Facial Emotion Recognition, Depressed Mood and Stigma in Adolescents with Intellectual Disabilities

(Volume 1 of 1)

Hannah Kiddle

Thesis Submitted in Partial Requirement for The Degree of D.Clin.Psychol.

Department of Clinical Psychology
School of Psychology
Faculty of Medicine, Health and Life Sciences
University of Southampton

May 2007

19,456 words

Abstract

Adolescents with intellectual disability (ID) are at increased risk of developing depression compared to their typically developing peers. It is important to consider social context when working with individuals with ID and depression. Social and cognitive factors relevant to depression in the ID population include stigma, low self-esteem, hopelessness and negative attributional style. Facial emotion recognition (FER) is an important prerequisite for social skills, which has been found to be impaired in depression; however, there have been reports that this ability is relatively spared in individuals with LD and depression. The literature review considers developmental perspectives to the development of depression in adolescents with ID. Research is drawn from the depression literature in typically developing adolescents, with consideration of how having ID may increase susceptibility to identified risk factors. Awareness of stigma is central to the social context of adolescents with ID. Changes in FER ability have been associated with depression among individuals with depression with and without ID. A hypothetical link between perceiving other's negative emotions as a result of the social stigma associated with ID and depression is proposed in the literature. The empirical paper explored the relationship between depression, FER and experience of stigma in the adolescent ID population. Verbal ability influenced FER, but there was limited evidence for an effect of depression on FER, and no evidence that this was associated with stigma. Stigma and depression were correlated. The results from this study are discussed with regard to future research and clinical practice.

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Acknowledgements

I would like to thank Professor Dave Dagnan for all his generous support, advice and encouragement in conceptualising and completing this research project. I would also like to thank Dr Catherine Brignell and Dr Matt Garner for their continued support and instruction.

My thanks to Roger Norgate and Bob Stratford for their advice regarding recruitment, to Dr Tony Brown for taking time to discuss the logistics of this project and to Professor Johannes Rojahn for answering my many questions about facial emotion recognition tasks.

Most importantly, I would like to thank all the teachers and headteachers who allowed me interrupt their school days to interview pupils at their schools and colleges, to the all the parents for agreeing to let me meet with their children and to all the young people who took part in the study. Without you this project would not have been possible.

Review of the Literature:

Vulnerability to Depression in Adolescents with Intellectual Disabilities

Hannah Kiddle
Department of Clinical Psychology
School of Psychology
Faculty of Medicine, Health and Life Sciences
University of Southampton

Running Head: Facial Emotion Recognition

Keywords: Intellectual Disability, Depression, Adolescents

This paper was prepared in line with the author guidelines for the Journal of Applied Research in Intellectual Disabilities (see Appendix A).

Abstract

The incidence of depression among adolescents with learning disability (ID) is higher than that observed in typically developing adolescents. Despite the increased vulnerability to depression research in this population is largely limited to studies investigating prevalence and assessment of depression. This paper examines how risk factors associated with depression in typically developing adolescents may assist in the understanding of depression in the adolescent ID population. These developmental risk factors are considered within psychosocial framework, and consider the risk factors at the level of the individual, immediate social environment, wider social environment and socio-political environment. Risk factors identified include genetic vulnerability, attachment, peer relationships and socio-economic status. The evidence on developmental risk factors is discussed alongside the evidence on the life experience of adolescents with ID and the influence these may have on vulnerability to depression are considered, including peer relationships, the experience of stigma and exposure to stressful life events. Identified risk factors for adolescent depression and life experiences of adolescents with ID provide a useful framework for understanding depression in adolescents with ID. Further research is required to explore the relationships between these risk factors and life experiences and their application to the wider adolescent ID population. The consideration of the social context is advocated when working with adolescents with ID and depression. Clinical implications and areas of future research are discussed.

Introduction

People with intellectual disability (ID) have often been found to have higher levels of mental ill-health than people without ID; the degree of difference often depends upon the populations studied, the diagnostic methods and the diagnostic system used (for example some studies include challenging behaviour as a psychiatric disorder whilst others do no not) (Cooper, Smiley, Morrison, Williamson, & Allan, 2007). There is increasing recognition of the psychosocial influences in the lives of people with ID and the effects these have on the level of psychological distress in this population and the way in which particular forms of disorder may present (Jahoda, Dagnan, Jarvie, & Kerr, 2006). There has also recently been increasing interest in the interaction of psychosocial and developmental factors in understanding the presentations of people with ID (Dagnan & Jahoda, 2006; Dosen, 1993).

This paper will explore this interaction with respect to depression with particular focus on adolescence. Adolescence is a time of change at all levels of the bio-psycho-social continuum and has been associated with increases in rates of depression in typically developing adolescents (Lewinsohn, Rohde, & Seeley, 1998; Reinecke & Simons, 2005). This paper will start by reviewing depression in adults and adolescents with mild to moderate ID, before exploring developmental models of and risk factors to depression in typically developing adolescents. The review will go on to discuss how the life experiences and the social context of adolescents with ID may increase their susceptibility to identified risk factors for depression, concluding with a discussion of implications for treatment and understanding of depression in adolescents with ID and possible directions for future research. The following databases were searched for all available years up to March 2007: PSYCHINFO, PUBMED, Google Scholar and Medline. This was supplemented by following up the references that were cited. The key terms used for searching were 'learning disability', 'intellectual disability', 'mental retardation', 'developmental disability', 'learning difficulty', 'adolescent', 'depression', 'risk factors' and 'vulnerability'.

Depression in People with Intellectual Disabilities

Prevalence and Presentation of Depression

Depression is one the most common psychiatric disorder observed in people with ID (Nezu, Nezu, Rothenberg, DelliCarpini, & Groag, 1995), with the risk of developing depression in mid-life (for adults with mild ID) suggested as being as much as four times that of people without ID (Richards et al., 2001). The prevalence of depression in this population has remained contentious, with authors suggesting that the difficulties in assessment and diagnosis have lead to an underestimation in prevalence (Jahoda et al., 2006). One of the difficulties in this area arises from the observation that the presentation of depression across the ID spectrum varies. Whilst sleep disturbance and depressed mood are noted in people with all severities of ID, people with mild ID are observed to exhibit symptoms closely matching standard diagnostic criteria (e.g. DSM-IV, American Psychiatric Association, 1994), with a shift in symptoms towards 'depressive behavioural equivalents' (such as self-injurious behaviour, screaming and aggression, which have been observed at a higher frequency among individuals with more severe ID and depression compared to their non-depressed peers) as the severity of ID increases (Marston, Perry, & Roy, 1997). The importance of behavioural equivalence in the diagnosis of depression is a matter of debate in the literature, with some researchers supporting the increased inclusion of behavioural symptoms (e.g. Evans, Cotton, & Florio, 1999), whilst others warn against the risk of false positives (e.g. Holden & Gitlesen, 2004) and question whether the suggested behavioural manifestations are in fact symptoms of depression (Tsiouris, Mann, Patti, & Sturmey, 2003).

The prevalence of depression also varies across the ID spectrum, although the direction of this variance is debated. Some authors report higher prevalence rates among people with mild ID and a decrease in rates as severity of ID increases (Holden & Gitlesen, 2004). These authors attribute this to differences in prevalence rather than to the increased difficulty in assessing and diagnosing depression among people with more severe ID. They argue that if differences were due to difficulties in assessment, non-verbal symptoms would be observed at a higher rate in individuals with severe and profound ID compared to those with moderate ID. This is not the case, with both verbal and non-verbal symptoms occurring more frequently in participants with moderate ID. The increased vulnerability to depression in people with mild ID has been attributed to their awareness of the social stigma associated with ID (Nezu et al., 1995) and inability to lead normal lives (Dosen, 1993). Alternatively, differences observed may be reflective of developmental stage, with individuals at a more advanced stage exhibiting more cognitive symptoms. This is observed in children and adolescents without ID, with children at lower developmental stages tending to report somatic symptoms whilst adolescents tend to report cognitive symptoms (National Institute for Clinical Excellence (NICE), 2005). However, other investigators have reported higher prevalence rates in individuals with more severe ID. Cooper and colleagues (2007) found that having a profound or severe learning disability was independently associated with mental ill-health. Comparison of the percentages of participants with mental ill-health[1] in the mild ID group and the moderate to profound ID group indicate no difference in the percentages. This suggests that whilst having a profound or severe ID may be associated with mental ill-health, other factors (such as having immobility or a severe physical disability) may affect mental ill-health in people with milder ID. The rates for affective disorders reported for the same group differ only by 0.2%, suggesting that whilst the risk factors for depression may differ for individuals with different severities of ID the rates for depression are relatively similar across the ID spectrum.

Prevalence in Adolescents

The prevalence of depression among adolescents with ID is higher than that of typically developing adolescents. Huntington and Bender (1993) report the prevalence of depression in adolescents with ID to be between 14 and 32%, compared to between 2 and 9% in typically developing adolescents and young adults. In adolescents with and without ID the prevalence of depression is higher in women (Lunsky, 2003; Nolen-Hoeksema & Girgus, 1994). Prevalence studies in the ID adolescent

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[1] Excluding autistic-spectrum disorders and problem behaviour.

population are affected by the same difficulties in assessment and diagnosis as in the adult literature (Masi, Pfanner, & Marcheschi, 1998) and therefore may represent an underestimation of the prevalence of depression in this population (Reiss, 1990). This paper will now consider the literature that identifies developmental predictors and risk factors for depression. The evidence for specific psychosocial features of the lives of people with ID that suggests they may be more susceptible to the effects of developmental factors will then be discussed.

Overview of Developmental View of Depression

There is a dramatic increase in the incidence of depression from early to late adolescents in typically developing children; with a incidence rate of only 1 to 3 percent in children under 13 rising to 9 percent in adolescents and young adults (Goodyer, 1995; Lewinsohn et al., 1998). There are a number of developmental factors associated with vulnerability to psychopathology which may be environmental, biological or psychological and may be specific to a given mental health problem, such as depression, or non-specific and applicable to a number of mental health problems (Donovan & Spence, 2000). The authors argue that these factors may interact with developmental stage; as a consequence the risk factor may be of more importance at one developmental stage and of little or no importance at another. Developmental risk factors identified in the development of depression include parental depression, genetic vulnerability, low socio-economic status, attributional style, temperament and early parental loss. Developmental risk factors will be considered within a psychosocial framework. Dagnan (2007) suggests that a psychosocial framework should consider risk factors and interventions at the level of the individual, of the immediate social environment (i.e. the family and direct carers), at the level of the wider social environment (i.e. at the level of housing, employment and leisure) and at the socio-political level. As each developmental factor is considered the evidence for specific vulnerability for adolescents with ID will be discussed.

Adolescents with ID are observed to show impairment in social and emotion perception skills, which may act as general risk factors that interact or moderate the relationship between the individual risk factors mentioned above and depression. For example, social skills are found to correlate with depression (Helsel & Matson, 1988); the ability to recognise facially expressed emotions is viewed as a pre-requisite to social competence (Helsel et al., 1988) and is believed by some authors to underpin the social skills deficits observed in people with ID (Rojahn, Rabold, & Schneider, 1995). This is supported by findings that adults and adolescents with ID show impaired performance on facial emotion recognition (FER) tasks compared to their typically developing peers (McAlpine, Kendall, & Singh, 1991; Moore, 2001; Rojahn, Lederer, & Tassé, 1995) and that FER ability significantly correlates with social skills (Warren, 1992). FER is also a precursor to the ability to accurately report one's own emotions (Reed & Clements, 1989); impairment in this ability has been associated with increased mental ill-health following certain stressful life events (e.g. Wadsworth & Harper, 1991).

Individual Factors

Genetic Vulnerability

Research has indicated a genetic vulnerability to depression, with children of parents with depression having an increased risk of developing depression (Cicchetti & Toth, 1998). Thirty percent of the variation in risk factors for depression in adolescents is believed to be genetic (National Institute for Clinical Excellence, 2005). Kendler and colleagues (Kendler, Gardner, & Prescott, 2002; Kendler, Gardner, & Prescott, 2006) view genetic vulnerability as a risk factor of childhood, their results suggesting that genetic vulnerability predicts risk factors associated with later developmental periods, such as temperament and exposure to negative life events. However, Bierut et al.'s (1999) twin study indicates that the influence of the non-shared environment plays the largest role in the development of depression. Family studies indicate that offspring of parents with unipolar depression are at greater risk of depression than offspring of parents with bipolar depression (see Rutter, Silberg, O'Connor, & Simonoff, 1999). This is at odds with heritability research, which estimates 80% heredity for bipolar (McGuffin & Sargeant, 1991) compared to 20 to 45% heredity for unipolar depression (Kessler, McGonagle, Wittchen, & Kendler, 1994), suggesting that factors other than shared genetics are central in the transmission of depression. Rutter et al. (1999) suggest that this may be due to the influence of environmental factors, such as impaired parent-child interaction, family discord and break-up and other associated difficulties (e.g. social disadvantage), all of which have been associated with parental depression.

The inability to separate these genetic and environmental factors is a major criticism of research into the heritability of depression in children (Goodman & Gotlib, 1999). In fact, environmental influences have been found to be important irrespective of whether a genetic vulnerability is present (Ritsher, Warner, Johnson, & Dohrenwend, 2001).

In addition to specific genetic vulnerability to depression people with ID also experience biological vulnerabilities, such as seizure disorders, sensory impairments and specific genetic syndromes (e.g. Fragile X Syndrome, Down Syndrome), which may impact on their vulnerability to psychopathology (Dykens, 2000). For example, there is an increased risk of depression among adults with Down's syndrome, with depression increasing across childhood and adolescence (Dykens, 2000).

Attributions

Cognitive theories propose that the interaction of a negative attributional style or negative self-schema and a stressor give rise to depression (Abramson, Metalsky, & Alloy, 1989; Beck, Rush, Shaw, & Emery, 1979). The diathesis-stress model views negative attributions as the product of an interaction with the environment, which may be acted out at a number of psychosocial levels (for example, interactions with the family, peers and wider social context). In this paper attributions are discussed as an individual factor, although it should be noted that this, and the other individual factors discussed, might interact with other social or developmental risk factors. Negative cognitive style does not appear to play a central role in the development of depression in younger children; a five-year longitudinal study[2] indicated that negative life events (stressors) alone are sufficient to predict depression in younger children. The correlation between cognitive style and depression increases with age, with negative cognitive style predicting depression in later childhood (Nolen-Hoeksema, Girgus, & Seligman, 1992). The authors attribute this trend to development in the child's cognitive capacities; they argue that in early childhood the explanatory style may be underdeveloped, and that as it becomes more stable it plays a more central role in the development of depression (Nolen-Hoeksema et al., 1992).

Alloy et al. (2001) suggest that children may learn their cognitive styles from observing and modelling significant figures in their life (parents and teachers, for example) or from direct learning from parental inferential feedback. Thus children may develop an inferential style that is consistent with parental communications of their inferences regarding the causes and consequences of negative life events in their child's life. The results gained in this area have been relatively consistent, with parental inferential communications being associated with their offspring's cognitive style (Alloy et al., 2001; Garber & Flynn, 2001). In addition to this, parents of high-risk children provided more global stable attribution feedback for events in their child's life, which were more negative than those provided by parents of low-risk children. Direct learning from parental inferential style has been found to be a more powerful mechanism for the development of negative cognitive style than modelling (Alloy et al., 2001). Parental attitudes towards disability were found to be crucial to sense of social well-being in people with ID (Zetlin

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[2] This study followed children from age 8 and 9 to age 12 and 13.

& Turner, 1985), suggesting that parental inferences about their child's disability may affect the child's inferences. Further research into the methods of transmission is required in the ID population given their role in the development of depression in typically developing children.

Adolescents with ID differ in their attribution towards academic failure (Kendler et al., 2002; 2006) compared to their typically developing peers. Students with ID were observed to attribute failure internally in terms of lack of ability, as opposed to typically developing students who attributed failure externally (Huntington & Bender, 1993). This is particularly important given that throughout their lives people with ID are likely to have repeated experience of failure at home and at school (Reed, 2001). If internal stable attributions about the repeated failures (e.g. attributed to lack of ability) are developed the individual may have high expectations of future failure and low expectations of success. According to the hopelessness theory, such expectations give rise to feelings of helplessness, low self-esteem and depression; which has been observed to a greater degree in adolescents with ID (Valås, 2001).

Gender

In addition to the increase in rate throughout adolescence, sex differences in depression also become apparent, with female adolescent rates of depression rising to twice that in males (Reinecke & Simons, 2005). This gender difference is not observed in younger adolescents and is believed to appear between the ages of 12 and 14 (Lewinsohn et al., 1998). Nolen-Hoeksema (2001; Nolen-Hoeksema et al., 1994) suggests that these gender differences are due to the interaction of two factors; firstly females are exposed to uncontrollable stressors in early adolescence to a greater degree that boys, and secondly it is suggested that even when males and females face the same stressors, women are more likely to develop depression due to gender differences in the way they respond to and cope with stress (Nolen-Hoeksema, 2001). Uncontrollable stressors that females are exposed to include biological changes of puberty and increased trauma and exposed to negative life events (e.g. sexual abuse, constrained choices) as a consequence of their lack of social power and status. The hypothesis that the societal views of developmental (pubertal) changes affects depression in females is supported by research by Reinecke and Simons (2005), who report that increased incidents of depression in girls with late and early onset are only observed in Caucasian women, suggesting it is culture rather that timing of puberty per se that affects depression. Nolen-Hoeksema's (2001) account of the gender differences in adolescent depression has interesting implications for the understanding of depression in adolescents with ID. Many of the factors cited for the increased rate of depression in females are relevant to people with ID, for example, the social status of young people with ID is reduced compared to their typically developing peers (e.g. Ochoa & Olivarez, 1995) and they are at increased risk of exposure to negative life events such as abuse (Sullivan & Knutson, 1998). In addition, people with ID have less effective coping skills, which may increase the impact of the stressor. The gender difference observed in the general population is echoed in the ID population (Lunsky, 2003) and may be suggestive of further increased risk in females with ID, perhaps as a result of factors such as puberty and decreased social power (which may be lower for females compared to males with ID).

Temperament

Temperament, such as neuroticism and negative affectivity (comparable to neuroticism), has been associated with higher levels of depression in adolescents (Mendlowicz et al., 2005; Oldehinkel, Veenstra, Ormel, de Winter, & Verhulst, 2006) when in conjunction with an unfavourable environment (adverse parent-child relationship, for example). It is these unfavourable circumstances, gender differences and stressors that ultimately determine whether this temperament will be exhibited as depression, bipolar disorder or personality trait (Mendlowicz et al., 2005). Temperament is a general risk factor of early adolescence and has a strong relationship with self-esteem, onset of depression and early onset anxiety disorders (Kendler et al., 2002; 2006). In addition to high negativity, high emotionality and low sociality has also been associated with increased depression and anxiety (Rende, 1993).

Research in temperament in young people with ID is limited and generally focuses on people with Down's syndrome as they form the largest relatively homogenous group of people with ID (Zion & Jenvey, 2006). Zion and Jenvey (2006) conducted a study investigating temperament in children with (varied) ID and mainstream children. The results indicated that children with ID demonstrated lower sociability and higher emotionality than their typically developing peers. Research on temperament in children with ID has not considered its relationship to depression, however, within the non-ID child population high emotionality and low sociability in girls and high emotionality in boys is associated with depression and anxiety (Rende, 1993). The finding that child with ID have high emotionality and low sociability and links between these temperaments and depression in the non-ID population, suggests that this may constitute a risk factor for depression in the ID population.

Family Specific Developmental Experiences

Parental Depression

Stressful life events are associated with depression in adults without ID (Abramson et al., 1989; Beck et al., 1979). Levels of child-related stress reported in parents of children with ID are higher compared to parents with typically developing children and increase the vulnerability of parents of children with ID to depression (Olsson & Hwang, 2001). However, whist the increased vulnerability claim is supported with mothers of people with ID, this difference is not observed in fathers, who show no differences in prevalence of depression compared to fathers of typically developing children (Olsson & Hwang, 2001).

Maternal depression has been associated with impaired parent-child interaction, family discord and break-up and low self-esteem, depressogenic attributional style and hopelessness in the child (Garber & Flynn, 2001). This depressogenic style and hopelessness has been linked to negative parenting behaviour, including emotional rejection, criticism (Alloy et al., 2001), restrictive control and low maternal care (Garber & Flynn, 2001). These negative parenting practices can affect the child indirectly through inferential feedback or lack of attention or expressed directly by the parent (e.g. abuse).

Attachment

Early attachment experiences have been linked to later adjustment and vulnerability to psychopathology, including anxiety disorders (e.g. Eng, Heimberg, Hart, Schneier, & Liebowitz, 2001), depression (e.g. Reinecke & Simons, 2005) and personality disorders (Fonagy, 2000). Bowlby (1979) proposed that the child develops internal working models about itself and others based on repeated patterns of interaction, which the child uses to predict and relate to its environment. These models provide prototypes for all later relationships. Children with sensitive, responsive attachment figures develop a secure internal model of a caregiver who is reliable and loving and of a self who is worthy of love and attention. On the other hand, attachment figures who are inconsistent in their responsiveness or who are consistently unresponsive provoke anxiety in the child, lead to the development of an anxious/insecure internal working model of a self that is unworthy of love and of a world that is a dangerous place where people cannot be trusted. In support of this, insecure attachment has been associated with negative self-concept and increased vulnerability to depression (Hammen, Burge, & Stansbury, 1995). It should be noted that insecure attachment it self is not sufficient or necessary for the development of psychopathology, rather it represents a general vulnerability factor (Scott Brown & Wright, 2001).

Scott Brown and Wright (2001) suggest that early attachment is important in providing stability for the adolescent in a time when physical, sexual and cognitive changes are occurring. A secure attachment relationship provides a base from which the adolescent can explore new social relationships, this is particularly important given the shift in relationships away from the family and towards peers during adolescence (Laursen & Williams, 1997). In line with this early attachment experiences have been identified as protective or risk factors for psychopathology and the quality of peer relationships in adolescents without ID (Scott Brown & Wright, 2001). Clasien de Schipper, Stolk and Schuengel (2006) suggest that children who are securely attached cope with stress more effectively. They also suggest that attachment relationships can be used to manage a stressful situation (i.e. as protection from or comfort following harm). Given the reduced efficacy of coping skills available to people with ID, the authors argue that attachment relationships are of even greater importance (Clasien de Schipper et al., 2006).

However, forming these attachment relationships may be more difficult for adolescents with ID (Clasien de Schipper et al., 2006) as signals expressed by child with ID may be more difficult for the caregiver to understand (Clasien de Schipper et al., 2006), which in turn may decrease their sensitivity and responsiveness to the child. Parental factors such as increased stress associated with caring for a child with disabilities and accepting the diagnosis of ID, may also negatively impact on the development of attachment relationships (Janssen, Schuengel, & Stolk, 2002). Initial rejection of an infant with ID is common and in a proportion of cases this will not be resolved, resulting in a child with an insecure attachment (Clegg & Lansdall-Welfare, 1995).

A proportion of children with ID spend large periods of their childhood away from their families in residential settings (Morris, 1995), with care being delivered by multiple caregivers. This may disrupt attachment relationships between the parent and child, which Bowlby viewed as the primary and central attachment relationship. The importance of and ability to form secondary attachment relationships is being increasingly recognised (Scott Brown & Wright, 2001), with research indicating that secondary attachment relationships are independent from the primary attachment relationship (Clasien de Schipper et al., 2006). Research has further indicated that these independent attachment relationships may differentially affect later psychological adjustment (Scott Brown & Wright, 2001). Children with ID have been observed to form attachment relationships with professional caregivers (e.g. support workers) who regularly provide care for them (Clasien de Schipper et al., 2006). Professional caregivers, therefore, might be able to compensate for poor attachment between the parent and child and as such act as a protective factor for later psychopathology (Clasien de Schipper et al., 2006). However, secondary attachments may only be built with professional carers who *regularly* provide care (Clasien de Schipper et al., 2006), a requirement that may be limited by high turnover (e.g. Hatton & Emerson, 1993). The lack of continuity and limited potential for sensitivity in professional carers poses additional risks for children without ID (Roy, Rutter, & Pickles, 2000) let alone child with ID who may face additional risk factors (e.g. reduced communication ability).

Given the increased difficulties that may be present in the development of attachment relationships in people with ID, the proportion of individuals with insecure attachment could be expected to outnumber those with secure attachment. This is supported in the research where significantly fewer people with ID have secure attachment. For example, Atkinson et al. (1999) reported secure attachment in a minority of their sample, with mothers in this minority group being rated as more sensitive. Other research has supported this and suggests that the most common attachment type in people with ID is disorganised (Janssen et al., 2002; Vaughn, Goldberg, Atkinson, & Marcovitch, 1994).

Other Family Based Life Events

The association between stressful life events and psychopathology in children and adolescents without ID is well documented (Tiet et al., 2001), this is especially so for young people who experience two or more stressful life events, suggesting a cumulative effect (Hatton & Emerson, 2004). The presence of a ID has been reported to increase the frequency, severity and impact of such life events on the young person (Hatton & Emerson, 2004). The rate of divorce and separation reported in the parents of people with ID is higher than in the parents of typically developing children (Hodapp & Krasner, 1995). In addition, children with disabilities are thought to be at higher risk of abuse than those without disabilities. Of the participants who had suffered abuse in Sullivan and Knutson's (1998) study 64% had disabilities, with those with ID experiencing the most severe combination of physical and sexual abuse of all the disability groups.

Another example of a family based life event is early parental loss (EPL). This has been implicated as a vulnerability factor for depression

(Reinecke & Simons, 2005): affecting the individual firstly through the ongoing and multiple stressors as a consequence of the loss and secondly through the establishment of maladaptive cognitive sets, impaired self-concept and failure to develop adaptive coping skills. Brown (1988) argues that stressful life events activate these maladaptive cognitive sets and beliefs and leads to depression. Therefore, EPL may only constitute a vulnerability factor if it occurs alongside other stressors and stressful life events, this may help to explain why some individuals who have suffered an early loss do not go on to develop depression. There is no evidence that people with ID are more at risk of early loss due to death, however, the paternalistic and protective attitude towards people with ID when a bereavement occurs (Oswin, 1991) is likely to make the impact of the loss greater. This is further influenced by the individual's impaired ability to understand and express the emotional aspects of death (in part due to an impaired FER ability; Moore, 2001), which increases the risk of psychiatric and behavioural problems following a bereavement (Bonell-Pascual et al., 1999).

The Wider Social Environment

Peer Relationships

During adolescence the frequency of interactions shifts from the parents to the peers (Laursen & Williams, 1997). As peer relationships become more central to the adolescent's support network the adolescent needs to develop the ability to cope with negative events, such as rejection from a desired peer group (Reinecke & Simons, 2005). During adolescence self-awareness increases and peer relationships become increasingly important (Laursen & Williams, 1997; Heiman, 2001). Social support and interpersonal relationships may be limited in adolescents with ID (Carr, 1995). Heiman (2001) suggests that a lack of social reinforcement may result in heightened feelings of isolation, helplessness and depression. The presence of social skills deficits in adolescents with ID is well documented (Haager & Vaughn, 1995; Kavale & Forness, 1996), and is believed by some authors to be underpinned by an emotion-perception deficit (Rojahn et al., 1995). These deficits and a limited understanding of the emotional aspects involved in the development and maintenance of relationships (Jobling, Moni, & Nolan, 2000) may further hinder normal social adjustment (Heiman, 2001).

Davis, Anderson, Linkowski, Berger and Feinstein (1991) suggest that amongst all the changes associated with adolescence the major concern for the young person is to be accepted by his/her peers and not to be 'different'. This may be more difficult for adolescents with ID given that a diagnosis of ID carries with it an associated social stigma. Research has demonstrated that people with milder ID are aware of this social stigma and the negative social consequences of their disability (e.g. Nezu et al., 1995; Szivos-Bach, 1993). People with ID report a lack of social acceptance as a significant concern of theirs, this concern is supported by studies indicating that adolescents with ID have lower peer acceptance than other students (e.g. Stone & La Greca, 1990). Awareness of belonging to a stigmatised group in adolescents with ID is associated with lower self-esteem and poor interpersonal relationships (Szivos-Bach, 1993), with group belonging negatively related to depression in people with ID (Dagnan & Sandhu, 1999).

Research has indicated that students at special schools have poorer social skills, increased difficulty in developing friendships, limited opportunity for social interaction and higher levels of emotional distress compared to students within a special unit in a mainstream school (Heiman, 2001). The author goes on to suggest that students placed within a mainstream school benefit from observing other (non-ID) students in social interactions and problem solving, leading to superior coping strategies for emotional and social problems (Heiman, 2001). These results should be interpreted with caution, it is possible that, as the author suggests, placement in a special education setting leads to inferior coping strategies, however it is equally possible that the students placed in special education settings already have impaired coping strategies and this may, in fact, be one of the reasons for this specialist placement. This area deserves more attention because of the number of young people still placed in special schools. In 2005, the number of students with a statement of special education need in England was 231,960 (Department for Education and Skills, 2005), with 40.8% of these students having moderate, severe or profound and multiple ID[3]. Forty-three percent of these students were in mainstream schools (primary, middle and secondary) with the remaining 57% placed in special schools or pupil referral units.

The increased importance of peer relationships is coupled with greater independence from the parents. The increased desire for independence in adolescents without ID can result in conflict between parent and child (Reinecke & Simons, 2005), with these conflicts being implicated in depression (Sheeber, Hops, Alpert, Davis, & Andrews, 1997). This process

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[3] These figures are based on ID criteria established by the Department of Education and may not be consistent with clinical ID criteria.

may be more difficult for adolescents with ID if parents have difficulty in letting go. Research has suggested that parental psychopathology maybe distorted by caring for a child with different needs, resulting in difficulty in allowing the child independence (Hollins & Sinason, 2000; Hubert, 1991).

Wider Social Networks

People in the wider social network (including healthcare professionals, carers and teachers) may further impinge the development and maintenance of social relationships. Reports of people with ID suggest that the behaviour and attitude of carers affect their ability to maintain relationships through restrictions on going out or a failure to provide the individual with privacy (Knox & Hickson, 2001). As social support plays an important buffering role in depression in adults with ID (Reiss & Benson, 1985), these restrictions and their impact on social relationships may have consequences for depression in adolescents with ID.

As discussed previously adolescents with ID are aware of the stigma attached to their disability (Cooney, Jahoda, Gumley, & Knott, 2006; Szivos-Bach, 1993). The experience of stigma may impact on many aspects of the individuals life, including the range of roles available to people with ID which are often restricted due to the low expectations other people have of their abilities (Dagnan & Sandhu, 1999). Mangili, Ponteri, Buizza and Rossi (2004) cite employers' discriminating attitudes as a reason for limited access to employment for people with ID[4]. The ability and opportunities to develop new

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[4] Mencap (2006) reports a 90% unemployment rate for people with ID known to services within the UK.

roles can help to maintain self-esteem (Oatley & Bolton, 1985), therefore these discriminating attitudes may have a direct impact on the self-esteem of people with ID.

The Socio-Political Context

Social Economic Status

Ritsher et al. (2001) found that SES was a particularly powerful factor for male adolescents and for adolescents of parents with no history of depression. It is believed that the full magnitude of the effect of low SES is not observed in already at high-risk groups (e.g. female adolescents and adolescents with parents with depression). The influence of low SES has received some support from other studies (e.g. Johnson, Cohen, & Dohrenwend, 1999). Conflicting results between studies in adolescents mirror the controversial pattern of results found in the adult literature (see Lorant et al., 2003).

Families supporting a child with ID tend to be more economically disadvantaged compared to families supporting a typically developing child (Emerson, 2003). This increased risk of exposure to poverty may be due to higher incidence of ID among poorer families (Leonard & Wen, 2002) or to the decrease in social status experienced due to the added financial and social stressors associated with supporting a child with ID (Emerson, 2004). Given that families of children with ID are at increased risk of low SES and the association between low SES and depression (Ritsher et al., 2001), the influence of SES on depression is especially relevant to this population.

However, the full influence of SES does not appear to be observed in high risk groups, such as females and children of parents with depression (Ritsher et al., 2001). As adolescents with ID are at increased risk of depression (Huntington & Bender, 1993), it is possible that the impact of low SES may not be fully exhibited in this population.

Clinical Implications and Further Research

A number of risk factors for depression have been identified in typically developing adolescents (Reinecke & Simons, 2005). The available evidence suggests that, for a number of reasons, the adolescent ID population may have a greater exposure to these developmental risk factors than those without ID. There is an increasing research focus towards the social context in which people with ID live and how this impacts on their psychological well-being (Dagnan & Jahoda, 2006). This research focuses on adults with ID, although awareness of the social stigma associated with ID and impaired social support have also been noted in adolescents with ID (Cooney et al., 2006; Szivos-Bach, 1993). The impact of the developmental factors identified may be exaggerated due to skills deficits (e.g. coping and social skills), environmental restrictions, stigma and repeated experience of failure within adolescents with ID. The social context of people with ID and the impact that this may have on their risk for depression may assist in explaining the increased prevalence of depression in adolescents with ID compared to their typically developing peers.

Identification of the risk factors involved in the development of depression in adolescents with ID also assists in the identification of possible areas for intervention across the different psychosocial dimensions. A number of parental factors have been identified including parental depression, grief, stress and low SES. It may be that parental support and education may help to reduce the impact of these factors on the adolescent's emotional well-being. For example, parental depression and grief affect the quality of the attachment between parent and child, which is implicated in the development of psychopathology (Scott Brown et al., 2001), including depression. It is possible that intervention to assist the parent in resolving their child's diagnosis (Janssen et al., 2002), read their child's communications and facilitate sensitivity may improve the quality of the attachment relationship and consequently reduce psychopathology in the child. As Janssen and colleagues (2002) state, it is important to test whether these interventions have an effect on reducing stress in people with ID.

Intervention with staff working with people with ID may also be effective in reducing the risk of depression. Research suggests that professional carers act as attachment figures in residential and day settings and can as a protective factor for later psychopathology (Clasien de Schipper, Stolk, & Schuengel, 2006). This is particularly important given the limited social support and increased exposure to stressful life events that adolescents with ID experience. Knowledge of attachment processes in people with ID may assist in the development of a service that meets the needs of its clients (e.g. regularity in staffing) and of the staff. Clegg et al. (1995) suggest that staff who become enmeshed with clients are torn between concern for the client and their own reactions, this conflict further intensifies the situation. They suggest that providing staff with the opportunity to make sense of the experience, acknowledge the anger or distress expressed by the people with ID and to consider how their response affects the client have been beneficial in staff groups working with people with ID. Clegg et al. (1995) state that this research needs to be extended to the wider range of people with ID, including those who are not showing clinical distress. It should also be noted that this research was carried out with adults with ID and therefore the applicability to adolescents cannot be assumed. Understanding of the attachment processes in staff working with people with ID may also assist in a more effective and sensitive management of bereavement in this population. Conboy-Hill and Waitman (1992) suggest that staff training in bereavement can enable them to develop an awareness of the type of losses that will affect individuals with ID, monitor behaviour changes in relation to this, distinguish between normal and abnormal grief, gain skills to support individuals in their grief and manage their own feelings about death and bereavement.

According to hopelessness theory (Abramson et al., 1989) the interaction of stressful life events and negative attributional style gives rise to hopelessness and depression. Given that adolescents with ID have an increased risk of exposure to stressful life events (e.g. parental divorce) and have repeated experience of (academic) failure, interventions focusing on enhancing their coping skills may be beneficial in assisting them to manage these stressful life events more effectively (Stanley, Dai, & Nolan, 1997). Evidence of negative attributional style and low self-esteem (the two proposed diatheses) in adolescents with ID, coupled with increased exposure to stressful life events suggests that the hopelessness theory of depression may be applicable to this population. Support for the hopelessness theory is limited due to the lack of research in this area, however the finding that achievement attribution correlated with hopelessness and the appropriateness of the Hopelessness Scale for Children for use with children and adolescents with ID are encouraging results (Wehmeyer & Palmer, 1998). Further testing of this theory in this population is required, followed by consideration of cognitive behavioural therapy (CBT) as a treatment for depression. In adults with ID variables of Beck's cognitive model have been found, although no studies exploring this in the adolescent ID population were found. Given that CBT is the treatment of choice for depression in children and adolescents (National Institute for Clinical Excellence, 2005) research in this area appears required.

The importance of the social context on the adolescents with ID has been emphasised in this paper, a factor that may be of particular importance during adolescence in which the role of peer relationships is central. Social support for adolescents with ID is limited, reasons for this include social skills deficit (Heiman, 2001; Jobling et al., 2000), restrictions imposed by residential facilities (Knox & Hickson, 2001) and social stigma. One area of social skills deficit examined in the literature is FER, this has been implicated in the development of social competence and also as a skill required in order to accurately report on one's own emotions (Reed & Clements, 1989). As social support plays a key role in buffering against psychopathology and peer relationships are of increased importance in adolescence, addressing social skills deficits may be effective in protecting against or reducing depression. Group training has proven beneficial in enhancing individual's FER skills

(McKenzie, Matheson, McKaskie, Hamilton, & Murrat, 2000) and emotion recognition has been included as a component of general treatment approaches (e.g. anxiety management; Lindsay, Neilson, & Lawrenson, 2001). These intervention studies suggest that FER training is effective, however the application of this to depression and to adolescents with ID requires confirmation. The relationship between depression and FER in people with ID may also require further investigation. In the general population people with depression have been shown to demonstrate a negative bias in FER (Gur et al., 1992), however this was not the case for people with ID and depression who appeared to have enhanced performance over non-depressed participants (Rojahn & Warren, 1997; Warren, 1992). These studies were confounded by cognitive ability (with higher ability participants being in the 'depressed group') and did not include participants with clinical depression. The finding that higher ability participants were in the depressed group may be suggestive of sampling bias, however it is possible that this is also indicative of the phenomenon described by other researchers (e.g., Holden & Gitlesen, 2004) in which people with milder ID have increased rates of depression. Nezu et al. (1995) suggest that this is due to an increased awareness of the stigma attached to their ID and provides an interesting question about how FER, stigma and depression may be related. Further research in this area, and specifically in adolescents with ID, may contribute to understanding of the role of stigma and social skills in depression.

As mentioned previously adolescents with ID appear to be a greater risk of the developmental factors associated with depression than their non-ID peers, with increased prevalence in this population supporting this suggestion.

The identification of risk factors for the development of depression in adolescents with ID has implications for the identification of at risk students and intervention possibilities. However, there are a number of areas that require further research to test the applicability to adolescents with ID, including the impact of child temperament on depression, hopelessness and the impact stressful life events. Research on depression in adolescents with ID is affected by similar difficulties facing research in the adult ID field. One such area concerns the diagnostic criteria used; as mentioned previously there is some debate concerning which criteria should be used, with standard diagnostic criteria deemed appropriate for individuals with mild and moderate ID (McBrien, 2003). However, the applicability of these criteria is questionable given the increased inclusion of behavioural equivalents advocated by some authors (Evans et al., 1999). The inconsistency in the use of diagnostic criteria between studies raises questions regarding the comparability of the samples. McBrien (2003) suggests that the use of recently published diagnostic criteria for people with learning disabilities (DC-LD; Royal College of Psychiatrists, 2001) provide the much needed professional consensus on diagnostic criteria. Many of the studies reported in this review are limited by their small sample sizes and their restriction to a specific sample (e.g. those attending special schools or individuals with mild ID) or diagnosis (e.g. Down's syndrome). These limitations question the extent to which these results can be generalised to the wider ID population; given the apparent influence factors such as severity of ID or educational establishment indicated in studies, it can be assumed that the wider application of these results is limited. Further to this many of the research tools used in studies are designed for children with

ID (e.g. temperament measure; Zion & Jenvey, 2006) the reliability and validity of which need to be confirmed in this population.

Conclusions

In conclusion, adolescents with ID are at increased risk of depression compared to their typically developing peers. Despite the high prevalence rates in this population the literature on depression is sparse and affected by methodological problems, including small and narrow samples and no agreed consensus on diagnostic criteria. In an attempt to further understand depression in this high-risk population, the literature on depression in adolescents without ID was reviewed. This highlighted a number of general factors identified as important in the development of mental health problems, including attachment, child temperament and parenting behaviour. A number of risk factors specific to the development of depression were also identified, including genetic vulnerability, parental depression, negative life events and peer relations. There are a number of shared experiences of people with ID that were identified as increasing their susceptibility to these risk factors. These experiences include experience of the social stigma attached to ID, increased exposure to negative life-events, social and emotion recognition deficits (which interacted with a number of the other individual factors identified) and increased rates of parental stress and associated depression. These shared life experiences and consequent increased susceptibility to risk factors may help explain the increased rate of depression in adolescents with ID compared to their typically developing peers. Identification of these risk factors enables identification of high-risk individuals and provides an opportunity for preventative interventions. These shared experiences also highlight the importance of the social context of the lives of people with ID, and leads support to some clinician's claims that social and cognitive factors should be considered together when working with people with ID and depression. This paper has provided some evidence of the applicability of identified risk factors of adolescent (without ID) depression to the adolescent ID population. However, further research is required to explore these relationships more closely, rigorously and throughout the wider adolescent ID population.

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Empirical Paper:

Facial Emotion Recognition, Depressed Mood and Stigma in Adolescents with Intellectual Disabilities

Hannah Kiddle
Department of Clinical Psychology
School of Psychology
Faculty of Medicine, Health and Life Sciences
University of Southampton

Running Head: Facial Emotion Recognition

Keywords: Intellectual Disability, Emotion Recognition, Depression, Stigma

This paper was prepared in line with the author guidelines for the Journal of Applied Research in Intellectual Disabilities (see Appendix A).

Abstract

Previous research has suggested there may be relationships between facial emotion recognition (FER) ability, depression and experience of the social stigma associated with having intellectual disability (ID) in people with ID. Research with non-ID samples indicates impairment in discrimination accuracy and a negative bias in people with depression. Studies in the ID field have found contradictory results suggesting superior overall FER ability in individuals with depression. However, this research has not differentiated between ability to accurately discriminate emotions and a possible negative bias. It was hypothesised that depression would be associated with increased experience of stigma, that FER would be related to both depression and stigma and that individuals with higher verbal ability would report more depression and greater stigma. Fifty adolescents with mild to moderate ID completed a computer-based FER task and self-report measures of depression and stigma. Depression significantly correlated with stigma. Contrary to the experimental hypothesis, verbal ability negatively correlated with depression and stigma. There were no group differences in FER due to depression, but depression negatively correlated with FER ability for potent happy facial expressions presented for 2 seconds. Participants with lower verbal ability demonstrated a bias towards reporting “happy”. The relationship between stigma and depression was supported, highlighting the importance of the social context of adolescents with ID. The relationship between FER and depression was only found in one experimental condition, this result was more consistent with results from the non-ID population, than previous studies of individuals with ID. Implications for research and clinical work are discussed.

Introduction

Depression in Adolescents with Intellectual Disability

People with Intellectual Disability (ID) have been reported to be at increased risk of depression compared to their peers without ID, with depression being one of the most common psychiatric disorder reported in this population (Nezu, Nezu, Rothenberg, DelliCarpini, & Groag, 1995). An increased incidence of depression has also been found in the child and adolescent ID population: Huntington and Bender (1993) reported that the prevalence of depression in adolescents with ID was between 14 and 32%. It should be noted that these prevalence studies may be an underestimation of the rate of depression in this population as a result of difficulties in assessment and diagnosis (Jahoda, Dagnan, Jarvie, & Kerr, 2006).

For people with mild to moderate ID standardised diagnostic criteria have been considered appropriate (McBrien, 2003) although it has been suggested that people with more severe ID are more likely to demonstrate depression through 'behavioural equivalence' (Marston, Perry, & Roy, 1997). Many of the cognitive aspects of depression observed in typically developing adolescents have also been observed in adolescents with ID, including low self-esteem (Szivos-Bach, 1993), negative attributional style (Huntington & Bender, 1993) and hopelessness (Wehmeyer & Palmer, 1998). However, the research into depression in adolescents with ID is sparse, despite its high prevalence in this population.

There are a number of risk factors for depression in adolescents without ID, including low socio-economic status, parental divorce, stressful life events and parental depression (Garber & Flynn, 2001; Ritsher, Warner, Johnson, & Dohrenwend, 2001; Tiet et al., 2001). A number of experiences common to lives of adolescents with ID have been identified that might increase their susceptibility to these risk factors. These include increased exposure to stressful life events (including increased vulnerability to abuse (Sullivan & Knutson, 1998), increased rates of parental divorce (Hodapp & Krasner, 1995) and increased rates of poverty (Emerson, 2003) compared to families of typically developing children), repeated experience of failure (Reed, 2001), impaired coping skill, impaired skills relating to social competence and experience of belonging to a stigmatised group (Szivos-Bach, 1993). The increased susceptibility to such factors in adolescents with ID may help to explain their increased rate of depression, compared to their typically developing peers.

Facial Emotion Recognition

Facial expressions of happiness, sadness, anger, fear, surprise and disgust are recognised universally across cultures, although the language used to describe these emotions varies (Ekman, 1993). The ability to recognise facially expressed emotions has been viewed a basic human skill and been identified as a prerequisite for social competence, with the ability to accurately recognise and interpret others' emotional states viewed as an essential component in forming and maintaining social relationships (McKenzie, Matheson, McKaskie, Hamilton, & Murrat, 2000). In typically developing children the ability to recognise and discriminate facially expressed emotions develops in infancy; with this ability observed as early as 7-months of age (Ludemann & Nelson, 1988). Research has suggested that, by the age of two children are able to recognise verbal labels for emotions (happy, sad etc.) and that by the age of three these have been incorporated into their own speech (Kasari & Freeman, 2001).

Facial Emotion Recognition and Depression

In the non-ID population individuals with depression have been observed to show impairment in the ability to recognise facially expressed emotions (e.g. Gur et al., 1992). These impairments appear to be selective, with no difference in overall performance (as measured by percentage of correct responses) between participants with and without depression (Gur et al., 1992). Participants with depression demonstrated a negative bias, in which neutral faces were misinterpreted as sad and happy faces as neutral, this negative bias reliably distinguished participants with depression from those without depression. The severity of depression further influenced this impairment, with participants with more severe depression demonstrating greater reductions in sensitivity to sad faces (Gur et al., 1992). Participants with manic depression demonstrated more errors and significant negative bias when in a depressed-phase (George et al., 1998), this, coupled with findings that patients in remission from major depression show improved facial emotion recognition (FER) ability compared to when they are in a depressed state (Mikhailova, Vladimirova, Iznak, Tsusulkovskaya, & Sushko, 1996), suggests that these impairments were associated with the depression.

Surguladze et al.'s (2004) recent study provided results, which supported previous findings of impaired discrimination accuracy and response bias in participants with depression. By using photographs of emotion facial expressions blended with neutral facial expressions, this study included two levels of intensity (50% and 100%) and two levels of duration of exposure to the emotional stimulus (100ms and 2000ms). Impairment to discrimination accuracy and abnormalities in response bias[1] were limited to certain experimental conditions (i.e. certain intensities and/or durations). Participants with depression showed greater impairment in discrimination accuracy mainly in conditions of shorter duration, and abnormalities in response bias to happy expressions of low intensity presented for longer durations. The authors concluded that the use of lower intensity and short duration conditions enabled the detection of more subtle impairments in measures of FER (Surguladze et al., 2004). The discrimination impairment and response bias were observed across different conditions indicating that these could be viewed as separate processes underlying FER.

Given the differences in FER at different states of depression (i.e. depression versus remission) antidepressant medication may affect recognition of facially expressed emotions. Neuroanatomy studies have indicated hyperarousal in the left amygdala in patients with depression in response to all facially expressed emotions. This hyperarousal has been found to normalise with the introduction of antidepressant medication (Sheline et al., 2001). Thus, the performance of participants taking anti-depressant medication could differ from those who are not prescribed such medication. Surguladze et al. (2004) found that participants on high does of antidepressant medication demonstrated a tendency to identify sad, but not happy, faces as neutral. These participants were impaired in trials of sad

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[1] Discrimination accuracy refers to the ability to discriminate between happy, sad and neutral faces. Response bias refers to the tendency to categorise the expression as an emotion rather than neutral, when unsure of the category to which the face belongs.

faces presented for short durations and at low intensities, but not for any other condition. The authors concluded that the impaired recognition accuracy and increased tendency to label happy faces as neutral in patients with depression, was not due to the effect of antidepressant dose. In light of the possible effect of antidepressant medication on FER ability, prescription of antidepressant medication was recorded during this study.

Facial Emotion Recognition and Adolescents with Intellectual Disability and Depression

Children and young people with ID have been found to display impairment in FER as compared to their typically developing peers (e.g. McAlpine, Kendall, & Singh, 1991). FER appears to be related to age in people with ID: younger children were found to perform at a level close to their typically developing peers, with this ability declining through adolescence into adulthood (Adams & Markham, 1991). The severity of ID also affected this ability, with individuals with more severe ID performing at a lower level than those with milder ID (McAlpine et al., 1991). However, these studies failed to include a control task and as a consequence the impairment in ability could be confidently attributed to either impaired emotion-perception competence (Rojahn, Rabold, & Schneider, 1995) or poor information processing abilities related to level of intelligence (Moore, 2001).

Potentially ‘paradoxical’ findings were noted when response accuracy among people with ID and depression compared to people with ID and no depression. Warren (1992) and Rojahn and Warren (1997) found that people with ID and depression demonstrated an increase in overall accuracy (i.e.

more correct responses) on FER tasks compared to people with ID without depression. Neither of these studies reported data on the individual emotions (i.e. happy, sad and neutral) and therefore ability was calculated on an overall basis. As a consequence of this, exploration of potential differences in sensitivity to facial expressions of emotion and specificity of which emotions were recognised more easily by depressed and non-depressed groups is not possible. As only data from correct responses was presented it is possible that a response bias might have been confounded with accuracy, that is if sad or neutral faces were more 'difficult' to identify, a greater willingness to report faces as neutral or sad could have made participants with depression appear to be more accurate. In addition to this, Warren's (1992) depression study was confounded with severity of ID, with participants with depression having less severe ID than participants without depression. Severity of ID was controlled in Rojahn and Warren's (1997) study, which found similar results.

Assessing Facial Emotion Recognition in People with Intellectual Disability

The research into FER in people with ID highlighted a number of factors, which should be taken into consideration when assessing emotion recognition in this population. The main factor was the inclusion of a control task requiring the participant to process information not specific to the domain in question (i.e. emotion recognition), this enabled conclusions of impairments in performance to be attributed to impairment in emotion recognition rather than general information processing impairments associated with ID. The inclusion of such a control task was one of the main advantages to the Penn

Facial Discrimination Task (PFDT; Rojahn, Kroeger, & McElwain, 1995). The PFDT contained 40 photographs of professional actors depicting happy, sad and neutral expressions; all distracting material (e.g. hair) was removed. Participants were presented with each photograph and required to rate the emotion. In the control task participants were required to rate the age of each model on a scale of young to old. Individuals with mild to moderate ID were found to perform at above chance level with reasonably high re-test reliability. The authors argued that inclusion of additional emotions would have increased the number of items in the test to unmanageable proportions for individuals with ID. Rojahn et al. (1995) further argued that the selection of happiness and sadness as the target emotions was justified given that they could distinguish between psychiatric conditions and represented either end of the positive-negative dimensions. The inclusion of only happy and sad emotions was supported by Surguladze et al. (2004) who suggested that these emotions were of particular relevance to the negative schemata of individuals with depression.

The paradoxical results in the ID field warrant further consideration. Findings by Surguladze et al. (2004) indicated that abnormalities in the FER of participants with depression were limited to certain experimental conditions; they advocated the inclusion of lower stimulus intensities and shorter presentation durations to detect more subtle abnormalities. Tasks assessing FER in people with ID have not included multiple levels of stimulus intensity and duration, and therefore may have missed subtle effects of depression in FER, which might be detected with these stimuli. As discussed previously it was possible that the greater accuracy observed in participants with ID and depression (Rojahn & Warren, 1997; Warren, 1992) was the result of a bias to identifying faces as neutral or sad. Given that discrimination accuracy and response bias have been indicated to be separate processes underlying FER (Surguladze et al., 2004), further exploration of this may explain the contradictory results gained in ID studies. Taking this into consideration, the present study utilised a FER task based on that used by Surguladze et al. (2004). Two levels of intensity (50% and 100%) and two levels of duration (100ms and 2000ms) were included in the task. Stimuli consisted of happy, sad and neutral faces. Measures of discrimination accuracy and response bias were recorded. In order to make the task appropriate for the participants' level of ability, the instructions and response scale used were consistent with the PFDT. Based on research in the ID field a control (gender) task was included to give a measure of the participant's information processing ability. In the PFDT the control task required participants to rate stimuli on the basis of age; the current study used the series of stimuli used by Surguladze et al. (2004) which contained a narrow age range of models. As such the age control task used in the PFDT was unsuitable, and an alternative task (gender) was included.

Stigma

Stigma arises when an individual differs in socially salient ways to the norm. Negative attributions are assigned to these differences, which are deemed undesirable by others. The combination of discrimination and status loss as a result of this stigma impairs the individual's ability to participate fully in the social and economic life of his/her community. This can only occur where there is a power differential between the two groups, that is where the stigmatised individual has less power than those negatively evaluating him/her. When the individual is aware that they are negatively evaluated, stereotyped and separated from others they are said to have 'felt stigma' (Link & Phelan, 2001). Awareness of stigma is believed to constitute a threat to the individual's sense of adequacy and well-being and can result in negative self-evaluations, which may in turn lead to depression and anxiety (Blackburn & Twaddle, 1996), which traditional theories of stigma believed resulted from the internalisation of negative images and stereotypes (Crocker, 1999).

Stigma and People with Intellectual Disability

Jahoda and Markova (2004; Szivos-Bach, 1993) and Szivos-Bach (1993) found that people with ID were aware of their status of being different. As mentioned above, being separated from others and awareness that you are not valued or respected is a threat to one's self-esteem: views about the self with regard to disability and stigma were found to be a core aspect of the self-concepts of adolescents with ID (Jahoda & Markova, 2004) and has been associated with low self-esteem in this population (Szivos-Bach, 1993). As in the non-ID population these self-concepts and self-evaluations were observed to influence the individual's interpretations and self-evaluations he/she made (Jahoda & Markova, 2004), which in turn may have had emotional consequences (e.g. depression, Dagnan & Sandhu, 1999).

Awareness of stigma has been hypothetically associated with FER ability. Moore (2001) suggested that children with good FER were more able to recognise the negative reactions from others arising from the social stigma.

It is therefore possible that differences in experience of stigma in individuals are related to differences in the ability to recognise facially expressed emotions. This transactional theory may provide a possible explanation for the difference in results in FER studies between individuals with depression with and without ID.

Aims and Hypotheses

This study aimed to investigate the discrimination accuracy of and response bias towards happy and sad expressed emotions in adolescents with ID with and without depressed mood. Previous research with adults without ID indicated that participants with depression demonstrate impaired emotion discrimination; however, research in the ID field reported paradoxical findings that individuals with depression demonstrated improved overall discrimination accuracy (Rojahn & Warren, 1997; Warren, 1992). The study aimed to investigate the relationship between depression and discrimination accuracy in people with ID further, and should results support the findings from the ID field, to explore whether the increase in accuracy was due to the influence of verbal ability or experience of stigma. Finally, the study aimed to replicate previous findings in the ID field of relationships between verbal ability and FER, verbal ability and depression and depression and stigma.

Based on previous findings the following hypotheses were generated. The literature leads to competing predictions with respect to the relationship between FER and depression. Based on the non-ID literature (Gur et al., 1992; Surguladze et al., 2004) it was hypothesised that participants with depressed mood would display reduced response accuracy compared to participants without depressed mood. An alternative hypothesis based on the ID literature (Rojahn & Warren, 1997; Warren, 1992) is that participants with depressed mood would display a superior response accuracy compared to participants without depressed mood. If the pattern of results described in the ID literature is found, the extent to which this reflects the influence of experience of stigma or verbal ability will be investigated.

Significantly poorer response accuracy would be observed for more ambiguous stimuli (i.e. expressions presented for lower compared to higher intensities and shorter comparer to longer durations). Effects of depressed mood on accuracy would be greater for ambiguous stimuli.

Participants with a higher verbal ability will demonstrate superior performance on the FER task than participants with comparatively lower verbal ability.

Participants with higher verbal ability will demonstrate higher levels of depressed mood and stigma.

Materials and Methods

Participants

Fifty-six (33 male, 23 female) participants were recruited from special schools and colleges with specialist placements in the South of England. Six participants withdrew from the study leaving a total of 50 participants (28 male, 22 female). The age range was 14 to 19 years, with a mean age of 15.51 years. Seventy-two percent of participants were right handed.

Special schools and colleges with specialist placements were identified through Ofsted reports or direct contact with the establishment. Letters explaining the nature of the study were sent to the headteacher or course head (see Appendix B), followed by a telephone call 2-3 weeks later. The headteacher or college staff identified potential participants. Given the age range of the participants parental consent (see Appendix C) was obtained prior to the interviews. Participants were excluded from the study if they had an autistic spectrum disorder or a psychiatric disorder (with the exception of clinical depression). In addition, participants whose primary communication system was non-verbal or who had sensory deficits were excluded. Parents were requested to list any medication their child was taking on the consent form.

Oral consent was gained from each participant prior to the interview. The procedure for gaining consent was consistent with that employed in other studies sampling from the ID population (Arscott, Dagnan, & Stenfert Kroese, 1998; Lunsky & Benson, 2001). For a more detailed account of the consent procedure and data see Appendix D. Participants who declined to take part or who withdrew from the study returned to their normal school activities.

Measures

The following measures were administered in the order in which they are described with the exception of the gender control task, which was administered after the Glasgow Anxiety Scale for People with an Intellectual Disability.

Facial Emotion Recognition Task: Part 1: Emotion Task

FER ability was assessed using a computer based task similar to that used by Surguladze et al. (2004). Experimental stimuli comprised eight (four male, four female) facial identities (models) taken from a standardised face set (Young, Perrett, Calder, Sprengelmeyer, & Ekman, 2002). For each model, selected expressions included faces that displayed 50% happiness (blended from 100% happy and neutral prototype expressions), 100% happiness, 50% sadness (blended from 100% sad and neutral prototype expressions), 100% sadness and a neutral expression (see Appendix E for example stimuli). Two additional models provided prototype sad, happy and neutral expressions for use in practice trials. Stimuli measured 85 mm x 110mm and were presented in greyscale using Inquisit version 1.33 (2002) on a Pentium III laptop computer. Participants' verbal responses were collected via a keyboard.

Facial Emotion Recognition Task: Part 2: Gender Task

To ensure that performance on the emotion task was specific to the domain tested (i.e. emotion recognition) rather than due to more global impairments or general IQ-related capacities a control task was included. In this task one block of the emotion task was presented consistent with the method described above. In the task participants were instructed to state if the stimulus depicted a man or a woman. As with the FER task the eight identities (four male, four female) were displayed for each emotion, intensity and duration.

Glasgow Depression Scale for People with a Learning Disability (GDS-LD) (Cuthill, Espie & Cooper, 2003)

The GDS-LD is a self-report measure of depression for people with ID. It correlates well with the Beck Depression Inventory. The scale has 20 items; responses are obtained in two stages. In stage one the respondent replies 'yes' or 'no' to the item (stage one). If the response is yes the respondent is then asked if that is 'sometimes' or always' (stage two). Participants are presented with visual cue cards (yes/no/sometimes/always) to assist responding. This measure has good test-retest reliability (r =.97) and internal consistency (Cronbach's α =.90). A clinical cut-off score of 13 yields 96% sensitivity and 90% specificity; these results were gained using an adult population, it is not known whether this clinical cut-off score will give the same level of sensitivity and specificity in an adolescent population.

Stigma Scale (Szivos-Bach, 1993)

The Stigma Scale assesses the respondent's perception of his/her own stigmatisation. This scale is reported to have good internal validity with item-total correlations ranging from .34 to .62. The scale-alpha was .81 (Szivos-Bach, 1993). The stigma scale has three sub-scales, feeling different (e.g. 'people treat me like a child'), anxiety (e.g. 'I am uncomfortable with strangers') and poor in-group contact (e.g. 'I hate telling people I come to this place'). The respondent is required to rate their agreement with the 10 items. In the adapted version used in this study a five-point visual analogue is presented alongside written and verbal response options and three positive items (e.g. I like watching TV) are included to balance the negative content of the questionnaire (Dagnan & Waring, 2004).

British Picture Vocabulary Scale Second Edition (BPVS-II, Dunn, Dunn, & Whetton, 1997)

The BPVS-II is a measure of receptive vocabulary for Standard English. It is designed for use with individuals between the age of 3 years and 15 years 8 months, but is widely used in research with people with ID as a proxy for a complete assessment of verbal intelligence (Dagnan et al., 1999; Sams, Collins, & Reynolds, 2006). The BPVS-II correlates well with other tests of general cognitive ability (e.g. British Ability Scales; Elliott, Smith, & Burley, 1997). Participants are presented with four simple black and white pictures on a page. Target words are read to the participant who is required to select the picture that best describes the target word. The words increase in complexity as the test proceeds. The BPVS consists of 14 sets, each containing 12 items, giving a total of 168 possible stimulus words. Administration began at the set corresponding to half the participant's chronological age. In accordance with the administration guidelines (Dunn et al., 1997) the basal and ceiling sets were established, with testing ending once the entire ceiling set had been administered. The BPVS-II has good reliability (median Cronbach's alpha of .93, median split-half of .86; Dunn et al., 1997), the validity of this version has not yet been established, but as it is derived from the previous version validity is assumed (Glenn & Cunningham, 2005).

Adapted Social Phobia Sub-scale

Adults who are social anxious have been observed to demonstrate an attentional bias away from emotional faces (Bradley et al., 1997; Mansell, Clark, Ehlers, & Chen, 1999). This finding is also demonstrated in the typically developing child and adolescent population; where participants with social phobia exhibited poorer facial emotion recognition, particularly for stimuli depicting happy, sad and disgust (Simonian, Beidel, Turner, Berkes, & Long, 2001). Given the possible influence of social phobia on the participant's ability to attend to and recognise facially expressed emotion, a measure of social phobia was administered. The Social Phobia Sub-scale from the Fear Questionnaire (Marks & Mathews, 1979) was adapted for use within the ID population; this had not previously been used with this population. The internal consistency of this measure was poor and therefore this measure was excluded from further analysis (see Appendix F).

Glasgow Anxiety Scale for People with an Intellectual Disability (GAS-ID) (Mindham & Espie, 2003)

The GAS-ID is a self-report anxiety measure for people with ID. It consists of 27 items divided in to three sections; worries, specific fears and physiological symptoms. Responses were gained using the same method described for the GDS-LD. The scale correlates reasonably with the Beck Anxiety Inventory and has good re-test reliability ($r = .95$) and internal consistency ($\alpha = .96$). The authors report 100% sensitivity and specificity with cut-off scores of between 13 and 15; again this data relates to an adult population, the specificity and sensitivity in an adolescent population is not known.

Procedure

Ethical approval was obtained from the University of Southampton School of Psychology ethics committee (see Appendix G).

All tasks were administered in a single test session. Testing lasted between 45 and 60 minutes, participants were offered a short break at the mid-point. Testing took place at the participant's school or college in a quiet room designated by the education establishment. On 5 occasions a member of school/college staff accompanied the participant, although had no input into the testing session. The presentation order of the tasks was the same for each participant; this is consistent with other studies (e.g. Surguladze et al., 2004) examining FER. Each participant and their parents received a debriefing statement, which was distributed by the school.

Facial Emotion Recognition Task

Participants were seated approximately 55 cm from the laptop monitor and familiarised with the task instructions (see Appendix E). Participants completed 6 practice trials, in which prototype sad, happy and neutral faces were each presented twice, once for 100ms and once for 2000ms. Each trial began with the presentation of a white fixation cross in the centre of the screen for 500ms followed by the presentation of a face, displayed for either 100 or 2000 ms. Following face offset, participants were asked to state whether the person's face was happy, sad or just ok (consistent with instructions used by Rojahn et al., 1995). The response was entered into the computer by the researcher. The next trial was presented following a short (1000ms) inter-trial interval. Presentation order of practice items was randomised across participants.

After a short break participants completed two experimental blocks each comprising 80 trials. Trial presentation and response collection was consistent with practice trials. Within each experimental block the neutral, 50% (sad, happy) and 100% (sad, happy) expressions from each model were presented twice (once for 100ms and once for 2000ms). Within each block, experimental trials were presented in a random order.

The participants were prompted to rate their own mood (based on Rojahn et al., 1995) at four points; prior to the task, following the practice items, at the end of block one and at the end of block two (end of task). Participants were shown a card with a question mark and asked to rate their current mood on a five-point visual analogue scale (ranging from 'a lot sad' to 'a lot happy').

Statistical Analysis

A series of one-sample Kolmogorov-Smirnov tests were conducted for all questionnaire and FER (emotion and gender) tasks. These confirmed that the data met the assumptions of normal distribution, therefore enabling parametric tests to be used in the statistical analysis. A significance level of .05 was used for the statistical analysis except where otherwise indicated.

Facial Emotion Recognition Task

Discrimination accuracy was calculated for the 8 separate subsets of targets (i.e. sad 50% 100ms, sad 50% 2000ms, sad 100% 100ms, sad 100% 200ms, happy 50% 100ms, happy 50% 2000ms, happy100% 100ms, happy 100% 200ms) taking into consideration the number of neutral faces [distractors], by using the following formula (Surguladze et al., 2004).

Discrimination accuracy = (number of hits + 0.5/ number of targets + 1) - (number of false alarms + 0.5/number of distractors + 1).

Therefore scores fall between 0 and 1, with higher numbers implying more accurate responding.

Response bias (e.g. tendency to label a neutral face as happy or sad) for the 8 separate subtests of targets was calculated according to false-alarm scores (i.e. the tendency to label a neutral face as happy or sad) using the following formula (see Appendix I for example calculations).

$$\text{Response bias} = \frac{(\text{number of false alarms} + 0.5/\text{number of distractors} + 1)}{(1 - \text{discrimination accuracy}).}$$

Numbers closer to 1 imply a bias to report the emotion (either happy or sad) and numbers closer to 0 imply a tendency to report “just ok”.

Results

Group Characteristics

The sample was split on the basis of GDS-LD score. The recommended clinical cut-off for of 13 was used to split the sample into a depressed and non-depressed group. Each group contained 25 participants. The means and standard deviations for each group are shown in Table 1. A series of t-tests were carried out to examine whether there were any significant differences between the groups on age, depression, anxiety and stigma. No significant differences were observed between the groups on age. T-tests indicated that the depressed group had higher scores for depression, $t(48) = -8.13$, $p < .001$; anxiety, $t(48) = 3.46$, $p = .001$; and stigma, $t(48) = 2.93$, $p = .005$. Fifty-six percent of the non-depressed group were male compared to 60% of the depressed group, this difference was not significant; $X^2(30) = 30.93$, $p = .419$. Sixty-eight percent of the non-depressed group were at school compared to 80% of the depressed group, this difference was not significant, $X^2(1) = .94$, $p = .333$.

Table 1.

Means and standard deviations for depressed and non-depressed groups

Measure	Depressed		Non-depressed		t
	Mean	*SD*	Mean	*SD*	
Age	15.77	*1.60*	15.25	*1.22*	-1.30
BPVS Raw Score	86.48	*16.936*	88.32	*14.43*	-.213
GDS	17.12	*3.689*	9.00	*3.367*	-8.13**
Stigma	20.48	*9.038*	13.4	*8.016*	2.93*
GAS	24.80	*8.935*	17.12	*6.566*	3.46**

* p< .05 (2-tailed) ** p< .01 (2-tailed)

Questionnaire Measures

Pearson's correlations were calculated for all questionnaire measures. These correlations are summarised in Table 2.

Table 2.

Correlation between questionnaire measures

Variable	BPVS Raw Score	GDS	Stigma
GDS	-.298*		
Stigma	-.313*	.538**	
GAS	-.187	.618**	.519**

* p< .05 (2-tailed) ** p< .01(2-tailed)

Significant negative correlations were found between verbal ability (BPVS raw score) and depression and between verbal ability and stigma. Therefore participants with higher verbal ability reported less depression and less experience of stigma. Significant positive correlations were found between depression and stigma and depression and anxiety. The results demonstrate that individuals with higher depression report greater experience of stigma and anxiety. Stigma and anxiety were also positively related, suggesting that individuals with higher stigma also reported greater anxiety.

Facial Emotion Recognition

Gender Task

Data was only available for 48 participants on the gender task due to a technical error. Participants were observed to perform above the level of chance (0) for this task for both female (t(47) = 29.57, p < .001) and male (t(47) = 29.67, p< .001) stimuli. All participants were observed to perform above chance; the range of performance was 0.22 to 0.98 (see Table 3 for hits and false alarm rates). This suggests that task demands were within the participants' capabilities.

Table 3.

Means and standard deviations for hits and false alarms on gender and emotion facial emotion recognition tasks

		Non-depressed				Depressed				Total			
		Hits		False Alarm		Hits		False Alarm		Hits		False Alarm	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Happy													
50%	100ms	9.96	2.59	3.72	2.57	10.12	3.31	3.52	2.55	10.04	2.94	3.62	2.54
	2000ms	10.96	3.40	3.76	3.23	11.40	3.12	3.32	2.94	11.18	3.24	3.54	3.07
100%	100ms	14.48	2.55	1.12	1.83	14.16	2.51	0.64	1.04	14.32	2.51	0.88	1.49
	2000ms	15.28	1.37	0.56	1.00	15.28	1.02	0.52	0.77	15.28	1.20	0.54	0.89
Sad													
50%	100ms	8.24	4.09	6.08	3.83	7.60	4.17	5.72	3.90	7.92	4.10	5.90	3.83
	2000ms	7.96	3.93	6.32	3.97	8.00	4.12	6.40	4.26	7.98	3.99	6.36	4.07
100%	100ms	9.48	3.23	4.20	3.21	9.08	3.90	3.80	2.24	9.28	3.55	4.00	2.75
	2000ms	10.40	3.38	4.20	2.84	9.32	3.16	4.36	2.93	9.86	3.28	4.28	2.86
Gender													
Male		38.80	1.19	7.00	7.14	38.30	2.55	4.30	5.30	38.56	1.96	5.71	6.40
Female		33.00	7.14	1.20	1.19	35.65	5.36	1.70	2.55	34.27	6.42	1.44	1.96

Significant positive correlations were observed between verbal ability and discrimination accuracy for both male (r = .429) and female (r = .428) faces. As verbal ability increased so did the accuracy at which participants were able to distinguish male from female stimuli. Negative correlations were observed between depression and discrimination accuracy for male and female faces; discrimination accuracy decreased as level of depression increased. No significant correlations were found with other questionnaire measures or measures of response bias (see Table 4). Given the strong relationship between verbal ability and accuracy, the relationship between depression and discrimination accuracy was explored further whilst controlling for the effects of verbal ability. Partial correlations controlling for verbal ability was carried out; no significant relationships between depression and discrimination accuracy for male faces (r = .185, p = .214) or female faces (r = .188, p = .206) were found. This suggests that the finding that discrimination accuracy decreased as depression increased was carried by verbal ability.

Table 4.

Correlation between questionnaire measures and discrimination accuracy on gender task

Variable	BPVS Raw Score	GDS	Stigma	GAS
Male Accuracy	.429**	-.299*	-.056	-.227
Female Accuracy	.428**	-.301*	-.060	-.230

* p< .05 (2-tailed) ** p< .01 (2-tailed)

Emotion Task: Discrimination Accuracy

Scores for discrimination accuracy were entered in a 2 x 2 x 2 x 2 mixed model analysis of variance (ANOVA) with emotion (sad, happy), intensity (50%, 100%), duration (100ms, 2000ms) as within-subject variables and depression group (depressed, non-depressed) as the between-subject variable. The means and standard deviations for each experimental condition are presented in Table 5.

Table 5.

Means and standard deviations for discrimination accuracy in each experimental condition

Emotion	Intensity	Duration	Depressed		Non depressed	
			Mean	*SD*	Mean	*SD*
Happy	100%	100ms	.69	*.27*	.76	*.19*
	100%	2000ms	.75	*.22*	.81	*.15*
	50%	100ms	.45	*.27*	.49	*.17*
	50%	2000ms	.52	*.25*	.55	*.20*
Sad	100%	100ms	.19	*.25*	.17	*.22*
	100%	2000ms	.20	*.24*	.22	*.22*
	50%	100ms	.10	*.16*	.10	*.14*
	50%	2000ms	.13	*.15*	.08	*.16*

Main effects of emotion, F(1,48) = 302.26, p< .001; intensity, F(1, 48) = 140.33, p< .001; and duration, F(1,48) = 8.71, p= .005, were observed. Comparison of the mean values for the discrimination accuracy indicated that the significant effect of emotion was the result of participants more accurately recognising happy faces (M = .63, SD = .20) compared to sad faces (M = .15, SD = .16). The main effect of intensity was the result of participants recognising expressions presented at the higher intensity (M = .47, SD = .17) more accurately than expressions presented at the lower intensity (M = .30, SD = .14). A similar pattern is noted for the duration main effect; in which the accuracy of responses is greater for longer (M = .41, SD = .15) presentations compared to shorter (M = .37, SD = .17) presentations. Overall participants appear to find happy, high intensity and longer duration presentations of expressions easier to recognise that those of low intensity, short duration or depicting a sad expression.

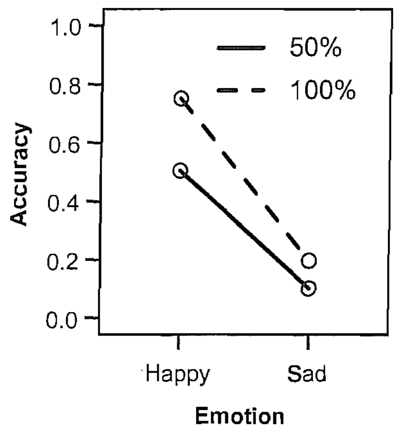

Figure 1. Interaction emotion x intensity for response accuracy

A significant interaction of emotion x intensity, F(1, 48) = 28.31, p< .001, was observed (see Figure 1). Comparison of the means indicated that this interaction was due to intensity having more of an effect on accuracy of recognition for happy than sad expressions, with participants more accurately discriminating happy faces presented at the higher intensity. No other significant interactions were found. No effect of depression was observed (F (1, 48) = .195, p = .660). The effect size for the effect of depression was very small, η^2 was 0.004, and therefore only 0.4% of the variance in accuracy was due to depression group. The power of the current study to detect such a small effect was 0.072. G-Power was used to calculate the sample size necessary in order to detect such a small effect with a power of 0.8. This would require a sample of 1545642.

Given the significant correlations between verbal ability and discrimination accuracy, BPVS raw score was entered as a covariate and the analysis repeated. Interactions between factors and covariates were found, indicating that the assumptions of homogeneity of regression coefficients had been violated. The analysis is therefore not reported in the body of the thesis (see Appendix H).

It was hypothesised that stigma may influence the relationship between depression and FER ability. It was inappropriate to enter stigma in to an analysis of covariance (ANCOVA) as a covariate given the difference in stigma scores between groups. To overcome this the depression groups were equalised on stigma, by omitting the participants with the bottom five scores in the non-depressed group and the participants with the top five scores in the depressed group, leaving 20 participants in each group. The groups now no longer differed on stigma scores, F(1, 38) = .49, p= .488.

Main effects of emotion, F (1, 38) = 269.58, p< .001; intensity, F (1, 38) = 104.81, p< .001; and duration, F (1, 38) = 5.37, p= .026, were observed. As before, comparison of the means indicated that these main effects were the result of participants greater accuracy to distinguish happy faces (M = .64, SD = .18) than sad faces (M = .15, SD = .16); to distinguish faces presented at higher intensity (M = .49, SD = .16) than lower intensity (M = .31, SD = .13); and to distinguish faces presented at a longer duration (M = .42, SD = .13) than at a shorter duration (M = .38, .16).

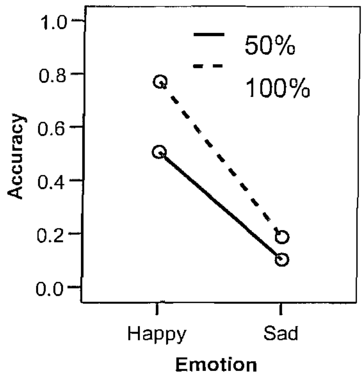

Figure 2. Interaction emotion x intensity with groups equated on stigma

A significant interaction between emotion and intensity, F(1, 38) = 29.79, p< .001, was observed (see Figure 2). This interaction was due to intensity having more of an effect in accuracy of recognition for happy than sad faces, with participants more accurately discrimination happy faces at the higher intensity. No effect of depression was observed (F (1, 38) = .001, p = .971). Therefore the pattern of results in the previous analysis could not be explained by group differences in stigma.

Emotion Task: Response Bias

Measures of response bias were entered into a 2 x 2 x 2 x 2 mixed model ANOVA with emotion (sad, happy), intensity (50%, 100%) and duration (100ms, 2000ms) as within-subject variables and depression group (depressed, non-depressed) as the between-subject variable. The means and standard deviations for each experimental condition are presented in Table 6.

Main effects intensity, F(1,48) = 195.47, p< .001; and duration, F(1,48) = 12.69, p= .001, were observed. Comparisons of mean values for the response bias indicated that the main effect of intensity was a result of participants' greater tendency to report an emotion (i.e. happy or sad) in high intensity pictures (M = .51, SD = .15) than in low intensities (M = .36, SD = .16 and in longer durations presentations (M = .45, SD = .16) than in shorter presentations (M = .42, SD = .15). That is participants were more likely to report an emotion rather than neutral in high intensities and long durations.

Table 6.

Means and standard deviations for response bias in each experimental condition

Emotion	Intensity	Duration	Depressed		Non depressed	
			Mean	*SD*	Mean	*SD*
Happy	100%	100ms	.53	*.19*	.49	*.28*
	100%	2000ms	.62	*.24*	.56	*.23*
	50%	100ms	.28	*.21*	.22	*.19*
	50%	2000ms	.33	*.22*	.27	*.24*
Sad	100%	100ms	.45	*.23*	.48	*.24*
	100%	2000ms	.46	*.22*	.52	*.24*
	50%	100ms	.42	*.25*	.46	*.27*
	50%	2000ms	.43	*.25*	.45	*.25*

A significant interaction was observed for emotion x intensity, F(1,48) = 102.69, p< .001; comparison of the means indicated that in the high intensity presentations participants tended to report an emotion in response to a happy face, with this bias reducing with presentation of sad faces. In low intensities participants tended to report "just ok" when presented with happy faces, with a greater tendency to report emotion when presented with a sad face, i.e. the intensity made more difference for happy than sad stimuli (see Figure 3).

Figure 3. Interactions: (a) emotion x intensity and (b) emotion x duration

An interaction between emotion x duration, F(1,48) = 8.45, p= .006, was also noted; the duration had more effect for happy than sad faces, i.e. participants demonstrated a bias towards reporting neutral when presented with happy faces in both durations, however this tendency was strongest within the shorter duration presentations. When presented with a sad face the tendency to report neutral was reduced for both durations. The tendency to report neutral remained strongest in the shorter duration presentations of sad faces (see Figure 3). No significant effects of depression were observed (F (1, 48) = .04, p = .843). The effect size for the effect of depression was very small,($\eta^{2 =}$ 0.001). The power of the current study to detect such a small effect was 0.054. G-Power was used to calculate the sample size necessary in order to detect such a small effect with a power of 0.8. This would require a sample of 24730392.

As mentioned previously stigma was hypothesised to influence the relationship between FER ability and depression, as with the discrimination accuracy data analysis was repeated using equalised stigma groups. Main effects of emotion, F(1, 38) = 9.21, p= .004; intensity, F(1, 38) = 162.45, p< .001; and duration, F(1, 38) = 7.31, p= .010, were observed. Again comparison of the means indicated that these effects were due to the participants' increased tendency to report an emotion when presented with a sad (M = .42, SD = .21) compared to happy expression (M = .37, SD = .18), in higher (M = .50, SD = .15) compared to lower intensities (M = .35, SD = .16) and in longer (M = .44, SD = .16) compared to shorted durations (M = .41, SD = .16).

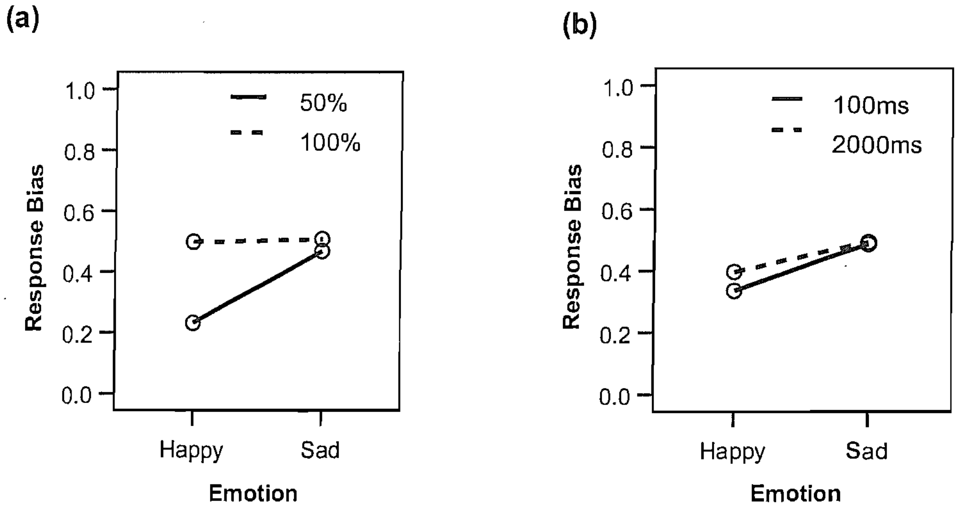

Figure 4. Interaction a) emotion x intensity b) emotion x duration for groups equated on stigma

As before significant interactions of emotion x intensity, F(1, 38) = 76.80, p< .001; and emotion and duration, F(1, 38) = 6.80, p= .013; were observed (see Figure 4). No significant effect of depression was observed (F (1, 38) = .002, p = .961).

No effect of depression was found on discrimination accuracy or response bias with this analysis. Further analyses was conducted, but did not find a significant effect of depression. These analyses are reported in Appendix J.

Experimental Variables and Questionnaire Measures

Pearson's correlations were calculated for all questionnaire measures and experimental conditions. These correlations are summarised in Table 7. Considering the large number of comparisons a critical probability of p= .01 was used. Significant correlations were found between verbal ability and discrimination accuracy for three of the happy emotion conditions (50% intensity for 100ms, 100% at 100ms and 100% at 2000ms). All of these correlations were positive, suggesting that as verbal ability increases so does the ability to accurately recognise happy faces. Trends to positive correlations were observed for sad faces presented at 100% intensity at each duration (100ms and 20000ms); indicating that participants with increased verbal ability tend to be more accurate at identifying sad faces at 100% intensity. Correlations between response bias for happy faces and verbal ability were also observed. Negative correlations between all presentations of happy face (50% and 100% intensity, and 100ms and 2000ms duration), indicating that as verbal ability decreases the tendency to respond "happy" increases. No correlations between BPVS and bias in the sad experimental condition were observed. A trend to a negative correlation was found between discrimination accuracy for happy faces presented at 100% intensity and for 2000ms and depression score, indicating that as depression increases the ability to accurately identify happy faces (at 100% for 2000ms) tends to decrease, that is the higher the depression score the less accurate the participant tends to be at discriminating this type of happy face. Given the strong relationship between verbal ability and discrimination accuracy for happy faces, the relationship between depression and discrimination accuracy was examined further whilst controlling for the effects of verbal ability. A partial correlation controlling for verbal ability was conducted; no significant relationships were found between depression and discrimination accuracy for happy faces presented for 2000ms at 100% intensity (r = -.194, p = .183); for 200ms at 50% intensity (r = -.024, p = .872); for 100ms at 100% intensity (r = -.091, p = .535) or for 100ms at 50% intensity (r = .028, p = .846). This indicates that the finding that as depression increased accuracy decreased for happy faces was carried by verbal ability.

The finding that as depression increases so does bias to report happy (when presented at 50% for 100ms) is paradoxical when considered in light of previous research (e.g. Surguladze et al., 2004). Given the strong relationship between verbal ability and bias to report “happy”, the relationship between depression and bias was examined further whilst controlling for the effects of verbal ability. A partial correlation controlling for verbal ability was conducted; no significant relationship between depression and bias (for happy faces presented at 50% intensity for 100ms) was observed (r = .263, p = .068).

Table 7.

Correlations between experimental conditions and questionnaire measures

Variable → Experimental condition ↓				BPVS raw score	GDS	Stigma	GAS	Age
Accuracy	Happy	50%	100ms	.395**	-.093	-.058	.033	-.102
		50%	2000ms	.242	-.093	.032	.087	-.116
		100%	100ms	.513**	-.227	-.183	-.008	-.102
		100%	2000ms	.582**	-.324*	-.210	-.088	.020
	Sad	50%	100ms	.107	-.058	-.061	-.069	.076
		50%	2000ms	.217	.019	.014	-.100	-.078
		100%	100ms	.321*	-.105	-.057	-.162	-.112
		100%	2000ms	.291*	-.154	-.225	-.180	-.063
Bias	Happy	50%	100ms	-.551**	.374**	.236	.242	-.232
		50%	2000ms	-.586**	.313*	.235	.294*	-.227
		100%	100ms	-.382**	.223	.091	.244	-.197
		100%	2000ms	-.432**	.185	.145	.260	-.266
	Sad	50%	100ms	-.045	-.059	.062	.146	-.059
		50%	2000ms	-.002	-.036	.094	.108	-.119
		100%	100ms	.117	-.099	.082	.072	-.096
		100%	2000ms	.118	-.165	-.064	.009	-.126

* $p < .05$ (2-tailed) ** $p < .01$ (2-tailed)

A partial correlation controlling for verbal ability was also conducted to explore the trend observed between depression and bias to report “happy” to stimuli presented at 50% intensity and 2000ms duration; no significant relationship between depression and bias in this condition was observed (r=

.024, p = .872). This suggests that the finding that increased depression was associated with increased bias for happy faces was carried by verbal ability.

The data for discrimination accuracy and response bias for each experimental condition were collapsed to give overall measures of discrimination accuracy and response bias for happy and sad faces. The correlation analysis was then repeated (see Table 8). Correlations between discrimination accuracy and verbal ability were still observed for happy and sad faces. A negative correlation was found between verbal ability and response bias for happy faces.

Table 8.

Correlations between collapsed discrimination accuracy and response bias scores and questionnaire measures

Variable → Experimental condition ↓		BPVS raw score	GDS	Stigma	GAS	Age
Accuracy	Happy	.468**	-.191	-.107	.018	-.097
	Sad	.309*	-.111	-.112	-.161	-.069
Bias	Happy	-.545**	.319*	.221	.300*	-.236
	Sad	.034	-.085	.060	.097	-.105

* p< .05 (2-tailed) ** p< .01 (2-tailed)

Of the 50 participants included in the study one was prescribed anti-depressant medication. This participant was excluded and the analysis repeated; this did not alter the pattern of results and therefore this participant was not excluded from the analysis presented.

Discussion

Participants performed at above chance level on the control task, indicating that the task demands were within the participants' level of capability. No effect of depression group was found on FER with results for both discrimination accuracy and response bias, suggesting that participants in the depressed group did not differ from participants in the group without depressed mood. This finding is due to the negligible effect of depression; in order to find an effect of depression it is predicted that a much larger sample would be required (for example, a G-Power calculation suggested that a sample size of 1545642 would be required to detect an effect of depression on response accuracy), the clinical significance of conducting such a large study to find a negligible effect is questionable. A trend to a negative correlation between depression score and discrimination accuracy was found for the least ambiguous happy faces (i.e. those presented at 100% intensity and for 2000ms), however this effect was carried by verbal ability. These results fail to support the result found in the non-ID literature that accuracy decreases as depression increases (George et al., 1998; Gur et al., 1992; Mikhailova et al., 1996), or the findings from the ID literature which have suggested that poorer FER may be associated with lower levels of depression (Rojahn & Warren, 1997; Warren, 1992). The participants in this study did not have clinical depression, given the influence of severity of depression on FER in the general population (Gur et al., 1992) recruiting participants who did not have clinical depression may have had an impact on the results gained. This is discussed further in the Strengths and Limitations section.

Response bias scores indicated a positive bias in participants with higher levels of depression, which is contrary to previous results (Surguladze et al., 2004) and fails to support the experimental hypothesis. It is possible that a similar effect may explain the paradoxical results found in the ID field (Rojahn & Warren, 1997; Warren, 1992). Further analysis showed that this effect was carried by verbal ability and was actually due to the participants with the higher depression scores also having more severe ID, which were linked to a bias to report faces were “happy”.

Overall participants demonstrated impaired discrimination accuracy for facial expressions presented for shorter durations and lower intensities, thus providing support for the second experimental hypothesis, and suggesting that the task is more difficult when stimuli are presented very briefly or at low intensity. Participants demonstrated greater discrimination accuracy for happy facial expressions, suggesting that this emotion was easier to identify. This is consistent with previous research in the ID field which indicates the increased ease at which happy faces are recognised relative to other emotions (Rojahn et al., 1995). This is also consistent with findings in the non-ID population (Surguladze et al., 2004), suggesting that this effect is not confined to people with ID. The finding that happy emotion, longer duration and higher intensity presentations are comparatively easier may explain why the only relationship between depression and response accuracy was found for happy faces presented at the higher intensity (i.e. no ambiguity) for the longer duration. It is of note that in the present study this predicted effect of depression was found with the least ambiguous stimuli, whereas previous research has found depression to have most effect on the recognition of subtle depictions of emotion (e.g. Surguldaze et al, 2004). It is possible that the stimuli were more difficult for participants in this study given their ID, and if the task had included more 'easier' conditions more effects of depression may have been found.

Verbal ability was found to positively correlate with response accuracy for happy faces (presented at 50% intensity for 100ms and at 100% for both durations) and sad faces (presented at 100% intensity for both durations). These results suggest that as verbal ability increases so does discrimination accuracy. These results partially support the experimental hypothesis that FER ability increases with verbal ability, thus lending support to previous research (e.g. McAlpine et al., 1991). This also supports the inclusion of an assessment of verbal ability and the links made between verbal and FER ability in studies investigating assessment for suitability for cognitive behavioural therapy for people with ID (Oathamshaw & Haddock, 2006). It is possible that the stronger relationships in the conditions involving presentations of happy faces was due to the decreased difficulty in identifying happy expressions relative to other emotions (Rojahn et al., 1995).

It is of note that participants in the depressed group demonstrated similar performance on the gender and emotion tasks, for both tasks relationships between discrimination accuracy and depression were carried by verbal ability. The similarity in performance suggests that any impairment observed on the emotion task is not due to a specific emotion perception difficulty, but rather may be indicative of a reduced information processing ability.

Response bias scores indicated a greater likelihood for participants to report faces were "just OK" for presentations of low intensity or brief duration.

Thus there was a bias to report ambiguous faces as neutral; which may be indicative of a response strategy i.e. to respond "just ok" if you are unsure of the emotion you have detected. The significant emotion by intensity and emotion by duration interactions showed that the tendency to report "just OK" for the low intensity or brief duration stimuli was greater for happy expressions.

Interestingly, participants with lower ability were most likely to have a bias to report faces were happy. Ability and social desirability are negatively related, i.e. individuals with lower ability are more affected by social desirability. It is possible that the finding that people with lower ability demonstrated a bias to responding happy is reflective of their tendency to say happy when in doubt because this is the socially desirable response. Response bias was found to negatively correlate with verbal abilities for all presentations of happy faces, suggesting that lower verbal ability is associated with a tendency to report faces to be "happy". This pattern was not observed for sad faces.

A significant negative correlation was found between BPVS raw score and depression score, indicating that as verbal ability increases the level of depression decreases. This is at odds with results suggesting that individuals with milder ID have higher rates of depression (Holden & Gitlesen, 2004). Within this sample the higher depression scores among those with lower verbal ability may be explained by low academic competencies (assuming that students with lower ability will have poorer academic competencies). This association between depression and low academic competency was reported by Heiman (2001), and also fits with more recent findings that individuals with more severe ID report more mental health problems (Cooper, Smiley, Morrison, Williamson, & Allan, 2007). It should be noted that no measure of academic competency was included in this study and therefore this explanation is hypothetical. Extending the idea that level of competency is associated with depression, it is also possible that individuals with milder ID have superior social skills compared to their peers with more severe ID. Research in the adult ID field has highlighted the association between poor social skills and depression (Helsel & Matson, 1988). Poor social skills have implications for the development and maintenance of social relationships; adolescents with ID are rated as less socially competent and suffer higher peer rejection and isolation (Haager & Vaughn, 1995; Svetaz, Ireland, & Blum, 2000). Given the impact of poor social support on the development of depression in adults with ID, it is feasible that the poor social skills observed in adolescents with ID also influences the development of depression. Assuming that level of depression increases as social skills decrease and that social skills increase as severity of ID decreases, it follows that individuals with milder ID may have superior social skills and lower rates of depression than their peers with more severe ID. This current study did not include a direct measure of social skills and was limited to adolescents with mild to moderate ID; further research into this hypothesis is required. An alternative hypothesis is that the greater depression scores in participants with lower verbal ability in this study is a result of an increased tendency to respond ‘yes’ to questions due to reduced understanding (acquiescence is discussed further in the Strengths and Limitations section).

Stigma was found to positively correlate with depression. This supports previous studies that indicated that stigma can lead to negative self-evaluations and psychological distress (Dagnan et al., 2004). High levels of stigma is associated with poor interpersonal relationships in adolescents with ID (Szivos-Bach, 1993). Moore's (2001) transactional hypothesis attributes these interpersonal difficulties to the changes in FER ability as a result of perception of social stigma. We had hypothesised that the pattern of results reported by Warren (1992) and Rojahn and Warren (1997), where people with ID and depression showed better FER than those without depression, might be due to a moderating effect of low stigma in participants who were poor at FER protecting them from depression. However, we did not find evidence of this paradoxical relationship between depression and FER.

No relationship between FER and stigma was found in the current study, although Moore argues changes in FER as a result of experience of stigma occurs in childhood, therefore raising the possibility that the impairment had already occurred in this sample and that a relationship may no longer be observed. The link between stigma and depression emphasises the influence of the social context on the psychological well-being of adolescents with ID and supports calls by clinicians and researchers in the adult ID field for the integration of social and cognitive approaches to depression management in people with ID (Jahoda et al., 2006; Dagnan et al., 2004). Research has suggested that pupils attending special schools are protected from the awareness of their stigmatised status and have a reduced awareness of their own abilities and limitations compared to their peers (with ID) schooled in mainstream settings (Cooney, Jahoda, Gumley, & Knott, 2006). Participants in this study had all attended schools for individuals with moderate learning difficulties (MLD). Assuming that special schools serve as a protective environment, this may have reduced the ratings of stigma by reducing the opportunities for the individuals to experience stigma. It is possible that the reduced experience of stigma as a result of being schooled in a special education system is the reason for the discrepancy between the higher level of depression found in people with milder ID by Holden and Gitlesen (2004) and the higher level of depression found in people with lower ability in the current study. Inclusion of pupils from mainstream settings and units attached to mainstream schools may provide further information on the potential protective affect of special schooling on experience of stigma and the consequent relationship to depression.

In summary, the hypothesis that depression would predict facial expression discrimination accuracy or be associated with a negative response bias was not supported. Accuracy at discriminating facial expressions was predicted by verbal ability and individuals with lower verbal ability demonstrated a bias to reporting “happy”. Lower verbal ability was associated with increased depression. Depression and stigma were positively associated.

The depression groups were found to significantly differ on level of anxiety, with a positive correlation between depression and anxiety observed. The association between anxiety and depression is a standard finding, and has been cited as a criticism of the use of analogue samples in depression research (see Strengths and Limitations section), although this relationship has also been observed in patients with depression (Vredenburg, Flett, & Krames, 1993). In addition, social phobia has been associated with impaired

FER in children and adolescents (non-ID), especially in the recognition of happy and sad faces (Simonian et al., 2001). A measure of social phobia was adapted and included in the study, however the internal consistency of this measure was found to be poor (see Appendix F) and therefore was excluded from further analysis. It is possible that the results gained were affected by level of anxiety and social phobia; future research may consider further exploring the relationship between these factors and FER ability the adolescent ID population.

Strengths and Limitations

Adolescence is a time of change, with shifts in personal relationships away from parents towards peers, changes in educational, and possibly residential, settings and changes associated with biological maturation (e.g. puberty). Adolescents with ID have reduced social and coping skills and are at greater risk of exposure to negative life events, all of which may impact on their ability to cope with the transition into adolescence and adulthood. Given that impairments in social skills and exposure to stressful life events are associated with depression and the higher incidence of depression in adolescents with ID as compared to their non-ID peers, understanding of the development of depression and risk factors for depression in young people with ID is crucial. Despite this, research in the area of adolescents with ID and depression has focussed largely on assessment; therefore, the inclusion of adolescents with ID represents a relative strength of this study.

The finding that participants performed above chance level on the gender categorising control task indicates that the FER task used in this study is an appropriate tool for assessing the ability of adolescents with mild and moderate ID to distinguish facially expressed emotions. In addition, in the FER task discrimination accuracy was significantly lower for stimuli that should have been more difficulty to categorise correctly (i.e. short presentations, ambiguity and sad expressions), thus supporting the task's validity as a measure of FER. This is particularly important given this task, unlike other tasks in the ID field, includes multiple levels of intensity and duration and a measure of response bias. The test-rest reliability of this measure needs to be established, however, the potential usefulness of this task as an assessment tool for either research or clinical (e.g. evaluating FER training, Rojahn et al., 1995) settings should be noted.

Some concerns regarding the ecological validity of measuring FER in this way were raised by Ceci (1987); criticisms include the two-dimensional nature of the stimuli, that only one source of information is provided (i.e. visual) and that the stimuli are static which differ from the dynamic, three-dimensional, multi-modal experience of real-life stimuli. This raises questions regarding whether any impairments observed are indicative of real-life difficulties. The finding that participants with ID perform better on tasks involving moving stimuli (Moore, 2001) further emphasises the caution that is required when interpreting impairments on pictorial FER tasks. Further research may consider the use of more ecologically valid stimuli.

The inclusion of a control task in assessments of FER in people with ID has been deemed necessary in order to attribute impairments on such tasks to emotion perceptions deficits rather than to general information processing impairments associated with ID. A control task was included in this study;

however the task differed slightly in response requirements to the emotion task. In the control task participants were required to state whether the model was a man or a woman; as with the emotion task the gender control task required the individual to perceive the picture, hold in mind visual information, make a non-categorical judgement and select their response (Moore, 2001), thus providing information on their information processing ability. However, the gender task only had two possible responses (man/woman) compared to the emotion task in which the participants had a choice of three responses. The increased number of responses in the emotion task may have increased the task demands with regard to remembering the possible responses. Therefore, whilst this control task may be able to provide information about whether the participant was able to process facial information, the reliability of the task to provide information about the impact of general information processing ability is limited given the reduced number of response options.

In his review of the FER literature Moore (2001) states that adults and adolescents with ID may not provide the most accurate measure of FER in people with ID, this was based on a number of studies which indicated that adolescents and adults perform comparatively worse than children with ID (e.g. McAlpine et al., 1991). It is possible therefore, that sampling from a population of children with ID would have given a more accurate measure of FER amongst people with ID. This would have been particularly interesting for the finding that reduced verbal ability was associated with a positive bias, as this may have been a protective strategy that individuals with a low level of understanding have developed. However, use of younger participants would also have influenced the other measures used, for example measures such as the Stigma Scale are validated with adolescents and so the suitability of these measures for use with younger children is questionable. No correlation of overall discrimination accuracy for happy or sad faces with age was found, indicating that there was no decline in ability across the adolescent age range. This does not necessarily refute previous findings that FER ability declines with age as the current study recruited from a narrow age band (adolescence). Given that the FER task used in this study has not been previously used in the ID population, results cannot be compared with other studies sampling different age ranges.

A strength of the study is that an objective experimental task was used to assess FER. However, this study also relied heavily on self-report measures to assess for depression, anxiety and stigma. Acquiescence is inversely related to intelligence (Gudjonsson, 1990) and is viewed by many researchers as a potential difficulty when interviewing and using self-report measures with people with ID (Finlay & Lyons, 2002). Acquiescence is more likely to occur if the individual does not know the answer, the question is ambiguous, when there are greater cognitive demands (including social concern, distraction and so forth) or when the individual has spent less time and effort in thinking about a given question (Finlay & Lyons, 2002; Knowles & Nathan, 1997). Given that people with ID may have associated memory problems, receptive language difficulties, and are more affected by social desirability (Stenfert Kroese, 2001), the problem of acquiescence needs to be considered with regard to the reliability of the results gained in this study. Methods to reduce the likelihood of acquiescence include avoiding yes/no response formats and the use of pictorial response scale to support understanding and memory (Stenfert Kroese, 2001). In a move away from the yes/no format the authors of the Glasgow scales (GDS-LD and GAS-ID) used three-point response with some reversed score items. The use of this three-point measure however, does require the respondent to reply yes/no and then to alter a yes answer to sometimes/always, as a consequence the scale is still open to problems of acquiescence in the initial stage. Although some reversed items are included in the scales, reversing half of the items could have further reduced acquiescence. The other self-report measure administered used a five-point response scale. All scales used visual analogue scales or symbols to reduce acquiescence and aid understanding and memory; therefore the problem of acquiescence has been considered and addressed to the capacity of this study. Comparing self-reports to ratings by other informants could have enhanced the reliability of these measures. Although a carer-supplement scale is available with the GDS-LD, it was beyond the scope of this study for each participant's parents or carer to complete the measures and may have affected the response rate.

A further limitation of this study is that the participants in the depressed group, whilst scoring above clinical cut-off, did not have a formal clinical diagnosis of depression. This is a common criticism of research in the area of depression, FER and people with ID (Rojahn & Warren, 1997; Warren, 1995). This criticism extends beyond the ID field, the use of analogue samples (where university students are placed in depressed or non-depressed groups based on their scores on a depression measure) in place of samples of patients with depression has been heavily criticised (Coyne & Gotlib, 1983; Gotlib, 1984). The criticisms cited by these authors include the claim that depression in college students is general distress not specific to depression, that patients with depression differ qualitatively on their expression of depression compared to these analogue samples and finally that there is a low correlation between psychiatric ratings and questionnaire measures in such analogue samples. These concerns have implications for the current study suggesting that the depressed group may not be comparable with adolescents with ID and clinical depression, this is particularly relevant given the variation in FER ability in people (without ID) with presence and severity of depression (Gur et al., 1992; Mikhailova et al., 1996). However, the criticisms presented by Coyne and Gotlib (1983) and Gotlib (1984) should be viewed with caution; in a reappraisal of the literature Vredenburg and colleagues (Vredenburg et al., 1993) concluded that these criticisms were unfounded and not empirically supported. Whilst this review refutes the claims made by Coyne and Gotlib (1983) and Gotlib (1984), further investigation of FER ability in people with ID and diagnosed depression may be warranted. In addition there is a distinction made between acute and persistent depression in the adult mental health literature (Moore & Garland, 2003), with low self-esteem, helplessness and hopelessness implicated as key cognitive characteristics in persistent depression. Moore and Garland suggest that application of the cognitive model of acute depression can lead to confusion and frustration for therapist and patient alike. As these cognitive characteristics have been identified in adolescents (Szivos-Bach, 1993) and adults (Esbensen & Benson, 2005; Nezu et al., 1995) with ID and depression, future research into depression within this population may benefit from establishing whether the distinction exists between these two types of depression and if so whether this affects FER ability.

Due to the relatively narrow range of ID (i.e. mild to moderate) sampled in the study the results cannot be generalised to individuals with severe, profound or multiple and complex ID. This represents a weakness of this study and of the literature in this area; the exclusion of people with more severe ID is largely due to their reduced ability to complete the tasks, for example the measures used in the current study (GDS-LD, GAS-ID and Stigma Scale) are all designed for use with people with mild to moderate ID and therefore are inappropriate for use with people with more severe ID.

Future Research

Warren (1992) and Rojahn and Warren (1997) indicated that people with ID and depression show improved FER ability, a finding that was difficult to reconcile with research from the general population. This study did not support these findings. One difference between previous studies and the current study is the age of the participant (adults versus adolescents); the influence of age on FER and depression in people with ID could be investigated further with the inclusion of a wider age range (e.g. children (up to 13), adolescents (14-19) and adults). A major limitation of this and previous studies is that participants were not clinically depressed. Given the relationship between severity of depression and FER in the general population, the inclusion of participants with clinical depression is necessary and should be considered in future research. Further studies may also look at establishing whether the distinction between acute and persistent depression found in the general population is also found in the ID population, and if so what impact the type of depression has on FER.

The association between verbal ability and depression was not within the predicted direction. Within the area of mental health in people with ID there appears to be some debate as to whether higher incidence of mental health problems are observed in individuals with mild or more severe ID. There are a number of hypotheses to explain each viewpoint. Of particular relevance to the adolescent population is the proposal that low academic competency is associated with depression (Heiman, 2001), this fits with evidence suggesting that individuals with more severe ID have higher incidences of mental health problems (Cooper et al., 2007). In addition poor social skills are associated with depression in the ID population (Helsel & Matson, 1988). Future research may consider the inclusion of a measure of academic and social competency and inclusion of participants across the full ID spectrum. This, of course, has implications for the type of measures used given the difficulties in assessing depression in individuals with more severe ID and the reliance on self-report measures, which may be deemed inappropriate given the participant's level of ability (e.g. Szivos-Bach, 1993).

Moore (2001) suggests that children may provide a more accurate measure of the FER abilities of people with ID as this ability decreases through adolescence and adulthood (Moore, 2001; Rojahn et al., 1995). Moore (2001) further suggests that this is due to inhibition of the FER ability as a result of perceptions of the negative emotions of others arising from the social stigma associated with ID. This has not been confirmed empirically, although our study gave some indication that individuals with more severe ID had a more positive bias, but further investigation of this idea may provide important information regarding the development of depression and low self-esteem in the ID population. If this was confirmed, an increasing positive bias with increasing age may be expected. Future research could beneficially establish at what age or level of development this decline begins, exploring the relationship between this decline and experience of stigma and self-esteem and investigating the possibility of an increasing positive bias with age. An association between stigma and FER also needs to be investigated further; no significant relationship was found between the experimental conditions on the FER task and stigma. It is possible that if FER ability is inhibited in childhood the ability to recognise stigma will also be inhibited. Examination of experience of stigma inline with the decline in FER may provide evidence to support Moore's (2001) transactional hypothesis. Given the apparent influence of special schooling on awareness of one's own disability, estimation of one's abilities and awareness of the stigma attached to ID (Heiman, 2001), future research should consider the type of educational establishment participants attend.

Conclusions

In conclusion, no group difference between the depressed and non-depressed groups on FER. This fails to support the non-ID FER research or the results reported by previous ID researchers (Rojahn & Warren, 1997; Warren, 1992). The results confirmed, and extended to the ID population, Surguladze et al.'s (2004) claim regarding the importance of including different levels of intensity and duration in the assessment of FER, although our participants with ID only showed effects of depression on the least ambiguous category of stimuli, whereas they found effects of depression with more subtly emotional stimuli. The results also confirmed previous findings of a relationship between verbal and FER ability. In addition it was found that participants with greater ID had more of a bias to report that the faces were happy, and this relationship was the reason for an apparent positive bias in the more depressed participants. This study also confirmed the relationship between depression and experience of stigma in people with ID highlighting the need for the consideration of the social context of the lives of adolescents with ID when working clinically with this population. Future research considering the inclusion of participants with a diagnosis of clinical depression and recruitment from a wider age range may help to further clarify the FER ability of people with ID and depression.

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Appendices

Appendix A

Instructions to Authors Journal of Applied Research in Intellectual Disabilities

Journal of Applied Research in Intellectual Disabilities

Author Guidelines

Papers (in English) should be sent by email to the editorial assistant and copied to the editors. Please find the details for doing this below.

Manuscripts should be sent by email attachment to

patclelland@wightcablenorth.net

and copied to both felce@cf.ac.uk and g.h.murphy@kent.ac.uk

Please scan the attachment with a virus check before sending by email.

Papers are accepted on the understanding that they have not been and will not be published elsewhere.

Articles are accepted for publication only at the discretion of the Editor. Articles should not exceed 7000 words. Brief Reports should not normally exceed 2000 words. Submissions for the Letters to the Editor section should be no more than 750 words in length.

Preparation of the Manuscript

Manuscripts should be formatted with a wide margin and double spaced. Include all parts of the text of the paper in a single file, but do not embed figures. Please note the following points which will help us to process your manuscript successfully:

- Include all figure legends, and tables with their legends if available.
- Do not use the carriage return (enter) at the end of lines within a paragraph.
- Turn the hyphenation option off.
- In the cover email, specify any special characters used to represent non-keyboard characters.
- Take care not to use l (ell) for 1 (one), O (capital o) for 0 (zero) or ß (German esszett) for (beta).
- Use a tab, not spaces, to separate data points in tables.

- If you use a table editor function, ensure that each data point is contained within a unique cell, i.e. do not use carriage returns within cells.

Cover Page

A cover page should contain only the title, thereby facilitating anonymous reviewing. The authors' details should be supplied on a separate page and the author for correspondence should be identified clearly, along with full contact details, including e-mail address. A suggested running title of not more than fifty characters, including spaces; and up to six key words to aid indexing should also be provided.

Main Text

All papers should be divided into a structured summary (150 words) and the main text with appropriate sub headings. A structured summary should be given at the beginning of each article, incorporating the following headings: Background, Materials and Methods, Results, Conclusions. These should outline the questions investigated, the design, essential findings and main conclusions of the study.

The text should proceed through sections of Abstract, Introduction, Materials and Methods, Results and Discussion, and finally Tables. Figures should be submitted as a seperate file. The reference list should be in alphabetic order thus:

Emerson E. (1995) *Challenging Behaviour: Analysis and Intervention in People with Learning Disabilities.* Cambridge University Press, Cambridge.
McGill P. & Toogood A. (1993) Organising community placements. In: *Severe Learning Disabilities and Challenging Behaviours: Designing High Quality Services* (Eds E. Emerson, P. McGill & J. Mansell), pp. 232-259. Chapman and Hall, London.
Qureshi H. & Alborz A. (1992) Epidemiology of challenging behaviour. *Mental Handicap Research* 5, 130-145

Journal titles should be in full. References in text with more than two authors should be abbreviated to (Brown *et al.* 1977). Authors are responsible for the accuracy of their references.

Spelling should conform to *The Concise Oxford Dictionary of Current English* and units of measurements, symbols and abbreviations with those in *Units, Symbols and Abbreviations* (1977) published and supplied by the Royal Society of Medicine, 1 Wimpole Street, London W1M 8AE. This specifies the use of S.I. units.

Illustrations and Tables

These should be referred to in the text as Figures using Arabic numbers, e.g. Fig. 1, Fig. 2, etc, in order of appearance. Figures should be clearly labelled with the name of the first author, and the appropriate number.

Each figure should have a separate legend; these should be grouped on a separate page at the end of the manuscript. All symbols and abbreviations should be clearly explained. In the full-text online edition of the journal, figure legends may be truncated in abbreviated links to the full screen version. Therefore, the first 100 characters of any legend should inform the reader of key aspects of the figure.

Tables should include only essential data. Each table must be typewritten on a separate sheet and should be numbered consecutively with Arabic numerals, e.g. Table 1, and given a short caption.

Please save vector graphics (e.g. line artwork) in Encapsulated Postscript Format (EPS), and bitmap files (e.g. half-tones) in Tagged Image File Format (TIFF). Ideally, vector graphics that have been saved in metafile (.WMF) or pict (.PCT) format should be embedded within the body of the text file. Detailed information on our digital illustration standards is available on the Blackwell web site at http://www.blackwellpublishing.com/authors/digill.asp.

Appendix B

Example Information Letter to Educational Establishments (School)

**University
of Southampton**

School of Psychology
Doctoral Programme in Clinical Psychology

University of Southampton
Highfield
Southampton
SO17 1BJ
United Kingdom

Telephones:
Direct line +44 (0)23 8059 5321
Fax +44 (0)23 8059 2588
Email

Headteacher
School address

Date

Dear

My name is Hannah Kiddle. I am a Trainee Clinical Psychologist at the University of Southampton. As part of my doctoral degree, I am conducting a study investigating the ability of people with learning disabilities to recognise other people's emotions and their awareness of the consequences of their disability (referred to as stigma).

I am recruiting pupils at special schools as part of this project and would like to interview pupils at your school. The interview will take about 60 minutes and will involve a computer task and some questionnaires. It would be good if a Learning Support Assistant could be involved, although this is not essential.

Pupils will not be interviewed without parental consent. There will be no cost for the school involved in this study. All information collected will be anonymous and confidential.

I have enclosed a question and answer section for further information. If you are happy for your school to take part or would like any further information please email me at hck104@soton.ac.uk or telephone me on 07968 105 354.

Yours sincerely,

Hannah Kiddle
Trainee Clinical Psychologist

Questions and Answers

1. **What is the purpose of the study?**

This research project is a requirement of my doctoral degree in Clinical Psychology. This study examines individuals' ability to recognise other people's emotions and their awareness of the consequences of their disability (referred to as stigma).

2. **Why has my school been chosen?**

I am recruiting participants from secondary special schools within the south of England.

3. **Does my school have to take part?**

No. It is up to you to decide whether or not your school participates. If you decide to take part please contact me by email or telephone.

4. **What will happen to me if I take part?**

If you wish for your school to participate I will make an initial visit to answer any further questions you may have and to make arrangements for the interviews. It is anticipated that these interviews will take place in school. Young people whom meet the criteria will be identified by the school and letters sent to their parents. The school will decide the timing of interviews, so as to minimise disruption to the school day.

The whole interview will take no longer than 60 minutes. A break will be offered a break after 30 minutes, with additional breaks if required. The participants will be asked to complete some questionnaires on how they are feeling and about their experience of stigma. These questionnaires have been used several times in people with learning disabilities of this age group. They will also be asked to complete a computer task in which he/she will be asked to state whether they think the face on the screen is happy or sad. All participants will be interviewed individually. Members of school staff may accompany the participant to the interview if required, although they will not be able to assist them in their responses.

5. **Do all young people at the school have to take part?**

No. This study will be recruiting young people aged 14 to 19 years of age who have a mild to moderate learning disability (IQ between 50 and 70). Young people who have an autistic spectrum disorder, a mental health problem (with the exception of depression) or who have any sensory impairment will not be eligible to take part in the study. Individuals whose primary communication system is non-verbal will also be unable to take part in the study. These exclusions are made as these conditions or difficulties may affect the individual's ability to complete the tasks.

Parents of eligible young people will be asked for their permission for their child to take part in the study. No further contact will be made with parents who no not give permission. Consent to participate will also be sought from young people at the start of the interview. If the child says "No" they will return to their class and no information about them recorded. Parents and young people are free to withdraw from the study at anytime without giving a reason, even if consent is initially given. If a child withdraws from the study all data about them will be destroyed.

6. What do I have to do?

If you are happy for your school to participate, please contact me by email or telephone. We will then arrange a time for me to visit the school. In this meeting we can discuss the practicalities of the study and arrange times for me to conduct the interviews.

7. What is being studied?

This study is looking at the relationship between the ability to recognise other people's emotions, awareness of stigma and mood. The ability to recognise other people's emotions and an awareness of other people's reactions to your disability has been linked with depression and anxiety.

8. What are the possible disadvantages and risks of taking part?

It is not anticipated that this interview will cause any distress. If at any point during the interview participants appear distressed or indicates that they wish to stop the interview will be terminated and all data destroyed. Participants and their parents have the right to withdraw from the study at any point.

9. What are the possible benefits of taking part?

There is no direct benefit to participants, their family or the school for taking part in this study. This research will aid to our knowledge about the experience of stigma and depression in people with learning disabilities and assist in understanding the risk factors for depression in people with learning disabilities. This may be of particular relevance to people within the 14-19 year who are making the transition from school.

10. What if something goes wrong?

If you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study the University of Southampton complaints mechanism will be available to you.

11. Will my taking part in the study be kept confidential?

All information collected about the school and your pupils during the course of the study will be kept confidential. The results of this study will be written in a report, which will be submitted to the University of Southampton as part of my doctoral dissertation. The report may also be submitted for publication in an academic journal. All information gained will be confidential, the young person's name and the name of the school will not be recorded and all information will be anonymous.

12. Who has reviewed the study?

The School of Psychology ethics committee at the University of Southampton has reviewed and approved the study.

13. Contact for further Information

Hannah Kiddle (Researcher):	Email: hck104@soton.ac.uk Telephone: 07968 105 354
Dr Catherine Brignell (Supervisor):	Email: c.brignell@soton.ac.uk

Postal Address:
Doctoral Programme in Clinical Psychology
34 Bassett Crescent East
School of Psychology
University of Southampton
Hampshire SO17 1BJ

If you decide for your school to participate you can request a copy of the finished report by email. As names will not be recorded it will not be possible to give you feedback on individual pupil's performance or scores on the questionnaires.

Thank you for taking the time to read this.

Appendix C

Example Parental Consent Letter (College)

University
of Southampton

School of Psychology
Doctoral Programme in Clinical Psychology

University of Southampton
Highfield
Southampton
SO17 1BJ United Kingdom

Telephones:
Direct line +44 (0)23 8059 5321
Fax +44 (0)23 8059 2588
Email

Dear Parent/Guardian

My name is Hannah Kiddle. I am a Trainee Clinical Psychologist at the University of Southampton. As part of my degree I am talking to pupils at your child's college about how they feel and think about things. I would like with talk with your child as part of this study.

The meeting will take about 60 minutes. Your child will be asked to do a computer task and fill in some questionnaires. I will only talk with your child if you say that you are happy for this to happen.

All the information that I am told will be kept private. Your child's name and the name of the college not be told to anyone or written in the report.

There is a question and answer section for further information. If you have any further questions please email me at hck104@soton.ac.uk or talk to your child's teacher. If you are happy for your child to take part please return the slip below to your child's class teacher by ______________________.

Yours sincerely,

Hannah Kiddle
Trainee Clinical Psychologist

Please sign and return to class teacher.

I have read the letter and I understand what my child will be asked to do. I understand that the name of my child and the college will not be told to anyone or written in the report and that all information will be kept private. I also understand that my child is able to leave the study at anytime and all information destroyed.

I agree that my child ______________________ may be included in this study.
(Name)

Signed____
(Name) (Date)

My child takes the following medication (please list)

____
____
____
____
____

Question and answer section

1. **What is the purpose of the study?**

My name is Hannah Kiddle. I am a Trainee Clinical Psychologist at the University of Southampton. This research project is part of my doctoral degree in Clinical Psychology. This study looks at how well people can name other people's feelings and how much they notice the effects of their disability.

2. **Why has my child been chosen?**

Special schools in the south are being asked to take part. Your child's college is one of the colleges chosen to take part. Your child has been chosen because he/she is between 14 and 19 years old.

3. **Does my child have to take part?**

No. You choose whether or not your child takes part. If you decide they can take part you should fill-in the permission form at the bottom of the letter.

You and your child can choose to leave the study at any time. You don't have to give a reason. Your child's data will be destroyed.

4. **What will happen to my child if they take part?**

I will visit your child at school. I will ask them to complete some questionnaires about how they feel. I will then show them some faces on a computer screen and ask them to say whether they think each face is happy or sad.

The interview will last 60 minutes at the most. There will be a break after 30 minutes. Your child may have more breaks if he/she needs them. The interview will take place at the school, at a time that will fit best with their college day. The class teacher will suggest the time. On the day of the interview your child will be asked if they want to take part in the study. If they say "No" they will not be asked to do anything. Instead they will be taken back to class. If they decide not to take part, no information will be recorded about them.

Some medicines might affect the way your child feels. This may affect the results of the study. If your child takes medication, it is important that I know the name of the medicines. This will be confidential and will not be written in the report. There is space on the permission form for you to write your child's medication.

5. **What do I have to do?**

If you are happy for your child to take part, please complete the permission slip. Return the form to the class teacher. You will not need to do anything else.

6. **What is being studied?**

This study looks at the link between being able to name other people's feelings, knowing that you have some difficulties and how you feel.

7. What are the possible disadvantages and risks of taking part?

The interview should not upset your child. The interview will end if your child looks upset or says they want to stop. All the information about your child will be destroyed. You and your child can leave the study at any point.

8. What are the possible benefits of taking part?

Your child will not directly get anything from taking part. This research will help us to understand about the way people feel.

9. What if something goes wrong?

If you have any complaints or worries you can complain to the University of Southampton. I will give you the name and contact details of someone to talk to.

10. Will my taking part in the study be kept confidential?

All information collected will be confidential. The results of this study will be written in a report. All information will be anonymous. Your child's name, the college name and the area will not be told to anyone or included in the report.

This report will be given to the University of Southampton as part of my doctoral degree. The report may also be published.

11. Who has reviewed the study?

The School of Psychology ethics committee at the University of Southampton has reviewed and approved the study.

12. Contact for further Information

Hannah Kiddle (Researcher):	Email: hck104@soton.ac.uk
Dr Catherine Brignell (Supervisor):	Email: c.brignell@soton.ac.uk

Postal Address:
Doctoral Programme in Clinical
Psychology
(34 Bassett Crescent East)
School of Psychology
University of Southampton
Hampshire SO17 1BJ

If you decide for your child to take part you can ask for a copy of the finished report by email. I will not be able to give you information about how your child did on the questionnaires, as I will not be recording names.

If you are happy for you son/daughter to take part please sign the form at the end of the letter and return it to the class teacher. Thank you for you help.

Appendix D

Consent Procedure and Data

Introduction

It has been argued that consent is an under-explored area within the intellectual disability population and that journal articles rarely report ethical practices in sufficient detail (e.g. Arscott, Dagnan, & Stenfert Kroese, 1998); the little research there is in this area focuses heavily on the adult population. The British Medical Association (BMA, 2001) suggests that, in research not intended to benefit the participant, competent minors can consent to take part. However, it is also advised that parental consent should be obtained. The BMA (2001) states that young people who lack the capacity to consent may be included in research when they are not placed at harm and parental consent has been obtained. Given that minors with capacity to consent are legally able to consent to participate in research it is important that the capacity of minors with intellectual disabilities (ID) is examined.

Method

Participants

The participants were 50 (28 male, 22 female) with ID recruited for the main study. Data from six individuals who withdrew from the main study is not presented here. The age range was 14 to 19 with a mean age of 15.5. The BPVS was completed for all participants as part of the main study. The group mean BPVS score was 8.31 with a range of 3.08 to 12.04. All participants had been schooled within a moderate learning difficulties (MLD) school.

Procedure

School of Psychology Ethics Committee approval was gained for the main study. Parental consent was obtained prior to the interviews with the young people. In the current study consent was sought using a similar method to that employed by Arscott et al. (1998). Information detailing the nature of the study, the advantages and disadvantages of participating and their right to withdraw was read to the participant. The participant was then presented with chunks of information and then asked the corresponding question (Table D1) to assess capacity to consent. Participants could score 0 (no response or irrelevant answer) or 1 (appropriate answer given) for each question. Failure to score at least one point was considered to indicate an overall lack of capacity to consent to taking part in the study. Participants were finally asked if they wanted to participate in the main study (yes/no response).

Results

All participants whose data is presented here agreed to take part in the main study. However, only 2% of participants (1 participant) answered all six questions correctly. A further 10% (5) answered five correctly, 50% (25) answered four correctly, 20% (10) answered three correctly, 10% (5) answered two correctly and 6% (3) answered one correctly. Two percent (1) failed to answer any of the questions correctly. Failure to answer any questions correctly was taken to indicate overall lack of capacity, however as parental consent had been obtained this individual was not excluded from the study. This is consistent with guidance from the BMA (2001).

Further analysis

Consistent with Arscott et al. (1998) the association between verbal ability (BPVS raw score) and number of items answered correctly was investigated. A Pearson's correlation coefficient revealed that verbal ability and number of items answered correctly were significantly related ($r = .421$, $n = 50$, $p < .01$). The association between chronological age and number of items answered correctly was investigated, with no correlation found ($r = .026$). The effects on gender on capacity to consent were tested using an independent sample t-test. The mean number of items answered correctly was 3.59 ($SD = 1.15$) for male participants and 3.33 ($SD = 1.24$) by female participants. This difference was not significant ($t = .743$, $df = 48$).

Table D1.

Questions asked to determine ability to consent and percent of participants responding correctly

	Question	Scoring criteria		Number (%) responding correctly
1	What will I be talking to you about?	Score 1:	Gives a partial description of study (e.g. you will ask me questions about photos/how I feel)	39 (78)
		Score 0:	Participant gives an irrelevant answer/an answer that is too vague (e.g. you will ask me about things)	
2	Who will I tell your answers to?	Score 1:	Participant gives an answer suggesting that the information will not be shared (e.g. nobody)	43 (86)
		Score 0:	Participant indicates that results will be shared (e.g. with teacher, parent etc)	
3	Are there any good things about talking to me?	Score 1:	Participant gives an answer with some face validity (e.g. Yes, I will enjoy it, I will be helping	7 (14)
		Score 0:	Yes/No/Don't know with no explanation or irrelevant answer	
4	Are there any bad things about talking to me?	Score 1:	Participant gives an answer with some face validity (e.g. I will have to miss some of my lesson)	2 (4)
		Score 0:	Yes/No/Don't know with no explanation or irrelevant answer	
5	What can you do if you decide you do not want to talk to me anymore?	Score 1:	Participant gives an answer that suggests they understand that they can withdraw at anytime (e.g. say stop or no)	38 (76)
		Score 0:	Participant gives an answer that suggests they do not understand that they can withdraw from the study (e.g. can't stop)	
6	Will anyone be mad at you if you do not want to do this or if you stop?	Score 1:	Participant gives an answer that suggests that they understand no one will be cross (e.g. No)	45 (90)
		Score 0:	Yes/don't know.	

Discussion

The results show that 98% of participants did not possess a full understanding of the nature, advantages and disadvantages of the study or their right to withdraw, despite agreeing to take part in the main study. Participants particularly struggled with the advantages and disadvantages of the study with only 14% and 4% respectively answering the questions correctly. It is possible that the disadvantages involved in participating were small, and perhaps the participants did not view missing their lesson or the study taking up some of there time as a disadvantage. This is consistent with Arscott et al. (1998) study in which only 2.5% of participants answered this question correctly. Similar difficulties were observed with the advantages of the study, but again the fact that participation would be helpful to someone else may not have been perceived as an advantage and is consistent with previous research (Arscott et al., 1998). Previous research has advocated the use of visual material to support the information presented to the participant (Arscott et al., 1998). Inclusion of visual material may have facilitated the participants' capacity to consent.

Participants also appeared to have difficulty with understanding that they could withdraw from the study (76%), although the majority of participants appeared to understand that there would be no repercussions of not taking part or withdrawing (90%). Difficulty in understanding the right to withdraw consent is a common finding in research on capacity (Arscott et al., 1998; Arscott, Dagnan, & Stenfert Kroese, 1999; Morris, Niederbuhl, & Mahr, 1993) and raises concerns about whether consent is truly voluntary (Arscott et al., 1998). It is of note that six participants did withdraw at various points during the main study (their data is not reported here), suggesting that they understood and felt able to withdraw from the study. In some of these cases participants were often disengaged and indicating that they did not want to continue without stating they wanted to stop. In these cases the researcher asked whether they wanted to continue, at which point they withdrew. It may be that checking consent throughout a study may enable people with ID to exercise their right to withdraw.

Results indicated that verbal ability (BPVS score) was associated with tendency to answer correctly. This is consistent with previous research with adults with ID (Arscott et al., 1998; Arscott et al., 1999; Morris et al., 1993). It is possible that the participants who withdrew from the study had a higher verbal ability and therefore understood their right to withdraw to a greater degree than other participants. As data from these participants was destroyed following their withdrawal, consideration of this question is not possible.

The BMA (2001) guidelines state that competent minors are able to consent to research. This study demonstrates that some adolescents with ID are able to fully (2% of participants in this study) or partially able to consent, this ability was found to be related to verbal ability and but not to chronological age. There is limited research into the factors affecting capacity of adolescents with ID to consent to research, but given that (if competent) they are able to give consent (BMA, 2001) this is an area that warrants further research.

Reference List

Arscott, K., Dagnan, D., & Stenfert Kroese, B. (1999). Assessing the ability of people with a learning disability to give informed consent to treatment. *Psychological Medicine, 29,* 1367-1375.

Arscott, K., Dagnan, D., & Stenfert Kroese, B. (1998). Consent to psychological research by people with an intellectual disability. *Journal of Applied Research in Intellectual Disabilities, 11,* 77-83.

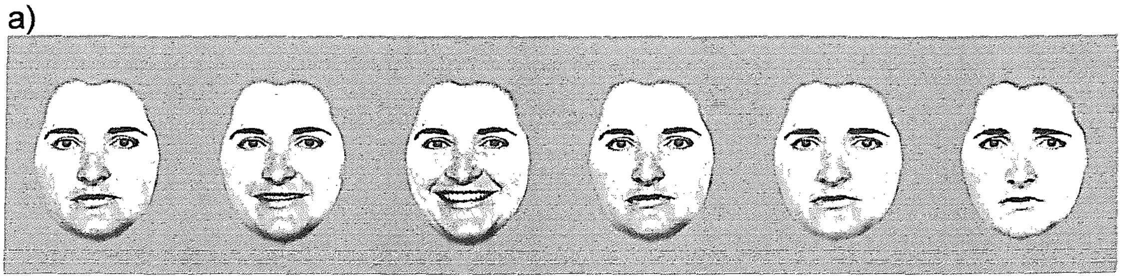
British Medical Association (2001). *Consent, Rights and Choices in Health Care for Children and Young People*. London: BMJ Books.

Morris, C. D., Niederbuhl, J. M., & Mahr, J. M. (1993). Determining the capacity of individuals with mental retardation to give informed consent. *American Journal on Mental Retardation, 98,* 263-272.

Appendix E

Example Stimuli for Facial Emotion Recognition Task and Task Instructions

Test stimuli



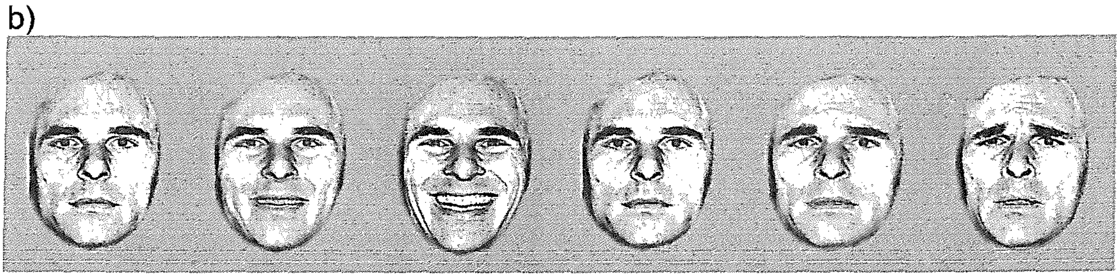


Figure E1. Example faces from Facial Emotion Recognition task for a) female model and b) male model. Emotions (displayed left to right) depict happy 0%, happy 50%, happy 100%, sad 0%, sad 50% and sad 100%.

Task instructions

We are going to look at some pictures on the computer together. I am going to show you several photographs of faces, one at a time. I want you to look carefully at each face and tell me if the person's face looks happy, sad or just ok. First you will see a cross. Then you will see a face. Sometimes the face will be very fast so watch carefully. You have to say if the person feels happy, sad or just ok. Before we begin lets practice.

Do you have any questions before we begin? Ok let's begin.

Appendix F

Adapted Social Phobia Scale and Reliability Data

It was hypothesised that social phobia may influence FER ability; therefore a measure of social phobia was included in the study. The social phobia scale was adapted from the social phobia sub-scale of the Fear Questionnaire (Marks & Matthews, 1979).

Original Scale

The original Fear Questionnaire is a 15-item scale designed to monitor the severity and change of phobic symptoms in patients with phobias. The scale is divided into three subscales, agoraphobia, blood/injury phobia and social phobia. These three subscales are totalled to give the total phobia score. The Fear Questionnaire has been found to have satisfactory internal consistency and is found to reliably assess social phobia (Cox, Parker, & Swinson, 1996). Satisfactory internal consistency is also found in non-clinical samples (Osman, Barrios, Osman, & Markway, 1993).

Adapted Social Phobia Scale

In this study the social phobia scale was administered alone, this has been reported in other studies (Safren, Neimberg, Brown, & Holle, 1997). The language of three of the five items was simplified (see Table F1) for use in the ID population. In addition an anchor statement was included ('going out in the rain') in order to orientate the participant to the scale and response requirements. In the original scale respondents are asked how much they would avoid each activity and rate their response on an 8-point scale with five verbal anchors (always, markedly, definitely, slightly and never). In the adapted social phobia scale the response scale was reduced to 5-points based on the verbal anchors of the original scale.

Table F1.

Adaptations to items on the Fear Questionnaire

Item	Fear Questionnaire	Adapted Social Phobia Scale
1	Eating or drinking with other people	*(No change)*
2	Being watched or started at	*(No change)*
3	Talking to people in authority	Talking to people in charge
4	Being criticised	Being told you've done things wrong
5	Speaking or acting to an audience	Talking in front of people

The language of these anchors was also simplified (always, often, sometimes, hardly ever and never). These anchors were presented with a visual analogue scale (see Figure F1) with five blocks in decreasing size. Each item was read aloud to the respondent. Each anchor was read aloud by the researcher whilst simultaneously pointing to the corresponding block on the visual analogue scale. The item was then read again and the participant encouraged to point to the correct block. This is consistent with the procedure used in other scales adapted for people with LD (e.g. the Hospital Anxiety and Depression Scale for people with LD).

Psychometric Properties of the Adapted Social Phobia Scale

The adapted social phobia scale had a mean score of 9.6 (SD = 4.17). The Alpha reliability of the five-item scale was .419, indicating that the scale had unsatisfactory reliability. The item-total correlations are presented in Table F2, which demonstrates that the reliability of the scale is not improved by the exclusion of any individual items. The mean score for males was 9.48 and for females 9.76, this difference was not significant (t (48) = -.232).

Table F2.

Item-total correlation for Adapted Social Phobia Scale

Item	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Squared multiple correlation	Cronbach's Alpha if item deleted
1	7.88	11.33	.34	.32	.27
2	7.40	15.06	-.03	.15	.55
3	7.92	10.52	.48	.45	.15
4	7.58	15.11	.05	.09	.47
5	7.62	11.55	.30	.27	.30

Pearson correlations were calculated for all questionnaire measures (see Table F3). Social phobia was found to positively correlate with stigma. There was no correlation between social phobia and the GAS-ID, which may have been expected given that social phobia is an anxiety disorder.

Table F3.

Correlation between questionnaire measures

Variable	1	2	3	4
1 BPVS raw sore				
2 GDS	-.298*			
3 Stigma	-.313*	.538**		
4 GAS	-.187	.618**	.519**	
5 Social phobia	-.187	.059	.280*	.139

* p< .05 (2-tailed) ** p< .01 (2-tailed)

Discussion

The internal consistency of the adapted social phobia scale was found to be poor, suggesting that this is not a reliable measure of social phobia in adolescents with ID. However, low reliability of measures is a general problem in ID research (Crabtree & Rutland, 2001). It is not clear whether the discrepancy between the good internal consistencies found by other authors (Cox et al., 1996; Osman et al., 1993) and the poor internal consistency on the adapted version is due to the alterations in the item language and response scale or represents poor reliability within a younger population with ID. There are no previous studies using the Fear Questionnaire in young people with ID[1], therefore it is not possible to compare the results here with other studies in this population. This scale was selected for its merits of reliably assessing social phobia and the short administration time, which was

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[1] Authors report the use of this scale with typically developing young people aged 16-20 (Mizes & Crawford, 1986).

judged to be important given the number of other assessments included in the study and the possible limited attention span of the sample. Given the poor internal consistency of this measure it was excluded from all further analysis in the main study.

One possible explanation for the poor reliability found in this study is the types of fears examined by the Fear Questionnaire. Research suggests that the content of children's fears change as age increases; in younger children (age 5-6) worries tend to focus on physical well-being, with the focus of worries shifting towards behavioural competence, social evaluation and psychological well-being as children get older (Vasey, Crnic, & Carter, 1994). Muris, Merckelbach and Luijten (2002) found an association between fears and worries and cognitive maturation as measured by a Piagetian conservation task. This association was not found with children with ID, which the authors attribute to the small proportion (24.8%) of these children who passed the conservation task. The social phobia subscale of the Fear Questionnaire measures anxiety motivated avoidance of performance situations. Given their level of cognitive development it is possible that the participants in this study had not reached the level of development in which the content of fears shifts towards behavioural competence, social evaluation and psychological well-being. This being so, it may be that the social phobia sub-scale is failing to measure the content of the participants' fears.

Scores on the social phobia scale correlated with stigma. This gives some indication of validity. However, the scale did not correlate with anxiety, which would be expected if the social phobia scale were a valid measure.

Further research is required into social phobia and appropriate measures of social phobia in adolescents with ID.

Figure F1. Example of item and response scale from Adapted Social Phobia Scale

Reference List

Arscott, K., Dagnan, D., & Stenfert Kroese, B. (1998). Consent to psychological research by people with an intellectual disability. *Journal of Applied Research in Intellectual Disabilities, 11,* 77-83.

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Cox, B. J., Parker, J. D. A., & Swinson, R. P. (1996). Confirmatory factor analysis of the Fear Questionnaire with social phobia patients. *British Journal of Psychiatry, 168,* 497-499.

Crabtree, J. & Rutland, A. (2001). Self-evaluation and social comparison amongst adolescents with intellectual difficulties. *Journal of Community and Applied Social Psychology, 11,* 347-359.

Marks, I. M. & Matthews, A. M. (1979). Brief standard self-rating for phobic patients. *Research and Therapy, 17,* 263-267.

Mizes, J. S. & Crawford, J. (1986). Normative values on the Marks and Matthews Fear Questionnaire: a comparison as a function of age and sex. *Journal of Psychopathology and Behavioral Assessment, 8,* 253-262.

Morris, C. D., Niederbuhl, J. M., & Mahr, J. M. (1993). Determining the capacity of individuals with mental retardation to give informed consent. *American Journal on Mental Retardation, 98,* 263-272.

Muris, P., Merckelbach, H., & Luijten, M. (2002). The connection between contrive development and specific fears and worries in normal children and children with below-average intellectual abilities: a preliminary study. *Behaviour Research and Therapy.*

Osman, A., Barrios, F. X., Osman, J. R., & Markway, K. (1993). *Psychological Reports, 75,* 1259-1266.

Safren, S. A., Neimberg, R. G., Brown, E. J., & Holle, C. (1997). Quality of life in social phobia. *Depression and Anxiety, 4,* 126-133.

Vasey, M. W., Crnic, K. A., & Carter, W. G. (1994). Worry in childhood: a developmental perspective. *Cognitive Therapy and Research, 18,* 549.

APPENDIX G

School of Psychology Ethics Committee Approval Letter

Dear Hannah

Re: Facial emotion recognition and stigma awareness in people with learning disabilities and depression

The above titled application was approved by the School of Psychology Ethics Committee on 25 September 2006.

This approval is subject to you including details of contacting the Ethics Committee directly on the debriefing letter.

Should you require any further information, please do not hesitate in contacting me. Please quote reference CLIN/04/27.

Best wishes,

Kathryn

Miss Kathryn Smith
Secretary to the Ethics Committee
School of Psychology
University of Southampton
Highfield
Southampton SO17 1BJ
Tel: 023 8059 3995 Fax: 023 8059 2606
Email: kms@soton.ac.uk

Appendix H

ANCOVA Analysis with BPVS Raw Score as a Covariate

Discrimination Accuracy ANCOVA

As BPVS raw score was found to correlate with accuracy this was included as a covariate and the analysis repeated. When BPVS was included as a covariate a significant interaction between intensity x BPVS raw score F(1, 45) = 11.31, p= .002 was found, indicating that the effect of intensity on facial expression processing accuracy was different for people with different levels of verbal ability. As interactions between factors and covariates indicate that the assumptions of homogeneity of regression coefficients have been violated, two separate ANCOVAs was carried out, so that the two levels of intensity were analysed separately. Analysis of the 50% intensity data indicated a significant effect of BPVS raw score, F(1,47) = 6.28, p = .016; no other main effects or interactions were observed. A similar pattern of results were observed with the higher intensity data, a significant effect of BPVS raw score was observed, F(1,47) = 19.03, p <.001; no other main effects or interactions were observed. Thus verbal ability was a strong predictor of facial expression recognition accuracy, and subsumed the effects of emotion expression and exposure duration.

Response Bias ANOVA

As with the analysis of accuracy data, verbal ability was entered as a covariate and the analysis repeated. A significant main effect of emotion was observed; F(1,47) = 6.26, p= .016. Comparison of the means indicates that this main effect is the result of participants' greater tendency to report neutral in response to happy faces (M = .412) than to sad faces (M = .458). The main effects of duration and intensity that were observed in the ANOVA are no longer significant, indicating that these effects are a result of differences in verbal ability The interaction of emotion x intensity remained, although was weakened, F(1,47) = 4.19, p=.046. Interactions between emotion and duration and emotion and intensity were found to be non-significant, again suggesting that these differences were due to verbal ability. There were significant interactions between intensity x BPVS raw score, F(1,47) = 7.5, p = .009; and emotion x BPVS raw score, F(1,47) = 7.44, p = .009. These interactions raise questions regarding violation of the assumptions of homogeneity of regression.

Appendix I

Example FER Calculations

Discrimination Accuracy

Discrimination accuracy = (number of hits + 0.5 / number of targets+ 1) - (number of false alarms + 0.5/number of distractors + 1)

Gender Task

Perfect responder: accuracy tends to 1

= (24 + 0.5/24 +1) – (0 + 0.5/24 + 1)

= 0.96

Chance responder (who reports both genders randomly): accuracy tends to 0

= (12 + 0.5/24 +1) - (12 + 0.5/24 + 1)

= 0

Emotion Task

Perfect responder: accuracy tends to 1

= (32 + 0.5/32 +1) - (0 + 0.5/16 + 1)

= 0.96

Chance responder (who uses all three response options randomly and equally): accuracy tends to 0

= (10.6 + 0.5/32 +1) - (5.3 + 0.5/16 + 1)

= - 0.01

Chance responder (who always reports an emotion e.g. happy): accuracy tends to 0

= (32 + 0.5/32 +1) -(16 + 0.5/16 + 1)

= 0.01

Chance responder (who always reports neutral): accuracy tends to -1

$$= (0 + 0.5/32 + 1) - (0 + 0.5/16 + 1)$$

$$= -0.01$$

Response Bias Emotion Task

$$\text{Response bias} = \frac{(\text{number of false alarms} + 0.5/\text{number of distractors} + 1)}{(1 - \text{accuracy}).}$$

'Emotion biased' chance responder (always reports the relevant emotion e.g. happy): bias tends to 1

$$= \frac{(16 + 0.5/16 + 1)}{(1 - 0.01)}$$

$$= 0.98$$

Unbiased chance responder (uses all 3 categories equally): bias tends to a third

$$= \frac{(5.3 + 0.5/16 + 1)}{(1 - 0.01)}$$

$$= 0.34$$

'Neutral biased' chance responder (always reports neutral): bias tends to 0

$$= \frac{(0 + 0.5/16 + 1)}{(1 - -0.96)}$$

$$= 0.03$$

Perfect Responder: bias tends to 0.6

$$= \frac{(0 + 0.5/16 + 1)}{(1 - 0.96)}$$

$$= 0.66$$

Appendix J

Additional Analyses

Excluding Participants with Mid-Range Depression Scores

Participants with mid-range depression scores were excluded to give two groups of participants with high (n = 18) and low depression (n = 18) scores. The depression groups did not differ of verbal ability (BPVS) and therefore the groups were not equated on BPVS raw scores. The pattern of results was similar to that gained in the initial analysis.

Discrimination Accuracy

Main effects of emotion, F(1, 34) = 180.69, p < .001; intensity, F(1, 34) = 87.86, p < .001; and duration, F(1, 34) = 8.93, p < .001, were found. A significant interaction between emotion x intensity, F(1,34) = 18.49, p < .001, was observed. No other significant interactions were observed. No effect of depression was found (F(1, 34) = .51, p = .480).

Response Bias

Main effects of intensity, F(1, 34) = 141.27, p < .001; and duration, F(1, 34) = 14.00, p = .001, were observed. Significant interactions between emotion x intensity, F(1, 34) = 71.03, p < .001; emotion x duration, F(1, 34) = 8.53, p = .006; and intensity x duration, F(1, 34) = 6.20, p = .018, were found. No other significant interactions were observed. No effect of depression was observed (F(1, 34) = .277, p = .602).

Excluding Outliers

Participants with poor performance on the gender task (outliers) were excluded and the analysis repeated. Two outliers were excluded, leaving a total of 24 participants in each group.

Discrimination Accuracy

Main effects of emotion, F(1, 46) = 294.18, p < .001; intensity, F(1, 46) = 144.39, p < .001; and duration, F(1, 46) = 7.72, p = .008, were found. A significant interaction between emotion x intensity, F(1,46) = 26.96, p < .001, was observed. No effect of depression was found (F(1, 46) = .24, p = .630).

Response Bias

Main effects of intensity, F(1, 46) = 208.05, p < .001; and duration, F(1, 46) = 10.67, p = .002, were observed. Significant interactions between emotion x intensity, F(1, 46) = 98.69, p < .001; and emotion x duration, F(1, 46) = 6.92, p = .012, were found. No effect of depression was observed (F(1, 46) = .209, p = .650).