic families. A majority of parents had attended third level education in both samples. Demographic information relating to parent education and employment is presented in results chapter 6.

Safety Procedures

Child Protection. Child protection and welfare guidelines were reviewed by all researchers and the lead researcher provided training for the two research assistants on identification and reporting of child maltreatment. The guidelines followed were Children First guidelines (Department of Health and Children, 2011). Parents were informed about responsibilities of the researchers to report suspicions of child abuse should that occur (see participant information leaflet Appendix B). Child consent to proceed with the study was obtained verbally and in writing and children were given a

copy to retain (Appendix C). Safety processes in place included Garda clearance certificates for researchers and the presence of a parent during testing with children.

Health and Safety. The lead researcher undertook training in health and safety procedures with research assistants who adhered to recommendations regarding researcher safety when gathering data in participants' homes, provided by the School of Psychology, Trinity College Dublin.

Data Protection. In accordance with data protection requirements and ethical procedures, the data collected was anonymized and stored securely by the lead researcher using paper files and two backed up hard drive copies of video and audio recordings. The parents and children in the study were informed of their rights to access or amend data and informed how to go about this. Families were provided with advice and contact details to report any concerns they may have about the research. Contact information was provided in the form of a leaflet which parents retained for their own records. In accordance with ethical guidelines on data storage and management, parents and children were informed that the data will be stored for 10 years from completion of the study and destroyed by the lead author in c.2026.

Test Equipment

The video was recorded using a Sony HDR-SR12 Handycam camcorder, and tripod. Laptop for presenting images in the Fluid Emotions Test (FET) used a Windows Intel CORE 64-bit operating system-based laptop. To present morphing facial emotion two different software programmes were utilized; PsychoPy software (Peirce, 2007) for presentation of morphing images was used prior to April 2016. After that date, Microsoft PowerPoint Windows 10 animation technology (Microsoft Corporation,

2015) was used to present morphing facial images. Language analysis data utilized the CLAN language analysis software (MacWhinney, 2000). Statistical analysis was conducted using IBM Statistics SPSS Versions 23 and 25 (IBM Corporation, 2016, 2018).

Measures

Demographic Information

A twenty-three item demographic questionnaire was completed by parents, which asked parents about educational status, family structure, employment and parent and child life events, (see Appendix G).

Family life events were measured by a demographic questionnaire which included adverse life events and a number of positive life transitions. Two scales were devised; one which represented only negative or adverse events and a total life events scale. Parents were asked to tick “yes” or “no” for events that had occurred in the last year. Sample items include; “death of immediate family member,” “marriage,” “income increased substantially,” “trouble with teachers at school,” and “divorce.” Items were summed to give a total life events score (max = 20) and an “adverse life events” scale (max = 10). A further brief life events scale for children was included which contains four items (max score = 4) which ask if the child has experienced traumatic or difficult experiences such as hospitalization or bullying. Parents were asked to tick “yes” or “no” for recent occurrences of these events. Scores were summed to give a total “child life events” score.

Kansas parent satisfaction scale. The Kansas parenting satisfaction scale, *form A* (James, Schumm, Kennedy, Grigsby, Schectman & Nichols, 1985; see end Appendix G) is a three item self-report measure designed to measure parent satisfaction with their relationship with their child. It asks parents to rate their relationship with their child, their child’s behaviour and their own parenting satisfaction on a seven-point likert scale, which asked, for example, “how satisfied are you with your relationship with your

child?” Scores below 5 on each scale are considered below normal. Total parent satisfaction score is the sum of scores, with a maximum of 21 points. The Kansas PSS (form A) scale is considered to have “good” internal consistency with Crohnbach’s alphas between .85 and .89 (Carpenter & Donohue, 2003; DeCato, Donohue, Azrin, Teichner, & Crum, 2002; Rho & Schumm, 1989). In an examination of the concurrent validity of the Kansas PSS between the Korean Kansas Family Life Satisfaction Scale and the Korean Kansas Pss *form A*, Jeong & Schumm (1990) found high correlations (.88) between the two scales, indicating “high” concurrent validity (DeCato, et al., 2002).

Depression and anxiety scale (DASS-21). Parents reported on subjective experiences of stress, depressed mood and anxiety using the Depression, Anxiety and Stress Scale (DASS 21, Henry & Crawford, 2005; see Appendix I). The DASS-21 is a 21 item self-report scale which is a shortened version of the Depression Anxiety and Stress Scale (DASS) (Lovibond & Lovibond, 1995), a 42-item scale measuring the same constructs. The DASS 21 scale asks adults to report physiological and cognitive symptoms associated with depression, anxiety and stress in the past week, rating each item on a four-point scale corresponding to never (0), sometimes (1), often (2) or almost always (3). Examples of items on each of the scales include: “I felt that I had nothing to look forward to” (depression scale), “I found myself getting agitated” (stress scale) and “I felt I was close to panic” (anxiety scale). The three scales are made up of seven items (statements) which range from 0 to a maximum of 21 with a maximum total score for the entire test of 63. On each of the scales, high scores indicate higher levels of symptoms of depression, anxiety or stress. The DASS-21 may be doubled and

converted to percentiles using the DASS normative data (Henry & Crawford, 2005) enabling severity of symptoms to be classified as within normal or clinical ranges.

The DASS-21 scale has adequate construct validity, with a correlation of .69 between the negative affect scale of the positive and negative affect schedule (PANAS, Crawford & Henry, 2004) and the “depression score” of the DASS-21. For the DASS-21, with a large community sample, Henry and Crawford (2005) reported high reliability (.93) for the total scale and alphas of .88 (depressed mood), .82 (anxiety) and .90 (stress) respectively for each scale. The overall score is recommended for screening psychological disorders among community adults rather than the individual scales (Tran, Tran & Fisher, 2013).

Child behaviour checklist. Children’s emotional and behavioural difficulties were measured by the Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2001; see Appendix H) which is a standardized measure of commonly occurring difficulties seen in the 6 to 18-year age range that has been extensively researched over several decades. The CBCL has 112 items rated on a three-point scale of 0 (not true), 1 (somewhat or sometimes true), or 2 (very true or often true). Parents rate the veracity of the statements in accordance with their children’s behaviour over the last six months with higher scores representing greater difficulties in children’s emotional and behavioural development.

The CBCL has eight clinical subscales; three of which comprise *internalizing domain* scales (anxious depressed scale, withdrawn depressed scale and somatising), and two which comprise *externalizing domain* subtests (rule breaking behaviour and

aggression). The measure also has three “other” clinical scales which include social problems, thought problems and attention problems. The scores in each domain are added together to give internalizing and externalizing domain scores which represent broad patterns of emotional difficulties or behaviour difficulties. Each clinical scale may be evaluated alongside same aged peers with “borderline” or “clinical” range scores easily identifiable in each clinical scale. Domain scores are totalled and compared with t-scores for children in the same age range. Similarly, total scores are converted to t-scores to give an index of clinical severity. Examples of items from each scale may be seen in Table 2 which includes cut-off scores for borderline clinical range at the 93rd centile. The score given is the lowest point of the borderline range and the top of the scales ranged from 16 points (somatic complaints) to 36 (aggressive behaviour). Boys and girls have slightly differing norms in the 6-11 age range and so boys and girls were rated separately according to their gender. This means that a score of 5 for a girl may indicate a “borderline clinical” score, while a boy of the same age scoring 5 may score in the “normal” range.

Table 2
Child Behaviour Checklist (CBCL) scale examples and cut-off clinical scores

Scale	Example of Scale Item	Girls' Borderline/ clinical range	Boys' Borderline/ clinical range
Anxious/ depressed scale	“nervous” or “feels worthless”	8	8
Withdrawn/ depressed scale	“sad” or “withdrawn”	5	4
Somatic complaints scale	“feels dizzy”	5	5
Social problems scale	“doesn't get along with other kids”	8	7
Thought problems scale	“can't get mind off certain thoughts”	5	6
Attention problems scale	“can't concentrate” or “impulsive”	9	10
Rule breaking behaviour scale	“lies, cheats”	5	6
Aggressive behaviour scale	“destroys others' things”	12	12

Achenbach and Rescorla (2001) report discriminant validity for the CBCL as “very high” at 85% likelihood that it will differentiate clinical from non-clinical subjects. The ability to discriminate between referred and non-referred children also ranged from 80% to 85% for individual scales. Test-retest reliability using the same informants (over a 1-week period) was “very high” at .95. Each item of the CBCL has been tested over several decades to establish its content validity and all items discriminated between referred and non-referred children at $<.01$ level (Achenbach & Rescorla, 2001).

Emotion Understanding Measures

Three tests of emotion understanding (EU) were used; the Emotion Vocabulary Test (EVT, Dyck, 2012; see Appendix K), the Test of Emotion Comprehension (TEC, English Version 2, Pons & Harris, 2000; see Appendix L) and the Fluid Emotions Test (FET, Dyck, 2012; see Appendix M).

Emotion vocabulary test (EVT). The emotion vocabulary test or EVT, (Dyck, Ferguson, & Shochet, 2001) is one part of the suite of assessments in the Emotion Recognition Scales (ERS), developed by Dyck et al. (2001) which was designed to measure children’s empathic abilities and emotion understanding across several different dimensions (Dyck, 2012). The EVT is a structured 24-item open-ended question and answer evaluation of children’s ability to describe emotions. It asks children to describe an emotion (e.g., “what does sadness mean?”) and awards points of 0, 1 or 2 based on the quality of responses; to a maximum of 48 points. A two-point score is awarded if the child gives a comprehensive definition of the emotion term or if they provide a good example of a situation that would elicit that emotion. Children’s

responses are recorded verbatim and assessed on the three-point scale. The EVT is reported to have good internal consistency, with alphas of .82 (Dyck, 2012; Dyck, Farrugia, Shochet & Holmes-Brown, 2004; Dyck, Ferguson, & Shochet, 2001). Inter-rater reliability is reported as high at .94. The EVT is significantly correlated with the “vocabulary” scale of the Weschler Intelligence Scale for Children – Fourth Edition (WISC IV) and bears similarities to the “vocabulary” scale of the WISC IV in the construction and scoring of the measure (Dyck, 2012). The EVT has been found to be reliable across diverse clinical child groups including children with ADHD, intellectual disabilities and children with hearing problems. Few comparison measures of theory of mind/ emotion understanding were available for children beyond the preschool period, so information on convergent validity was limited (Dyck, 2012).

Test of emotion comprehension (TEC). The test of emotion comprehension (TEC, Appendix L) was developed by Pons, Harris and de Rosnay (2004) to measure children’s abilities in comprehending emotion. It was developed based on their review of the theoretical literature to address the developmental stages in children’s emotion understanding including simple emotion recognition, understanding of external cause of emotion, understanding of regulation, concealment and moral emotions (Pons, Harris, de Rosnay, 2004). The test is presented in an A4 booklet using a child-friendly cartoon format and requires minimal expressive vocabulary by asking children to indicate correct answers. Many items can be answered by pointing to the correct answer or by uttering very few words. The authors suggest that scoring on the nine components of emotion understanding yield a maximum test score of 9 and there are 21 test items as some of the components require just a single response and some have several responses. Descriptions of each test item are given using a standardised presentation provided by

the test authors in the manual. Pons et al. (2004) provide norms for children aged 3 to 12 years based on their evaluation of 100 children in the original test sample. Reliability and validity information is reported in Albanese, de Stasio, Di Chiacchio, Fiorilli and Pons (2010) who reported “good” test-retest reliability with $r(18) = .84$. and significant correlations between the TEC and child language and cognition (Pons, Harris & Doudin, 2002; Tenenbaum, Visscher, Pons, & Harris, 2004). Molina and Di Chiacchio, (2008) reported good internal consistency (.79) in the Italian version of the TEC which was evaluated with a large sample (967 children).

Fluid emotions test (FET). The fluid emotion recognition test (FET) was developed by Dyck, Farrugia, Shochet and Holmes-Brown, (2004) and became part of the suite of scales in the Emotion Recognition Scales, designed to test emotion recognition, empathy and emotion understanding (Dyck, 2012, Appendix M). The FET presents 32 still and 32 morphing photographs of facial emotion and is designed to measure speed and accuracy of facial emotion recognition on static and morphing images. The test items (facially expressed emotion) utilised the 52-item facial emotion stimulus set developed by Matsumoto and Ekman (Japanese and Caucasian Facial Emotion Expressions, JACFEE, Matsumoto & Ekman, 1995). Dyck et al. developed a 64-image set from the JACFEE stimulus set, depicting 7 emotions plus a neutral face (8 categories) of varying difficulty. The images present items which are equally balanced between men and women of Caucasian and Japanese ethnicity on facial emotions depicting happy, sad, angry fearful, surprised, contemptuous or disgusted emotions and a neutral condition.

Presentation of the fluid emotions test (FET) is by computer. The first (static) stimulus is presented and once the child has answered/ provided a label, the tester presents the next stimulus, which is a morphing image that transforms the existing face to a different face with a different emotional expression. The change takes 4 seconds to complete and the child's answer and the time taken to respond are recorded. Scoring the FET for accuracy of emotion labelling is measured by counting the number of accurate responses to presentations of facial emotion. For example, if a "fearful" face was presented and the child responded "surprised", this is scored 0, but if the child responded "afraid" or "terrified", this is scored as 1.

The original JACFEE photographs, which are expanded in the FET from 52 to 64 photographs, displayed high cross-cultural reliability for each emotion presented and took intensity of expressed emotion as well as gender and ethnicity into account (Biehl, Matsumoto, Ekman, Hearn, Heider, Kudoh, & Ton, 1997). Internal consistency for the FET were .69 (still photos), .81 (morphing photos) and .86 (speed). The FET accuracy measure is not suitable for deaf children and less reliable when conducted with children with ADHD or intellectual disabilities (Dyck, 2012).

Child Ability Measures:

Children's intellectual ability was measured with two subtests from each of the main scales of the Wechsler Intelligence Scale for Children, Fourth U.K. Edition (WISC IV UK, Pearson Corporation, 2003; see cover sheet included in Appendix J) a test designed to elicit children's verbal abilities and nonverbal/ perceptual reasoning abilities. As verbal and perceptual abilities correspond most closely to the theorized general ability index (GAI), (Raiford, Weiss, Rolfhus, & Coalson, 2005), and may be

more effective in estimating intellectual abilities in special populations, e.g., children with diagnoses of EBD or other psychological disorders, (Mayes & Calhoun, 2006) the other two factors on the measure (Processing Speed Index and Working Memory) were not evaluated.

The WISC IV examines *Verbal Comprehension* subtests and from this scale subtests chosen were “Similarities” and “Vocabulary”. “Similarities” measures children’s ability to explain concepts and asks, for example, “how are ice and steam alike?”. The “vocabulary” subtest of the WISC IV is an open-ended question and answer format in which the subject’s response is recorded verbatim and scored on a three-point scale indicating the quality of response. The test’s administration handbook gives principles for scoring alongside a wide range of examples of each value score and children’s abilities to define words such as “leave” or “precise” are examined. The “similarities” subtest is similarly administered, with 0, 1 and 2 points awarded depending on the quality of the verbal response. Both these subtests assess children’s expressive language ability.

The WISC IV also examines *Perceptual Reasoning* which measures nonverbal intelligence, and subtests chosen were “Block Design” and “Matrix Reasoning.” The “block design” subtest requires the child to manipulate red and white blocks to match a presented picture. The “matrix reasoning” subtest requires the child to identify which of a number of visually presented stimuli completes the test series. Each of the WISC IV subtests become increasingly challenging as the test progresses. Test completion of the four subtests ranges from fifteen minutes to half an hour approximately.

Scoring the Weschler test was conducted as per the manual instructions for pro-rating scores. Scale scores were pro-rated for each child and calculated for their chronological age. Mean abilities on Verbal Comprehension (VIQ) and Perceptual Reasoning (PIQ) are precisely 100 with a standard deviation of 15 (WISC IV Manual, Pearson, 2000).

Williams, Weiss and Rolfhus, (2003) found that the WISC IV demonstrated both convergent and discriminant validity. Both split-half and test-retest reliability were high for WISC IV subtests with values ranging from .82 to .95 for the four subtests chosen in the present study, thus the test displays high internal consistency and stability over time (Williams, et al., 2003). Factor analysis by Williams et al. (2003) provided evidence for the four-factor model of intelligence measured by the WISC IV, while Marley, Canivez, James, James and Good (2013) found evidence for a bi-factor and four factor model of ability as measured by the WISC IV UK edition in an Irish sample.

Parent-Child Interaction Task

Language analyses. To elicit parent and child conversation, from which to assess ISL use and language use generally, parents and children were asked to interact during a book narration task using a highly detailed wordless picture book, (“Tuesday,” Wiesner, 1991) to elicit conversation. The book has won an award for its illustrations and contains a story about a group of frogs that secretly fly at night time through towns and houses with a twist in the tale at the end. The interaction was video and audio recorded and parent and child language were transcribed according to the CHAT format into the CLAN language analysis programme (MacWhinney, 2000) and programmed and analysed for language complexity and quantity. Measures of language quantity,

complexity and lexical diversity were computed automatically following pre-set commands. Each parent-child conversation was typed and transcribed into the CLAN programme and formatted according to programme rules. Each speaker was denoted by a specified marker (e.g., *MOT* for mother or *FAT* for father). The start and end of each utterance was delineated according to the rules of the programme and specific punctuation was required to tell the programme who was speaking and what kind of an utterance was being produced (e.g., noun or verb). Word spellings were standardized according to the CLAN lexicon. Unidentifiable utterances such as a mumble were indicated by specific notation. The programme was given specific commands to produce for example, mean length of utterance measured in morphemes or total number of words spoken. The programme also produced additional measures, such as a measure of lexical diversity (VOCD). The output was in numerical format in an excel table which could then be trimmed and imported into SPSS. Data for each speaker (e.g., mother or child) was generated separately for each participant. Consistency in transferring data between programmes involved multiple checks to ensure transfer of data from CLAN to SPSS was conducted accurately.

Language quantity. CLAN language analyses (MacWhinney, 2000) analysed quantity and complexity of language from transcripts and produced an Excel table (Microsoft Corporation, 2015) which was then input to SPSS-23. Quantity of spoken language was measured by: total utterances spoken, total words spoken and mean length of utterance measured in words.

Language complexity. There are many ways to examine language competence (Scholfield, 1995) and the present research utilizes the computerized programme

designed by MacWhinney (2000) to examine language complexity via complexity of syntax and complexity of morphemic structure. For this study, mean length of utterance in morphemes or MLUm is used as a proxy for complexity of language, with longer sentences indicating greater complexity (Scholfield, 1995). A further measure of grammatical complexity examined the mean number of verbs spoken per utterance.

Lexical diversity. Greater variation in words spoken is indicative of a more diverse lexicon. The CLAN programme evaluates vocabulary diversity (or VOCD) which gives an indication of the amount of word repetitions in a spoken passage. Fewer repetitions mean more diversity of language and this is used as an index of complexity (McCarthy & Jarvis, 2010). The measure is calculated by repeated sampling of the transcript and obtaining a mean diversity score. VOCD is considered to be a more reliable indicator of language complexity than the previously used Type Token Ratio (TTR) which is unduly influenced by the length of the sample chosen (McCarthy & Jarvis, 2010). In the present study, all three of these measures of complexity were obtained from the CLAN language analyses.

Internal state language coding. To measure ISL, transcripts were examined and coded using coding schemes by Ruffman, Slade and Crowe (2002) and Taumoepeau and Ruffman, (2008). In accordance with those coding schemes, ISL was categorized as either “cognitive”, “emotion” or “desire” language.

ISL coding. Contextual information was used to differentiate ISL terms. In line with coding schemes by Ruffman, Slade and Crowe (2002) and Taumoepeau and Ruffman (2008) ISL is divided into three types which include *cognitive* terms (e.g., I

think it is a frog, or I *know* he is flying); emotion terms such as “sad” or “happy” (but not behavioural descriptions of *crying* or *laughing*); and desire terms (*want* or *wish*). Behavioural manifestations of emotion that did not refer to activity within the mind (dancing, laughing, etc.) were not counted as instances of ISL. Repetitions of the previous speaker’s term were not counted, nor were repetitions within a sentence “*I know, I know*” or use of cognitive terms that did not refer to anything and which could be understood as a filler or a stereotyped utterance. Repetitions were rare, but stereotyped phrases were common throughout the transcripts. The use of the words “might”, “must” or “perhaps” have been included in other coding schemes and are often called “modulations of assertion” i.e., statements moderating the certainty of a statement. These were not included as ISL references in the present study. Examples from the transcript of how ISL is counted in the present study are as follows (Table 3) with ISL terms underlined.

The coding examples given in Table 3, show that in the first case example, after the child speaks, the parent repeats the child’s term directly with little modification and so the repeated term (stressed out) is not counted as a new instance of ISL. In case example 2, the child is contradicting the father’s interpretation of the picture rather than simply repeating his phrase, so the repeated term “happy” is counted several times. The child in the second example uses the word “like” in a colloquial way which acts as a filler / stereotyped utterance and therefore is not counted as ISL. Ambiguous terms such as “strange,” “weird” and “crazy” were not included as ISL. Use of synonyms helped clarify meaning within a certain context. For example, in cases of “like” or “miss” which could mean several things, replacing the word with an alternative meaning helped to clarify whether or not the word should be counted.

Table 3
Internal State Language (ISL) Coding Examples

CASE EXAMPLE 1 (Clinical Group)	
Child 1	“That guy was just eating his sandwich and he looked outside and saw flying frogs and he was <u>freaked out</u> .” (<i>emotion ISL</i>)
Mother 1	“Oh, my goodness.”
Child 1	“And he was a tiny bit <u>stressed out</u> .” (<i>emotion ISL</i>)
Mother 1	“A tiny bit stressed out yeah if he sees flying frogs.” (<i>repeated utterance not counted</i>)
CASE EXAMPLE 2 (Community Group)	
Child 2	“And that guy is like, that guy is like oh my God, I am so <u>happy</u> ” (<i>emotion ISL</i>)
Father 2	“I do not <u>think</u> he is <u>happy</u> because he is falling” (<i>cognitive ISL, emotion ISL</i>)
Child 2	“No look it is a <u>happy</u> kind of face” (<i>emotion ISL</i>)
Father 2	“Eh, kind of”
Child 2	“I <u>know</u> that is actually, that is like his face, it is a <u>happy</u> face yeah and he is like he is just jumping at the last second and they all jump into there and he is like come on come on.” (<i>cognitive ISL, emotion ISL</i>)

Quantifying ISL. Many authors have used Brown, Donelan-McCall and Dunn’s (1996) coding system for internal state language (ISL) which describes mental states such as *desire talk*, *emotion talk*, *cognitive talk* and “*other*.” In Brown et al.’s original coding system was a fourth category of ISL called “*modulations of assertion*” which included words that indicated status of a thought or idea such as “must” or “maybe” (Brown’s 1996). In order to simplify the categories of ISL, this was not included in the present coding scheme. An example of a classification system for ISL that includes both mentalistic and physiological internal states is Meins, Fernyhough, Johnson and Lidstone’s (2006) system to classify parent and child speech used mutually exclusive categories such as: internal state comments, perception comments, self-references,

attempt comments, distancing comments and general descriptions. Meins et al. (1998) used a different system to “describe a friend” using classifications for mentalistic, behavioural physical and general categories. The present study adapted Brown et al.’s (1996) coding scheme which has been used by Taumoepeau & Ruffman (2008). The category of “modulations of assertion” was excluded.

Pilot Study

To evaluate the feasibility of the procedures and measures, a pilot study was conducted with two children which identified that minor changes in the order of presentation of some of the measures were necessary. The initial aim of speaking to parent first was not realistic as the child was typically eager to get started and needed attention first. During the pilot study, timing breaks for children participating in the study were also determined. The pilot study identified that two questions in the initial protocol were not appropriate or relevant and these were removed. These asked parents when they discussed their own feelings with their child and what this usually concerned. As the question was unduly ambiguous and it was unclear what information it would yield, these two were removed. Overall few changes were required in the testing protocol.

Procedure

The research was conducted in the family home to maximize comfort and convenience to the parents and children and to establish a naturalistic context for conversation between child and parent. Testing took a minimum of one and a half hours and took place at a time nominated by the family. Parent and child testing sessions

alternated during the visit and the child had an opportunity to have “breaks” while the other participant engaged with the researcher.

Testing protocol was as follows: parents and children were introduced to the researcher, information about the study given once more and consent to proceed was obtained in writing. The video/ audio recording was then set up. The child section of testing commenced initially, beginning with four subtests of the WISC IV which took approximately 20-30 minutes. During this time, parents completed demographic questionnaires, Kansas Satisfaction scales, DASS-21 scales and the CBCL. If any parent needed assistance with completion of questionnaires, that was provided once the researcher was finished the first testing segment.

Once WISC IV testing was completed, the child was given a break and either drew a picture or played with their own things at home. The parent demographic questionnaire was then reviewed and parents were asked about their child. Then parents and children were asked to narrate the picture book together. Following the book reading task, which took between 5 minutes to 15 minutes to complete approximately, the child completed the EVT, TEC and finally the FET in that order. Overall testing took a minimum of 90 minutes. If the testing session took longer, the researcher offered to return a different day. In half of the cases in the clinical sample, a second appointment to return for completion of testing was made, at a time nominated by the parent. All community participants completed testing in a single visit. A majority of testing was undertaken in the late afternoon when children came home from school. A retail voucher of approx. 20 Euro was given to thank families for their time. Each child received a few tokens of appreciation for their participation such as educational toys

puzzles or stationery. Feedback from the children and families on the research was gathered and debriefing information was provided for parents and for children (Appendix D).

Data Analysis

Generating Variables

All variables were entered into SPSS-23 (IBM Corporation, 2016). Several questionnaires had scales or totals that required only simple aggregation/ summation and this was completed for the following scales: life events scale (parents) and child life events scale, Kansas Parent Satisfaction Scale, DASS-21 Scale and subscales, Emotion Vocabulary Test and the Test of Emotion Comprehension. Several scales required more calculations and this is described below.

CBCL. CBCL scores were coded individually and entered into SPSS. The eight clinical scales were calculated by summing items in each of the eight clinical subscales and to give domain and total score for each participant. This yielded a total score as well as scores in the following domains and clinical scales, all of which have a minimum value of zero. For specific scales, (e.g., attention problems scale) a “clinical range” score was computed to group children into those who had clinical range problems in that area versus those who did not. Rank ordering of the scales showed few differences if borderline scores were included or excluded, so borderline clinical range difficulties are included where measures of clinical severity are given. In the examples of “borderline” range scores given below, the girls’ 6 to 11 years ranges are provided. See Table 4 for minimum and maximum scores and clinical severity ranges.

Table 4
CBCL Maximum and Clinical Range Scores

	Scale	Min/ Max Score	Borderline Clinical Ranges* <i>t</i> score > 60
Internalizing Domains:	Anxious	0-64	11-13
	Depressed		
	Somatic		
Externalizing Domains:	Rule Breaking Aggressive	0-70	12-15
Clinical Scales	Anxious/ Depressed	0-26	8-10
	Withdrawn/ Depressed	0-16	5-6
	Somatizing	0-22	5-6
	Social Problems	0-22	8
	Thought Problems	0-30	5-6
	Attention Problems	0-20	9-10
	Rule Breaking	0-34	5-6
	Aggression	0-36	12-15

WISC IV UK Edition

Totals for each of the subtests of the WISC IV were summed and scaled for each child individually in accordance with their precise age bracket (approximately 3-month age bands) using the age brackets in the manual. This yielded scale scores (with a mean of 10) for each subtest individually for each child. Two verbal subtests were entered into SPSS; “vocabulary” and “similarities.” To generate a verbal IQ score, each child’s standard score was pro-rated according to the manual instructions (dividing by 2 and multiplying by 3, rounding decimals up). The re-calculated score was compared with standard scores of other children in the test manual, against a mean of 100. Two perceptual reasoning scores (called performance IQ or PIQ here) were summed individually for each child; these yielded scale scores for the PIQ subtests of “block

design” and “matrix reasoning,” each with a mean of 10. The PIQ score was also prorated in accordance with the manual instructions and the resulting nonverbal IQ score entered into SPSS. Thus, for each of the four subtests, a scale score with a mean of 10 was generated and for each of the two scales, a standardized domain score was generated with a mean of 100 (6 scores in total) and all were normed in accordance with the child’s age group and recorded on the standardized WISC IV record form (see Appendix J).

Fluid Emotions Test (FET) Variables

The following six different scores were generated for the fluid emotions test:

Still photo accuracy	(FET A)
Morphing photo accuracy	(FET B)
Total facial emotion recognition accuracy	(FET Total)
Speed of morphing photo recognition	(Time FET B)
Accuracy of specific emotion type	(Angry/ Happy Accuracy)
Speed of recognition of emotion type	(Angry/ Happy Speed)

Scores were analysed by accuracy of emotion type (e.g., happy or surprised faces), by overall accuracy of still and morphing faces and speed of response time was recorded for morphing faces. Accuracy scores from still photographs (FET A) and “morphing” or changing (FET B) photographs of facial expressions were combined to give a total FET accuracy score for each child. Speed of response time for the morphing photograph only was recorded.

Generating Language Variables

Transcripts of parent-child conversations were analysed using the CLAN programme. The following variables were produced for each adult and child which are then input to the SPSS file as individual variables for each participant. Multiple cross-checks to ensure integrity of data were conducted throughout this process.

- total number of utterances;
- total number of spoken words;
- mean length of utterance calculated in morphemes (MLUm);
- the percentage of verbs per utterance;
- and a vocabulary diversity index (VOCD D).

Generation of ISL Variables

In line with previous studies of ISL (e.g., Doan & Wang, 2010; Taumoepeau & Ruffman, 2008), calculation of ISL was carried out in two ways; by counting the number of words referring to internal states in each transcript (absolute values of ISL) and then taking this number and dividing it by the total number of utterances (proportion of ISL or ISL %). Due to expected variation in the number of words produced by individual speakers, the proportion of ISL was used, although some studies use both absolute values and proportion of ISL in their calculations. Doan and Wang (2010) for example, used both absolute values and percentage ISL, arguing that the quantity of ISL terms spoken during conversation is an indication of the level of exposure to mental state talk that a child receives, while the proportional calculation controls for variation in total speech quantity. In the present study, the number of ISL terms used is presented by category and indicates the amount of mental state talk used by parents during a conversation with their children.

Data Integrity

Ensuring the integrity of the data was a key part of generating variables, coding and setting up the data for statistical analysis and this was achieved in a number of ways.

Ensuring complete data sets. Firstly, the lead researcher chose only complete or almost complete data sets from the total community sample which originally comprised 49 children and parents. In several data sets, there were elements of the data missing, so the data set was trimmed so that those with complete questionnaires and videos were included. This left 40 children with almost fully complete test protocols. There was little missing data as a result and missing data occurred at random.

Data entry. The second way that data was cross-checked was through the lead researcher generating the coding schemes, the SPSS data files and inputting all of the data into SPSS. As this was conducted by the lead researcher thus coding errors were relatively easier to identify because of familiarity with the structure of the data, with the position of the variable within the data set and of typical values of each data point.

Coding. All transcripts that required an evaluative response (e.g., questions that required choosing to award 1 or 2 points for a child's answer) were re-examined and re-coded by the lead researcher to ensure consistency. The lead researcher coded the following measures to ensure consistency and accuracy: WISC IV vocabulary and similarities subtests and EVT scores and internal state language quantity and type.

Transcription. Parent-child conversation was cross-checked by the lead researcher who transcribed all of the conversations for the clinical and community samples, thereby ensuring consistency throughout the clinical and community samples in transcription, analysis and in ISL coding. Language complexity data from the CLAN output files was cross-checked through the placement of participant ID information adjacent to the Excel data during transfer of data from Excel to SPSS.

Ensuring methodological consistency. Each research assistant was trained in reporting child abuse concerns, health and safety, use of the video equipment, how to interact with children and parents and tutored in the administration of the WISC IV. The test protocol was provided in a booklet form and the order of presentation was clearly outlined so that the test “flowed” from one section to the next. As each testing session was video recorded, it was relatively easy to ensure methodological consistency and overall this was excellent. During data analysis, an unexpected finding occurred and it was possible to go back to the videos to see if any methodological variation, e.g., in the manner of presenting the item was responsible for the variation.

Excluding methodological error. One task that was not included in the final analysis because of a methodological error involved part of the test protocol examining ISL during a reminiscing task. This was conducted as part of the parent-child dyad interaction. Immediately following the book narration, parents and children were asked to reminisce about times when the child felt “happy,” “sad,” “angry” or “scared.” The aim of the task was to contrast ISL use between parent-child dyads during book reading and during a reminiscing task. For one of the community samples, an error was made in the way this question was asked (researcher asked the question, rather than asking the

parent to elicit this information). Despite a number of efforts to address this error it was decided not to proceed with the inclusion of the reminiscing data in the final analysis as the influence of this change in methodology on the children's responses could not be determined.

Controlling for researcher effects. Controlling for researcher effects was attempted by maintaining consistency in order and method of presentation, however some differences in the age and status of the researchers were present which may have had an impact on some elements of testing. This was particularly evident in the amount spoken by parents about their child during an open-ended interview which asked parents about their child. This segment of the research has not been analysed thus far and so no data has been generated regarding this aspect of testing.

ISL inter-rater reliability. Inter-rater reliability for ISL coding was carried out for parent ISL and child ISL by the lead researcher and a research assistant who was familiar with the aims of the study and trained in the use of the coding scheme described earlier. Reliability was calculated for overall ISL for 20% of transcripts (12 transcripts) divided proportionately (8 community and 4 clinical transcripts, chosen at random). Pearson's r was very high: .97 for ISL total and .98 for category of ISL.

Statistical Analysis

Careful statistical analysis was conducted with calculations and statistics checked during the editing process to ensure accuracy in results.

Ensuring data security and confidentiality. Ethical data management and storage presents practical issues, for example ensuring anonymity and secure storage of paper and electronic files over a period of a decade and taking responsibility for maintenance of the security of that data as well as taking responsibility for its destruction. Once stored the data should ideally not be moved. Data needs to be stored for ten years and then destroyed. This requires a consistent and secure location for the duration of that time. Of particular concern is data from a clinical group where any breach is of significant concern. The lead author undertook to securely store the data and to destroy it after ten years.

Use of equipment by several researchers meant that videos needed to be deleted promptly from camera hard drives and stored securely. The lead researcher undertook this for the clinical and community samples, thereby ensuring privacy and confidentiality were maintained.

Data Analysis

Tools

Statistical analysis was conducted using SPSS (version 23 & 25, IBM Corporation, 2016, 2018). Language analyses was conducted using the CLAN language analysis programme (MacWhinney, 2000).

Plan of Analyses

Chapter six will examine demographic, family and symptom profiles of the two groups. Chapter seven will then examine language variables such as ISL and language complexity/ quantity. Following this, chapter eight looks at emotion understanding (EU) on three measures of EU. Next, chapter nine focuses on the key hypothesis which examines associations between ISL and EU for parents and children in both groups. Chapter ten uses regression methodology to predict key variables.

Statistical Analysis for Demographic Data

Descriptive statistics will examine group characteristics of age/ gender/ family size and composition/ parent education and employment. Group comparisons will be conducted using t tests/ ANOVAS or chi square when appropriate. Child CBCL scores and profiles will be examined for differences between groups and any associations explored. Then parent and child life events and parent satisfaction/ mental health symptoms will be compared using t tests between groups. Lastly, chapter six will use Pearson correlations to examine associations between contextual factors and symptoms and present these using a correlation matrix.

ISL and Language Data Analysis

Group comparisons on child and parent language will be conducted using t tests to assess for differences in quantity, syntactic complexity and vocabulary diversity in spoken language. Then, ISL will be quantified by wordcount and as a proportion of utterances for parents and children in each group and comparisons between groups conducted using t tests for mean difference. Analysis of the type of ISL in each category (e.g., cognitive or desire talk, etc.) will also be conducted. Children's ability assessments will be analysed for means on verbal IQ and nonverbal IQ using analysis of variance and differences between groups presented. In the last section of the chapter on language, Pearson correlations between child language, ability and ISL will be conducted to evaluate associations between language complexity, child ability and ISL use, by group. This process will be repeated for parent ISL and parent education/ language complexity and quantity to assess for associations between these variables. Finally, associations between family size and children's ISL are examined using Pearson correlations.

Statistical Analysis of Emotion Understanding (EU) Measures

Descriptive statistics (means, standard deviations, and ranges) will be calculated for each emotion understanding (EU) measure (Emotion Vocabulary Test, EVT; the Test of Emotion Comprehension, TEC; and the Fluid Emotions Test, FET) completed by the children and examined for group differences using Analysis of Variance (ANOVA) by group and gender. The fluid emotions test will be analysed for accuracy of discrete emotions (e.g., mean clinical group "happy" recognition compared with community) and mean recognition time for total morphing photos and for each type of facial emotion.

A correlation matrix to evaluate the associations between the main variables in the study will be conducted. This will include examinations of child characteristics and EU; between EU measures and child ability on verbal and nonverbal IQ tasks; between EU and EBD status, e.g., internalizing and externalizing difficulties and between the three measures of EU. Pearson correlations and bivariate and partial correlations will control for potential moderators of associations of EU such as VIQ.

Statistical Analysis of Main Hypothesis

One of the main hypotheses was that parent ISL is associated with child emotion understanding (EU) and in chapter nine, Pearson correlations examined the associations between ISL and EU for parents and children in both groups. Partial correlations investigated moderators of those associations such as VIQ or parent education. To examine which variables best predict emotion understanding, linear regression techniques evaluated predictors of EU in the final section.

Chapter 6 Demographic Results

Overview

This section presents demographic information for the families in the study, profiles emotional and behavioural difficulties (EBD) among children from the clinical* and community groups, examines parent reported quality of life measures including child and parent life events, parenting satisfaction and parent reported mood symptoms. Demographic factors, life events and parent and child mood are examined for associations between the variables.

**Note:* As a shorthand term, children with emotional and behavioural difficulty (EBD) and their parents are referred to as “clinical group” during the results section.

Demographic Information

Family composition. Table 5 outlines demographic information showing parents of children in the clinical group were less likely to be employed; with thirty percent reporting unemployment. No families from the community group experienced unemployment. Seven primary carers of children in the clinical group worked outside the home (35%) versus 33 primary carers of children in the community group (83%). When employed, parents in both groups worked similar quantities of hours.

Educational attainments were high in both groups. Most parents in the clinical group completed Leaving Certificate (80%) or attained a University degree (60%). Community group parents had higher educational levels with school and college completion at 100% and 72.5% respectively (Figure 2). Working hours were associated with educational level for parents in the clinical group only; r (clinical) = .592, p = .006, r (community) = .074, p = .653. Pearson's chi square indicated that the relation between clinical status and employment was significant, $\chi(1) = 13.54$, $p < .001$, $\Phi = .475$. Two-way analysis of variance (ANOVA) on parent working hours yielded main effects for educational level (F ratio of $F(5) = 4.32$, $p = .002$) and clinical status independently (F ratio of $F(1) = 8.54$, $p = .005$) and no interaction effect.

Table 5
Demographic Characteristics of Clinical and Community Families

	Clinical Group <i>n</i> = 20	Community Group <i>n</i> = 40		
	<i>Mean (SD)</i>	<i>Mean / (SD)</i>	<i>t</i>	<i>p</i> (95% CI)
Respondent: Mother	90%	82.5%		
Respondent: Father	10%	17.5%		
Adopted children	2	0		
Bilingual families	4	2		
Caucasian ethnicity	17	39		
African ethnicity	2	1		
Hispanic ethnicity	1	0		
Mean parent age	41.65 (6.05)	41.95 (4.58)	0.21	<i>ns</i>
Siblings 0-17 yrs	2.45 (0.83)	2.26 (0.72)	0.93	<i>ns</i>
Mean parent ed. level	Level 6	Level 7	2.56	<.05*
Primary carer wrk hrs	32.86 (10.17)	32.15 (9.96)	0.71	<i>ns</i>
Second parent wrk hrs	41.50 (8.41)	37.58 (8.16)	1.42	<i>ns</i>
Both parents employed	25%	70%		
Both parents present, one employed	40%	17.5%		
Two parents both u/e	10%	0%		
Single parent employed	5%	7.5%		
Single parent u/e	20%	0%		

*significant at $p \leq .05$ level.

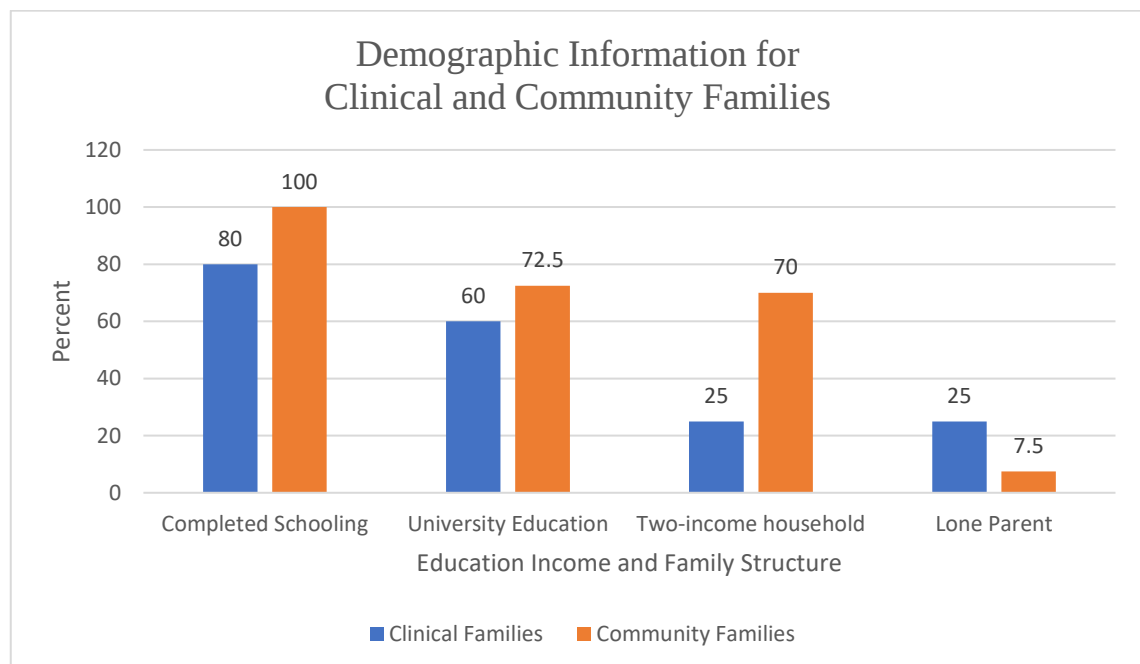


Figure 2. Demographic and educational comparisons of clinical and community families.

Emotional and behavioural difficulties. Four levels of comparison are made for Child Behaviour Checklist scores (CBCL, Rescorla & Achenbach, 1983). Total CBCL scores are presented; internalizing and externalizing domain scores are compared; subscale group differences are presented and lastly, severity/ comorbidly occurring children's symptoms are described.

CBCL total scores. Children in the clinical group scored a mean total CBCL score of 59.9 (25.92) compared with 19.6 (12.16) for the community group; a highly statistically significant difference, $t(1, 23) = 6.58, p < .0001, CI [27.60, 52.90], \eta^2 = .54$ (see Table 2). The three highest scoring subscales were aggression, anxiety and attention for children in both samples (Figure 3).

CBCL domain scores. Children in the clinical group had mean domain scores (internalizing, externalizing domains) which were three times those of community group children. Internalizing domain $M (sd)$ for children in the clinical group was 17.8 (11.79) compared with community M of 6.64 (4.38) which is a highly statistically significant difference, $t(1,22) = 4.10, p = .0005, \eta^2 = .33, CI [5.49, 16.82]$ (Table 2). Similar magnitudes of difference were seen on the externalizing domain, $t(1, 24) = 3.95, p = .001, \eta^2 = .29, CI [4.71, 14.99]$.

CBCL subscales. Subscales of the CBCL showed statistically significant differences between groups on each of the clinical subscales of the CBCL (Table 6) with greatest mean difference 8.5 points higher for clinical group on "attention", $t(1, 57) = 10.47, p < .0001, CI [6.92, 10.19]$. Boys were much more likely to experience problems with attention compared with girls; $t(1, 57) = 3.36, p < .01, CI [1.64, 6.48]$.

“Somatizing” and “withdrawn/ depressed” subscales showed the smallest magnitude of difference between groups but were still significantly different; somatic $t(1, 21) = 2.65$, $p = .015$, CI [0.71, 5.87], withdrawn/ depressed $t(1, 23) = 2.72$, $p = .012$, CI [0.49, 3.56] (see Figure 3). Strength of association differed between subtests. Preliminary analyses indicated that attention and anxiety subscales did not correlate significantly for children in either group (clinical $r = .081$, $p = .735$, community $r = .154$, $p = .348$) but attention and aggression subscales were significantly correlated for children in the clinical group (clinical $r = .740$, $p < .0001$, community $r = .297$, $p = .067$). Internalizing and externalizing domains were significantly correlated for children in the community group only (clinical $r = .302$, $p = .195$, community $r = .565$, $p < .0001$). Figure 3 displays the mean scores for each group for the eight clinical subscales.

CBCL severity. The number of symptoms within borderline or clinical range severity experienced by children from either group is depicted in Figure 4. There was significant within-group variation among the clinical sample and 100% of this group scored within the clinical range on at least one subscale of the CBCL. All of the children in the clinical sample experienced both internalizing and externalizing problems. Attention problems were present for 17 children (85%) from the clinical group. One third of children in the community group had some difficulties in clinical ranges. Three community group children experienced clinical range difficulties on two or more subscales (7.5%), see Figure 4.

Table 6
Comparison of CBCL Total, Domain, and Subscale Scores by Group

	Clinical Group				Community Group				Group Differences	
	Border.	Clin.	<u><i>n</i> = 20</u>		Border.	Clin.	<u><i>n</i> = 40</u>		<i>t</i>	<i>p</i> <
			Combined <i>n</i> (%)	Group <i>M</i> (<i>SD</i>)			Combined <i>n</i> (%)	Group <i>M</i> (<i>SD</i>)		
Total CBCL Score	-	-	-	59.90 (25.92)	-	-	-	19.60 (12.16)	6.58	.001***
Internalizing Domain	-	-	-	17.8 (11.79)	-	-	-	6.64 (4.38)	4.10	.001***
Internalizing Range	-	-	-	3 - 47	-	-	-	0 - 19	-	-
Externalizing Domain	-	-	-	15.7 (10.46)	-	-	-	5.85 (5.39)	3.95	.001***
Externalizing Range	-	-	-	1 - 42	-	-	-	0 - 20	-	-
<u>SUBSCALES</u>										
Anxious Depressed	4	8	12 (60%)	9.90 (5.81)	1	2	3 (7.5%)	4.1 (3.04)	4.21	.001***
Withdrawn Depressed	3	3	6 (30%)	3.15 (3.15)	1	1	2 (5%)	1.13 (1.47)	2.70	.01**
Somatic	0	7	7 (35%)	4.75 (5.44)	2	0	2 (5%)	1.46 (1.52)	2.65	.05*
Social Problems	8	2	10 (50%)	7.10 (4.13)	0	1	1 (2.5%)	1.97 (2.15)	5.98	.001***
Thought Problems	3	12	15 (75%)	8.05 (4.89)	4	2	6 (15%)	2.38 (2.14)	4.90	.001***
Attention	7	10	17 (85%)	11.35 (3.90)	0	0	0 (0%)	2.80 (2.40)	10.47	.001***
Rule Breaking	1	5	6 (30%)	4.15 (3.19)	0	1	1 (2.5%)	1.31 (1.72)	3.07	.01**
Aggression	2	6	8 (40%)	11.55 (7.28)	3	0	3 (7.5%)	4.54 (3.93)	4.02	.001***

Note: CBCL = Child Behaviour Checklist. Internalizing Domain Score comprises Anxiety/ Depression, Withdrawn/ Depressed and Somatising Scales; Externalizing Domain Score comprises Rule Breaking and Aggression Scales. "Border" = borderline clinical significance, reflecting *t* scores between 65 and 70. "Clin" = clinically significant scores, reflecting *t* score above 70. *significant at $p \leq .05$ level; ** significant at $p \leq .01$, *** significant at $p < .001$.

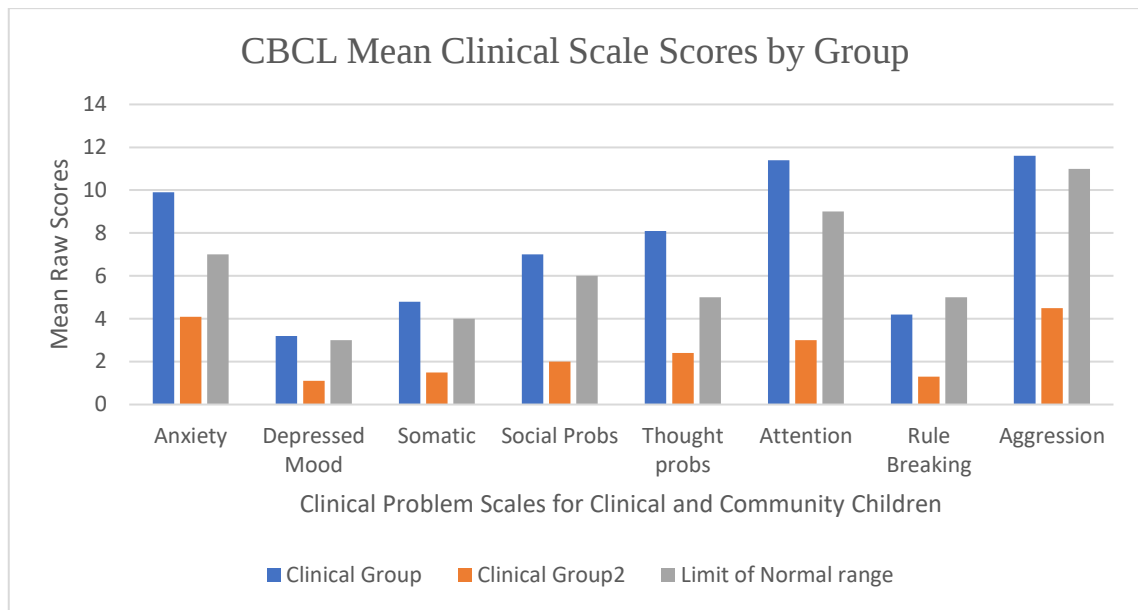


Figure 3. Child Behaviour Checklist (CBCL) (Rescorla & Achenbach, 1983), mean scores for children in the clinical and community groups. “Limit of normal range” represents upper level of typical ranges of problems scales; scores above which reflect clinically elevated difficulties.

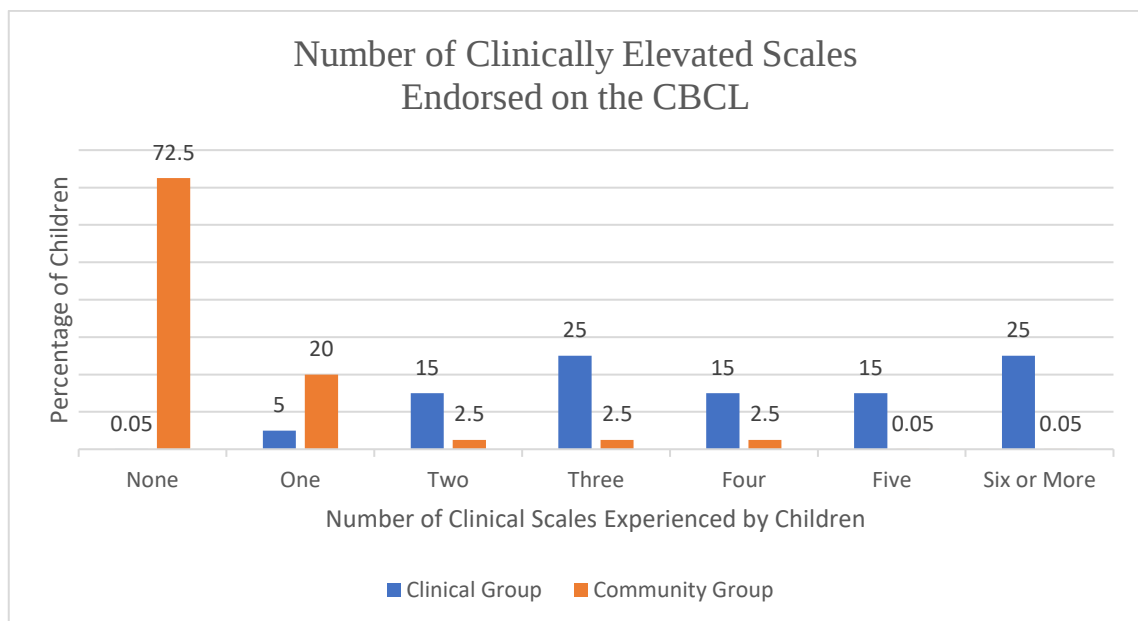


Figure 4. The number of clinically elevated scales reported for each child in clinical and community groups. Clinically elevated scales are indicated when a child’s score is above the cut off range at 93rd centile on the child behaviour checklist (CBCL).

Life Events.

Children. Preliminary analyses conducted using one-way ANOVA identified that children in the clinical group experienced significantly more adverse life events including hospitalization and bullying. Mean for reported life events was 1.65 (1.04) for clinical children and 0.64 (0.74) for community children, $F(1, 57) = 18.48, p < .0001, \eta^2 = .24$. Significant social problems were identified with 55% of children in the clinical group experiencing bullying compared with 15% of children in the community group (6 children) and eight children in the clinical group (40%) were currently having difficulty at school compared with two community group children (5%). Among the children in the clinical group fifty percent were reported to have experienced a traumatic event compared with 25% of controls. Two children in the clinical group had witnessed violent crimes and seven had recently been in hospital (35%) while four children from the community group (10%) had recently been in hospital (Figure 5).

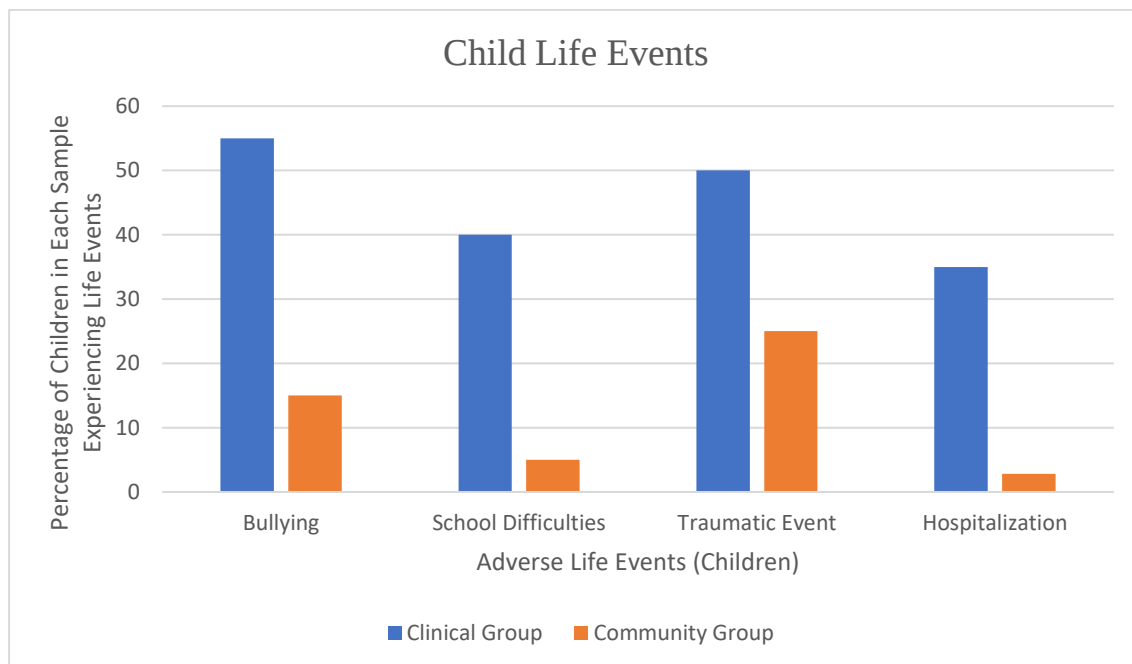


Figure 5. Child life events experienced by children in either group in recent months.

Family. Exploratory analysis examined differences in adverse life events between groups using one-way ANOVA. Adverse family life events were higher among clinical families, including “divorce” “death of a close family friend” or “relationship problems” and clinical families had $M(sd)$ of 1.65 (1.63) life events compared with 0.67 (0.87) for community group respectively ($F(1, 57) = 9.20, p < .004, \eta^2 = .14$). No group differences in life transitions or overall life events were reported.

Kansas Parent Satisfaction Scales. Clinical group parents had “low” mean scores on satisfaction with their parenting and satisfaction with their child’s behaviour (i.e., below 5). Exploratory analyses using t tests to compare means indicated that clinical group parents reported statistically significantly lower mean parenting satisfaction levels; clinical $M = 14.90$ vs community $M = 17.69, t(1, 24) = -3.37, p < .01$ CI [-4.50, - 1.98] and lower satisfaction with their child’s behaviour, $t(1, 26) = -4.74, p < .0001, \eta^2 = .36, CI [- 2.40, - .95]$ (Table 7). Bonferroni correction changed the critical alpha value to $p < .006$, indicating significant differences in parent satisfaction with child behaviour only. Lower parenting satisfaction was negatively correlated with CBCL externalizing scores for both clinical and community groups (overall $r = -.816, p < .0001$; clinical $r = -.795, p < .0001$; community $r = -.666, p < .0001$) indicating a “large” effect (Cohen, 1977) of externalizing scores but not group membership on parent satisfaction.

Depression Scale (DASS-21). It was hypothesized that parents of children in the clinical group would experience greater mental health concerns. T tests for group differences in DASS-21 scores indicated higher “anxiety” and “total” scores for parents in the clinical group but no difference in depression or stress symptoms (Table 7). The

largest between-group difference in DASS – 21 scores was on the “anxiety” scale which yielded $t(1, 27) = 2.53, p = .018, \eta^2 = .129, CI [0.41, 3.93]$. Applying Bonferroni correction increases alpha to .006 indicating no significant differences in parent symptoms on the DASS-21.

Exploratory analyses to examine if parent and child mood concerns were similar was conducted using Pearson correlations. Parent mood ratings on DASS-21 scales positively correlated with child symptoms on subscales of the CBCL with similar mood profiles. This indicated significant associations across groups for depression and anxiety in parents and their children, but no clear pattern for aggressive behaviour (see Table 8). Parent DASS-21 anxiety score was significantly associated with the child anxiety/depression scale of CBCL; clinical $r = .557, p = .001$, community $r = .520, p < .001$. Similarly, a significant correlation was seen between parent’s own report of depression with childrens depressed and low mood on the CBCL (clinical $r = .646, p = .002$, community $r = .330, p = .046$). Child aggression scores on the CBCL were not associated with parent anxiety (clinical $r = .057, p = ns$; community $r = .239, p = ns$) or depression (clinical $r = .078, p = ns$; community $r = .303, p = .066$) for either group but highly negative child behaviour was significantly associated with stress scores for parents in both groups. Aggression was significantly associated with parent stress on the DASS 21 scale for clinical group children ($r = .500, p = .025$). Using Bonferroni corrections to control for multiple comparisons, the family-wise error rate of .05 becomes .01. Therefore, correlations of parent and child anxiety symptoms remained significant for both groups and correlations between depressed mood symptoms for clinical dyads were significant.

Contextual Factors. A minor hypothesis was that contextual factors such as adverse life events or socio-economic factors would be associated with parent and child wellbeing and reflected in symptoms of parent stress/ depression and in child emotion and behavioural difficulties. Zero order correlations to examine associations between the variables are presented in Table 9. Bonferroni correction was applied to control for multiple comparisons and alpha set at $p < .003$. Child life events were significantly correlated with emotional and behavioural symptoms for children in the clinical group only (CBCL scores) (clinical $r = .654, p = .002$; community $r = .343, p = .035$). Parents' emotional symptoms on the DASS-21 were significantly correlated with child life events, for parents in the community group (clinical $r = .458, p = .042$ and community $r = .487, p = .002$). Parent education was associated with adverse life events for parents in the clinical group only; clinical $r = .790, p = .0003$, community $r = .021, p = .900$ and the magnitude of this correlation was significantly different ($p < .001$, correlation test, Preacher, 2002). Cohen's (1977) conventions identify a large effect size, suggesting high practical significance for parent education on report of adverse life events for parents in the clinical group.

Table 7

Comparison of Parent DASS 21 Scores and Kansas Satisfaction Rating by Group

	Clinical Group <i>n</i> = 20	Community Group <i>n</i> = 40		95% CI
	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>t</i>	<i>p</i>
Kansas Total	14.90 (3.54)	17.69 (1.54)	3.37	**
Kansas Behaviour	4.35 (1.46)	6.03 (0.84)	4.74	***
Kansas Parenting	4.95 (1.15)	5.41 (0.59)	1.68	ns
Kansas Relationship	5.60 (1.54)	6.26 (0.55)	1.85	ns
DASS-21 Total	16.05	10.13	2.29	*
Depression	4.0	2.53	1.46	ns
Anxiety	3.8	1.63	2.53	*
Stress	8.25	5.97	2.06	ns

Note: Kansas = Kansas Parent Satisfaction Rating comprising satisfaction with child behaviour, satisfaction with own parenting and satisfaction with relationship with child. DASS-21 = Depression Anxiety & Stress Scale. *significant at $p \leq .05$ level; ** significant at $p \leq .01$; *** significant at $p \leq .001$; ns = not statistically significant.

Table 8

Correlations between Child CBCL Scores and Parent Satisfaction and Symptom Ratings

	Clinical Group <i>n</i> = 20		Community Group <i>n</i> = 40	
	<i>r</i>	95% CI <i>p</i>	<i>r</i>	95% CI <i>p</i>
<u><i>Satisfaction Ratings</i></u>				
Internalizing X Kansas Total Score	-.251	ns	-.219	ns
Externalizing X Kansas Total Score	-.795	***	-.660	***
<u><i>Symptom Ratings</i></u>				
DASS-21 Dep & CBCL Dep	.646	**	.330	*
DASS-21 Anx and CBCL Anx	.557	***	.520	***
DASS-21 Stress and CBCL Agg	.534	*	.092	ns
DASS-21 Anx and CBCL Agg	.052	ns	.239	ns

Note: Kansas = Kansas Parent Satisfaction Rating. DASS-21 = Depression Anxiety & Stress Scale. Internalizing = internalizing domain of the Child Behaviour Checklist (CBCL). Externalizing = externalizing domain of CBCL. "Dep" = depression score. "Anx" = anxiety score. "Agg" = aggression score. *significant at $p \leq .05$ level; *** significant at $p \leq .001$; ns = not statistically significant.

Table 9

Correlations between Life Events & Parent/ Child Wellbeing

Clinical Grp (n = 20) → Community Grp (n = 40) ↓	CBCL	Parent Education	Parent Kansas Total	Parent DASS-21 Score	Child Life Events	Difficult Family Life Events
CBCL	-----	-.075 (ns)	-.679***	.408	.654**	.217 (ns)
Parent Education	.031 (ns)	-----	.167 (ns)	.447*	.376 (ns)	-.790***
Parent Kansas Total	-.485**	.119 (ns)	-----	.437*	.539**	.225 (ns)
Parent DASS-21 Score	.478**	-.204 (ns)	-.239 (ns)	-----	.458*	.547*
Child Life Events	.343*	.016 (ns)	-.122 (ns)	.487**	-----	.482*
Difficult Family Life Events	.063 (ns)	-.021 (ns)	.079 (ns)	-.107 (ns)	.299 (ns)	-----

*significant at $p \leq .05$ level; ** significant at $p \leq .01$; *** significant at $p \leq .001$; ns = not statistically significant.

Summary of Main Findings

Families in the Clinical and community family structure showed similarities in the number of siblings, family size and composition. Parents in both parent groups had a mean educational level of third level (college or university). Clinical group parents were less likely to have a university education. Clinical parents who were primary carers worked less than community parents who were primary carers. Both clinical status and educational level predicted parent employment independently.

Among children in the clinical group, total CBCL scores were three times those of children in the community group. The presence of comorbid symptoms was typical among children in the clinical group, with most (95%) experiencing clinical range difficulty on two or more subscales and this was present for 7.5% of children in the community group. The largest between groups difference for a given symptom was found on the “attention” subscale; 70% of children in the clinical group were reported as having attention/ activity problems. No community group children were reported as experiencing same.

Group differences in parent satisfaction, adverse child and family life events and mood symptoms were noted, with clinical group families experiencing greater stress, life events and lower satisfaction levels. Adverse life events and mood were correlated for children in the clinical group and for parents in the community group. Parent and child mood difficulties such as anxiety were significantly correlated. Parent satisfaction was significantly associated with children’s externalizing behaviour, such as aggression, with a large effect size.

Chapter 7 Internal State Language Results

Overview

This chapter examines parent and child language during a book narration task for quantity and complexity of language and for internal state language (ISL). The first section examines quantity, quality and complexity of speech used in the narratives of children and adults in both groups. Group and gender comparisons are presented. Following this, descriptive data is presented for the quantity and type of ISL used by children and parents in both groups. Finally, zero order correlations are presented in separate correlation matrices for parents and children to allow exploration of associations for syntactical complexity, lexical diversity, child ability and parent education. The chapter ends with a summary of key findings.

Data Plan

The normality of the spread of data was examined on key variables. One significant outlier was identified on language-related variables examined in this section (case number 56, on mean length of utterance in morphemes or MLUm). Options to address undue influence of the outlier were 1) to exclude the data point, or 2) to align the data point with the next closest. Both actions were taken and comparison tests repeated, resulting in no significant changes in findings. The outlier was retained without amendment.

Shapiro-Wilks test for normality identified significant kurtosis on several variables, namely MLUm and child internal state language proportion (ISL) as well as on the measure of vocabulary diversity (VOCD) and on the quantity of utterances spoken by children and parents in both groups so comparison measures use Mann-Whitney U tests rather than t-tests, however, results were similar using both parametric and nonparametric tests.

General Language Overview.

It was hypothesized that children in the clinical group would display reduced language abilities overall, reflected in fewer spoken utterances, reduced grammatical complexity (reflected in lower mean length of utterance in morphemes or MLUm) and in a more restricted vocabulary reflected by higher scores on VOCD. Table 10 presents the results for child and adult language analyses.

Child Narratives.

Quantity of speech. Preliminary examination found that there were no significant group differences in the total number of utterances spoken by children in either group during the book narration (clinical *mdn* = 58.5, community *mdn* = 43.0, $U = 293$, $p = .093$).

Gender analysis. Mann Whitney U tests comparing child gender differences, showed that boys in the clinical group produced a greater number of utterances than typically developing boys (clinical mean rank = 18.21, $M = 70.5$ vs community mean rank = 12.00, $M = 49.69$, $U = 60$, $p = .049$). Bonferroni correction for multiple analyses increased the critical alpha value to $p < .004$ so the finding was non-significant. Girls in the clinical group also produced more utterances but the difference was not significant ($U = 61.5$, $p = .694$).

Quality of lexicon. Median VOCD scores for the clinical group were 56.43 and median for the community group was 53.58; $U = 313.5$, $p = .175$. The hypothesis that children in the community group would display a more diverse lexicon was not supported.

Gender analysis. Child gender analyses of VOCD scores using Mann Whitney U tests showed no significant differences in lexical diversity among boys from the clinical and community groups ($U = 72, p = .096$) or girls in either group ($U = 72, p = .100$).

Complexity of syntax. It was hypothesized that MLUm would be shorter for children in the clinical group. Mann-Whitney U test indicated that medians were 5.85 for clinical group children and 9.15 for children in the community group, indicating a significant difference between groups ($U = 200, p = .002$). Hedges $g = 0.83$, (Hedges 1981) indicating a large effect size and suggesting a high degree of practical significance of group membership on child MLUm. Subsequent Bonferroni correction for multiple hypothesis testing increased the family-wise error rate to a threshold of $p = <.004$ for the language analyses presented in Table 10. The hypothesis that children's syntax would be less complex evidenced by shorter MLUm for clinical group participants was supported.

Gender analysis. Examination of gender and group showed significant differences in syntactical complexity between boys in the clinical and community groups, with MLU (morphemes) significantly shorter for boys in the clinical group, (clinical mean rank = 9.57 vs community = 20.07, $U = 29, p <.001$). Girls in the two groups showed no significant differences in MLUm (clinical mean rank = 12.67 vs community mean rank = 15.61, $U = 55, p = .477$). Hedges' $g = 1.25$ indicating a large effect of gender on MLUm and a high degree of practical significance.

Parent Narratives.

Exploratory analyses investigated if parents in the clinical and community groups displayed similarities in the quantity, quality and complexity of spoken language to their children during the book narration task.

Quantity of speech. There was large within-group variation in the total number of utterances produced by parents. Clinical group parents displayed very large standard deviations and differences in mean ranks (see Table 10). The distribution was positively skewed, with no significant differences found on Mann-Whitney U test comparisons between total number of utterances produced by parents in either group, ($U = 335$, $p = .312$).

Quality of lexical diversity. No significant between- group differences in vocabulary diversity (VOCD) were found on t test comparisons of parent language. Mean ranks were 33.18 and 29.16 for clinical and community parent lexical diversity respectively ($U = 346.5$, $p = .401$), see Table 10.

Complexity of syntax. Parent language complexity showed significant group differences with mean MLUm of 8.32 (SD 3.43) for parents of children in the clinical group and 9.12 (3.31) for controls, (see Table 10). Mean rankings were 24.08 and 33.71 for clinical and community groups respectively, ($U = 271.5$, $p = .044$). This difference was reduced to below threshold significance when Bonferroni correction was applied.

Parent and Child Language Associations

Variation in quantity of spoken language within parent-child dyads was similar between clinical and community groups when examined by non-parametric tests, however, qualitatively, there was a “mismatch” between parent-child dyads in the clinical group, with verbosity on one or other partner in the conversation. Examination of the data showed that 9 children talked significantly more than parents and 11 parents spoke significantly more than children among clinical group dyads. Correlations between number of utterances spoken by clinical and community dyads were exceptionally high for both groups, (.81 for clinical dyads and .98 for community dyads). Total words spoken showed a significant correlation for children in the community group only (clinical $r = .29$, $p = .22$, community $r = .35$, $p = .03$).

Table 10
Group Comparison of Parent and Child Language Quantity and Complexity During Book Narration

	Clinical Group $n = 20$		Community Group $n = 40$		95% CI	
	<i>Mean (SD)</i>	<i>Mean Rank</i>	<i>Mean (SD)</i>	<i>Mean Rank</i>	<i>U</i>	<i>p</i>
<i>Quantity</i>						
Child Total Utterances	67.40 (38.56)	35.85	50.15 (22.96)	27.83	293	ns†
Boys Total Utterances	70.50 (38.82)	18.21	49.69 (20.21)	12.00	60	*
Girls Total Utterances	60.17 (40.53)	16.25	50.46 (25.05)	14.67	61.5	ns
Parent Total Utterances	75.20 (51.23)	33.73	52.13 (23.95)	28.89	335	ns
<i>Syntactic Complexity</i>						
Child MLU Morphemes	6.65 (3.05)	20.5	9.90 (4.39)	35.5	200	**
Boys MLU Morphemes	6.23 (2.82)	9.57	11.07 (4.29)	20.07	29	***
Girls' MLU Morphemes	7.60 (3.60)	12.67	9.12 (4.36)	15.61	55	ns
Parent MLU Morphemes	8.32 (3.43)	24.08	9.12 (3.31)	33.71	271.5	*
<i>Lexical Diversity</i>						
Child VOCD	61.58 (20.54)	34.83	52.81 (11.33)	28.34	313.5	ns
Boys VOCD	63.32 (21.49)	18.36	52.17 (9.96)	13.00	72	ns
Girls VOCD	57.52 (19.34)	15.50	52.23 (12.34)	15.50	72	ns
Parent VOCD	60.35 (16.02)	33.18	57.70 (13.91)	29.16	346.5	ns

†ns = not statistically significant. * significant at $\leq .05$, ** significant at $\leq .01$, *** significant at $\leq .001$.

Internal State Language (ISL) Overview

In this section, child and parent use of internal state language (ISL) during a book reading task is described and associations with language data and individual characteristics are presented.

Data Analysis

Examination of the data indicated that parent ISL was normally distributed but child ISL was not, displaying significant kurtosis in the clinical group. Child ISL is compared using Mann-Whitney U tests and normally distributed variables are examined for group differences with t tests.

ISL Quantity and Type

Descriptive data for ISL indicated that children used approximately 40% less ISL than their parents during the book narration task. Within-group variation in quantity of ISL ranged from 0 to 60 words for parents with a means between 7 and 10 ISL words per narration. Use of ISL terms by children ranged from 1 to 27 words for clinical group children and 1 to 38 for children in the community group with mean of 9 ISL words per narration (Table 11). Two children in the clinical group and two in the community group produced one ISL word during the book narration.

It was hypothesized that cognitive ISL would be most commonly used by both parents and children in this age group. Parents in both samples used cognitive ISL most and desire ISL least. This pattern was also seen among children in the community group. Against expectations, emotion ISL words were most commonly seen among children in the clinical group.

Group differences in children's ISL. It was hypothesized that children in the clinical group would use less ISL when expressed as a proportion and when measured as total wordcount per transcript, compared with children in the community group. A Mann-Whitney U test identified that differences in median proportion of ISL use for the two groups were beyond chance expectancies (clinical mean rank = 24.25 vs community mean rank = 33.63, $U = 275$, $p = .05$). Total ISL wordcount was compared for children in the clinical and community groups using a Mann-Whitney U test to compare medians, which found no differences in median ISL use represented by wordcount (clinical mean rank = 28.98, community mean rank = 31.26, $U = 369.5$, $p = .362$). The hypothesis that clinical group children would use less ISL than community group children was supported when ISL was calculated as a proportion of speech (Figure 6) but applying Bonferroni corrections rendered the findings non-significant.

Group differences in parent ISL. No hypotheses were made regarding quantity of parent use of ISL in either group. Exploratory analyses conducting t tests indicated that there were no significant differences between parents in clinical and community groups' use of ISL in narration of a storybook when ISL was represented by total wordcount; $t(1, 26) = 0.96$, $p = .418$, $\eta^2 = .016$, 95% CI [-5.47, 12.77] nor when represented as a proportion of total speech during the narration task, $t(1, 58) = 0.98$, $p = .333$, $\eta^2 = .016$, CI [-.11, .14].

Parent gender and ISL. The hypothesis that mothers would use more ISL with children than fathers was not testable due to small numbers of fathers among clinical participants. Preliminary analyses showed that for fathers in the community group, one

ISL word per five sentences was produced compared with one ISL word every four sentences for mothers, (.20 versus .28 ISL words), which is not significantly different, $t(1, 58) = 1.53, p = .131, \eta^2 = .039, CI [-0.17, 0.02]$. For the two fathers in the clinical group, mean proportion of ISL used was less than half that of clinical mothers and community group parents of either gender.

Parent ISL and child gender. Exploratory analysis of the influence of child gender on parent ISL using t tests for differences between parent-boy and parent-girl dyads in ISL showed no significant differences if children were boys or girls; Mean ISL proportion was .23 with sons and .29 with daughters, $t(1, 58) = 1.70, p = .094, \eta^2 = .046, CI [-0.12, .01]$.

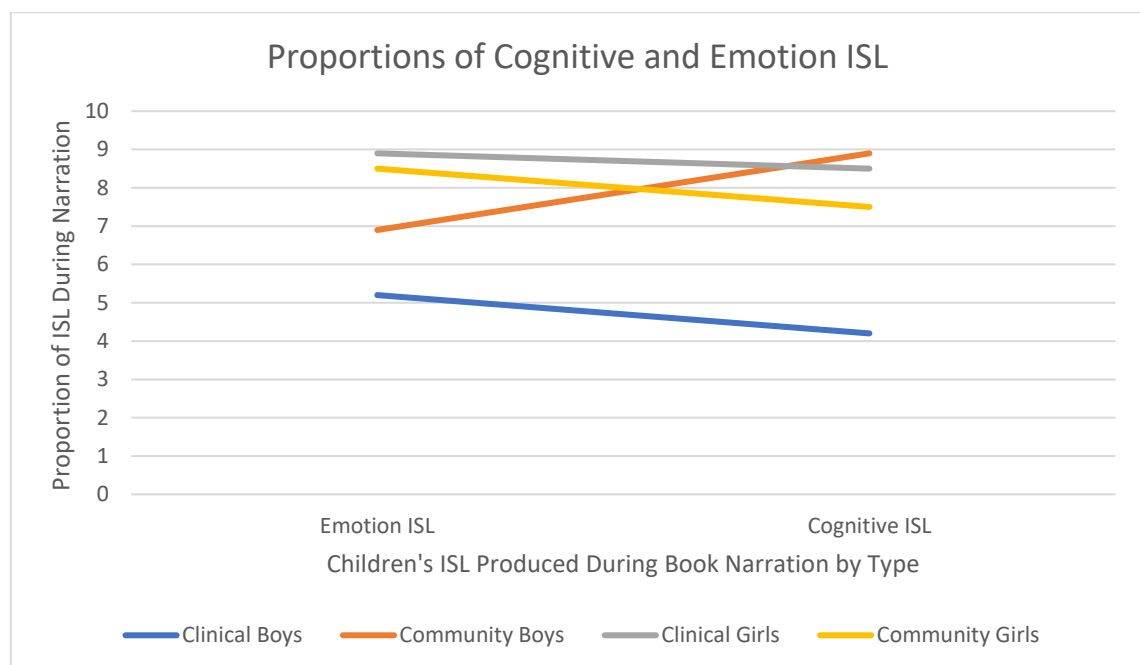


Figure 6. Proportions of Internal State Language (ISL) produced by children in the clinical and community groups during a book narration by type of ISL (cognitive or emotion ISL). Proportions have been multiplied by 100.

Child gender and ISL. Boys used .14 ISL words compared with .19 ISL terms for girls, and this difference was statistically significantly different when comparing mean ranks for the whole group, (clinical mean rank = 25.48 vs 35.52 for community, $U = 299.5$, $p = .026$) but not statistically different when gender and group were considered separately. Examination of cognitive and emotion ISL separately, indicated that boys in the clinical group used half the amount of cognitive ISL compared with girls in the clinical group, (Mann-Whitney $U = 18$, $p = .048$) and compared to boys in the community group ($U = 55$, $p = .017$) but emotion terms were not significantly different between boys and girls in the clinical group ($U = 32$, $p = .444$) and girls from both groups were markedly similar, see Figure 6. There were no differences in verbal IQ between boys and girls who used low levels of ISL but girls who used high levels of ISL had higher verbal IQ ($M = 111.7$ (girls) versus $M = 100.3$ (boys), $t(1, 19) = 2.5$, $p = .02$). Bonferroni correction reduced ISL differences to below threshold significance.

Correlations between parent and child ISL. It was hypothesized that greater ISL use by parents would be associated with greater ISL use by their child. Correlations between community parents' use of ISL and child use of ISL was significant when measured by wordcount ($r = .613$, $p < .0001$) but not when measured as a proportion (see Table 12). No statistically significant correlation was found between ISL use by parents and children in the clinical group when ISL was measured by either method (see Table 12). The hypothesis that parent and child ISL would correlate was supported for children in the community group only. Figure 7 depicts mean ranks for ISL in parent-child dyads by group, alongside analyses of language grammatical complexity (MLUm), quantity (utterances) and vocabulary (VOCD).

Table 11
Group Differences in ISL During Book Narration

	Clinical Group <i>n</i> = 20		Community Group <i>n</i> = 40			95% CI	
	ISL Wordcount <i>M</i> (<i>SD</i>)	ISL Proportion <i>M</i> (<i>SD</i>)	ISL Wordcount <i>M</i> (<i>SD</i>)	ISL Proportion <i>M</i> (<i>SD</i>)	ISL Proportion Mean Rank Clin/Comm	<i>U</i>	<i>p</i>
Child ISL Total Range	9.90 (7.73) 1 - 27	.14 (.10)	9.30 (8.33) 1 - 38	.18 (.10)	24.25 vs 33.63	275	*
Child Cog ISL Range	3.60 (3.24) 0 - 12	.05 (.04)	4.35 (4.93) 0 - 26	.08 (.06)	23.85 vs 33.83	267	*
Child Emot ISL Range	4.45 (4.73) 0 - 16	.06 (.06)	4.00 (3.94) 0 - 17	.08 (.08)	26.48 vs 32.51	319	<i>ns</i>
Child Desire ISL Range	1.00 (1.26) 0 - 4	.02 (.03)	0.93 (1.59) 0 - 8	.02 (.03)	25.50 vs 33.00	300	<i>ns</i>
Parent ISL Total Range	18.40 (18.21) 1 - 59	.24 (.14)	14.75 (11.16) 0 - 60	.28 (.14)	27.5 vs 32.00	340	<i>ns</i>
Parent Cog ISL Range	10.00 (9.90) 1 - 34	.14 (.11)	7.70 (7.00) 0 - 36	.14 (.08)	28.6 vs 31.45	362	<i>ns</i>
Parent Emot ISL Range	7.15 (8.00) 0 - 27	.09 (.06)	5.98 (4.80) 0 - 23	.12 (.07)	26.3 vs 32.60	316	<i>ns</i>
Parent Desire ISL Range	1.30 (1.78) 0 - 7	.01 (.02)	1.08 (1.21) 0 - 4	.02 (.03)	27.93 vs 31.79	348	<i>ns</i>

† *ns* = not statistically significant. * significant at $\leq .05$.

Table 12
Correlations Between Parent and Child Internal State Language (ISL) Use

	Clinical Group <i>n</i> = 20		Community Group <i>n</i> = 40	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i> (95% CI)
Parent and Child ISL Proportion	.302	.195 <i>ns</i>	-.085	.603 <i>ns</i>
Parent and Child ISL Wordcount	.287	.220 <i>ns</i>	.613	***

*** $p < .001$.

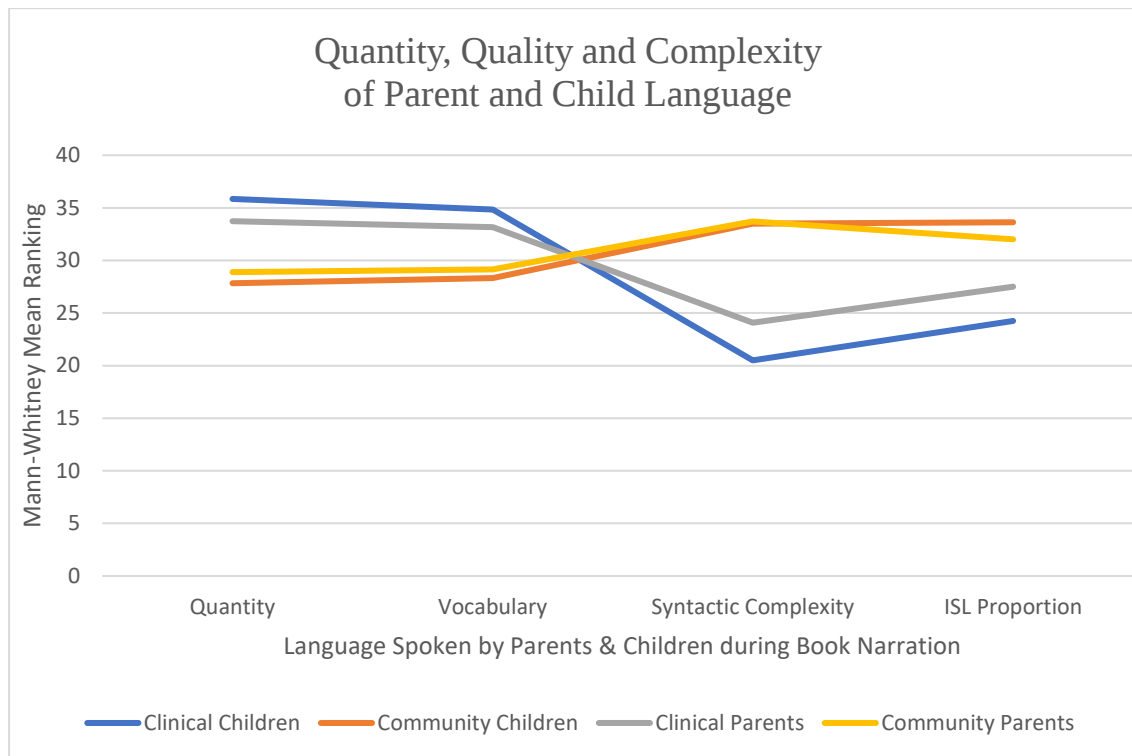


Figure 7. Mean ranks for language quantity, vocabulary diversity (VOCD), syntactic complexity (MLUm) and proportion of ISL. Rankings are Mann-Whitney U Test rankings. Higher VOCD represents lower vocabulary diversity.

Verbal/ Nonverbal IQ

Verbal IQ. Descriptive data for IQ showed that mean verbal IQ (VIQ) for children in the clinical group was 98.65, close to the test average of 100, (see Table 13) and ten points lower than VIQ for children in the community group (109.33), resulting in a statistically significant difference, $t(1, 25) = 2.66$, $p = .014$, $\eta^2 = .153$, CI [-18.96, -2.40]. One way analysis of variance (ANOVA) yielded main effects for gender and clinical status on VIQ and no interaction effect; F ratio for gender was $F(1) = 5.17$, $p = .027$, and F ratio for clinical status was also $F(1) = 5.17$, $p = .027$ indicating that clinical status and gender were equally associated with differences in verbal IQ. Boys from the clinical group scored significantly lower than boys in the community group, $t(1, 19) =$

2.78, $p = .015$, $\eta^2 = .216$, $CI[-23.84, -2.89]$. On subtests which make up total VIQ score, the largest between group difference was found on “vocabulary”, $t(1, 26) = 2.86$, $p = .008$, $\eta^2 = .162$, $CI[-3.99, -6.52]$ which examines expressive language abilities. Only “vocabulary” score differences for boys remained significant when Bonferroni correction was applied.

Nonverbal IQ. Perceptual reasoning (nonverbal IQ or PIQ) was not significantly different between groups however within group differences were large with clinical group PIQ range of 51 to 149, twice that of the community group PIQ (75 to 123) and this difference in range was particularly evident among boys. No significant mean differences between VIQ and PIQ were found between groups.

Table 13
VIQ and PIQ scores for Clinical and Community Groups

	Clinical Group $n = 20$	Community Group $n = 40$		95% CI
	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>t</i>	<i>p <</i>
Vocab Subtest	8.42 (3.22)	10.74 (2.11)	2.86	**
Sim Subtest	11.21 (3.12)	12.64 (1.76)	1.86	ns
VIQ	98.65 (16.81)	109.33 (8.84)	2.66	*
Block Design	9.63 (4.46)	11.23 (2.16)	1.48	ns
Matrix Reas.	9.74 (4.51)	9.62 (2.45)	0.11	ns
PIQ	97.35 (24.90)	103.31 (11.54)	1.06	ns
Boys' VIQ	94.64 (16.79)	108.00 (8.86)	2.78	*
Boys' PIQ	94.64 (27.44)	102.69 (10.29)	1.04	ns
Girls' VIQ	108.00 (13.84)	110.26 (8.89)	0.49	ns
Girls' PIQ	103.67 (18.15)	103.74 (12.55)	0.01	ns

Note: “Vocab” = vocabulary, “Sim” = similarities and “Matrix Reas” = matrix reasoning and block design are subtests from the Wechsler Intelligence Scale for Children – Fourth UK Edition (WISC – IV UK).
*significant at $p < .05$ level, ** significant at $p < .01$ level, “ns” = not statistically significant.

ISL Correlations

Table 14 shows correlations between parent language, ISL and parent education. Correlations between ISL and MLUm were $r = .893$, $p < .0001$ for clinical parents and $r = .386$, $p = .014$ for community parents. These correlations are of a statistically different degree of magnitude of correlation ($p < .0005$, Preacher, 2002) and Bonferroni correction showed that the association remained significant only for clinical parents. ISL was unrelated to the total number of spoken utterances. Bonferroni corrected associations between clinical group parents' educational level and ISL were rendered not significant, see Table 14.

Table 14

Correlations between Parent Language, Internal State Language (ISL) and Education

Clinical Group $n = 20 \rightarrow$ Community Group $n = 40 \downarrow$	Parent ISL	Total Utterances	MLU Morphemes	VOCD	Educational Level
Parent ISL	---	.061	.893***	.209	.508*
Total Utts	.113	---	.141	-.219	-.160
MLU Morphemes	.386*	-.010	---	.268	.546*
VOCD	.046	.192	.095	---	.150
Educational Level	.221	.216	-.081	.139	----

* $p < .05$, *** $p < .001$ ***

Table 15

Correlations between Child Language, Internal State Language (ISL) and Verbal IQ

Clinical $n = 20 \rightarrow$ Community $n = 40 \downarrow$	Child ISL	Total Utterances	MLU Morphemes	VOCD	VIQ	PIQ
Child ISL	---	.002	.451*	-.216	.541*	.283
Child Total Utts	.294	---	.109	.384	.151	-.134
MLU Morphemes	.583***	-.141	---	-.421	.587**	.532*
VOCD	.060	.102	-.168	---	-.358	-.331
Child VIQ	.089	.031	-.051	-.131	----	.790**
Child PIQ	-.084	-.123	.096	-.297	.403*	---

Note: VIQ = verbal IQ (pro-rated), PIQ = nonverbal IQ (pro-rated) scales of the Weschler Intelligence Scale for Children – Fourth UK Edition, (WISC-IV UK). * $p < .05$, ** $p < .01$, *** $p < .001$ ***

ISL and child language characteristics. It was predicted that child language abilities would correlate with proportion of ISL. Examination of the association between syntactical complexity and ISL identified a significant correlation between ISL and MLUm for both clinical and community children ($r = .451, p = .046$ and $r = .583, p < .0001$ respectively), supporting the prediction that ISL is correlated with increased syntactic complexity. Bonferroni correction increased threshold alpha to $p < .003$ for this analysis, so that only the community association was significant.

VOCD was not associated with children's ISL use, (see Table 15) for children in either group. The vocabulary subtest of the WISC IV indicated a below threshold correlation with child ISL production for children in the clinical group only ($r = .547, p = .015, r = .109, p = .508$) and differences in the associations of ISL between groups.

The proportion of ISL produced by children was correlated with child verbal IQ which showed a below Bonferroni-corrected threshold correlation only for the children in the clinical group (clinical $r = .541, p = .014$; community $r = .089, p = .589$). Nonverbal IQ was unrelated to ISL for children in either group; clinical $r = .283, p = .227$, community $r = -.083, p = .609$.

The hypothesis that ISL use would correlate with children's vocabulary diversity (VOCD) was not supported. Children's VOCD scores were significantly positively related to age and further examination of this association showed that VOCD was related to age for children in the clinical group only ($r = .499, p = .025$, community $r = .073, p = .656$) but below threshold for Bonferroni corrected alphas. As it is expected that older children would display a more diverse lexicon (and a positive correlation

indicates less vocabulary diversity) this is an unexpected finding and may be associated with pragmatic language skills or issues related to the association between age and IQ for this particular sample.

ISL and Family Characteristics.

It was hypothesized that family structure would be associated with greater ISL use in children, with the presence of older siblings or adults in the family home associated with greater ISL modelling and use among younger children. This hypothesis was not supported. No differences in family size were associated with increased ISL use among children.

Summary

There were no differences between groups in quantity of parent ISL, parent language quantity, grammatical complexity or vocabulary diversity. Grammatical complexity, indexed by the mean length of utterance in morphemes (MLUm) was significantly correlated with ISL for children in the community group and parents in the clinical group.

Boys in the clinical group used less ISL overall than community group boys. Additionally, boys from the community group used more cognitive ISL and this was not associated with their verbal IQ. These differences were non-significant when Bonferroni correction was applied. For clinical group boys, expressive language scores measured by verbal IQ particularly “vocabulary” and grammatical complexity measured by MLUm were lower than for boys from the community group. Child ISL was associated with VIQ for children in the clinical group only.

ISL was unrelated to diversity of child or parent vocabulary and was unrelated to the quantity of spoken language of parents and children in either group.

Chapter 8 Emotion Understanding Measures

Overview

This chapter presents descriptive and comparative statistics for the three measures of emotion understanding (EU) examined in this study: Emotion Vocabulary Test (EVT) Test of Emotion Comprehension (TEC) and the Fluid Emotions Test (FET). Firstly, data is presented and analysed by group (clinical and community) and by gender for each measure. Then facial emotion recognition by emotion valence is presented and analysed. Association of child characteristics (age, ability, gender and emotional and behavioural difficulties) with each type of EU is presented. Then symptoms and emotion understanding are examined for sensitivity and accuracy of emotion recognition. Lastly, the strength of the associations between different EU measures are described for children in both groups.

Section Overview

Emotion vocabulary test (EVT). Children in the clinical group scored a mean of 18.65 and community group; a mean of 22.93, (Table 16). Gender analysis showed that clinical group boys had a mean EVT score of 16.5 and mean community boys' EVT was 21.81. Girls' EVT score was identical for both groups, at 23.67 (Figure 8). Two way analysis of variance (ANOVA) indicated a main effect of gender on EVT ($F(1) = 4.65, p = .035, \eta^2 = .08$) but no main effect for clinical status ($F(1) = 1.61, p = .209, \eta^2 = .03$) and no interaction effect ($F(1) = 1.61, p = .209, \eta^2 = .028$). Hedges' g was .58 indicating a medium effect size of gender on EVT. The hypothesis that clinical group children would display greater difficulty in describing emotions was not supported; instead a main effect of gender was identified. Boys in both groups had lower EVT scores than girls.

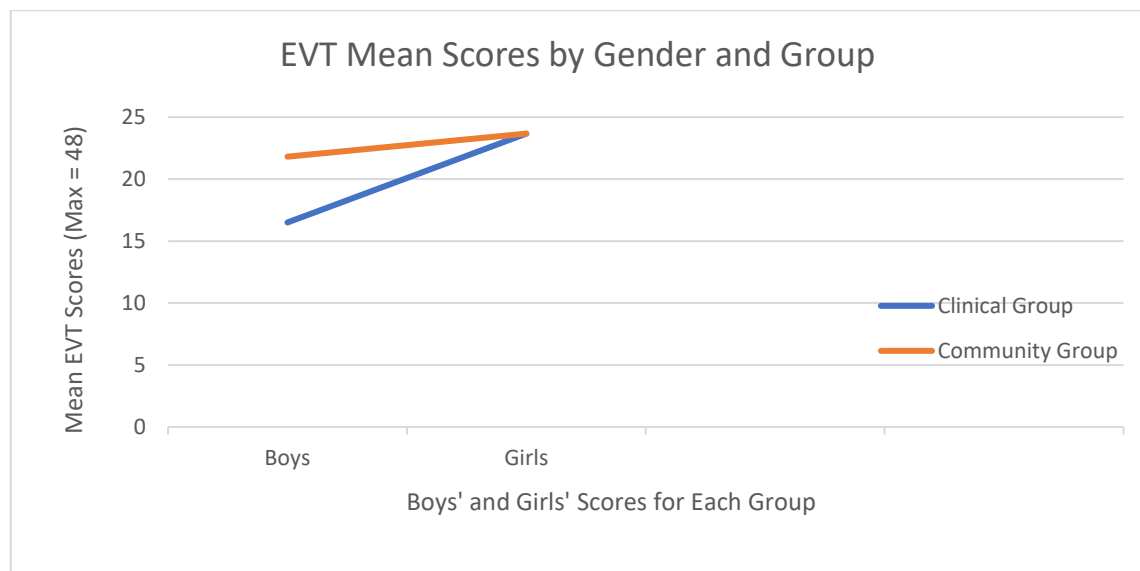


Figure 8. Mean Emotion Vocabulary Test (EVT) Scores for boys and girls in the clinical and community groups. No significant group differences were identified but ANOVA found that boys scored lower than girls in both groups ($p < .05$).

Test of Emotion Comprehension (TEC)

It was hypothesized that children in the clinical group would display lower mean TEC scores. Means were 17.9 and 19.0 for children in clinical and community groups respectively. One child in the clinical group achieved the maximum score of 21 points (5%) while four children (10%) in the community group attained this score. Gender analysis showed that mean TEC scores for girls were 19.33 and 18.83 for clinical and community group children respectively. Boys' TEC scores were 17.29 and 19.27 for clinical and community groups respectively. Analysis of variance (ANOVA) for TEC scores indicated no main effect of gender ($F(1) = 2.43, p = .125, \eta^2 = .042$) or of clinical status ($F(1) = 2.04, p = .159, \eta^2 = .036$) but revealed a significant interaction effect between clinical status and gender; ($F(1) = 5.73, p = .020, \eta^2 = .094$) indicating that means for boys and girls were statistically significantly different depending on group status (Figure 9).

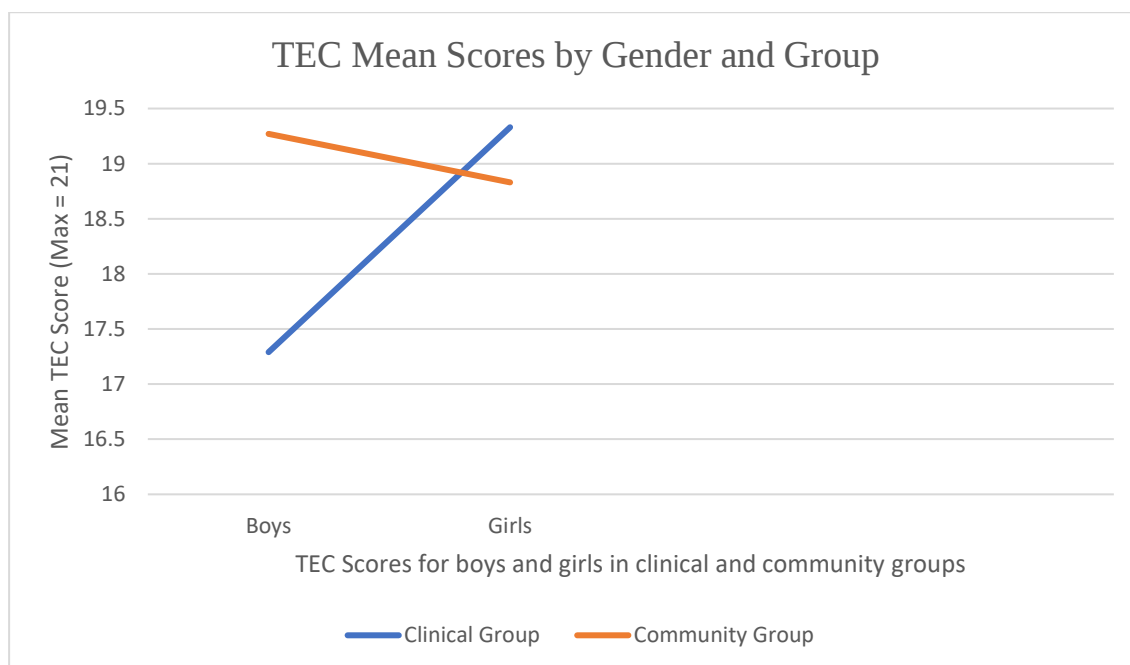


Figure 9. Mean Test of Emotion Comprehension (TEC) scores for boys and girls in the clinical and community groups. ANOVA indicated a significant interaction between group and gender ($p < .05$).

Fluid Emotions Test (FET)

FET scores were not normally distributed so non-parametric tests of difference were applied. Facial emotion recognition was measured by speed and accuracy of labelling still (FET A) and morphing (FET B) photographs. It was hypothesized that children in the clinical group would be less accurate in recognizing facial emotion than children from the community group. It was further predicted that anxiety symptoms would be associated with FET speed (faster times) on negatively valenced faces.

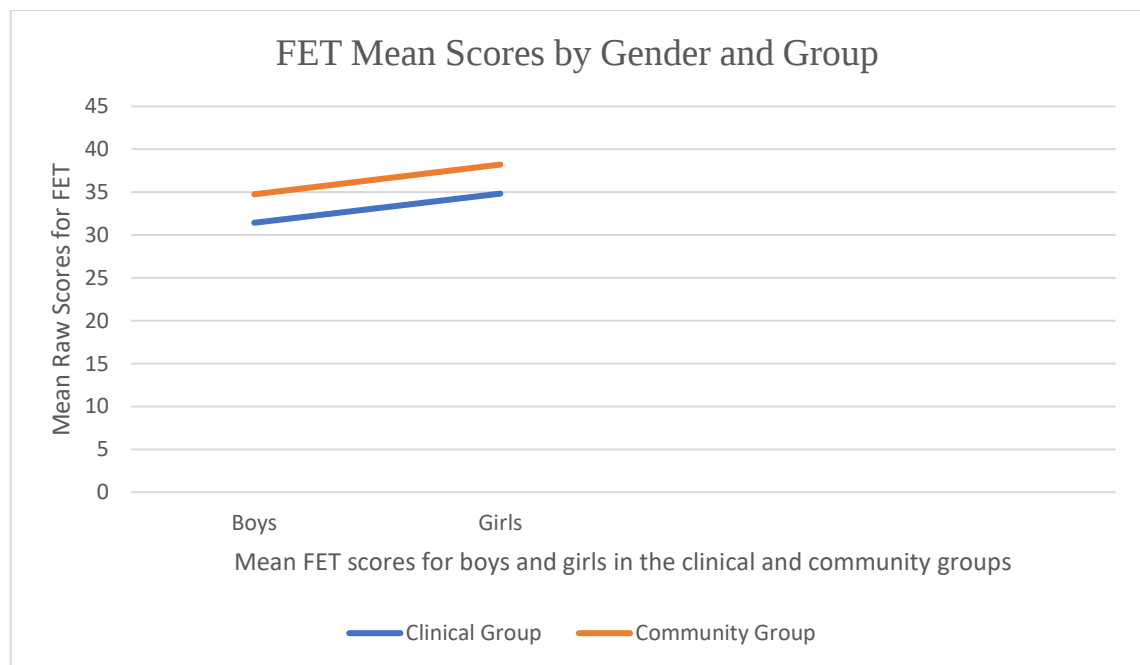


Figure 10. Mean Fluid Emotions Test (FET) total score by group and gender.

FET accuracy total. Children in the clinical group scored a mean total FET accuracy of 32.45, and community group children scored a mean of 36.80. Examining gender and facial emotion recognition showed that girls scored an average of 34.83 and 38.22 on FET accuracy total in the clinical and community groups respectively and boys scored means of 31.43 and 34.75 respectively. Examination of the data indicated that FET A and FET B scores were not normally distributed. Levene's test indicated

non-normal variation for FET A and Shapiro-Wilks test showed that FET B was negatively skewed. Normal plots and detrended QQ plots for both FET A and FET B showed significant outliers that were unduly influencing the data. Box plots identified those variables, which were removed and the distribution still showed significant skewness, so Mann-Whitney U tests were conducted to examine differences between the groups on FET scores. Total FET scores were similar for children in both groups, with $U = 273.5$, $p = .107$, (see Figure 10).

FET A still photograph condition. On the still photo condition (FET A) children in the clinical group scored a mean accuracy score of 15.90 whereas community group children scored a mean of 18.03. Gender analysis showed that means were 15.14 and 17.00 for boys in the clinical and community groups respectively, and girls' means were 17.67 and 18.74 respectively. A Mann-Whitney test indicated that still photograph recognition accuracy (FET A) did not differ significantly in rank for children in the clinical group (mean rank = 24.42) compared with children in the community group (mean rank = 31.17, $U = 274$, $p = .107$).

FET B morphing photograph condition. On morphing photographs of facial emotion (FET B) means for children in the clinical and community groups were 16.55 and 19.26 respectively. Gender analysis showed that boys' mean scores were 16.29 and 18.93 for children in the clinical and community groups respectively and 17.17 and 19.48 for girls in the clinical and community groups respectively. Examining median scores using Mann Whitney U tests indicated that no significant mean rank differences were found between children in the clinical and community groups: (FET B $U = 272$, p

= .13; mean rank for clinical group = 24.32 and mean rank for community group = 31.34).

FET speed. It was hypothesized that emotion recognition would be faster on more “prototypical” emotions. This hypothesis was partially supported. For both clinical and community groups, the three fastest response times, in order, were; “happiness”, “surprise” and “sadness”. “Neutral” and “angry” faces were among the slowest to identify for both groups. Speed of recognition was not normally distributed (Shapiro-Wilks’ $p < .001$) and detrended QQ plots showed that time taken to respond to FET B was positively skewed. Mann Whitney U test showed that children in the clinical and community groups showed significantly different response times in emotion recognition overall (clinical group mean rank = 18.29; community mean rank = 32.34, $U = 158$, $p = .003$) indicating faster response times for the clinical group. Bonferroni corrected p values supported this result.

Facial emotion recognition accuracy by emotion type. Children in both clinical and community groups, found “happiness” the easiest emotion to identify with mean accuracy of 78% and 98% respectively. “Neutral” emotional expression, “sadness”, “anger” and “fear” all showed similar levels of recognition with accuracy ranging from 60% to 75% across those emotional expressions for both groups. “Surprise” was accurately identified by 46% of children from the clinical group and 70% of community children. The most difficult emotional expressions for both groups to identify were “disgust” and “contempt”. At least 40% of children reported “disgust” as either “angry” or “annoyed”. Children in the community group identified “disgust” correctly 14% of the time and children in the clinical group, 8% of the time.

“Contempt” was the most difficult to identify, with 99% or above error responses and was most likely to be described as “happy” by children in both groups, see Table 17.

There were no statistically significant group differences in recognition scores on faces depicting “anger”, “sadness”, “fear” or “neutral” expressions. Median scores were significantly different for “happiness” and “surprise” recognition between groups, with children in the community group displaying significantly fewer errors and higher median scores (“happy” mean rank for clinical = 13.38, mean rank for community = 37.99, $U = 57.5$, $p < .0001$; “surprise” mean rank for clinical = 20.63, mean rank for community = 34.17, $U = 202.5$, $p < .003$). Bonferroni corrected p values supported this result. Hedges’ g indicated a large effect of clinical group membership on recognition of happy faces ($g = 1.62$) and surprised faces (0.82).

FET response attrition. With increasing trials, children in the clinical group displayed higher rates of missed responses, (see Table 18). Between group differences in FET accuracy were re-examined for responses on the first two-thirds of items (i.e., before response attrition commenced) which showed that the statistical significance of differences remained the same.

Table 16

Descriptive Measures of Emotion Understanding for Clinical & Community Groups

	Clinical Group <i>n</i> = 20		Community Group <i>n</i> = 40	
	<i>Mean (SD)</i>	<i>Range</i>	<i>Mean (SD)</i>	<i>Range</i>
EVT	18.65 (9.47)	1-33	22.93 (6.01)	9-39
TEC	17.90 (2.45)	11-21	19.00 (1.41)	15-21
FET A Still Photo	15.90 (4.59)	4-22	18.03 (3.79)	13-24
FET B Morphing Photo	16.55 (5.22)	3-24	19.26 (2.80)	14-25
FET Total	32.45 (9.53)	7-44	36.80 (7.56)	28-48
FET Reaction Time	149.83 (46.15)	2.25-9.25	183.68 (40.26)	4.00-9.40

Note. EVT = Emotion vocabulary test; TEC = Test of emotion comprehension; FET = Fluid emotions test comprising still face condition accuracy (FET A); morphing face condition accuracy (FET B); total accuracy score (FET Total) and speed of response (FET Reaction Time = mean total response time in seconds).

Table 17

Fluid Emotions Test (FET) Accuracy by Emotion Type

	Clinical Group <i>n</i> = 20		Community Group <i>n</i> = 40		95% CI	
	<i>Mean (SD)</i>	<i>Median</i>	<i>Mean (SD)</i>	<i>Median</i>	<i>U</i>	<i>p</i>
“Happy” (Max = 8)	6.25 (1.59)	13.38	7.84 (0.44)	37.99	57.5	***
“Sad” (Max = 9)	5.95 (2.11)	27.45	6.31 (2.13)	31.31	339	ns
“Angry” (Max = 7)	4.75 (1.88)	31.68	4.63 (1.51)	28.36	336	ns
“Scared” (Max = 9)	5.55 (2.44)	27.55	5.75 (2.24)	30.53	341	ns
“Neutral” (Max = 7)	5.20 (2.44)	26.83	6.03 (1.40)	30.91	326.5	ns
“Surprised” (Max = 7)	3.25 (2.22)	20.63	4.92 (1.96)	34.17	202.5	**
“Disgusted” (Max = 7)	0.60 (1.19)	25.05	1.00 (1.36)	31.84	291	ns
“Contempt” (Max = 9)	0.10 (0.45)	29.03	0.08 (0.27)	29.75	370	ns

Note. FET = Fluid emotions test total accuracy scores comprising still face condition accuracy (FET A) plus morphing face condition accuracy (FET B). * significant at $p \leq .05$, ** significant at $p \leq .01$.

Table 18

Percentage of Missed Responses on FET Emotion Recognition Test for Clinical and Community Samples

	Clinical <i>n</i> = 20	Community <i>n</i> = 40
FET 1-10	4%	5%
FET 11-20	3%	1.5%
FET 21-30	12.5%	0.75%
FET 31-32	15%	3.75%

Note. FET = Fluid Emotions Test, (Dyck, 2012) shows 2 photographs per item. A missed response was deemed to occur when a child did not provide a verbal response to the stimulus.

Child Characteristics and Emotion Understanding (EU)

It was hypothesized that children's emotion understanding (EU) scores would vary according to individual child characteristics such as age and ability; positive correlations were expected between child age, VIQ and PIQ and performance on the three EU tests (EVT, TEC and FET).

Age. Table 19 shows correlations between child characteristics and each of the three EU tests for children in the clinical and community groups. Age was associated with EVT for children in the community group only ($r = .321, p = .044$) and not significant when Bonferroni correction applied.

VIQ. The hypothesis that verbal IQ would correlate with scores on EU measures, particularly EVT, was supported for children in the clinical group and partially supported for children in the community group, (see Table 19). EVT showed a significant relationship with VIQ for children in both groups. It was hypothesized that EVT would correlate highly with the "vocabulary" subtest of the WISC IV due to similarities in administration and scoring of the measures. Further exploration of the VIQ-EVT association showed that as expected, EVT was highly correlated with the "vocabulary" subtest of the WISC IV (clinical group $r = .762, p < .0002$, community group $r = .422, p = .007$). Bonferroni corrected p values supported this result.

The strongest correlations were found between TEC and VIQ for clinical group children ($r = .722, p = .0003$). The association between TEC and VIQ was not significant for children in the community group ($r = .012, p = .942$, see Table 19) and

the magnitude of the correlations was significantly different ($p < .01$, Preacher, 2002). Correlation magnitude between FET and VIQ was .496 ($p < .05$) and not significant for children in the community group ($r = .131$, $p = .433$, see Table 19).

PIQ. It was hypothesized that children's nonverbal ability (PIQ) would correlate with their performance on EU measures, in particular, with tests of EU that rely on visual processing skills such as FET and TEC. This hypothesis was supported only for children in the clinical group. For clinical group children, PIQ was statistically significantly correlated with all three EU measures which yielded correlations of $r = .586$, $p = .007$ (PIQ x EVT) $r = .632$, $p = .003$ (PIQ x TEC) both indicating a "medium" effect size (Cohen, 1977) and a correlation of $r = .453$, $p = .045$ for PIQ x FET. Bonferroni correction indicated that only the first two results were significant. PIQ was not significantly correlated with measures of EU for children in the community group: (correlations between $r = .148$ and $r = .268$, all non-significant, see Table 19).

Table 19

Correlations between Emotion Understanding (EU) and Child Age, Ability and Clinical Scale Scores

	Clinical Group <i>n</i> = 20		Community Group <i>n</i> = 40	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Age x EVT	.099	.678	.321	*
Age x TEC	-.194	.413	.010	.954
Age x FET	.058	.807	.040	.807
VIQ x EVT	.674	***	.341	*
VIQ x TEC	.722	***	.012	.942
VIQ x FET	.496	*	.131	.433
PIQ x EVT	.586	**	.268	.099
PIQ x TEC	.632	**	-.167	.316
PIQ x FET	.453	*	.148	.376
Ext x EVT	.058	.807	.040	.811
Ext x TEC	.100	.675	.111	.509
Ext x FET	.113	.397	.119	.475
Int x EVT	.302	.195	.052	.752
Int x TEC	.260	.268	.073	.665
Int x FET	.466	*	.232	.161
Att x EVT	-.156	.511	-.043	.795
Att x TEC	-.405	.077	.314	.055
Att x FET	-.299	.200	-.315	.054
Soc x EVT	-.060	.802	.022	.894
Soc x TEC	.075	.753	.035	.836
Soc x FET	.166	.485	-.027	.873

Note: EVT = Emotion vocabulary test; TEC = Test of emotion comprehension; FET = Fluid Emotions Test; Ext = Externalizing Behaviour, Child Behaviour Checklist (CBCL, Achenbach & Edelbrock, 1983); Int = Internalizing Behaviour scale, CBCL, Att = Attention score, CBCL, Soc = Social Scale Score, CBCL. VIQ = Prorated Verbal Comprehension Index Score & PIQ = Pro-rated Perceptual Reasoning Index Score, both from Weschler Intelligence Scale IV, UK Edition, Psychological Corporation.

p* < .05, ** *p* < .01, * *p* < .001.

CBCL Scores and Emotion Understanding (EU)

It was hypothesized that children with high scores on externalizing, internalizing domains and attention scale of the Child Behaviour Checklist (CBCL) would show greater difficulties in emotion understanding, particularly for facial emotion and for negatively valenced emotion expressions.

Externalizing Scores and EVT, TEC, FET Scores. It was hypothesized that emotion understanding difficulties would be associated with greater externalizing behaviours in children. Against expectations, externalizing behaviour scores on the Child Behaviour Checklist (CBCL) were not correlated with any of the measures of emotion understanding for either clinical or community children (see Table 19).

Internalizing Scores and EVT, TEC, FET Scores. Internalizing difficulties were statistically significantly correlated with total FET scores for children in the clinical group only (clinical $r = .466$, $p = .039$; community $r = .232$, $p = .161$) and a positive correlation indicated that higher anxiety was associated with more accurate facial emotion labelling. There were no group differences in recognition accuracy of angry faces for children with/ without anxiety; $t(1, 56) = 0.89$, $p = .38$). No differences were found between children with or without internalizing difficulties on EVT, TEC or FET. The hypothesis that internalizing scores on the CBCL would correlate negatively with FET scores was not supported. Bonferroni correction indicated that the association with anxiety was below threshold alphas for the clinical group.

Social problems scale and EVT, TEC and FET scores. The hypothesis that children's scores on the "social problems" scale of the CBCL would correlate with

lower scores on EU measures was not supported on any of the measures of EU for children in either clinical or community groups, (see Table 19).

Attention scale and EVT, TEC, FET. It was hypothesized that attention problems would be negatively correlated with TEC and FET scores. Recognition of negatively valenced facial emotion on FET such as angry, sad or fearful expressions, was hypothesized to be more difficult for children with attention problems. Exploratory analyses were conducted between attention and EVT.

Attention was negatively correlated with EU but below threshold significance for all of the EU tests for children in the clinical group and for two EU tests for the community children. For children in both groups, the association of attention difficulties and TEC accuracy scores was close to margins of significance (clinical $r = .405$, $p = .077$, community $r = .314$, $p = .055$, see Table 19).

Child Symptoms and Emotion Understanding

Clinical range difficulties were identified for children who scored above $t = 65$ for each symptom type of “attention,” “anxiety,” and “depressed mood.” Examination of FET scores by symptom type was conducted with presence/ absence of each mood symptom as the group indicator.

Attention difficulties. It was hypothesized that children with clinical range attention problems would display reduced accuracy in emotion recognition particularly on negatively valenced facial emotion expressions. Dividing the group into those with/ without clinical range attention difficulties identified 19 children with clinical range

attention problems and 41 children without. Examining FET emotion type by presence/absence of attention problems using a Mann Whitney U test found significantly different mean accuracy rankings between children with/ without attention problems on recognition accuracy for “happy” ($U = 131.5, p = <.001$) and “surprised” ($U = 192, p < .003$) faces but once Bonferroni corrected, “disgusted” facial expressions were no longer significant ($U = 239, p < .015$, see Figure 11 this chapter and Appendix N, Table 1). Mean accuracy for “happy” faces was 6.42 (1.61) and 7.18 (0.61) for children with/ without attention difficulties respectively. “Surprised” faces had means of 3.15 (2.19) and 4.92 (1.96) for children with/ without attention difficulties. Hedges g indicated a large effect of attention on happy facial recognition and a medium effect on surprised faces. Although differences in facial emotion recognition by type were identified, the hypothesis that attention problems would be associated with reduced accuracy in recognizing negatively valenced emotion was not supported; children with attention problems made more recognition errors across emotion valences.

Mann-Whitney U tests examined mean rankings of emotion recognition speed between children with and without clinical range attention problems. Children with attention problems had significantly faster emotion recognition times on five out of the eight emotions measured (see Figure 12 in this chapter and Appendix N, Table 2).

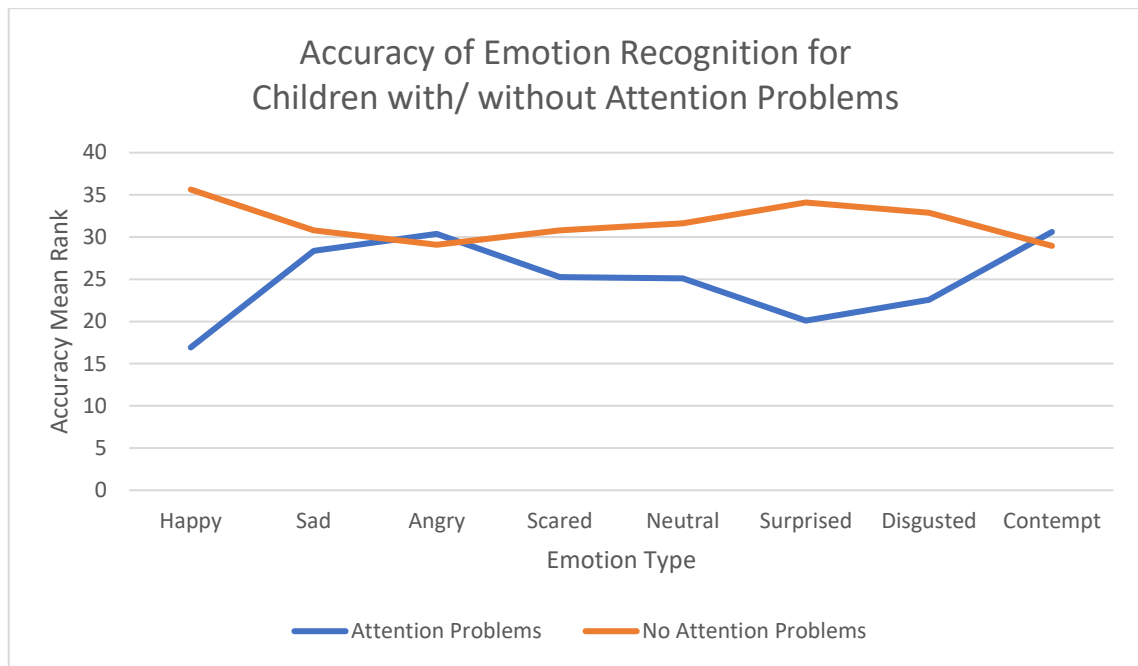


Figure 11. Comparison of Mann-Whitney U Test mean accuracy ranks between children with and without attention problems for each type of facial emotion of the FET measure.

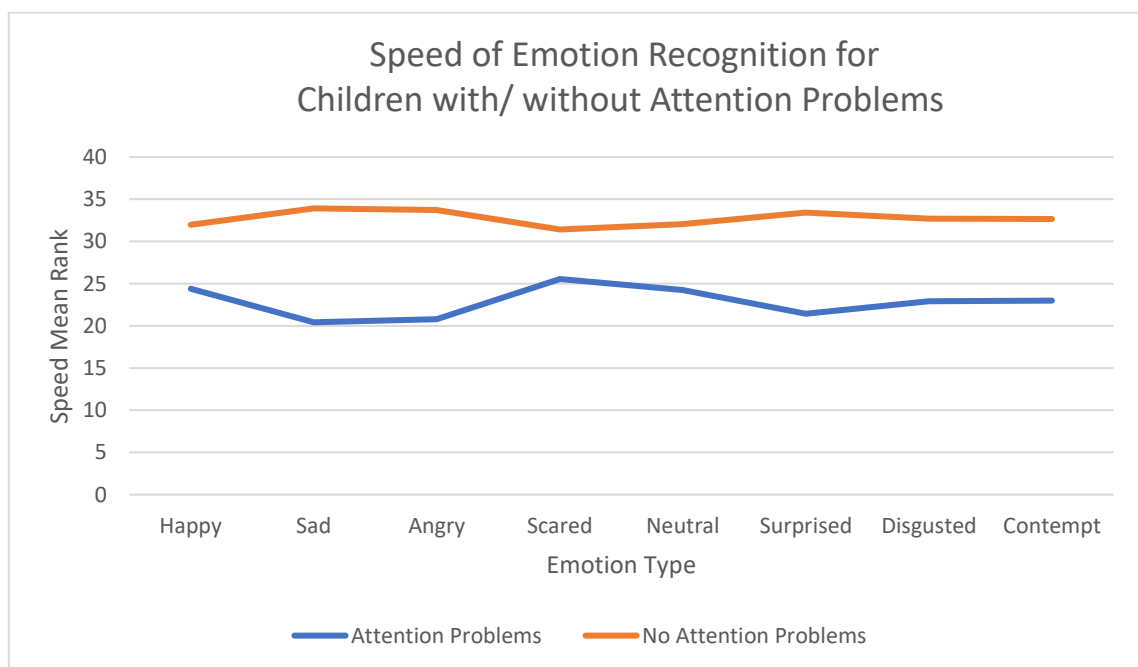


Figure 12. Comparison of Mann-Whitney U Test mean speed ranks between children with and without attention problems for each type of facial emotion of the FET measure.

CBCL anxiety score. It was hypothesized that children with anxiety and depressed mood would display significantly reduced accuracy on facial emotion recognition and shorter recognition times for negatively valenced emotional expressions. Clinical range anxiety was present for 18 children in the clinical and community samples and absent for 42 children. Mann Whitney U tests for group differences identified significant differences in “happiness” recognition only for anxious children ($U = 203.5, p = .005$) see Figure 13 this chapter and Appendix O, Table 1. Mann Whitney U tests examined facial emotion recognition speed by emotion type indicating that there were no differences in speed of facial emotion recognition between children with anxiety/ depression and those unaffected (see Figure 14 this chapter and Appendix O, Table 2).

CBCL withdrawn/ depressed score. Children with t scores above 65 on the “withdrawn/ depressed” scale were significantly better at describing emotion evidenced by higher scores on the EVT. This finding was statistically significant for clinical and community groups separately and when verbal IQ was controlled (clinical $r = .601, p = .007$; community $r = .369, p = .023$), indicating a “small” effect of withdrawn/ depressed symptoms on EVT. Mann-Whitney U test indicated that when the group was divided into those with/ without depressed mood, that boys with low mood were significantly better at describing emotions than girls and those without mood difficulties when age and IQ were controlled ($r = .375, p = .05$). Evaluation of depressed mood and FET scores indicated greater difficulty in recognizing “happy” faces (Mann-Whitney U Test = 155.5, $p < .05$) for children with depression. However, Bonferroni corrections applied to these results increased the family wise error rate so these findings were no longer significant.

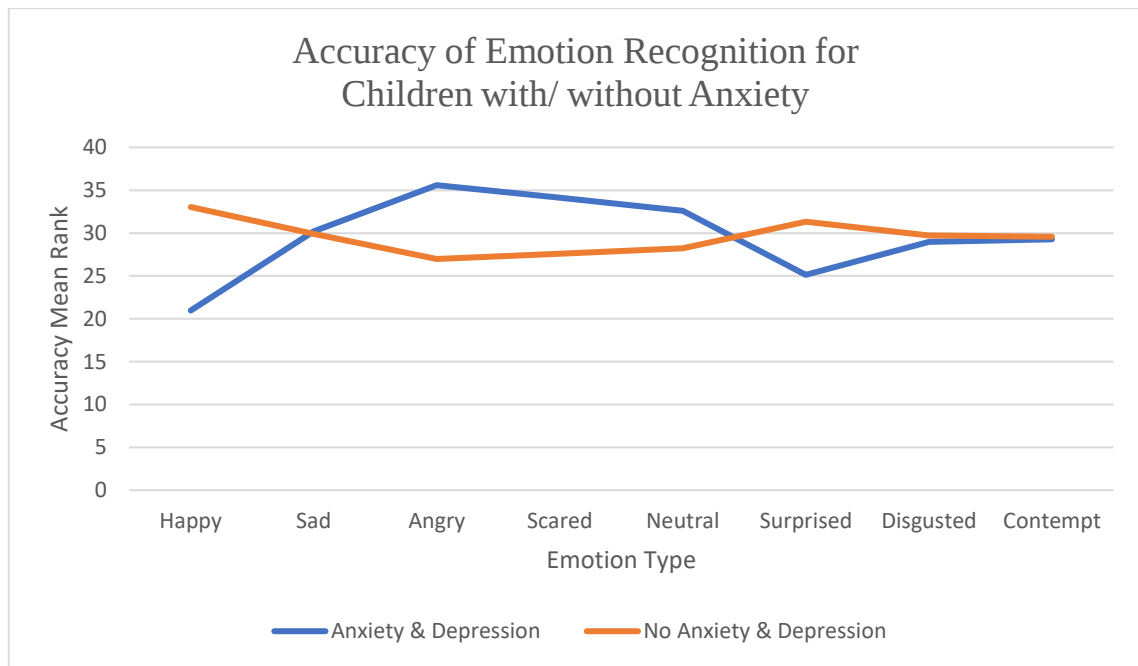


Figure 13. Comparison of Mann-Whitney U Test mean accuracy ranks between anxious and non anxious children for each type of facial emotion of the FET measure.

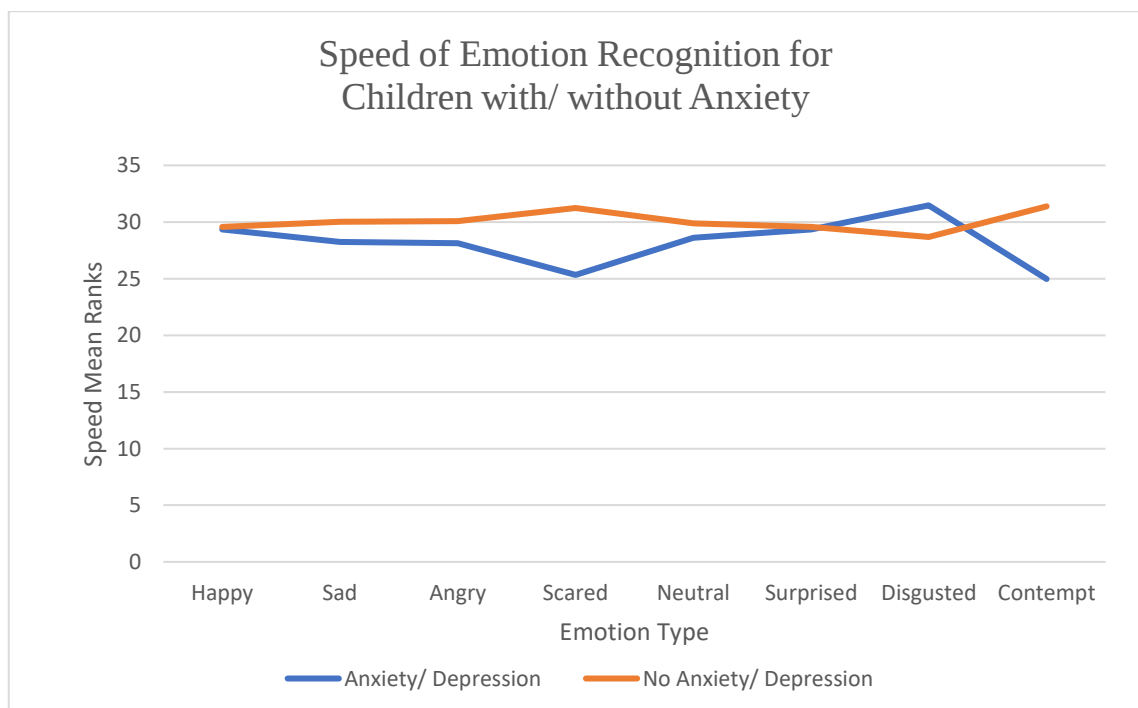


Figure 14. Comparison of Mann-Whitney U Test mean speed ranks between anxious and non anxious children for each type of facial emotion of the FET measure.

Correlations Between Measures of Emotion Understanding (EU)

It was hypothesized that measures of EU would correlate significantly with each other for children in both clinical and community groups. This hypothesis was supported for children in the clinical group only, (see Table 20). There was a statistically significant correlation between EVT and TEC for children in the clinical group but no relationship between these variables for children in the community group, (clinical $r = .612$, $p = .004$, community $r = .006$, $p = .970$). To ascertain the impact of VIQ on EU, partial correlation between EVT and TEC was conducted, controlling for VIQ which found that strength of association between the measures was reduced to below threshold significance for the clinical group children when VIQ was controlled for, ($r = .245$, $p = .313$) and the community group EVT/ TEC relationship was relatively unchanged ($r = .010$, $p = .954$, see Table 20).

FET and EVT scores were statistically significantly correlated for children in the clinical group but not the community group (clinical $r = .704$, $p = .0005$, community $r = .165$, $p = .317$) and the magnitude of these correlations is significantly different ($p < .01$, Preacher, 2002). The strongest association was found between TEC and FET scores for the children in the clinical group only, (clinical $r = .824$, $p = <.0001$, community $r = .007$, $p = .965$) with markedly different associations between these measures for the community group children ($p < .0001$, Preacher, 2002).

FET accuracy and speed were associated for children in the clinical group only, with longer emotion recognition times (i.e., slower speed of emotion recognition & labelling) on FET associated with accuracy for children in the clinical group only, ($r = .559$, $p = .016$) not for community group children ($r = -.069$, $p = .679$).

Table 20

Correlations Between Measures of Emotion Understanding (EU)

	Clinical Group <i>n</i> = 20		Community Group <i>n</i> = 40	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
EVT x TEC	.612	.01**	.006	.970
EVT x TEC controlling VIQ	.245	.313	.010	.954
EVT x TEC controlling VIQ/ PIQ	.232	.355	.046	.790
TEC x FET	.824	<.001***	.007	.965
TEC x FET controlling VIQ	.774	<.001***	.001	.994
TEC x FET controlling VIQ/PIQ	.680	<.01**	.017	.923
FET x EVT	.704	.001**	.165	.317
FET x EVT controlling VIQ	.577	<.01***	.124	.465
FET x EVT controlling VIQ/PIQ	.637	.006**	.106	.539
FET Accuracy x FET Speed	.559	.016**	-.069	.679
FET Accuracy x FET Speed Control VIQ	.515	.035*	-.133	.440
FET Accuracy x Speed Control VIQ/ PIQ	.434	.106	-.129	.459

Note: EVT = Emotion vocabulary test; TEC = Test of emotion comprehension; FET = Fluid emotions test. VIQ = Prorated Verbal Comprehension Index Score on Weschler Intelligence Scale IV, UK Edition. ** $p < .01$, *** $p < .001$.

Main Findings

Few group differences on measures of EU were evident in this study. Children in both groups performed equally well on overall scores on tests of emotion vocabulary, comprehension and facial emotion recognition. Differences in emotion vocabulary were associated with gender and lower verbal IQ. Boys in the clinical group had greater difficulty on EVT compared with girls from either group or community group boys. This difference was associated with differences in “vocabulary” scores subtest. Girls from the clinical and community groups scored similarly on measures of emotion vocabulary (EVT).

Children from clinical and community groups performed equally well on TEC but there was a significant interaction between group and gender when group differences were examined. TEC was highly correlated with intellectual ability for children in the clinical group but not for children in the community group.

FET scores were similar for children in both groups when examined overall. Against expectations, internalizing and externalizing behaviour difficulty was not associated with differences in EU test performance. Group differences in identification of “happiness” and “surprise” were identified between children in the two groups and clinical group children showed faster response times overall. When specific symptoms were examined, anxiety and attention problems were associated with difficulties in recognizing “happy” facial expressions. Intellectual ability was significantly associated with performance on EU measures for children in the clinical group. Nonverbal IQ was unrelated to FET performance for children in the community group.

Children with anxiety and depression showed typical response times but children with attention problems showed faster responses. Greater accuracy was associated with slower response times.

Social difficulties were unrelated to EU performance for children in either group. Children with attention problems showed greater difficulties on the TEC and FET measures. Clinically significant attention scores were associated with difficulties in recognizing “happy”, “surprised” and “neutral” facial expressions.

Finally, EU measures were significantly correlated for children in the clinical group only. Controlling for verbal IQ reduced the strength of the association between two of the measures (EVT and TEC) for children in the clinical group.

Chapter 9 ISL and EU Associations

Overview

The overarching hypothesis of this thesis is that parent or child internal state language is associated with children's EU. The hypothesis is first examined in relation to the Emotion Vocabulary Test (EVT) the Test of Emotion Comprehension (TEC) and the Fluid Emotions Test (FET). Next, associations between language and EU and correlations between the main study variables for clinical and community groups are presented. Finally, correlations between key study variables are discussed.

Parent ISL.

It was hypothesized that proportion of parent internal state language (ISL) would correlate with children's EU scores on the Emotion Vocabulary Test (EVT) the Test of Emotion Comprehension (TEC) and the Fluid Emotions Test (FET). Bonferroni correction for this set of analyses increased the critical threshold to $p < .01$.

Emotion Vocabulary Test (EVT).

Group differences. There was no significant correlation between parent ISL and child EVT (clinical $r = .35$, $p = .13$, community $r = .03$, $p = .86$). The hypothesis that parent ISL would be associated with EVT was not supported for children in the clinical or community groups.

Gender differences. Examining parent ISL and child gender indicated that parent ISL significantly positively predicted EVT for boys ($r = .497$, $p < .005$) and significantly negatively predicted EVT scores for girls ($r = -.381$, $p = .038$). When verbal IQ and parent education were controlled, parent ISL remained significantly positively correlated for boys only ($r = .408$, $p = .035$) and the association with girls' EVT scores was below threshold significance ($r = -.333$, $p = .090$). Parent cognitive ISL was highly correlated with boys' but not girls' EVT scores (boys' $r = .469$, $p = .009$; girls' $r = -.316$, $p = .089$). Bonferroni corrected alpha values were consistent with this finding; the hypothesis that parent ISL would predict children's EU scores was supported for boys but not for girls in the overall group; parent ISL and cognitive ISL proportion were significantly associated with boys' EVT scores. Using Cohen's (1977) conventions, the effect size was in the small to medium range.

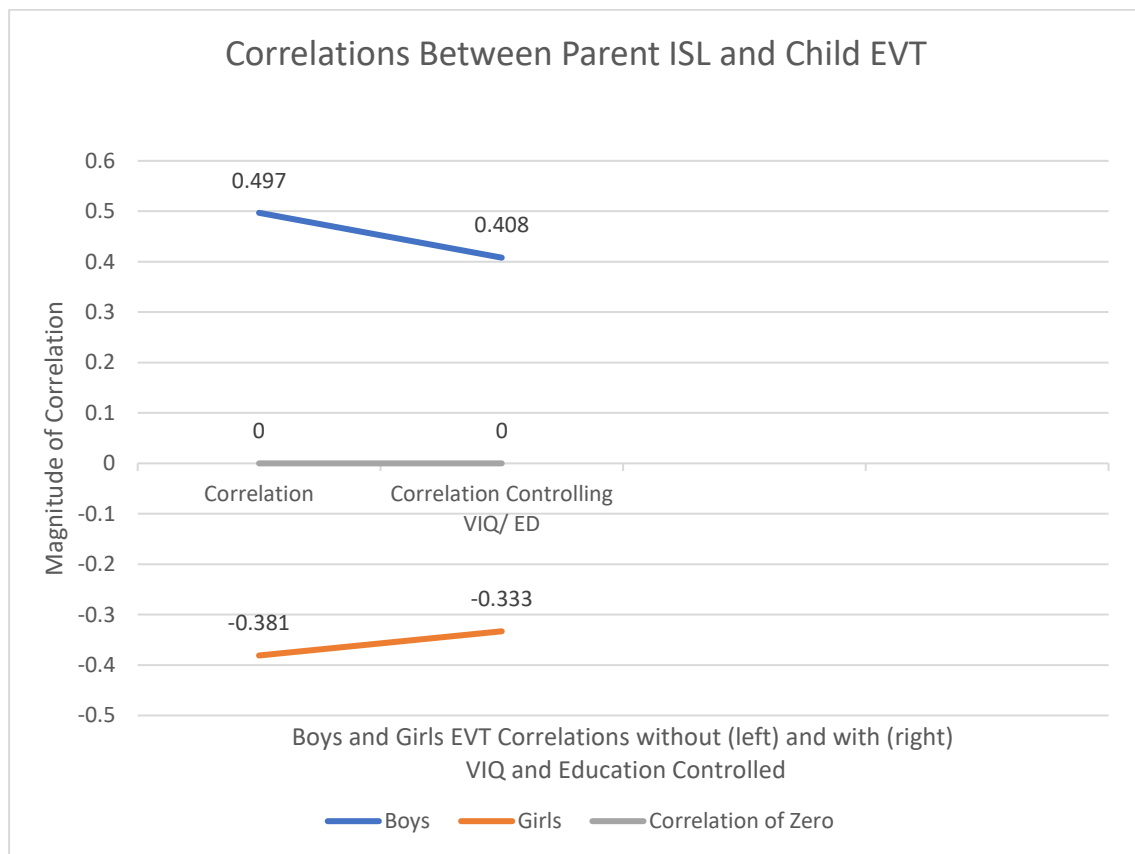


Figure 15. Correlations between Parent ISL and Emotion Vocabulary by Gender.

Test of Emotion Comprehension (TEC).

Group differences. Correlations between parent ISL proportion and child TEC scores were not significant for either the clinical group ($r = .25, p = .285$) or the community group ($r_{\text{community}} = .09, p = .600$). The hypothesis that parent ISL would predict emotion comprehension on the TEC measure was not supported.

Gender differences. Examination of the associations between parent ISL and child gender on TEC scores indicated that parent ISL was not associated with boys ($r = .186, p = .334$) nor girls' TEC scores ($r = .112, p = .557$) when the group was examined for gender differences in parent ISL associations.

Fluid Emotions Test (FET).

Group differences. The association between parent ISL and children's FET scores was not significant for children in the clinical group on total FET score ($r_{\text{clinical}} = .23, p = .341$) or on still photographs ($r = .26, p = .27$) or morphing photographs ($r = .18, p = .44$). Parent ISL was associated with child FET scores for children in the community group total scores ($r = .37, p = .022$) and on still ($r = .33, p = .04$) and morphing ($r = .45, p = .004$) photographs, (see Figure 16) however, Bonferroni correction meant only the morphing condition remained significant. Parent emotion talk did not predict community group children's total FET scores ($r = .354, p = .027$) or on still ($r = .317, p = .049$) or morphing photographs ($r = .392, p = .015$) once Bonferroni correction was applied. The hypothesis that parent ISL would predict EU was supported for children in the community group on the morphing emotion recognition task (FET) only and the size of the effect was in the small to medium range.

Controlling for Parent Education and VIQ in FET. Partial correlation, controlling for parent educational level and child verbal IQ (VIQ) showed that the association between parent ISL and children's FET (total) score increased when variance associated with parent education and child verbal IQ was partialled out ($r = .503, p = .002$, see Figure 16) representing a medium effect size. In contrast, for children in the clinical group, the association between parent ISL and child FET scores on the morphing condition decreased when parent education and child verbal ability were considered, ($r = .052, p = .838$).

Gender analysis. Examining parent ISL correlations with FET by gender indicated that parent ISL was at the 95% confidence interval for boys' FET scores ($r =$

.364, $p = .048$) but below threshold for girls' FET scores ($r = .264$, $p = .216$). The association between boys FET scores and parent ISL weakened to below threshold levels when children's verbal IQ and parent education were accounted for (boys' $r = .218$, $p = .185$).

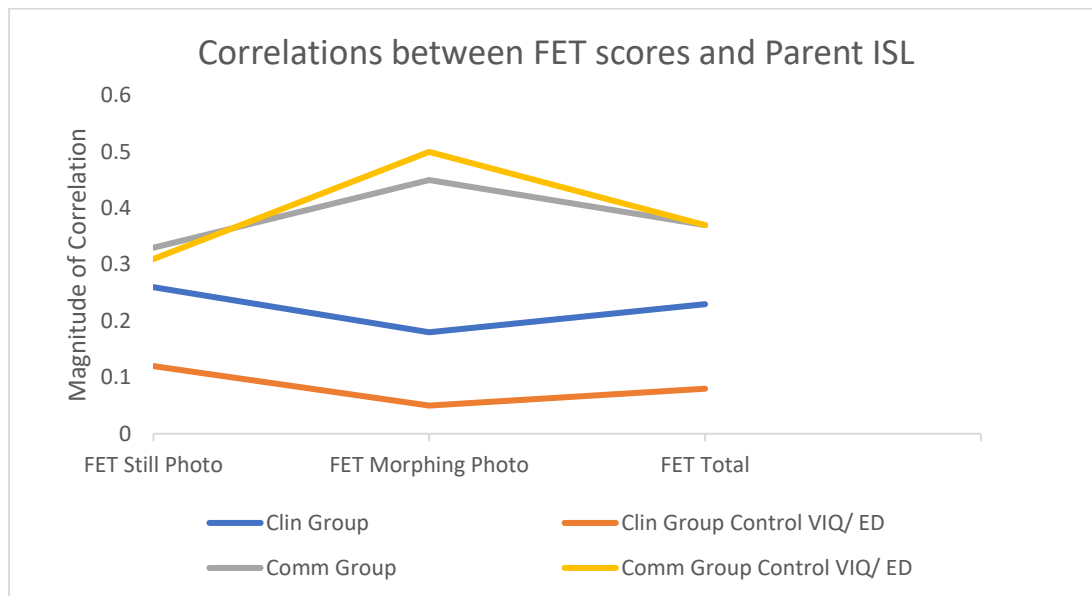


Figure 16. Correlations between parent ISL and children's FET scores with/ without VIQ and parent education variance partialled out.

Child ISL

It was hypothesized that children's use of internal state language (ISL) would be associated with EVT and TEC scores. This hypothesis was not supported on any of the measures.

EVT. Correlations between children's use of ISL and scores on EVT indicated that the two variables were not significantly associated for either group, (clinical group $r = .41$, $p = .075$, community group $r = .13$, $p = .42$, see Table 21, correlation matrix for main variables).

TEC. Pearson correlations between child ISL proportion and child TEC scores showed no significant associations between the variables for either group (r clinical = .35, $p = .135$; r community = .20, $p = .230$, Table 21).

FET. Correlation between child ISL and FET (total) scores was not significant for children in either group (r clinical = .18, $p = .44$ and r community = .20, $p = .21$).

Table 21
Correlation Matrix for Main Variables

Clinical → Community ↓	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. PARENT Education	-	.49*	.33	.19	.33	.13	.09	.55*	.07	.57*	-.07	-.08	-.31	-.05	-.38
2. VIQ	.40*	-	.79**	.67**	.73**	.50*	.59**	.32	.54**	.42	-.14	-.31	-.42	-.08	-.21
3. PIQ	.39*	.40*	-	.59**	.63**	.45*	.53**	.12	.28	.27	-.18	-.23	-.14	-.04	-.06
4. EVT	.22	.34*	.27	-	.61**	.70**	.52**	.26	.41	.35	.30	-.06	-.16	-.06	.15
5. TEC	-.02	.01	-.17	.01	-	.82**	.47*	.15	.35	.25	.26	-.10	-.41	.08	-.04
6. FET	.18	.13	.15	.17	-.01	-	.36	.13	.18	.23	.47**	-.04	-.30	.17	.21
7. MLUm CHI	-.05	.05	.10	.27	.19	-.10	-	.14	.45*	-.02	-.02	.03	-.01	.10	-.04
8. MLUm PARENT	-.08	-.13	-.12	.02	-.13	.25	-.59*	-	.34	.89**	.02	.05	.08	.01	.21
9. Child ISL	.18	.09	-.08	.13	.20	.21	.58**	-.45**	-	.30	.13	-.07	-.05	-.13	-.24
10. Parent ISL	.22	-.12	-.18	.03	.09	.37*	-.33*	.39*	-.09	-	.01	-.08	-.13	.06	-.27
11. CBCL INT	.10	-.13	-.16	.05	-.07	.23	-.15	.32*	-.20	.21	-	.30	-.07	.49*	.66**
12. CBCL EXT	.07	-.13	-.04	-.04	-.11	.12	.08	.13	-.02	-.03	.57**	-	.73***	.55*	.43
13. CBCL ATT	-.35*	-.14	-.39*	-.04	.31	-.32*	.55**	-.32*	.41*	-.30	.20	.31	-	.32	.25
14. CBCL SOC	.07	-.19	-.26	.03	.04	-.03	.15	.05	.00	-.01	.75**	.57**	.30	-	.59**
15. Adverse Child L.E.	.02	-.13	-.16	.26	.14	.20	-.09	.09	-.11	.18	.45**	.17	.02	.46**	-

Note: VIQ and PIQ = verbal /nonverbal IQ, WISC IV; EVT = test of Emotion Vocabulary; TEC = Test of Emotion Comprehension; FET = Facial Emotion Test; MLUm = mean length of utterance in morphemes by children (CHI) or parents (PAR); Child/ Parent ISL = proportion of internal state language; CBCL scores: INT = internalizing, EXT = externalizing, ATT = attention problems, SOC = social problems, L.E. = life events. * $p < .05$, ** $p < .01$, *** $p < .001$.

Internalizing and Externalizing Difficulties

Children's ISL was unrelated to their mood or behaviour as measured by the child behaviour checklist (CBCL). Internalizing scores were unrelated to total child ISL proportion ($r = -.125$ and $r = -.204$, for clinical and community groups respectively, both *ns*). Similarly, externalizing scores were unrelated to child ISL totals ($r = -.065$ and $r = -.018$ for clinical and community groups respectively, both *ns*).

Parent Language and Emotion Understanding (EU)

Parent language and child EU are evaluated: namely, quantity, vocabulary and grammatical complexity and the role of parent education and children's EU is also examined. The hypotheses states that parent language quantity, vocabulary diversity and grammatical complexity would be associated with both ISL and with children's emotion understanding on language dependent measures. The hypotheses were not supported for any of the parent measures on any of the child emotion understanding measures. Correlations for each are set out below.

Parent language quantity. Emotion vocabulary scores were unrelated to parent utterances; clinical $r = .081$ and community $r = -.210$, both non-significant. Similarly, parent total utterances were unrelated to scores on the TEC measure; clinical $r = -.327$, $p = .123$, and community $r = .156$, $p = .344$, both non-significant.

Parent vocabulary. It was hypothesized that parent vocabulary would be linked with children's scores on EU skills requiring verbal abilities. Parent VOCD scores reflecting vocabulary diversity were not related to clinical children's EVT scores for children in the clinical group, but were significantly related to children in the

community group's EVT scores ($r_{\text{clinical}} = .169, p = .46, r_{\text{community}} = .319, p = .045$). Parent VOCD was unrelated to children's scores on the TEC measure, (r_{clinical} and $r_{\text{community}}$ were .042 and .144 respectively, both ns).

Parent language complexity. Table 21 shows that parent mean length of utterance in morphemes (MLUm) which measures grammatical complexity was unrelated to EVT for either group (clinical $r = .26, p = .270$, community $r = .02, p = .892$) or to TEC (clinical $r = .15, p = .520$, community $r = -.13, p = .445$) or to FET total score (clinical $r = .13, p = .585$, community $r = .25, p = .125$).

Child Language and Emotion Understanding

Children's language was examined to assess for associations between vocabulary diversity (measured by VOCD) and grammatical complexity (measured by MLUm) on language dependent measures of emotion understanding such as EVT and TEC.

Vocabulary diversity. Correlation between EVT and VOCD for children in both groups were $-.199$ and $-.020$ for clinical and community children respectively, both non-significant. Correlations with VOCD and TEC were $-.244$ and $-.246$ for children in the clinical and community groups respectively, both non-significant. The hypothesis that vocabulary knowledge/ diversity would be associated with language dependent EU measures was not supported.

Language complexity. MLUm was significantly associated with EVT and TEC for clinical group children, ($r = .52, p = .02$) for EVT, ($r = .47, p = .036$) for TEC, see

Table 21. Community group children's MLUm was unrelated to EU scores, (see Table 22). The hypothesis that child language complexity would relate to children's performance on language dependent EU measures was supported for children in the clinical group only on MLUm.

Correlations Between Key Study Variables

This section highlights a number of significant associations in the main correlation matrix (Table 21). Bonferroni correction is not applied for this matrix due to the large number of comparisons and the exploratory nature of the sample.

Parent education. Adverse family life events were significantly negatively associated with educational level for clinical group families, ($r = -.79, p < .0001$). Educational level and adverse life events were unrelated for community group families ($r = -.021, p = .900$). Parent education was also significantly associated with MLUm ($.55, p < .01$) and parent ISL ($.57, p < .01$) for clinical group parents.

Child attention. For clinical group children, child attention scores were highly correlated with externalizing behaviour problems ($r = .73, p < .001$) but not for children in the community group ($r = .30, p = .067$). Child attention scores were negatively correlated with several variables for children in the community group including nonverbal IQ, FET scores and parent MLUm (see Table 21). Positive associations with child attention include child MLUm and child ISL.

Child internalizing difficulties. Internalizing difficulties were significantly correlated with children's experience of recent adverse life events such as hospitalization and bullying (clinical $r = .66, p < .001$, community $r = .45, p < .01$) (Table 21) indicating a moderate practical significance (Cohen 1977). Child age was also positively correlated with adverse life events for both groups (clinical $r = .53, p < .01$, community $r = .35, p = .05$) indicating a small to moderate practical significance.

Social difficulties. It was hypothesized that social difficulties would be associated with EU however, no significant associations were found with social development for children in either group. Correlations between social development and internalizing/ externalizing behaviour problems indicated that as expected, social difficulties were significantly associated with child internalizing difficulties (r clinical = .49, $p < .05$, r community = .75, $p < .01$) and externalizing difficulties (clinical $r = .55$, $p < .05$, community $r = .57$, $p < .01$).

Key Findings:

Parent ISL predicted children's morphing facial emotion recognition scores for children in the community group. Controlling for child verbal ability and parent education increased the significance of the finding and the effect size was in the medium range. Parent ISL did not predict EU scores for children in the clinical group. Parent ISL predicted emotion vocabulary test (EVT) scores for boys overall but not for girls and the practical significance of the association indicated a small to medium effect size (Cohen, 1977).

Child characteristics were predictive of EU scores for clinical group children. Verbal and nonverbal IQ was significantly associated with EU scores for this group. Verbal IQ was also associated with ISL and language complexity (MLUm) for clinical group children only. Child ISL did not predict EU scores on any of the measures for either group once verbal IQ variation was controlled. Children's language complexity measured by mean length of utterance in morphemes was associated with both EVT and TEC for clinical group. For clinical group children, Symptoms of anxiety and attention but not depression were associated with greater difficulties on recognizing happy faces.

Chapter 10 Predicting Emotion Understanding

Overview

In this chapter, regression analyses examine three EU measures to identify predictors for each variable. When variables were correlated above $r = .25$ for each group separately, they were entered into a multiple regression equation to predict each measure of EU for the overall sample. Simple linear regressions were conducted with predictor variables initially and if significantly predictive of the target variable, were entered into the multiple regression equation. The data are presented overleaf for emotion vocabulary (EVT) emotion comprehension (TEC) and emotion recognition (FET) measures.

Predicting Emotion Vocabulary (EVT)

Three variables which were associated with EVT included VIQ, PIQ and child language complexity measured in morphemes (MLUm). Examination of variance inflation factors (VIF) showed acceptable levels between the variables, each of which was normally distributed.

The three predictor variables for EVT were entered into a multiple regression equation. PIQ was no longer significantly associated with EVT when both VIQ and MLUm (child) were included in the equation so was removed and the process repeated without PIQ. Multiple linear regression statistics for EVT are presented in Table 22 which showed that both terms entered into the regression equation were highly predictive of EVT ($R^2 = .383$, $F(2, 56) = 17.36$, $p < .0001$). Betas for VIQ and MLUm (child) were .502 ($p < .0001$) and .227 ($p < .01$) respectively. VIQ was the strongest predictor of EVT indicating that for every increase of two verbal IQ points, emotion vocabulary score increased by one point. The hypothesis that children's language ability would predict EVT scores was supported: both VIQ and language complexity measured by MLUm were significantly predictive of EVT.

Table 22
Simple Linear Regression Analysis: Predictor Variables for Emotion Vocabulary (EVT)

Variable	Mean ($n = 60$)	Std Dev.	Regression β	95% CI p
VIQ	105.71	13.03	.581	<.001***
MLUm	8.82	4.26	.392	<.01**

Note: Verbal IQ = prorated verbal comprehension index score on Weschler Intelligence Scale IV, UK Edition. MLUm = mean length of utterance measured in morphemes. ** $p < .01$, *** $p < .001$.

Predicting Emotion Comprehension (TEC)

Variables which were correlated with TEC were subjected to simple linear regression to establish if they were sufficiently predictive of the target variable. This identified that VOCD and child ISL were significantly predictive of TEC. However, as variation associated with VIQ was significantly predictive of clinical group TEC scores, (chapter 9) VIQ was also included in the regression equation. Multicollinearity statistics (VIF) were within acceptable limits.

Variables not predictive of TEC in the regression equation were removed one at a time until all predictor variables in the model were significant. This process identified that only VIQ was predictive of TEC for children in the sample overall as neither VOCD nor child ISL were significantly predictive of TEC. This left VIQ as the best predictor of TEC ($R^2 = .262$, $F(1, 57) = 19.90$, $\beta = .512$, $p < .0001$). The hypothesis that child language was significantly predictive of TEC was partially supported; verbal IQ was predictive of TEC.

A number of alternative regression models partially predicted TEC however, none of the models predicted above 30% of the variation in TEC scores and among those several predictors were not statistically significant. The next best model to predict TEC included nonverbal IQ only ($R^2 = .147$, $F(1, 57) = 9.70$, $\beta = .384$, $p = .003$). Attention difficulties were significantly associated with lower TEC scores ($r = .290$, $p = .03$). The hypothesis that parent ISL would predict TEC was not supported for the group overall; TEC was difficult to predict and best accounted for by verbal or nonverbal IQ.

Predicting Facial Emotion Recognition (FET)

Variables which were correlated above .25 with FET on preliminary analyses for both groups were subjected to simple linear regression analyses including parent ISL, internalizing difficulties and attention scores. Simple linear regression established that each predictor was significantly associated with the target variable. Multiple linear regression was conducted with all three predictor variables for FET (total) which indicated that the best model to predict FET included attention and anxiety ($R^2 = .254$, $F(2, 55) = 10.71$, $\beta(\text{anxiety}) = .441$, $p < .002$, $\beta(\text{attention}) = -.606$, $p < .00004$). However, anxiety was not significantly predictive of FET when examined separately, so the model which includes parent ISL and attention is presented here and ISL was more predictive of FET in this model than either VIQ or PIQ (Table 23).

Table 23

Multiple Linear Regression Analysis: Predictor Variables for Fluid Emotions Test (FET)

Variable	Mean ($n = 60$)	Std Dev.	Regression β	95% CI p
Parent ISL	.61	.26	.254	*
Attention	5.69	5.04	-.316	*

Note: Parent ISL = parent internal state language proportion; "attention" = total raw score on attention scale rated by parents on the Child Behaviour Checklist (CBCL). * $p < .05$.

Key Findings

The three measures of children's emotion understanding have different main predictors. Emotion vocabulary (EVT) was best predicted by verbal IQ. The Test of Emotion Comprehension (TEC) scores were best predicted by child ability in general but specific predictors were difficult to establish. FET scores were predicted by a number of child and parent characteristics individually but the best model included child anxiety (higher levels indicating greater accuracy) and attention (lower levels of attention problems predicting greater accuracy). Parent ISL was significantly predictive of FET for the overall group and accounted for more variation in FET than PIQ and VIQ on this occasion.

Chapter 11 Discussion

Overview

This study examined associations between parent internal state language (ISL) and children's emotion understanding (EU) among a group of children with emotional and behavioural difficulties (EBD). Findings indicated that parent ISL was associated with children's emotion understanding on two of the three measures of EU. Parent ISL was significantly associated with children's facial emotion recognition for children in the community group, but not for children in the clinical group. Furthermore, parent ISL was associated with emotion vocabulary for boys overall but not for girls. The findings tentatively support the social constructionist perspective that discussing emotional and mental states with parents continues to be associated with differences in socio-emotional understanding in middle-to-late childhood for some children. The research builds on that of other authors examining emotion socialization processes by extending upwards the age at which the influence of parent ISL on children's emotion understanding may be seen and by examining associations of ISL and language among parents and children experiencing EBD. The findings contribute to theoretical understanding of the construct of emotion understanding by evaluating three different types of EU among a group of children experiencing difficulty with regulation of emotions and behaviour. Comparison of the three measures allowed examination of similarities and differences in pathways to emotion understanding for the two groups. The practical relevance of the results is to highlight the subcomponents of emotion understanding and self-other understanding among children with EBD, so that specific targeted interventions may be generated for children with EU vulnerabilities in a therapeutic setting. The findings also have the potential to inform programmes aimed at improving children's socio-emotional competencies. One possible outcome of the

findings is to inform parenting interventions which aim to enhance socio-emotional understanding and communication practices. A further potential application of the research findings is to inform assessment of children's emotion understanding, attention and language and how these factors influence emotion processing among children with EBD.

The study identifies that three key areas of children's processing abilities rather than membership of a particular diagnostic group are the most important influences on EU for children with EBD. Children's abilities to process verbal content, to pay attention to salient features of a situation (e.g., facial emotion) and their current mood states each contribute in different ways to understanding of emotion. This supports the information processing perspective on emotion, e.g., Crick and Dodge (1994). The study has the potential to inform our understanding of children's emotional development as it examined three different aspects of EU among children with emotional and behavioural difficulty. This finding also has practical relevance because it identifies a need for those who provide therapeutic programmes to systematically assess individual factors which contribute to emotion understanding. While the finding has particular relevance for children, it also has the potential to inform intervention with adult populations where emotion understanding is a therapeutic focus. Challenges in emotion understanding may compound emotion regulation difficulties and so EU is an important component of the overall children's emotional development. To date the relevance of emotion understanding in emotion regulation has been little examined among clinical groups. Although many clinical services aim to support regulation of children's emotional development, the contribution of other dimensions of emotional development are rarely integrated sufficiently or explicitly into therapeutic programmes

despite their shared relevance in models of children's emotional development. In the discussion that follows, four overarching research questions which guided this analysis are examined and main findings within each topic are reviewed. Then characteristics and challenges for the group of children in the present sample is discussed referencing factors that predicted children's EBD in this study. Following this, the process of conducting research is reviewed, by discussing the particular needs of the children in this group, reviewing measures and aspects of recruitment that were more or less effective. Finally, study limitations and contributions are presented.

Parent Internal State Language (ISL) and Child Emotion Understanding (EU)

The overarching question in the present study asks "does parent internal state language (ISL) predict child emotion understanding?" To this question which framed the present study, the answer is a qualified "yes." Though direction of effects in ISL cannot be firmly established with a cross-sectional design like that of the present study and genetic influences on shared variance in empathy within families cannot be ruled out, this research shows that parent ISL was significantly associated with EU for some children on some of the measures. One of the main findings was that the proportion of ISL spoken by parents was associated with facial emotion recognition (FET scores) on the morphing condition for children in the community group. For children in the community group, parent ISL was a better predictor of FET than other indices of parent language or their own nonverbal IQ. This is a particularly surprising finding as it may indicate that the influence of parent language in labelling and recognizing emotion may be more important than children's own perceptual processes. The findings on the FET task is particularly interesting in this regard because it is a highly visual task. Success on the FET task requires the integration of children's visual-perceptual abilities and

verbal processes to produce a correct response. Perceptual processes are highly important in processing facial emotion and findings from this study (e.g., associations with nonverbal IQ and attention) skills attest to this. However, parent ISL was significantly associated with FET scores for the community group and rather than diluting the findings, controlling for children's IQ strengthened the association. The findings have both theoretical and practical applications as they give support to the theory that parent references to internal states remain an important socialization agent of community group children's understanding of emotion even at this relatively late stage of childhood. The findings suggest when parents narrate stories that are replete with internal state/ mental state terms with children, that this supports children's own capabilities to find the correct word for facial emotion. As this was a cross-sectional study design, the associations between of longitudinal exposure to mental state talk on children's abilities to label facial emotion could not be established. It could be argued, that parents ISL production is stable over time (e.g., Meins, Fernyhough, Johnson & Lidstone, 2006) and therefore, differences in children's exposure to mental state talk accrue over a long period of time. If this is the case, high or low levels of parent ISL use may reflect a long-standing tendency to use ISL or think in mentalistic ways. Based on this view, the associations seen in the study between parent ISL and children's FET scores may represent the presence or absence of a longer-term "training" within a given family in thinking about mental states. Another interpretation is that association does not imply causation and that the findings reflect genetic similarities. However, the differential associations between parent ISL and boys' and girls' scores on emotion vocabulary suggest genetics are not the only factor. While the results do not out rule genetic influences or other external shared variation, the findings point to the importance of exposure language about mental states in promoting children's emotion

understanding even on visually-based assessments such as facial emotion recognition. This has practical relevance for teaching, parenting and therapy. For parenting interventions and for educators of children in middle to late childhood the results underscore the value of teaching language about internal states for children's social-emotional understanding throughout childhood, not simply in the preschool period.

Why do we not see the same associations between parent ISL and child FET for children with EBD that we see for the community group? The reasons may relate to the diversity of the children who comprise the EBD group in the current sample. This group have wide-ranging IQ levels on both verbal and nonverbal abilities and many have significant challenges in paying attention. It is possible that underlying intellectual ability determines the degree of association between parent ISL and children's socio-emotional competencies when EBDs are present. If there is a wide range of abilities on the FET task among children with EBD, the influence of parent ISL if present, may be less evident. A common feature among children who attend mental health clinics is the presence of expressive and higher order language difficulties in mental health presentations. Consistent with research by Cohen, Farnia & Im-Bolter (2013) who identified that 45% of referrals to local clinics experienced language delays, in the present study, boys with EBD displayed significantly lower vocabulary scores and less complex grammatical constructions in the narrative task. The language difficulties identified by Cohen et al. (2013) relate to children's delays in language expression, ability to use inference and having less complex verbal expression; all of which may be more commonly seen among children from lower socio-economic backgrounds (Hoff, 2013). For children with relatively poorer attention and language development, the influence of parent ISL if present, may have less of an impact on their ability to name

emotional states. Socio-economic and neurobiological factors are likely to account for larger differences in expressive language among the group in the present sample.

Furthermore, underlying neurobiological factors may be associated with both emotional or behavioural difficulties as well as linguistic expression for the children with EBD, rendering other associations less visible if present.

Emotion Vocabulary.

Parent total ISL and cognitive ISL predicted the performance of all boys in this sample on a measure of emotion vocabulary even when parent education and child VIQ were controlled. Girls' emotion vocabulary on the other hand, was negatively associated with parent ISL and this association reduced to below threshold significance when VIQ and parent education were controlled. This finding extends upwards the age at which associations between parent ISL and child emotion understanding are identified, albeit only among boys. It is unclear if this finding is linked to differences in gender emotion socialization or to parent responsiveness to children's language. It is possible that the conversational dynamics within dyads were different with sons versus daughters. A further possibility is that parents of girls with well-developed language took a back seat when discussing the picture book and allowed verbally skilled daughters to lead or conversely that parents of daughters with relatively poorer ISL took a more active role in discussing the story.

In this study, the link between parent ISL and emotion vocabulary for boys but not girls is associated with child rather than parent factors. Parental ISL was not structured by child gender in this study and the utterances of parents and children of both genders are highly correlated. Roger and colleagues reported that parents use more

ISL with their pre-schoolers who are sons versus daughters and that boys used more ISL with their mothers than girls (Roger, Rinaldi & Howe, 2012). However, similar to the present study, other studies of ISL have found no gender differences (e.g., Jenkins, Turrell, Kogushi, Lollis & Ross, 2003).

Differences in the quantity of elaboration however, has been found among high and low SES groups which may be related to children's level of language development. For example, Ebert and colleagues (Ebert, Peterson, Slaughter, & Weinert, 2017) identified divergences between parent ISL and children's theory of mind (TOM) among high and low SES groups. They found that elaboration of mental state utterances was predictive of higher SES children's TOM whereas non-elaborated mental state utterances were positively associated with TOM for lower SES children. The authors propose that greater elaboration benefitted children with more advanced language development whereas for children with from lower SES, simple naming without elaboration was more beneficial for their theory of mind because it matched their less well-developed language skills at that point in time (Ebert et al., 2017). It is possible that the results in the present study identifying gender related variation in associations between parent ISL and emotion vocabulary arise from either language complexity or conversational pragmatics. The question of elaboration in internal state language was not examined in the present study and is a marker of more advanced ISL that could be examined in the future. A further related issue in ISL is the question of conversational pragmatics and turn taking, which could be revisited in the context of ISL. Though some associations between parent ISL and child EVT / FET were found in this study, no associations between parent ISL and the Test of Emotion Comprehension (TEC) were seen among this age group. The lack of discriminatory power of the TEC across a

number of variables is potentially a consequence of ceiling effects seen among both groups with this measure, which was comfortably within most children's level of ability.

A second key question in this study asked if children with emotional and behavioural difficulties (EBD) would score more poorly on tests of emotion vocabulary, comprehension and facial emotion recognition. Overall, the two groups of children in the study were equally skilled on EU measures. However, there were also important differences in the strength of associations of several key variables in the study. Two aspects of children's own abilities stand out as important in achieving "success" on measures of emotion understanding which were: verbal IQ and attention skills. For the emotion vocabulary task (EVT) verbal IQ was correlated at the .05 level for children in both groups. This highlights the relevance of verbal expression for children's abilities to describe emotion and suggests that similar abilities underlie emotion vocabulary for both groups of children. For boys in the EBD group, language ability was a particularly important variable that linked to a range of findings. Although boys in the present EBD group had reduced verbal expression skills relative to other boys and to girls, the link between verbal IQ and EVT was consistent across the two groups indicating that there were no qualitative differences in emotion vocabulary. Boys with EBD produced marginally less ISL which was associated with reduced grammatical complexity rather than with an absence of ISL terms during speech. Boys with EBD not only had greater expressive language difficulty but were more talkative overall. Possible reasons for the latter finding include child effects such as pragmatic language and emotional factors. For example, if boys are anxious about their ability to verbalize, they may work harder to compensate during conversation. A second possibility is that boys with EBD and

lower levels of language experience difficulties with understanding turn-taking or tuning in to subtle pragmatic markers of e.g., knowing when to enter or discontinue a conversation based on the nonverbal cues of others. This may be a factor if children also experience challenges in impulse control or attention. A further possible interpretation is that boys were simply responding to their parents who happened to be particularly engaged in the study, thus accounting for greater number of utterances.

The second test of emotion understanding conducted was the TEC measure. Though children with EBD scored lower on this measure, the findings were not significantly different. TEC scores for boys in the community group were higher and the TEC correlated significantly with other measures of EU and with intellectual abilities for children with EBD only. The third test of EU involved facial emotion recognition (FET) and was only associated with nonverbal IQ among the group of children with EBD. These results highlight important features of each component of EU, thereby confirming associations of the measures as well as highlighting the lack of associations between child characteristics and TEC and FET. For the most part children with EBD and children from the community group performed equally well on the FET measure and few group differences were found. Overall children with EBD were equally accurate on facial emotion recognition when compared with a community group which potentially reflects the strengths of this group of children in socio-emotional understanding overall. While this finding runs contra to many studies of emotion recognition in clinical groups, children in diagnostic groups examined in previous research may have experienced serious long-term psychopathology, so the absence of a positive finding may represent higher levels of global functioning. However, there were some subtle differences in FET recognition between the groups. Among the EBD group,

many children experienced attention control difficulty and mood difficulties and both of these factors were linked to differences in FET scores. Attention difficulties presented the greatest challenges for children on the FET task. Children with EBD were significantly faster at responding than children from the community group, and when examined according to symptom type, differences in recognizing specific facial emotions were identified.

Child attention problems and EU. The most affected group of children were those who experienced attention problems. This group experienced more errors on FET but no difficulties were found on EVT nor TEC. Attention problems were associated with errors in identifying “surprised” and “disgusted” faces as well as “happy” faces. The FET task is challenging for this age group, requiring sustained and flexible attention and the integration of visual and linguistic processes. The findings suggest that clinical range difficulties in attention and impulsivity interfere with accurate encoding of visually presented emotion. The mechanisms are unclear and may involve labelling deficits, valence recognition deficits or impulsive tendencies influencing response selection. Valence recognition deficits in facial emotion were not investigated in the present study and may benefit from further examination. If present, mistaking “sad” for “happy” valence errors, for example, represent some of the more serious errors in emotion understanding that could potentially impact children’s functioning. If labelling deficits were a significant issue for this group, EVT scores may have reflected this difficulty/ comorbidity, but this was not seen. This does not out rule labelling factors as an individual issue for some children with attention problems however, the overall findings were that children with EBD performed equally as well as their peers on FET.

Speed of response time was also significantly faster for children with attention problems. For example, when the group was divided by anxious/ depressed symptoms, the reaction times were no different to those of community group children (see Appendices 14-15). Accuracy and speed were positively correlated indicating that more impulsive response styles were associated with reduced accuracy. The present study supports the finding by Da Fonseca, Segui, Santos, Poinso and Deruelle (2009) that children with attention difficulties have problems in facial emotion recognition across valence types, not just on negatively valenced faces.

Mood problems and EU. Few differences were found on EU measures for children with high levels of anxiety or depression with the exception that children with anxiety but not depression had greater difficulties in recognizing “happy” faces. Other emotion valences were unaffected by mood. In fact, children with both anxiety and depressed mood were equally adept as their community counterparts at recognizing emotion overall. The findings contrast other studies which show that children with anxiety display increased sensitivity evidenced by faster reaction times to negatively valenced emotion and greater labelling errors to non-angry faces. However, the findings are consistent with other studies where anxiety was not found to be associated with increased threat sensitivity (e.g., Ewing, Dash, Thompson, Hazell, Hughes & Cartwright-Hatton, 2016).

Child ability and EU. The three measures of emotion understanding (EU) were not correlated for children in the community group. In contrast, the three measures of emotion understanding were highly correlated for children with EBD. This a surprising result given that each measure endeavours to assess emotion understanding. While it is

not surprising that the children with EBD had EU scores which were highly correlated, the unusual finding is the marked lack of association between the three EU measures among children in the community group. The three measures of EU were chosen deliberately to identify different components of the construct of emotion understanding. The component of EU for each is somewhat different. For example, emotion vocabulary (EVT) is measured in a question and answer format and the responses are recorded verbatim and scored using a generic index reflecting the comprehensiveness of the answer. The FET is a visual task that requires a single word answer and requires children to switch from one face to another and identify the emotion therein. The qualitative “feel” to each of these tests is significantly different, with the second test being much more “live” because of the nature of facially presented emotion. The TEC task is a child-friendly test which covers many different aspects of emotion understanding across relatively few items and there is no qualitative component; the answer is either right or wrong. These three types of task are very different and tap into three different dimensions of EU. “Emotion understanding” is potentially as broad as human experience itself, as it is a multifaceted and multi-layered construct. It may be that the most salient factor that underpins performance on these three measures is not related to emotion understanding at all, but in fact to children’s own intellectual, verbal, visual and attention processing abilities.

While the EVT test was correlated with verbal IQ for both groups, no associations between FET or TEC and children’s intellectual ability were found among the community group. The reasons for such marked differences in association between IQ and emotion understanding on TEC and FET in particular is possibly due to 1) size of the sample, 2) the spread of the data and 3) variation in children’s performance on the

measures. The size of the target group in the present study was significantly smaller than that of the community group and the variation in IQ was larger. This meant that any variation on a test measure that was also linked to variance in IQ was more identifiable among the children with EBD, because the distribution of the data points was wider and therefore associations were more evident. The wider variation associated with IQ for the smaller group of children resulted in higher correlations despite smaller numbers, meaning the effects of IQ variation in particular was more visible. The third issue is that variation in engagement with the task may have influenced the performance of children with EBD who struggled with learning. This may have been a factor for example, in persistence with a difficult task, thereby amplifying the influence of IQ on the data.

Arguably, one of the strengths of the present study was the attempt to separate out influences relating to children's intelligence and ability on their EU. It was expected that both verbal and nonverbal abilities would be influential across the board regarding children's EU. This was not the case and it was clear that nonverbal abilities were unrelated to community group children's EU abilities even on the FET measure which is a highly visual task. When variation in IQ was large, the impact of both verbal and nonverbal IQ was clear; EBD group children's performance on tests of EU were significantly correlated with their level of ability. Sole examination of a community group might lead to the conclusion that only verbal ability was associated with EU, whereas the present study gives a clear indication about the role of nonverbal IQ in EU in certain contexts.

The present study identified no differences in ISL production between parents in the two groups. Parent ISL was related to education for parents of children with EBD. The finding suggests that educational level is particularly important in language complexity and ISL, rather than the presence of any underlying problem in ISL use among parents who have children with EBD. This finding has theoretical and practical significance and may warrant further investigation. Though ISL was not different between groups, some differences in parent language were evident nonetheless. Although both samples overall experienced high levels of parent education, parents of children with EBD experienced slightly lower levels of education which were related to ISL production. The result highlights differences in communication skills between families which may prompt considerations about enhancing communication by therapists during psychoeducational intervention.

Much of the research interest in parent ISL during childhood has been related to the developmental acquisition of a theory of mind in the preschool period. Beyond that, parent and child ISL has been little examined except in special populations (e.g., Pochon & Declercq, 2014; Siller, Swanson, Serlin & Teachworth, 2014) or in reminiscing contexts which do not examine children's understanding of emotion (e.g., Roger, Rinaldi & Howe, 2012) and there has been little research conducted on changes in parent or child mental state language throughout childhood and into adolescence. Discussion of mental states during childhood lays the foundation for later parent-to-teenager discussion of mental states during the crucial teenage years. The ability to maintain psychological intimacy with others is a recurrent theme in the topic of adolescent mental health. ISL use between parents and children during ordinary conversations may provide a habit of psychological intimacy and maintenance of close

ties, thereby permitting greater closeness throughout the crucial teenage years. In the present study, parents and children in both groups had conversations most days of the week, with a few exceptions. This is an encouraging finding which highlights the close affective connections between the parents and children in this study.

During adolescence, as the teenager's network becomes wider, the tendency of parents and young people to engage in dialogue about their mental states may change. The study of parent and teenager ISL is of interest because of the role that exchange of mental content plays in mental health. As teenagers become more autonomous, their peers become increasingly important sources of support and intimacy and having both peer and adult confidantes allows different kinds of engagement. There is substantial evidence that having a close connection with a confiding adult, particularly a parent, remains a crucial factor in determining a young person's mental health and wellbeing (e.g., Bond, Butler, Thomas, Carlin, Glover, Bowes & Patton, 2007). Having a confidante can be a protective factor when emotional troubles arise for young people. Nonetheless, there is evidence to suggest that beyond the childhood years, some young people struggle to identify confidantes with whom they can discuss mental health (Conway, Heary & Hogan, 2015; Dooley & Fitzgerald, 2012). Research suggests that there may be relatively few adults who model appropriate discussions on the topic of mental health for young people (Mueller, Callanan & Greenwood, 2016). Despite this, the ability to discuss mental states is a crucial skill in the maintenance of mental health and wellbeing. Internal state language in adolescence perhaps becomes more critical as it can assist with psychological intimacy, with accessing support or with problem-solving emotionally charged situations through dialogue.

There are a number of possibilities as to why are there so few studies relating to use of ISL among parent-adolescent dyads or among older children. It may be that the underlying investigation in studies of parent ISL asks about the ability of parent behaviour such as language to shape or influence children's knowledge. If parent language quality or quantity (for example) has a formative effect on children's knowledge of mental states, it follows that when children are very young, their opportunities to learn about mental states arises primarily from conversations with their primary carers. It also follows then, that as children's social circles widen to include peers, teachers and other significant adults, the presumed influence of parent mental state language is lessened and this may explain why there is little research into ISL-EU associations among older children and adolescents. Historically, the research literature that focused on the association between parent ISL and child EU centred on the cognitive developmental milestone of the understanding of false belief, which is achieved between the ages of 4 and 5 years of age among typically developing children (Wellman, Cross & Watson, 2001). Further dyadic investigations into ISL and children's EU extended downwards towards toddlers and infant age ranges rather than upwards into older childhood and adolescence. The present study extended the age investigated upwards into older childhood, but for practical reasons did not include children's wider circle of interlocutors, such as the associations between ISL of a second parent and children's EU. This is a weakness of the present study and may have affected the significance of the findings in either direction. Greater methodological rigour to separate the associations between parent ISL and child EU within different relationships (e.g., fathers versus their mothers) may yield more differentiated findings on the associations between ISL and children's EU, particularly for children in clinical groups. In addition, the study did not ask about or control for the exposure to ISL of

significant others, for example, an older sibling or a childminder/ grandparent. To fully examine the role of caregiver ISL in children's emotion understanding requires a more comprehensive examination of relationships and greater control of variables such as time engaged in talking with that significant other is recommended. The present study of 8 to 11-year-old children makes assumptions about the primacy of parents in ISL production and as caregivers/ interlocutors, but this would benefit from further exploration.

A second possible reason for the absence of dyad investigation of ISL and emotion understanding in later childhood may relate to a shift in research foci from typical trajectories to the search for what goes awry in middle childhood. Many studies of ISL in middle childhood focus on the link between parent language and children's emotional and behavioural outcomes. For example, Bohanek et al.'s (2009) research examined how parent dinner time narratives (rather than ISL) linked with children's internalizing and externalizing behaviour. Other clinically focused investigations examine clinical groups' ISL such as Centifanti et al.'s (2016) study which examined associations between parent ISL and mentalizing among ten-year-old children with callous-unemotional traits. Relatively few studies of either emotion understanding or ISL in the middle childhood period examine child language and parent language in the same study. When emotion understanding/ theory of mind among adolescents is examined, there is an absence of inclusion of parent language in the methodology. Adolescents may have a wide variety of influences on their emotion understanding and ability to verbalize mental states, so it is difficult to control for all of the variation in a single study. Nonetheless, there is a significant gap in both the developmental literature

and in the clinical literature on the role of parent language and adolescent functioning particularly as it relates to emotion understanding and internal state language.

Gender differences in the tendency of adults to utilize internal state language have been identified in a number of studies (e.g., Chaplin, Casey, Sinha & Mayes, 2010; Roger, Rinaldi & Howe, 2012). However, it is not clear if these differences begin during childhood or during the teenage years. One task for further research is the investigation of ISL among young men and women during adolescence. The present findings suggest that for some of the boys in this study, lower expressive vocabulary and reduced grammatical complexity are associated with reduced ISL. Reduced references to internal states are also characteristic of gaps in emotion knowledge among specific groups, e.g., children with autism spectrum or youth with alexithymia. While difficulties in emotion understanding were not found in the present study, nonetheless, there appears to be a group of boys for whom expressive language is a particular challenge. The present findings suggest that the language abilities and verbal processing of such children should be more carefully evaluated on a routine basis as part of therapeutic intervention particularly as it relates to communication of mental states. Speech and language therapists have an important role in identifying gaps in linguistic ability and pragmatic language and there is scope for greater integration of specialist knowledge in therapeutic intervention.

Children's ISL. Boys in the EBD group had greater difficulties in expressive vocabulary relative to their peers, evidenced by significantly poorer scores on the WISC IV "vocabulary" subtest. Differences were also identified for this group in mean length of utterance measured in morphemes (MLUm). The present research indicates that boys

in the EBD group produced 50% less ISL than of that of their community peers. The same was not true for girls in the present sample. It is likely that linguistic complexity drives the reduced levels of ISL rather than the other way around. Training studies have shown that children can increase their use of ISL when they practice using mental state terms compared with when they simply hear stories replete with mental state terms (Ornaghi, Brockmeier & Gavazzi, 2011). It would be interesting to see if this finding is consistent across levels of verbal ability. For example, are similar improvements evident for children with high levels of verbal ability compared with low levels of verbal ability? Does language ability constrain the influence of teaching on children's ability to use ISL?

Cognitive ISL is the most frequently used form of ISL in the present study, but only by a small margin. The main difference was that boys from the EBD group spoke significantly fewer cognition words, whereas boys from the community group spoke significantly more. The divergence between the two groups may reflect less well-developed verbal skills (EBD group boys had both lower IQ and reduced grammatical complexity in produced speech) and it is possible that this difference in verbal skills has a greater impact on their functioning than difference in type or quantity of ISL. Of note, children's own ISL use was not associated with any measures of emotion understanding beyond the effects of IQ.

Emotion words emerge earlier than cognitive words overall in childhood and typically by the age of five years, cognitive words become the main form of ISL within conversations. This may lead to the assumption that emotion words are more developmentally "immature" than cognitive words or that cognition words are the most

common. It is clear from the present study that emotion talk remains an important type of ISL at this stage of development. Tompkins et al. (2018) in a meta-analysis of the impact of ISL on EU and theory of mind (TOM) with much younger children, found an association between the type of ISL and the type of EU/ TOM task on which children were successful. For example, Tompkins et al. (2018) found stronger associations between desire and cognition talk and young children's TOM, whereas parent emotion talk, in contrast, had a stronger association with children's emotion understanding. In the present study boys from the EBD group used less than half the quantity of cognitive ISL compared with their community group counterparts, but aside from language and EVT, few other associations were found. As indicated, children's own ISL was not associated with EU on any of the measures once VIQ was controlled. It is unclear if the type of ISL used (e.g., cognitive vs emotional vs desire terms) has developmental implications for children in this age group but the meta-analytic review data suggest that it may.

Children's internalizing and externalizing scores were not linked with their use of ISL nor with EU in the present study. Therefore, developmental implications for children's own use of ISL were difficult to ascertain. It may be that a ready ISL lexicon is particularly useful in "hot" emotionally arousing situations whereas this study examined ISL during a "cold" cognitive task (book narration). The use of ISL in "hot" emotionally arousing situations may use more emotion type ISL than cognitive and naturalistic examinations of narratives during hot and cold emotion situations would be interesting to examine.

Two further aspects of ISL that may merit further investigation include the examination of the typical developmental trajectory of ISL throughout childhood and the examination of ISL among fathers of children with EBD. The 8-to-11-year olds in the present group produced about 40% of the quantity of ISL of their parents. However, the use of ISL among adolescents is little studied in typically developing teenagers, particularly as it relates to parent-adolescent conversations and language complexity. The developmental trajectory of this process for boys and girls, with fathers and mothers is of interest. Too few fathers among the target group parents meant that no group differences could be established but of note two fathers in the target group spoke half the proportion of ISL spoken by community group fathers or mothers in either group. This is a feature that may merit further investigation. A further interesting task hinted at by Dunn (2004) would be to track the development of children's ISL over time into adolescence, through dyad or peer interaction with parents and particularly fathers in a clinical group.

The associations between language complexity and production of ISL was examined in a number of ways in this study by examining parent and child vocabulary diversity, grammatical complexity and quantity of language. In this study, child and parent language complexity correlated significantly for children in the community group. Parent and child mean length of utterance, measured in morphemes (MLUm) was correlated with ISL for parents in the clinical group and for children in the community group. In the present study, child language follows parent language closely in terms of quantity and complexity (see Figure 7) and for children in the community group, child ISL quantity matched that of their parents. Possible reasons for the difference in the strength of these associations are the links between language

complexity and ISL production. Parents who speak in shorter sentences as part of their natural speech may be less likely to use ISL because it requires a different kind of sentence construction. Longer, more complex sentences are positively associated with ISL terms, for the parents of children with EBD. If sentence length overall is longer for the parents in the community group because of greater overall language complexity associated with SES, perhaps ISL is freed from grammatical complexity issues and parents may choose to use it less or more.

Two competing hypotheses relating to language complexity and ISL use are contained within the language analyses. The first relates to the “*general language hypothesis*” which highlights the role of language complexity in understanding of mind (e.g., Nelson, 2005). The second is the “*sentential complementation hypothesis*” which states that knowledge of the grammatical form of a “sentential complement” is a precursor to the understanding of false belief (De Villiers, 2005). The measurement of ISL in this study excluded phrases like “I know” that had no referent which meant that measurement of ISL and sentential complements in the present study were intricately intertwined. As a consequence, ISL was inherently linked to MLUm; a marker of grammatical complexity. This was found among parents in the clinical group and children in the community group indicating a significant correlation. While this may seem like a significant finding, it is merely an artefact of how ISL was measured. In support of a “general language hypothesis” which proposes that language is a gateway to a wealth of thoughts and ideas about how people think and therefore is crucial in the development of self-other understanding (Nelson, 2005) were two findings. Firstly, the present study found that ISL and education were linked for parents of children with EBD, indicating that more educated parents were using more mental state terms among

this group. Additionally, ISL was linked with verbal IQ for children with EBD indicating that language complexity measured by verbal IQ in this case, i.e., a general marker of language ability, plays a role in ISL production for some children. Thus, the study provides support for a general language hypothesis in ISL which is evident among the participant group and provides qualified support for the syntax/ complementation hypothesis as an artefact of measurement.

The children in the target group in the present study experience significant hardship compared with the community sample. Challenges are associated with their own experiences and their abilities to process those experiences. The picture presented by the demographic and ability assessments is one of cumulative challenges and stressors for parents of children in the EBD group relative to community group controls which is reflected in 1) family demographics; 2) child emotional and behavioural profiles; 3) parent report of adverse life events and 4) child life events.

Family composition and employment. There was greater diversity among the families in the EBD group which included adoption, bilingual home environments and more diversity in ethnicity. There was also a greater range of employment circumstances among target families; more of the primary carers worked in the home and there was greater single parents and unemployment. Educational level acted as a buffer for target group parents, who were more likely to be working if they had higher educational levels. The question of burden of care was present for some families who mentioned the need for reduced working hours. During interview and testing, several parents reported that they had already reduced their working hours to care for their child's emotional or behavioural needs. Due to the nature of children's difficulties,

caregiving tasks are not easily outsourced. The picture is one of greater disadvantage among families attending clinical services with their children despite overall moderate to high levels of education among both groups. The presence of education as a buffer among clinical families highlights the protective role of education in adverse circumstances. This is particularly evident in the association between adverse family life events and parent education in the study which was exceptionally high for families attending clinical services.

Child emotional and behavioural profiles. Two findings characterize the group's EBD profiles relative to their community counterparts: the presence of clinically elevated symptoms for all children in the EBD sample, and the presence of comorbidly occurring emotional and behavioural difficulties. Child behaviour checklist (CBCL) scores indicated highly significant differences between groups with 19/20 children (95%) in the target EBD group reported to have two or more comorbidly occurring difficulties on the child behaviour checklist (CBCL). In contrast just three out of forty children (7.5%) in the community sample experienced comorbidly occurring difficulties. A majority of children in the EBD group experienced difficulties with attention compared with none of the community group. Internalizing and externalizing domains were significantly correlated for children in the community group only, indicating that when community group children experienced emotional concerns, that this may place them at greater risk of behavioural disorders. For children in the EBD group, emotional disorders and behavioural disorders were more varied and affected their social and academic functioning more significantly across the board. The most consistent correlate of externalizing difficulties was lower parent satisfaction ratings which was seen among both the target group and community group families. The

experience of chronic behaviour problems in children can make parents feel like “bad” parents and aside from eliciting negative parenting strategies, behaviour difficulties can also perpetuate a sense of “not managing” effectively the challenges that life presents. This is particularly difficult when compounded by socio-economic factors such as unemployment and a series of adverse life events.

Family life events. Adverse family life events were highly correlated with low parent educational levels for families of children with EBD. This finding supports the associations between chronic stressors associated with neighbourhoods and poverty experienced by some families. Despite broadly similar SES groupings, no correlations between adverse life events and education were found for community participants. Parent wellbeing was associated with number of reported life events. The effect of low mood on parent tendency to report negative life events or child behaviour cannot be ruled completely. Gartstein, Bridgett, Dishion and Kaufmann (2009) found that depressed parents may overstate boys’ externalizing behaviour and girls’ internalizing behaviour, thereby requiring some additional confirmation of child psychopathology under circumstances where parents are depressed. Though there was a cohort of parents who experienced significant adversity, a large majority of the parents in this study were well, i.e., not experiencing significant psychiatric illness.

Child life events. In the present study, adverse life events were measured in two ways: one was a scale indicating difficult family life events, containing 10 items (max score = 10) which formed the demographic questionnaire completed by parents. The other life events scale was a brief measure containing just four items (max score = 4) which was included to reflect immediate challenges experienced by the child such as

hospitalization or bullying. It was expected that adversity would be associated with greater child symptomatology and that the more robust scale with 10 items would show a greater association with CBCL scores. This was not found to be the case. One of the consistent predictors of children's CBCL scores in the present study was the presence of increased adverse life events for the children in both groups in the study from the four-item child life events scale rather than from the ten-item family life events scale. The findings in this study replicate those of other researchers (Cunningham & Boyle, 2002; Meins, Centifanti, Fernyhough & Fishburn, 2013); that is, for children in both groups, the recent experience of adverse life events such as hospitalization or being bullied predicted internalizing difficulties of anxiety and depression. The scale itself was rudimentary and just one child scored the maximum of 4 on this brief measure. More effective measures of children's adverse experiences could have been chosen to identify the risks posed to children from accumulated experience of adversity.

Children's externalizing difficulties were significantly negatively correlated with parent satisfaction and positively correlated with parent experiences of stress for children both groups. It is somewhat surprising that the 10-point life event scale identifying greater ranges of adversity such as parental separation or bereavement was not linked to children's symptoms. Studies that identify links between mental health and childhood adversity often use retrospective accounts from adults (e.g., Merrick et al., 2017) and methodological differences may account for some of the findings.

The children in the present study experiencing emotional difficulties have challenges across the board in terms of comorbidly occurring difficulties in emotions and behaviour, in life events and family health/ wellbeing. There is a group of children

in the present sample who are at additional risk because of vulnerability in verbal expression, lower SES and parent resources. The needs of this group are multifaceted and may require significant intervention. It is recommended that where particular aspects of emotion processing are affected, e.g., verbal skills, mood or attention concerns, that children are systematically evaluated for problems in emotion understanding to ameliorate the impact of such problems on children's emotion regulation capabilities.

Review of Research Process

Recruitment challenges. Recruitment for the study was challenging because the target group involved a clinical group. Child and Adolescent Mental Health Services (CAMHS) were the primary setting from which the client group was recruited. When the research commenced, children in the 8-11-year-old range were the most frequently referred age group referred for intervention to CAMHS. Changes in service provision implemented since the initial phase of this research meant a change in referral protocols in favour of adolescents and more serious cases such as deliberate self-harm, suicidal intention or psychosis. This resulted in greater severity of presentation in caseload for CAMHS clinicians, and fewer children in the age range of the present study. A factor that causes dissonance in the clinical setting is the competition for resources of time and clinician's attention between academic research and the more immediate life issues that are presented by clients. Therapists focus upon real-time dilemmas, with research a lower priority. Possibly for these reasons, recruitment was slow and the number of cases of target age range was significantly reduced over the course of the study. Recruiting a group of children with emotional, behavioural and mental health difficulty is also ethically challenging because families may be in distress or a child may be in an acute

phase of difficulty. Two lessons learnt from the present study were firstly, that clinicians need to monitor if both the child and the parent are willing and well enough to participate in research. Child consent for research is important to address at the outset and it is essential that referring clinicians do not rely on parent consent only. The second issue is that many families enjoyed the experience of engaging in research which gave them an opportunity to discuss their child with someone other than their treating therapist, and to be visited in their own home. Ethical factors in recruitment meant that clients were not recruited from the researcher's own caseload. The brief nature of a cross-sectional research design in the present context meant that no long-term commitment was required either. Thus, it was easy for families to say "no" if they wished without any consequences or loss of esteem. The independence of the research process from clinical treatment was particularly important for psychological safety for participating families. Most families experienced the research as a positive experience. Achieving a balance between these two tensions in conducting research with a group of children attending clinical services is particularly important. Future research endeavours should consider these two aspects of research with children attending clinical or mental health services.

Review of measurement factors. The present study analysed ISL use as a proportion of the overall amount of talk to account for verbosity in ISL. In Tompkins et al.'s (2018) and Devine and Hughes's (2016) meta-analyses, some of the key findings related to how ISL was measured. For example, the strength of the association between parent ISL and children's EU/ TOM was related to instances of counted ISL rather than proportional ISL. Both studies found that counting instances of ISL use was associated with larger effect size than calculating proportion of ISL, though both were positively

associated. In the present study, both absolute values and proportions were calculated and proportions were ultimately chosen as the most logical predictor. Given that both the meta-analyses highlighted this issue, in future studies, it would be recommended that both proportional and absolute values of ISL would be included in the findings.

Review of EU measures. The Emotion Vocabulary Test (EVT, Dyck, 2012) asks children to define emotion words such as “jealousy” or “terrified.” It is suitable for the age range in the present sample and easy to administer. One test item was problematic because it asked children the meaning of the word “violated.” While most children of this age range did not know the answer, it is a question that should be substituted for a more neutral term. The meaning of the word “violated” could potentially evoke strong feelings for some children if there is a question of sexual abuse or if there are significant emotion regulation difficulties. The EVT uses a question and answer format like many test situations children may encounter in school, so the presence of a test item that potentially elicits strong emotion for a small proportion of children is particularly incongruent in this context. Any amendments to the measure should consider omitting or substituting the word “violated” for this age. The EVT showed a significant correlation with verbal IQ for children from both groups. It was highly correlated with the “vocabulary” score on the WISC IV for children with EBD. The EVT also correlated very highly with TEC and FET for children with EBD. The three measures of EU in this study did not correlate significantly with each other for children in the community group. As discussed earlier in the chapter, the three measures were chosen because of the differences between them. However, the lack of correlation between the EVT and other measures of EU is a potential difficulty which could be

addressed by examining associations of the EVT with other measures of emotion vocabulary among typically developing children.

The Test of Emotion Comprehension (TEC, Pons et al. 2004) was a child-friendly, easy to administer test which provides clear instructions in a cartoon-type booklet. It was not stressful for the children, because the measure requires minimal verbal expression from the child and is presented in a familiar book format. Children tend to feel they have performed well on the test, so there is no “failure” of performance on the test. Although it has been widely used in research with children up to the age of 12 years it has been little examined among clinical populations to date but is suitable for children attending mental health or developmental services because of the ease of administration and pleasant presentation. The instructions on the TEC are slightly “wordy” and for children with receptive language difficulty, the instructions may need appropriate pacing. The TEC has been used in research contexts many times with typically developing children and some studies have begun to use this measure with children with clinical diagnoses (Bender, Pons, Esbjorn, Reinholdt & Dunne, 2015). Despite this, the measure was less informative about emotion understanding of children in the two samples compared with the other two measures of EU utilized. There was limited variability in score among the children in this age group. As several children in both groups achieved at ceiling levels, the TEC may suit younger children. The TEC is a potentially valuable tool in identifying gaps in stages of emotion understanding if used along with other measures and has untapped clinical utility as a quick-to-administer and informative measure of specific aspects of emotion understanding. This “stage” type of emotion understanding assessment is little used in clinical settings which are often more focused on diagnostic concerns.

The Fluid Emotions Test (FET, Dyck, 2012) proved to be an excellent research tool for measuring children's facial emotion recognition which was capable of identifying differences in facial emotion recognition among the chosen groups. It yielded important information about children's ability to process facial emotion in the present study. The test is easy to administer and suitable for the target age group. Children in the study were interested in the novelty of the task and keen to engage with the test as it is presented on a computer/ laptop. The main criticism of the measure is its length, which contains 32 items, with two facial expressions in each, totalling 64 faces. Dyck (2012) adapted Matsumoto and Ekman's (1995) test by making it longer and the test shows some duplication of items which is confusing for some children. A shorter version of the measure may be equally informative regarding children's abilities to recognize facial emotion. Examination of shortened versions of the FET showed that the statistical associations of the shortened items (using 23 items instead of 32) were the same with the present group of children. Shortening the measure and removing duplicates would be recommended. The present form of the FET was tiring for children with attention difficulties. The FET may have clinical utility, but would need to be shortened for routine administration with clinical samples and contextual information provided. Most therapeutic programmes do not pay attention to emotion understanding at this kind of level. For children with significant face processing difficulty, for example children with autism, this may not be high up on the list of concerns for intervention. Yet, one of the findings in adult studies of social anxiety is that confusion regarding facial emotion is a source of stress for many with social anxiety. This merits further exploration. Finally, the lack of cohesion between the three measures in the study for

children in the community group is of concern and further examination of how best to measure emotion understanding in an integrated way remains an unanswered question.

Limitations of Study.

The present study has a number of limitations, the first of which is sample size. The target sample is small and the results may not be generalizable due to the wide variation in ability and comorbid symptoms within the sample. The advantage of the small-scale group meant a more detailed level of analysis was possible which may not have been feasible with a larger group. The study conducted multiple comparisons which increase the risk of type II error. To counteract this, Bonferroni corrections were applied to increase rigour. However, this has limitations, for example it was not practical to apply this correction in the main correlation matrix for example (Table 21).

A further limitation of the study is the generalizability of the findings to other groups of children with EBD. The research examined a group of children with EBD who had a significant number of comorbid mental health difficulties. This was problematic because it was difficult to fully exclude other diagnoses, e.g., ADHD. Many children in the study experienced significant problems with attention and impulsivity and several had ADHD. The examination of a more clear-cut diagnostic group may provide clearer results. The present study found associations with language, attention and mood and while it is particularly informative that these factors were linked with identifiable differences in emotion understanding, samples with less comorbidity may show clearer links. Despite these significant criticisms, the study has a real-life quality because the children who participated represent typical mental health and psychological service users of this age group. The mixed nature of the symptoms that children presented with meant that emotion processes which cross many different

diagnostic categories could be examined leading to findings that may readily translate across diagnoses and which may be replicated in a clinical setting.

A further limitation of the study is its' design, which is cross-sectional in nature. Longitudinal studies have the benefit of being able to identify which factors in children's lives and which aspects of their emotion understanding abilities are more influential variables that impact emotion management over time. This longer-range view is not possible in a study of shorter duration. A practical aspect of the short-term nature of the study was that families could easily opt "in" or "out" as it suited them. The study did not control for the effects of therapy or duration of engagement with the clinical service and families were evaluated "as is" rather than attempting to account for treatment effects.

The primary research question asked if parent ISL promotes children's emotion understanding. This question makes an assumption that there is continuity in parent ISL over time. The method used in the study assumes that the quasi-naturalistic task is an accurate representation of everyday family talk and there is more than a strong implication that the direction of influence is from parent to child. It is possible that none of these assumptions are correct, though there is some evidence to suggest that people tend to talk in similar ways over time (Meins et al., 2012). This study examined only concurrent parent ISL in relation to child emotion understanding. The roles of other adults or agents of socialization (other parent, older siblings, school, youth club etc) are not accounted for and parent ISL might vary more across different contexts than we currently know. A longitudinal design would give greater surety that the associations identified are robust and may inform about the direction of effects. It is possible that

child effects are responsible for the quantity of ISL that parents use. Perhaps more psychologically-minded children elicit more ISL from parents, though the reverse could equally be argued; that children elicit greater ISL from responsive parents when their emotion understanding or ability to discuss mental states is relatively poor. The contrasting findings of boys' and girls' emotion vocabulary score suggest some pragmatic features may apply though it is unclear if this is related to parent responses or to gender or language development differences in their children or to other features of the social interaction.

In the present study, the children were significantly older than in many previous investigations of ISL where children were often in the toddler/ preschool age. As children grow older, their circle widens and they may have a range of people and media with whom they exchange or from whom they receive information about mental states. Parental influences on children's developing understanding of mind may become more distal than proximal as their offspring age so the finding of associations between parent ISL and children's EU in this older age group is of particular interest. The findings attest to the role of parent ISL for typically developing children but did not support the link between ISL and EU for children with EBD. Boys with EBD had greater difficulties in expressive language. Most of the children in the EBD group also had reported difficulties with concentration and impulsivity. Therefore, it is likely that conversational pragmatics between parents and children in the EBD group were affected, and this was evidenced in lack of conversational synchrony among parents and children in the EBD group. This may partially explain some of the findings to do with conversation dynamics in this study and this area could be further investigated.

Despite attempts, the present study did not fully exclude the role of SES and parent education in ISL in the study. There is considerable evidence that children's socio-economic status is related to language production and to theory of mind (e.g., Devine & Hughes, 2018; Hoff, 2016). Future endeavours to examine ISL may wish to consider this issue more closely in recruitment, perhaps with older/ younger siblings of participants to match more closely for SES.

Not all parental references to mental states reflect the experience of the other person accurately. Parents may mis-read situations and ISL may reflect an incorrect interpretation. Meins, Fernyhough, de Rosnay, Arnott, Leekam, and Turner (2012) found that attuned and non-attuned comments were independent of each other, indicating that a parent can display both sensitivity and errors in mentalizing simultaneously. Meins et al. (2012) found that attuned comments predicted attachment styles in young children. The question of the accuracy of mentalistic comments is interesting and this factor could be examined more widely among clinical populations particularly in relation to accuracy of understanding of emotion or how naming of mental states influences regulation of emotion in hot versus cold cognitive/ emotional situations. Additionally, the literatures on ISL and "mentalizing" could benefit from further examination and integration among children and youth with mental health or psychological difficulties. One of the limitations of the present study is that parental sensitivity was measured on only one dimension; the presence of internal state language. Other dimensions of parenting sensitivity could have been evaluated to ensure that features of parent communication such as affective response or pragmatic aspects of conversation were not associated with the target variables.

One of the limitations of the study was the failure to control for length of treatment within CAMHS and the Psychology Services from which the participant group was chosen. It is possible that length of treatment in CAMHS is linked with increased emotion understanding and that the identification of treatment duration as a variable would provide additional explanatory power to the associations of emotion understanding. While some children attending for clinical services may have received direct counselling or psychotherapy for example, with a Psychologist, it is equally as likely that they may be seen by a Psychiatrist who may review symptomatology or an Occupational Therapist who may work using physical and sensory strategies for symptom reduction. Equally, parents may be the main attendees at CAMHS on many occasions rather than the child. Therefore, treatment duration is not easily operationalized or specified as “treatment” may mean different things. Training studies in emotion understanding have utilized a teaching/ narrative paradigm to foster emotion understanding and theory of mind which have been effective and which specified the duration of training precisely (Ornaghi et al., 2011). Symptom reduction is often a core target of treatment, rather than emotion understanding per se which could be viewed as an indirect result of treatment, or as a mechanism of treatment or both.

In the attempt to focus on emotion understanding in development, the present study examined only conscious emotional awareness. However, we know that not all emotion or mental states are conscious. Grandjean, Sander & Scherer (2008) propose that the “feeling” or subjective elements of experience which are accessible to verbal communication are inevitably limited as much of the emotion process occurs below the threshold for awareness. Verbal reports of emotion may be influenced by pragmatic factors, and may add elements to the emotional response that are not present in the

physiological or action tendency (Grandjean et al., 2008). Using ISL as an introspective device is therefore limited by this view. Other psychophysiological measures have the capacity to tap into emotional reactions that are below the threshold of conscious awareness. The experience of emotion is profoundly multi-levelled and most of the time our awareness of emotion is limited. As Panksepp (2007) says, identifying which of our feelings are primary emotional reactions and which are secondary appraisals is nearly impossible. While this is true, the attempt to introspect by using ISL is probably a worthwhile endeavour, to attempt to bring consciousness and awareness to emotional processes even if the reflection is not wholly “accurate” or complete.

Directions for Future Research.

Considerable research has focused on the early developmental period investigating children’s theory of mind and parent ISL. This fruitful area has rarely extended beyond early childhood and there has been relatively little focus on emotion understanding in middle childhood or teenage years, compared with the quantity of studies carried out on theory of mind in the preschool years. It is recommended that ISL throughout children’s development in typical and atypical groups would be examined particularly as it relates to children’s emotional development. It is recommended that emotional development is examined among older children and youth with EBD by examining emotion understanding, regulation and expression. The affective social competence model (ASC, Halberstadt, Denham & Dunsmore, 2001) provides a conceptual backdrop for evaluation of these components of children’s emotional development. As this research indicates, the children in the present sample experience severe difficulties in one area (emotion regulation) and fewer difficulties in the other two areas of emotional development (emotion understanding and emotional expression).

There is significant scope for further examination of children's development using this model. The ASC model provides a comprehensive overview of the components of emotional development that have practical utility in therapeutic and educational settings. The ASC could be readily operationalized into subsets of skills relating to the components of emotional development and would easily adapt to a broad-based model of emotional development. The operationalization of the model would allow assessment and intervention with the components of emotional development that are most crucial for children in particular subgroups. Emotional expression and understanding may be particularly important for deaf children for example; emotional expression may be the most significant component for children with specific language impairment; whereas emotion regulation may be the single most crucial component for children with EBD. Having a developmental model of emotional development as a backdrop to clinical service provision may inform a more comprehensive treatment approach particularly for children and teenagers which is ideally provided within the context of a multidisciplinary programme.

There has been some research on ISL during the early developmental period but knowledge of ISL during later childhood and adolescence is limited. Discussion of internal mental states is a cornerstone of psychological intimacy when done well. The value of ISL and emotion understanding for child or youth mental health relates to its capacity to bridge the internal worlds of two people and create or maintain psychological intimacy. Suggestions for further research include: examination of the role of ISL during the early and later teenage years, focusing on the ISL produced by youth and parents and how this relates to adolescent wellbeing or mental health. A further suggestion is to examine the role of ISL in monitoring awareness of internal

physiological states (interoception). From intervention studies and meta-analyses, it is known that training in ISL has an impact on children's production and comprehension of ISL (Durlack, Weissberg & Dymnicki, 2011; Ornaghi, Brockmeier & Gavazzi, 2011). Replication of this research in a clinical or therapeutic setting is recommended. It is recommended that the use of ISL under "hot" and "cold" conditions of emotional arousal is examined further.

Given the comorbidity of specific language impairment (SLI) in clinical populations and the role of language in theory of mind and emotion understanding, it may be useful to examine EU-ISL link more among children with EBD. Gremillion and Martel (2014) suggest that preventative interventions focused on early patterns of disruptive behaviour might usefully examine the role of attention and language in contributing to children's emotional and behavioural presentations in the preschool period. The present study found that attention and language were particularly important for children with EBD. Further extension of this research with emotional expression (verbal and nonverbal) may be informative. In the present study, there was a group of boys who struggled more with language and ISL in the target group and these young people may need additional support in learning to tune into, interpret and manage emotional and mental states. Greater awareness in society of the need to talk about mental states may help and there are a number of public health awareness campaigns to highlight the need to de-stigmatize discussions about mental health. Greater awareness of a range of parenting strategies, skills and competencies at a broader societal level may help this group of young people. Schools are well placed to identify vulnerable youngsters where socio-emotional competency and verbal abilities are underdeveloped but this may require specific resources and additional assessment techniques. There has

been an increased awareness of the importance of schools in fostering mental health awareness and the Department of Education and Skills (1999) has incorporated a social/personal health education (SPHE) curriculum throughout schools in Ireland which addresses basic emotion recognition skills and awareness of emotion causes at primary school level as one of a broad range of topics covered.

For children with difficulties with emotion and behavioural difficulties, the ability of the child and their caregivers to utilize language relating to inner mental states could provide a crucial buffer in assisting emotion regulation and emotion communication. The child's ability to explain inner mental states may be particularly important in helping busy parents view negative behaviour as arising from distress, when faced with negative behaviour from their child with EBD. It may be that where children are able to explicate their inner mental states easily, that they receive more sensitive responses from parents regarding behaviour as the precipitants to negative behaviour may be more easily understood. Ideally, using ISL during everyday conversation where EBD is a concern, may allow such children to discuss emotional or behavioural concerns more readily thereby reducing the need for impulsive or externalizing behaviours. The ASC model provides a comprehensive backdrop for testable hypotheses in relation to the above transdiagnostic emotion processes and brings the management of emotional arousal into a holistic frame that can be readily operationalized, giving scope for increasing our theoretical and practical knowledge about the antecedents and treatment of EBD in targeted ways.

Summary.

A key consideration for children in the present target group is how they understand their own and others' emotions and how they use that understanding to 1) inform their social relationships and 2) manage and monitor their own experiences of emotion. For children who have difficulty in regulating emotion, emotion misunderstanding may have far reaching consequences. Misunderstanding of even a brief duration of the intention of a parent or peer, may have greater social consequences when a child has difficulty in regulating their feelings.

The present study found that parent ISL and children's processing both contribute to children's emotion understanding at this stage of development. Children's own processing abilities are the best predictors of emotion understanding for the target group in the present sample. Parent ISL was a significant predictor for children in the community group. The findings support Crick and Dodge's social information processing model (1994) of emotion understanding. The results are also consistent with the ASC model by Halberstadt, Denham & Dunsmore (2001) and with developmental psychopathology theory which states that the borders of typical and atypical development reveal essential characteristics in emotion processes (Cicchetti, 1984). Social information processing models emphasize children's psychological appraisals and information processing abilities in how they interpret and understand emotion (Crick and Dodge, 1994). The present research highlights that children's mood states are important in emotion processing, consistent with this view of appraisal-based information processing. The research also supports a developmental psychopathology framework as children's attention and verbal skills influence their capacity to understand emotion, particularly in a clinical context. It may be that for children with

emotional and behavioural difficulties IQ and attention skills are particularly important in helping them understand emotion under “cold cognition” situations. Finally, the research partially supports the social constructionist perspective view of emotion understanding as arising from the interaction and contextualized provision and practice of learning within social contexts. Emotional learning, it appears, is partially dependent on language and environment in late to middle childhood for the present sample. Boys displayed greater associations with parent ISL in terms of their emotional vocabulary and community children overall displayed significant associations between recognizing and labelling emotion and parent use of internal state language.

The key importance of ISL is that it reflects “everyday mentalizing” in people’s lives. Children’s abilities to discuss emotional and mental states is dependent on language skills and on their exposure to conversations about internal states of mind and emotion. A parent’s tendency to narrate their internal psychological dialogue may be especially helpful for children with emotional and behavioural difficulties, through providing opportunity to “troubleshoot” challenging interactions between family members as they are occurring or provide opportunities for reflection in the aftermath of an emotional or behavioural outburst. When a child misbehaves, if they are young, they may benefit from parent mentalizing strategies such as being given a choice of emotion labels. For a typically developing older child it is expected they will provide a reasonable description of why they behaved in a certain way. For children with poor expressive language, parents may need further training to support emerging emotion communication. With regular opportunities for mentalizing during the day parents and children may create a “habit” of mentalizing leading to relief for the child that their motives were understood, empathized with and that they will not be unduly punished.

Children with impulse control difficulties, poor recall, or children who experience intense or conflicting emotions may find it difficult to describe their rationale for behaviour for reasons such as fear of censure and disapproval by caregivers, because of underdeveloped verbal abilities or because they have limited comprehension of their own motives. Parent responses to children who have limited abilities to accurately report on their internal states or internal psychological dialogue may become more behaviour or punishment focused if children are unable to explain their motives, fearing that they have “bad” children who need punishment in order to comprehend the consequences of behaviour, or eliciting negative or ineffectual behaviour management strategies. A mentalistic frame of reference for understanding child behaviour is essential to help parents repair maladaptive emotional and behavioural responses with their child. This study operationalized a mentalistic frame of reference as the tendency by parents and children to discuss internal states during conversation. This study aimed to examine if discussion of internal states worked similarly for children with EBD and their parents, by examining this facet of communication in parent-child dyads.

Contributions of the present study. This study extended upwards the age range at which parent ISL and child EU are typically examined and chose a group of children with emotional and behavioural difficulties (EBD) as a focus. The hypothesis at the outset was that children with EBD may understand emotion less well than their community counterparts and it was unclear if parents of children with EBD used ISL to the same extent as those among a community group. The study found that parent ISL is important for typically developing children; but that for children with EBD, their own

processing skills in attention, language and mood are highly relevant. Happy faces were more difficult for children in the target EBD group to identify. The study found that there were no group differences in EU for children with emotional and behavioural difficulty (EBD) and that parent ISL is broadly similar between parents from both groups. Child and parent language complexity was intricately linked to ISL and the research gave qualified support to the proposals that sentential complements and general language abilities are both necessary for ISL. The study of children with EBD showed the serious and impactful experiences that some children and families encounter and the research has benefitted from the generous contribution of their time and knowledge.

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Appendix A recruitment poster

Everyday Conversations Study

Are you the parent of an

8-10 year old?



Researchers from the School of Psychology in Trinity College Dublin invite you to get involved with research into how ordinary conversations between children and parents helps children's development.

What is the research about?
We are visiting homes, researching how parent conversation links to children's understanding of emotion.

Children's Development and Parent Communication

Research suggests that how parents discuss emotion with their children in everyday situations may be linked to children's later development in emotion understanding. This study aims to improve our understanding of how conversations about feelings (happiness, sadness etc) with their children may be linked to improved understanding of emotion.



School of Psychology, Aras an Phlarsaigh,
Trinity College, Dublin, 2. Email:
sheridan@tcd.ie Text or call XXX XXXXXX

What's involved?

If you and your child are happy to get involved, we will come to your home at a time that suits you. We will ask your child to complete some puzzles. While your child is doing these, we will ask you to complete some questionnaires. We will also video record you and your child chatting together. It takes about an hour and a half altogether.

What happens after?

There is a retail voucher for families and a small thank you token for your child.

We aim to give you a copy of the overall findings in the post about one year after. You can pull out of the study at any time, until the results are put together. Your information will remain confidential and stored securely. If there are any child protection concerns, Tusla child protection guidelines will be followed.

If you are interested call or text Audrey on
XXX XXXX

Appendix B Parent Consent

Parent Consent - Audrey Sheridan, Postgraduate Researcher, School of Psychology, Áras an Phiarsaigh, Trinity College Dublin, D. 2.
Email: sheridau@tcd.ie Research Supervisors: Dr. Jean Quigley, School of Psychology, Áras an Phiarsaigh, Trinity College, Dublin 2)
telephone: xxxxxxxx Fax: xxxxxxxx and Dr. Charlotte Wilson, School of Psychology, Áras an Phiarsaigh, Trinity College, Dublin 2)
telephone: xxxxxxxx Fax: xxxxxxxx.

Participant Information Leaflet & Consent Form

Researcher ID

Everyday Conversation Study

Thank you for indicating your interest in getting involved in this research. The aim of the study is to find out how parents and children use words to discuss thoughts, wishes and feelings during everyday conversations to see how this is linked to children's development in emotion and behaviour.

Please discuss the study with your child. If you decide to get involved, we will call you to arrange to visit your home and meet you and your child together. Usually one visit to the home is all that is needed, lasting about an hour and a half. For parents, there are questionnaires, for your child the first part will involve testing using a brief ability (IQ) test and a brief emotion understanding test. Let us know if you would like help completing questionnaires.

In the second part, we will ask you and your child to play and chat and recall some events that were happy or sad. We will record the visits. At the end, there will be a small token of appreciation for participating in the study for the child and a Dunnes Stores Voucher for parents.

Privacy: We won't store any personal data belonging to you on the information we record. We will code your information and keep any identifying information separately. The data will be stored securely in a locked filing cabinet and two researchers will ensure the data storage is secure. You are entitled to access your data (which will be stored for ten years) under the freedom of information act, however, if you do wish to access your data, please contact either of the researchers or their supervisors. If any data you access contains incorrect or misleading information, you are entitled to have that data amended to reflect these changes. As is standard research protocol, if there is any danger implied to the child or some other person, it is not permitted to keep this private and this information must be shared with Tusla child welfare agency in line with child protection guidelines. We will keep you informed at all times in such a situation.

Involvement in the study is optional and you can withdraw at any stage up until we put all of the information together. When the study is over, we will give you information about the

Parent Consent - Audrey Sheridan, Postgraduate Researcher, School of Psychology, Áras an Phiarsaigh, Trinity College Dublin, D. 2.
Email: sheridau@tcd.ie Research Supervisors: Dr. Jean Quigley, School of Psychology, Áras an Phiarsaigh, Trinity College, Dublin 2)
telephone: xxxxxxxx Fax: xxxxxxxx and Dr. Charlotte Wilson, School of Psychology, Áras an Phiarsaigh, Trinity College, Dublin 2)
telephone: xxxxxxxx Fax: xxxxxxxx.

overall findings and their implications. We aim to give this information in the post about one year after the data is collected.

We look forward to meeting with you and your child and we hope that this research study will be an enjoyable experience for you both. We are grateful to you for participating in the study and respectful of yours and your child's privacy. If you have any concerns about the study, you may contact the researcher directly, or her supervisors at the above addresses.

Thank You.
Audrey Sheridan.

To be completed by participants:

1: Parent Consent and CODE

I agree to participate in this study and to allow my child to participate in the study. I understand that I may opt out at any time up until the data is analysed. I have been given information about the purpose of this study. I understand that the information is confidential (unless there is a safety concern).

_____ (signature)

_____ (print name)

_____ (I.D. CODE)

Parent Copy: _____

Researcher Copy: _____

Appendix C Child Consent

Child Consent Leaflet

Parent Consent - Audrey Sheridan, Postgraduate Researcher, School of Psychology, Áras an Phiarsaigh, Trinity College Dublin, D. 2.
Email: asherdan@tcd.ie Research Supervisor: Dr. Jean Quigley, School of Psychology, Áras an Phiarsaigh, Trinity College, Dublin 2)
telephone: XXXXXXXX Fax: XXXXXXXX and Dr. Charlotte Wilson, School of Psychology, Áras an Phiarsaigh, Trinity College, Dublin 2)
telephone: XXXXXXXX Fax: XXXXXXXX

Child Consent and Information Leaflet

Researcher ID

Parent and Child Everyday Conversations

Thank you for helping with this research. We hope to find out how parents and children use words to discuss how they feel or what they think during everyday conversations. We want to find out more about how using these kinds of words may help children understand emotion. If you get involved, we will come to your home to meet you and your parent.

How long will it take?

Usually one visit to your home is all that is needed. The time should be about one and a half hours. There will be lots of chances to take a break if you get tired.

What would I be doing?

You will be doing a few puzzles and questions first, then you and your parent will chat and play and to tell each other some things you remember. Then we will take a break and after that there will be a few more questions and a few pictures to look at. While you do this, your parent will be filling in their own questions. We will take a video of it all.

What will be in it for me?

We hope it will be quite interesting and fun to meet someone new and do different things as part of the research. If it's not, let us know!! There will also be a small token of appreciation for participating in the study.

Child Consent Leaflet

Parent Consent - Audrey Sheridan, Postgraduate Researcher, School of Psychology, Áras an Phlarsaigh, Trinity College Dublin, D. 2.
Email: sherida@tcd.ie Research Supervisors: Dr. Jean Quigley, School of Psychology, Áras an Phlarsaigh, Trinity College, Dublin 2)
telephone: xxxxxxxx Fax: xxxxxxxx and Dr. Charlotte Wilson, School of Psychology, Áras an Phlarsaigh, Trinity College, Dublin 2)
telephone: xxxxxxxx Fax: xxxxxxxx.

What will you do with the information?

Study it carefully – along with information from lots of other families. We will not be looking at your results on their own. We will code your information and keep it private.

You can say no to being involved at any time until we are studying all the results together. When the study is over, we will send you some results about one year later.

The information is private for all the children in this study. If there was a problem about any kind of safety we won't keep that private and would need to talk to other people.

Any other questions or comments?

If you have any concerns about the study, you can contact the researcher directly, or her supervisors at the above addresses.

Thank You.

Audrey Sheridan.

1: Child Assent

I would like to do this today	
	
Yes	No

2: Copy for Records

Please check:

Parent Copy given: _____

Researcher Copy retained: _____

3: Identifying Code

Name: _____
Code: _____
(For completion by researchers)

Appendix D Debriefing Information Participant Group

Debriefing Information

Audrey Sheridan, Postgraduate Researcher, School of Psychology, Áras an Phiarsaigh, Trinity College Dublin, D. 2. Email: asheridau@tcd.ie Research Supervisors: Dr. Jean Quigley, School of Psychology, Áras an Phiarsaigh, Trinity College, Dublin 2) telephone: xxxxxxxx Fax: xxxxxxxx and Dr. Charlotte Wilson, School of Psychology, Áras an Phiarsaigh, Trinity College, Dublin 2) telephone: xxxxxxxx Fax: xxxxxxxx.

Debriefing Information for Participants;

Researcher ID

Everyday Conversation Study

1: Identifying Code

Name: _____

Code: _____

(For completion by researchers)

A Huge “thank you” to you both for participating in this research study today. We hope it will help us understand more about how children experience and learn about emotion from everyday conversations.

1: What was the research experience like for you today? (Ask participants to elaborate)

1: a: Parent:

1: b: Child:

Debriefing Information

Audrey Sheridan, Postgraduate Researcher, School of Psychology, Áras an Phlarsaigh, Trinity College Dublin, D. 2. Email: sheridan@tcd.ie Research Supervisors: Dr. Jean Quigley, School of Psychology, Áras an Phlarsaigh, Trinity College, Dublin 2) telephone: XXXXXXXX Fax: XXXXXXXX and Dr. Charlotte Wilson, School of Psychology, Áras an Phlarsaigh, Trinity College, Dublin 2) telephone: XXXXXXXX Fax: XXXXXXXX.

Accessing support if distressed: Clinical Sample:

We do not expect that this research will have lasting distressing effects; however, if distress arises in the context of this study please let us know as this is important feedback for us – contact details are at the top of the page. If significant distress is experienced by you or your child we also recommend you contact your key worker/ key therapist at your child's therapy service to access help and support. Out of hours emergency numbers such as temple street children's hospital also offer support if children are distressed (for children under 16 years), and if parents are distressed, Samaritans (1850 60 90 90) and Parentline (01 6767960) offer out of hours support for children and families.

Reminders: Confidentiality and Data Access

Your privacy is important, so we won't store any personal data belonging to you on the information we record. We will code your information; keep any identifying information separately and stored securely. You are entitled to access or amend your data under the freedom of information act.

Complaints, Queries and Feedback:

If you have any questions about this or any other matters relating to the study, please do not hesitate to contact the researcher at the above address. We will give you information about the overall findings and their implications in the post about one year after the data is collected. If you have any concerns or complaints about the study, you may contact the researcher directly, or her supervisors at the above addresses.

2; Do you have any further questions or queries about the research?

3; Future Participation: One of the most helpful kinds of research is when families are visited over time. If we are conducting follow up research in approx 1 year, would you be willing to participate in any further research?

Yes ☐ No ☐

4; Future Data Analysis Permission:

Please accept these tokens of appreciation.

Thank You. Audrey Sheridan.

Appendix E School of Psychology Research Ethics Committee



COLÁISTE NA TRÍONÓIDE, BAILE ÁTHA CLIATH
Ollscoil Átha Cliath

TRINITY COLLEGE DUBLIN
The University of Dublin

F.A.O. Audrey Sheridan

School of Psychology Research Ethics Committee

13th May 2014

Dear Audrey,

Following receipt of amendments (both those requested by the Research Ethics Committee on 6th January 2014 and additional amendments submitted by you on 15th April 2014), I am pleased to inform you that your application entitled "Inner State Language: parents and children" has been approved by the School of Psychology Research Ethics Committee.

Yours sincerely,

Richard Carson
Chair,
School of Psychology Research Ethics Committee

Scoil na Siceolaíochta,

Dámh na nEolaíochtaí Sóisialta agus Daonna,
Áras an Phiarsaigh, Coláiste na Tríonóide,
Baile Átha Cliath 2, Éire

School of Psychology,

Faculty of Arts, Humanities and Social Sciences,
Áras an Phiarsaigh, Trinity College,
Dublin 2, Ireland

T 353 (0)1 896 1886
F 353 (0)1 671 2006
psychology@tcd.ie
www.psychology.tcd.ie

Appendix F HSE Ethics Committee



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Phoenix Care Centre,
Grangegorman,
North Circular Road,
Dublin 7.
Tel: (01)8276507/76508
Fax: (01)8276591

Audrey Sheridan

Study Title: Inner State Language and Emotion Understanding in Clinical
Referred Parent Child Dyads
Application: Audrey Sheridan

The proposal was reviewed by the Ethics Committee.
Your proposal was: Approved.

Appendix G Parent Demographics

Strictly confidential

Please note your information in these questionnaires will be kept strictly confidential. No personal information will be disclosed. The evaluation results will be presented as averages and all individual identifying information will be removed.

Parent Identifying Code: _____

1. Your Child's Age: _____

2. Your Child's year/ month of birth: _____

3. Child's gender:

Male ☐

Female ☐

4. Your Relationship to this child:

Mother ☐

Father ☐

Other ☐

If other please specify (e.g. grandparent) _____

5. Parent Age: What is your age? _____

6. Sex: What is your gender? Male ☐ Female ☐

7. Please specify your ethnicity: e.g. Caucasian, Asian, etc. _____

8. Nationality: _____

9. Marital Status: Married ☐ Cohabiting ☐

Divorced ☐ Separated ☐

Single ☐ Widow/er ☐

10. What best describes the household in which your child is living?

Original family (both biological or adoptive parents present) ☐

Step Family (two parents, one being a step parent) ☐

Single parent family ☐

Other (please describe) _____

11. Are there any other adults present in the household? E.g grandparent or other extended family?

Employment:

12. Are you currently in paid employment? Yes ☐ No ☐

If yes, how many hours per week? _____

13. Is your partner currently in paid employment? Yes ☐ No ☐

If yes, how many hours per week? _____

14. Does your family receive any government benefit or pension? Yes ☐ No ☐

Education completed

15. What is the highest grade or year of school you completed? Please tick.

- Primary School ☐
- Secondary School – no exams ☐
- Secondary School – Junior Cert or equivalent ☐
- Secondary School – Leaving Cert level no exams ☐
- Leaving Certificate ☐
- Vocational Training or PLC or some college ☐
- College Primary Degree or Diploma ☐
- College Masters or Higher Diploma or above ☐

Family size

16. How many children live in your household who are...

- Less than 5 years old? ☐
- 5 through 12 years old? ☐
- 13 through 17 years old? ☐

17. Life Events: During the last 12 months, have any of the following events occurred in your immediate family? Please check on the answer sheet any that have happened.

Relationship Problems yes ☐ no ☐

Divorce yes ☐ no ☐

Marital reconciliation yes ☐ no ☐

Marriage yes ☐ no ☐

Separation yes ☐ no ☐

Pregnancy yes ☐ no ☐

Other relative moved into household	yes ☐	no ☐
Income increased substantially (20% or more)	yes ☐	no ☐
Went deeply into debt	yes ☐	no ☐
Moved to new location	yes ☐	no ☐
Promotion at work	yes ☐	no ☐
Income decreased substantially	yes ☐	no ☐
Alcohol or drug problem in immediate family	yes ☐	no ☐
Death of close family friend	yes ☐	no ☐
Began new job	yes ☐	no ☐
Entered new school	yes ☐	no ☐
Trouble with superiors at work	yes ☐	no ☐
Trouble with teachers at school	yes ☐	no ☐
Legal problems	yes ☐	no ☐
Death of immediate family member	yes ☐	no ☐

18. Are you attending any special services for your child? Yes ☐ No ☐

If yes, please explain _____

19. Have you ever attending parenting courses e.g. Parents Plus / Hanen Programme?

Yes ☐ No ☐

20. Have you attended any other parenting support services? Yes ☐ No ☐

If yes, please describe _____

21. Has your child experienced any of the following in recent past e.g. last couple of years?

1) Bullying?	Yes ☐	No ☐
2) Hospitalization?	Yes ☐	No ☐
3) Any kind of traumatic event?	Yes ☐	No ☐
4) Other?	Yes ☐	No ☐

21. If you answered yes to the last question, please describe what happened

22. If your child is away from you for a day or so, what best describes how they greet you on return?

(please tick what is most like your child in general)

- | | |
|--|--------------------------|
| 1) They say hi and give me a big hug and are happy to see me. | ☐ |
| 2) They say hi and give me a hug but may complain a little later
or show me they are angry with me. | ☐ |
| 3) They say hi but play it cool and don't show much affection at the time. | ☐ |
| 4) They let me know they were worried about me and that they missed me. | ☐ |
| 5) They are usually angry with me after being away from me for a while. | ☐ |

23. **Parenting Experiences now.** The following three questions are about your relationship with your child at the moment. Remember, there are no right and wrong answers, just try and be as honest as possible.

Give your answer on a 7-point scale from 1 = Extremely Dissatisfied, to 7 = Extremely Satisfied.

Extremely Dissatisfied	Very Dis- satisfied	Somewhat Dissatisfied	Mixed	Somewhat Satisfied	Very Satisfied	Extremely Satisfied
---------------------------	------------------------	--------------------------	-------	-----------------------	-------------------	------------------------

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. How satisfied are you with
your child's behaviour? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. How satisfied are you with
yourself as a parent? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. How satisfied are you with
your relationship
with your child? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

😊 Thank you Very Much 😊

Appendix H School Age CBCL

CHILD BEHAVIOR CHECKLIST FOR AGES 6-18			For office use only ID # _____									
CHILD'S FULL NAME: First _____ Middle _____ Last _____			PARENTS' USUAL TYPE OF WORK, even if not working now. (Please be specific — for example, auto mechanic, high school teacher, homemaker, laborer, lathe operator, shoe salesman, army sergeant.) FATHER'S TYPE OF WORK: _____ MOTHER'S TYPE OF WORK: _____									
CHILD'S GENDER: ☐ Boy ☐ Girl		CHILD'S AGE: _____	CHILD'S ETHNIC GROUP OR RACE: _____									
TODAY'S DATE: Mo. ____ Day ____ Year ____		CHILD'S BIRTHDATE: Mo. ____ Day ____ Year ____										
GRADE IN SCHOOL: _____ NOT ATTENDING SCHOOL: ☐		Please fill out this form to reflect your view of the child's behavior even if other people might not agree. Feel free to print additional comments beside each item and in the space provided on page 2. <i>Be sure to answer all items.</i>										
THIS FORM FILLED OUT BY: (print your full name) _____												
Your gender: ☐ Male ☐ Female												
Your relation to the child:												
☐ Biological Parent ☐ Step Parent ☐ Grandparent ☐ Adoptive Parent ☐ Foster Parent ☐ Other (specify) _____												
I. Please list the sports your child most likes to take part in. For example: swimming, baseball, skating, skate boarding, bike riding, fishing, etc.												
None ☐		Compared to others of the same age, about how much time does he/she spend in each?										
a. _____		<table style="width: 100%; text-align: center; font-size: x-small;"> <tr> <td>Less Than Average</td> <td>Average</td> <td>More Than Average</td> <td>Don't Know</td> </tr> <tr> <td>☐</td> <td>☐</td> <td>☐</td> <td>☐</td> </tr> </table>			Less Than Average	Average	More Than Average	Don't Know	☐	☐	☐	☐
Less Than Average	Average	More Than Average	Don't Know									
☐	☐	☐	☐									
b. _____		<table style="width: 100%; text-align: center; font-size: x-small;"> <tr> <td>Below Average</td> <td>Average</td> <td>Above Average</td> <td>Don't Know</td> </tr> <tr> <td>☐</td> <td>☐</td> <td>☐</td> <td>☐</td> </tr> </table>			Below Average	Average	Above Average	Don't Know	☐	☐	☐	☐
Below Average	Average	Above Average	Don't Know									
☐	☐	☐	☐									
c. _____		<table style="width: 100%; text-align: center; font-size: x-small;"> <tr> <td>Below Average</td> <td>Average</td> <td>Above Average</td> <td>Don't Know</td> </tr> <tr> <td>☐</td> <td>☐</td> <td>☐</td> <td>☐</td> </tr> </table>			Below Average	Average	Above Average	Don't Know	☐	☐	☐	☐
Below Average	Average	Above Average	Don't Know									
☐	☐	☐	☐									
II. Please list your child's favorite hobbies, activities, and games, other than sports. For example: stamps, dolls, books, piano, crafts, cars, computers, singing, etc. (Do not include listening to radio or TV.)												
None ☐		Compared to others of the same age, about how much time does he/she spend in each?										
a. _____		<table style="width: 100%; text-align: center; font-size: x-small;"> <tr> <td>Less Than Average</td> <td>Average</td> <td>More Than Average</td> <td>Don't Know</td> </tr> <tr> <td>☐</td> <td>☐</td> <td>☐</td> <td>☐</td> </tr> </table>			Less Than Average	Average	More Than Average	Don't Know	☐	☐	☐	☐
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Below Average	Average	Above Average	Don't Know									
☐	☐	☐	☐									
III. Please list any organizations, clubs, teams, or groups your child belongs to.												
None ☐		Compared to others of the same age, how active is he/she in each?										
a. _____		<table style="width: 100%; text-align: center; font-size: x-small;"> <tr> <td>Less Active</td> <td>Average</td> <td>More Active</td> <td>Don't Know</td> </tr> <tr> <td>☐</td> <td>☐</td> <td>☐</td> <td>☐</td> </tr> </table>			Less Active	Average	More Active	Don't Know	☐	☐	☐	☐
Less Active	Average	More Active	Don't Know									
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b. _____		<table style="width: 100%; text-align: center; font-size: x-small;"> <tr> <td>Less Active</td> <td>Average</td> <td>More Active</td> <td>Don't Know</td> </tr> <tr> <td>☐</td> <td>☐</td> <td>☐</td> <td>☐</td> </tr> </table>			Less Active	Average	More Active	Don't Know	☐	☐	☐	☐
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☐	☐	☐	☐									
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Less Active	Average	More Active	Don't Know									
☐	☐	☐	☐									
IV. Please list any jobs or chores your child has. For example: paper route, babysitting, making bed, working in store, etc. (Include both paid and unpaid jobs and chores.)												
None ☐		Compared to others of the same age, how well does he/she carry them out?										
a. _____		<table style="width: 100%; text-align: center; font-size: x-small;"> <tr> <td>Below Average</td> <td>Average</td> <td>Above Average</td> <td>Don't Know</td> </tr> <tr> <td>☐</td> <td>☐</td> <td>☐</td> <td>☐</td> </tr> </table>			Below Average	Average	Above Average	Don't Know	☐	☐	☐	☐
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☐	☐	☐	☐									
c. _____		<table style="width: 100%; text-align: center; font-size: x-small;"> <tr> <td>Below Average</td> <td>Average</td> <td>Above Average</td> <td>Don't Know</td> </tr> <tr> <td>☐</td> <td>☐</td> <td>☐</td> <td>☐</td> </tr> </table>			Below Average	Average	Above Average	Don't Know	☐	☐	☐	☐
Below Average	Average	Above Average	Don't Know									
☐	☐	☐	☐									

Be sure you answered all items. Then see other side.

Please print. Be sure to answer all items.

- V. 1. About how many close friends does your child have? (Do not include brothers & sisters)
☐ None ☐ 1 ☐ 2 or 3 ☐ 4 or more
2. About how many times a week does your child do things with any friends outside of regular school hours?
 (Do not include brothers & sisters) ☐ Less than 1 ☐ 1 or 2 ☐ 3 or more

VI. Compared to others of his/her age, how well does your child:

- | | Worse | Average | Better | |
|---|--------------------------|--------------------------|--------------------------|---|
| a. Get along with his/her brothers & sisters? | ☐ | ☐ | ☐ | ☐ Has no brothers or sisters |
| b. Get along with other kids? | ☐ | ☐ | ☐ | |
| c. Behave with his/her parents? | ☐ | ☐ | ☐ | |
| d. Play and work alone? | ☐ | ☐ | ☐ | |

VII. 1. Performance in academic subjects.

Does not attend school because _____

Check a box for each subject that child takes		Falling	Below Average	Average	Above Average
Other academic subjects—for example: computer courses, foreign language, business. Do not include gym, shop, driver's ed., or other nonacademic subjects.	a. Reading, English, or Language Arts	☐	☐	☐	☐
	b. History or Social Studies	☐	☐	☐	☐
	c. Arithmetic or Math	☐	☐	☐	☐
	d. Science	☐	☐	☐	☐
	e. _____	☐	☐	☐	☐
	f. _____	☐	☐	☐	☐
	g. _____	☐	☐	☐	☐
	_____	☐	☐	☐	☐
	_____	☐	☐	☐	☐

2. Does your child receive special education or remedial services or attend a special class or special school?

☐ No ☐ Yes—kind of services, class, or school: _____

3. Has your child repeated any grades? ☐ No ☐ Yes—grades and reasons: _____

4. Has your child had any academic or other problems in school? ☐ No ☐ Yes—please describe: _____

When did these problems start? _____

Have these problems ended? ☐ No ☐ Yes—when? _____

Does your child have any illness or disability (either physical or mental)? ☐ No ☐ Yes—please describe: _____

What concerns you most about your child? _____

Please describe the best things about your child. _____

Please print. Be sure to answer all items.

Below is a list of items that describe children and youths. For each item that describes your child **now or within the past 6 months**, please circle the **2** if the item is **very true or often true** of your child. Circle the **1** if the item is **somewhat or sometimes true** of your child. If the item is **not true** of your child, circle the **0**. Please answer all items as well as you can, even if some do not seem to apply to your child.

0 = Not True (as far as you know)			1 = Somewhat or Sometimes True	2 = Very True or Often True			
0	1	2	1. Acts too young for his/her age	0	1	2	32. Feels he/she has to be perfect
0	1	2	2. Drinks alcohol without parents' approval (describe): _____	0	1	2	33. Feels or complains that no one loves him/her
0	1	2	3. Argues a lot	0	1	2	34. Feels others are out to get him/her
0	1	2	4. Fails to finish things he/she starts	0	1	2	35. Feels worthless or inferior
0	1	2	5. There is very little he/she enjoys	0	1	2	36. Gets hurt a lot, accident-prone
0	1	2	6. Bowel movements outside toilet	0	1	2	37. Gets in many fights
0	1	2	7. Bragging, boasting	0	1	2	38. Gets teased a lot
0	1	2	8. Can't concentrate, can't pay attention for long	0	1	2	39. Hangs around with others who get in trouble
0	1	2	9. Can't get his/her mind off certain thoughts; obsessions (describe): _____	0	1	2	40. Hears sound or voices that aren't there (describe): _____
0	1	2	10. Can't sit still, restless, or hyperactive	0	1	2	41. Impulsive or acts without thinking
0	1	2	11. Clings to adults or too dependent	0	1	2	42. Would rather be alone than with others
0	1	2	12. Complains of loneliness	0	1	2	43. Lying or cheating
0	1	2	13. Confused or seems to be in a fog	0	1	2	44. Bites fingernails
0	1	2	14. Cries a lot	0	1	2	45. Nervous, highstrung, or tense
0	1	2	15. Cruel to animals	0	1	2	46. Nervous movements or twitching (describe): _____
0	1	2	16. Cruelty, bullying, or meanness to others	0	1	2	47. Nightmares
0	1	2	17. Daydreams or gets lost in his/her thoughts	0	1	2	48. Not liked by other kids
0	1	2	18. Deliberately harms self or attempts suicide	0	1	2	49. Constipated, doesn't move bowels
0	1	2	19. Demands a lot of attention	0	1	2	50. Too fearful or anxious
0	1	2	20. Destroys his/her own things	0	1	2	51. Feels dizzy or lightheaded
0	1	2	21. Destroys things belonging to his/her family or others	0	1	2	52. Feels too guilty
0	1	2	22. Disobedient at home	0	1	2	53. Overeating
0	1	2	23. Disobedient at school	0	1	2	54. Overtired without good reason
0	1	2	24. Doesn't eat well	0	1	2	55. Overweight
0	1	2	25. Doesn't get along with other kids				56. Physical problems without known medical cause :
0	1	2	26. Doesn't seem to feel guilty after misbehaving	0	1	2	a. Aches or pains (not stomach or headaches)
0	1	2	27. Easily jealous	0	1	2	b. Headaches
0	1	2	28. Breaks rules at home, school, or elsewhere	0	1	2	c. Nausea, feels sick
0	1	2	29. Fears certain animals, situations, or places, other than school (describe): _____	0	1	2	d. Problems with eyes (not if corrected by glasses) (describe): _____
0	1	2	30. Fears going to school	0	1	2	e. Rashes or other skin problems
0	1	2	31. Fears he/she might think or do something bad	0	1	2	f. Stomachaches
				0	1	2	g. Vomiting, throwing up
				0	1	2	h. Other (describe): _____

PAGE 3

Be sure you answered all items. Then see other side.

Please print. Be sure to answer all items.

0 = Not True (as far as you know)	1 = Somewhat or Sometimes True	2 = Very True or Often True
0 1 2 57. Physically attacks people		0 1 2 84. Strange behavior (describe): _____
0 1 2 58. Picks nose, skin, or other parts of body (describe): _____		0 1 2 85. Strange ideas (describe): _____
0 1 2 59. Plays with own sex parts in public		0 1 2 86. Stubborn, sullen, or irritable
0 1 2 60. Plays with own sex parts too much		0 1 2 87. Sudden changes in mood or feelings
0 1 2 61. Poor school work		0 1 2 88. Sulks a lot
0 1 2 62. Poorly coordinated or clumsy		0 1 2 89. Suspicious
0 1 2 63. Prefers being with older kids		0 1 2 90. Swearing or obscene language
0 1 2 64. Prefers being with younger kids		0 1 2 91. Talks about killing self
0 1 2 65. Refuses to talk		0 1 2 92. Talks or walks in sleep (describe): _____
0 1 2 66. Repeats certain acts over and over; compulsions (describe): _____		0 1 2 93. Talks too much
0 1 2 67. Runs away from home		0 1 2 94. Teases a lot
0 1 2 68. Screams a lot		0 1 2 95. Temper tantrums or hot temper
0 1 2 69. Secretive, keeps things to self		0 1 2 96. Thinks about sex too much
0 1 2 70. Sees things that aren't there (describe): _____		0 1 2 97. Threatens people
0 1 2 71. Self-conscious or easily embarrassed		0 1 2 98. Thumb-sucking
0 1 2 72. Sets fires		0 1 2 99. Smokes, chews, or sniffs tobacco
0 1 2 73. Sexual problems (describe): _____		0 1 2 100. Trouble sleeping (describe): _____
0 1 2 74. Showing off or clowning		0 1 2 101. Truancy, skips school
0 1 2 75. Too shy or timid		0 1 2 102. Underactive, slow moving, or lacks energy
0 1 2 76. Sleeps less than most kids		0 1 2 103. Unhappy, sad, or depressed
0 1 2 77. Sleeps more than most kids during day and/or night (describe): _____		0 1 2 104. Unusually loud
0 1 2 78. Inattentive or easily distracted		0 1 2 105. Uses drugs for nonmedical purposes (don't include alcohol or tobacco) (describe): _____
0 1 2 79. Speech problem (describe): _____		0 1 2 106. Vandalism
0 1 2 80. Stares blankly		0 1 2 107. Wets self during the day
0 1 2 81. Steals at home		0 1 2 108. Wets the bed
0 1 2 82. Steals outside the home		0 1 2 109. Whining
0 1 2 83. Stores up too many things he/she doesn't need (describe): _____		0 1 2 110. Wishes to be of opposite sex
		0 1 2 111. Withdrawn, doesn't get involved with others
		0 1 2 112. Worries
		113. Please write in any problems your child has that were not listed above:
		0 1 2 _____
		0 1 2 _____
		0 1 2 _____

Appendix I DASS 21



DASS 21 NAME _____ DATE _____

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

- 0 Did not apply to me at all - NEVER
- 1 Applied to me to some degree, or some of the time - SOMETIMES
- 2 Applied to me to a considerable degree, or a good part of time - OFTEN
- 3 Applied to me very much, or most of the time - ALMOST ALWAYS

FOR OFFICE USE

	N	S	O	AA	D	A	S
1 I found it hard to wind down	0	1	2	3			
2 I was aware of dryness of my mouth	0	1	2	3			
3 I couldn't seem to experience any positive feeling at all	0	1	2	3			
4 I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3			
5 I found it difficult to work up the initiative to do things	0	1	2	3			
6 I tended to over-react to situations	0	1	2	3			
7 I experienced trembling (eg, in the hands)	0	1	2	3			
8 I felt that I was using a lot of nervous energy	0	1	2	3			
9 I was worried about situations in which I might panic and make a fool of myself	0	1	2	3			
10 I felt that I had nothing to look forward to	0	1	2	3			
11 I found myself getting agitated	0	1	2	3			
12 I found it difficult to relax	0	1	2	3			
13 I felt down-hearted and blue	0	1	2	3			
14 I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3			
15 I felt I was close to panic	0	1	2	3			
16 I was unable to become enthusiastic about anything	0	1	2	3			
17 I felt I wasn't worth much as a person	0	1	2	3			
18 I felt that I was rather touchy	0	1	2	3			
19 I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3			
20 I felt scared without any good reason	0	1	2	3			
21 I felt that life was meaningless	0	1	2	3			
TOTALS							

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Appendix J WISC IV

WISC-IV^{UK}

WECHSLER INTELLIGENCE SCALE
FOR CHILDREN® – FOURTH UK EDITION

Child's Name _____

Examiner's Name _____

Calculation of Child's Age

	Year	Month	Day
Date of Testing			
Date of Birth			
Age at Testing			

Total Raw Score to Scaled Score Conversions

Subtest	Raw Score	Scaled Scores				
Block Design						
Similarities						
Digit Span						
Picture Concepts						
Coding						
Vocabulary						
Letter-Number Seq.						
Matrix Reasoning						
Comprehension						
Symbol Search						
(Picture Completion)		()			()	
(Cancellation)					()	()
(Information)		()				()
(Arithmetic)			()			()
(Word Reasoning)		()				()
Sums of Scaled Scores						
		Verbal Comp.	Perc. Rsng.	Work. Mem.	Proc. Speed	Full Scale

Sum of Scaled Scores to Composite Score Conversions

Scale	Sum of Scaled Scores	Composite Score	Percentile Rank	% Confidence Interval
Verbal Comprehension		VCI		
Perceptual Reasoning		PRI		
Working Memory		WMI		
Processing Speed		PSI		
Full Scale		FSIQ		

SAT Scores

Baseline			
	Maths	English	Science
KS 1			
KS 2			
KS 3			
KS 4			

Record Form

Subtest Scaled Score Profile

	Verbal Comprehension					Perceptual Reasoning				Working Memory			Processing Speed		
	SI	VC	CO	(LN)	(WR)	BD	PCn	MR	(PCm)	DS	LN	(AR)	CD	SS	(CA)
19															
18															
17															
16															
15															
14															
13															
12															
11															
10															
9															
8															
7															
6															
5															
4															
3															
2															
1															

Composite Score Profile

	VCI	PRI	WMI	PSI	FSIQ
160					
150					
140					
130					
120					
110					
100					
90					
80					
70					
60					
50					
40					

Appendix K ERS Test (Dyck, 2012)

Emotion Vocabulary Test

Name: _____

Age: _____ Gender: M F

Test Date: _____

Instructions:

Note: Discontinue after five consecutive failures.

Before starting the test, say to the child:

“I am going to ask you some questions, and I would like you to tell me the answers.”

Starting with the first item, read aloud each question exactly as it is written.

If the child says “I don’t know” you may say:

Have you felt _____ ?

What does it look like when you feel _____ ?

What causes _____ ?

Do not ask any other leading questions.

The scoring key provides samples of responses provided that are followed by “(Q)” and similar responses must always be queried. If the child responds with a slang response or another response not found in dictionaries, or if you are in doubt about the acceptability of a response involving a colloquialism, ask the child for another meaning.

Scoring Key for the Emotion Vocabulary Test

Each item is scored 2, 1, or 0 points. The maximum score is 48 points.

The following general scoring principles should be applied.

- | | | |
|----------|---|--|
| 2 points | – | A good synonym (e.g., Happy means feeling pleased) |
| | – | An excellent example of a general situation that elicits this emotion (e.g., People feel happy when good things happen to them) |
| | – | An excellent example of a specific situation that elicits this emotion (e.g., I feel happy when I get presents that I really wanted) |
| | – | Description of the correct facial expressions/bodily response and use of a less pertinent synonym or a vague description of an appropriate situation |
| 1 point | – | A vague or less pertinent synonym (e.g., Happy means feeling well) |
| | – | Description of the appropriate facial expression/bodily response only (e.g., Happy is when you are smiling). |
| | – | A vague description of an appropriate situation that is not improved after being queried (e.g., I am happy at school) |
| | – | When the response has more correct parts than incorrect parts. |
| 0 points | – | Obviously wrong answers. |
| | – | An incorrect synonym. |
| | – | An incorrect example of a situation that would lead to that emotion. |
| | – | When the answer includes more wrong parts than correct parts. |

Murray J. Dyck, 2012

Appendix L Test of Emotion Comprehension Scoring Sheet

Test of Emotion Comprehension (TEC) Score sheet

School/ Nursery	Date of examination:
Degree:	Examiner:
Participant:	Duration of examination:
Gender	
Age:	

Remarks:

Pages	Component	Answers				Remarks
1	1a Sad	Happy	Sad	Angry	Alright	
2	1b Happy	Happy	Sad	Alright	Scared	
3	1c Angry	Happy	Alright	Angry	Scared	
4	1d Alright	Happy	Sad	Angry	Alright	
5	1e Scared	Happy	Alright	Angry	Scared	

6	Ila Turtle	Happy	Sad	Angry	Alright	
7	Ilb Gift	Happy	Sad	Alright	Scared	
8	Ilc Brother	Happy	Alright	Angry	Scared	
9	Ild Bus	Happy	Sad	Angry	Alright	
10	Ile Monster	Happy	Alright	Angry	Scared	

11	III control	<i>(T/S likes</i>	<i>Cocoa (help)</i>	<i>P/H doesn't</i>	<i>Like cocoa</i>	<i>(help)</i>
11	IIIa T – cocoa	Happy	Sad	Alright	Scared	
11	IIIb P n-cocoa	Happy	Sad	Alright	Scared	
12	III control	<i>T/S doesn't</i>	<i>Like salad</i>	<i>P/H likes</i>	<i>salad</i>	<i>(help)</i>
12	IIIc T – n salad	Happy	Sad	Alright	Scared	
12	IIId P. Salad	Happy	Sad	Alright	Scared	

13	IV Control	<i>Rabbit d.k.</i>	<i>help</i>			
13	IV Fox Rabbit	Happy	Alright	Angry	Scared	

14-16	V control	<i>T/S happy</i>	<i>Help if other</i>	<i>Response</i>	<i>given</i>	
17	V Photo	Happy	Sad	Alright	Scared	

18	VI Regulation	Hands	Do	Think	Nothing	
19	VII Marbles	Happy	Alright	Angry	Scared	
20	VIII Mixed	Happy	Sad Scared	Hap. Scar	Scared	

21	IX Control	<i>It's naughty</i>	<i>(help)</i>			
22	IXa Resist	Happy	Sad	Angry	Alright	
22-23	IXb Mother	Happy	Sad	Angry	Alright	

Author: Francisco Pons & Paul L. Harris, Oxford University, 2000. (TEC – English version 2 Spring 2000)

Appendix M Fluid Emotions Test Instructions

Fluid Emotions Test

Set-up:

Test items need to be loaded into a Powerpoint (or comparable) file in order. The test is administered as a Powerpoint presentation. Cursor keys are used to move from item to item; the morph is initiated by clicking on the static image.

A stop-watch is required.

Instructions:

“Now I'm going to show you some pictures on this computer. I'm going to show you pictures of people's faces. The people in these pictures are showing different kinds of feelings; some people might be feeling sad or happy or angry or other kinds of feelings. Or, these people might not be showing any kind of feeling at all. What I want you to do is tell me what kind of feeling the person is showing. If the person isn't showing any kind of feeling, I want you to tell me that, too. Here's the first picture. Is that man feeling something? What is this man feeling?”

Show first picture.

If the emotion is correctly identified (fear):

“Good. Now I'm going to make the picture change into a different picture. Watch closely. As soon as you know what kind of feeling the new person is showing, I want you to tell me. Okay? Watch the picture change and, as soon as you know what the person is feeling, tell me.”

Morph the picture and start the stop-watch. Record the responses and the response time.

If there is a delay, repeat the question: “what is this man feeling?”

If the first picture is not correctly identified:

“No, this man is feeling afraid. He looks scared. Now I'm going to make the picture change into a different picture. Watch closely,” etc. etc.

Do not provide any more corrections.

All 32 slides need to be presented.

Appendix N Fluid Emotions Test and Attention

Table 1

Clinical Range Attention Problems and FET Accuracy Mean Ranking by Emotion Type

	Attention Problems <i>n</i> = 19	No Attention Problems <i>n</i> = 41	Mann-Whitney U 95% CI	
	Mean Rank	Mean Rank	<i>U</i>	<i>p</i>
“Happy”	16.92	35.63	131.5	<.001***
“Sad”	28.37	30.78	349	ns
“Angry”	30.37	29.08	354	ns
“Scared”	25.24	30.78	289	ns
“Neutral”	25.11	31.64	287	ns
“Surprised”	20.11	34.08	192	<.01**
“Disgusted”	22.58	32.87	239	<.05*
“Contempt”	30.61	28.96	349	ns

Note. FET = Fluid emotions test total accuracy score comprising still face condition accuracy (FET A) plus morphing face condition accuracy (FET B). Mean Ranks represent Mann-Whitney U test scores mean ranking by problem type. Attention Problems = clinical range (t score 65 and above) on parent reported attention difficulties on the Child Behaviour Checklist (CBCL, Achenback and Edelbrock, 1983). * significant at $p \leq .05$, ** significant at $p \leq .01$, *** significant at $p \leq .001$.

Table 2

Clinical Range Attention Problems and FET Speed Mean Ranking by Emotion Type

	Attention Problems <i>n</i> = 19	No Attention Problems <i>n</i> = 41	Mann-Whitney U 95% CI	
	Mean Rank	Mean Rank	<i>U</i>	<i>p</i>
“Happy”	24.39	31.99	273.5	ns
“Sad”	20.42	33.92	198	<.01**
“Angry”	20.79	33.74	205	<.01**
“Scared”	25.55	31.42	295	ns
“Neutral”	24.26	32.05	277	ns
“Surprised”	21.42	33.44	217	<.05*
“Disgusted”	22.92	32.71	247	<.05*
“Contempt”	23.00	32.67	245.5	<.05*

Note. FET = Fluid emotions test speed scores on morphing face condition accuracy (FET B). Mean Ranks represent Mann-Whitney U test scores mean ranking by problem type. Attention Problems = clinical range (t score 65 and above) on parent reported attention difficulties on the Child Behaviour Checklist (CBCL, Achenback and Edelbrock, 1983). * significant at $p \leq .05$, ** significant at $p \leq .01$, *** significant at $p \leq .001$.

Appendix O Fluid Emotions Test and Anxiety

Table 1

Clinical Range Anxiety and Depression and FET Accuracy Mean Rank x Emotion Type

	Attention Problems <i>n</i> = 18	No Attention Problems <i>n</i> = 42	Mann-Whitney U 95% CI	
	Mean Rank	Mean Rank	<i>U</i>	<i>p</i>
“Happy”	20.97	33.04	203.5	<.01**
“Sad”	30.21	29.02	353	ns
“Angry”	35.59	26.98	245	ns
“Scared”	34.12	27.59	270	ns
“Neutral”	32.59	28.22	296	ns
“Surprised”	25.12	31.32	274	ns
“Disgusted”	28.97	29.72	339	ns
“Contempt”	29.29	29.59	345	ns

Note. FET = Fluid emotions test total accuracy score comprising still face condition accuracy (FET A) plus morphing face condition accuracy (FET B). Mean Ranks represent Mann-Whitney U test scores mean ranking by problem type. Anxiety and Depression = clinical range (t score 65 and above) on parent reported anxious/ depressed scale on the Child Behaviour Checklist (CBCL, Achenback and Edelbrock, 1983). * significant at $p \leq .01$.

Table 2

Clinical Range Anxiety and Depression and FET Speed Mean Rank x Emotion Type

	Attention Problems <i>n</i> = 18	No Attention Problems <i>n</i> = 42	Mann-Whitney U 95% CI	
	Mean Rank	Mean Rank	<i>U</i>	<i>p</i>
“Happy”	29.35	29.56	346	ns
“Sad”	28.24	30.02	327	ns
“Angry”	28.12	20.07	325	ns
“Scared”	25.32	31.23	277	ns
“Neutral”	28.62	29.87	333.5	ns
“Surprised”	29.35	29.56	346	ns
“Disgusted”	31.47	28.68	315	ns
“Contempt”	24.97	31.38	271	ns

Note. FET = Fluid emotions test speed scores on morphing face condition accuracy (FET B). Mean Ranks represent Mann-Whitney U test scores mean ranking by problem type. Anxiety and Depression = clinical range (t score 65 and above) on parent reported anxious/ depressed scale on the Child Behaviour Checklist (CBCL, Achenback and Edelbrock, 1983).