Impaired Social Functioning in Unipolar Depression

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Doctor of Philosophy
2009

Author's Declaration

I declare that this thesis contains the results of my own work and that it has been composed of by myself. All work belonging to other researchers has been fully acknowledged in accordance with academic conventions.

Signed .....

Date .....

Acknowledgements

To Graeme, the love of my life. For the past three years you have been there for me every day, always ready with a seemingly endless supply of love, support and black americanos (in a take out cup), caramel wafers and all the time in the world. So to you, my first thank you, you're the best part of every day and I just adore you.

My second thank you is to you Madeleine. I feel like a different person to the one who entered your office over three years ago. I thank you for your guidance and encouragement. Your confidence in my abilities has helped me to achieve more than I thought I could and for that I will always be grateful.

My third thank you is to my Mum and Dad and my two brothers Connor and Paul. Thank you all for spurring me on and for being such a great family, I love you all more than words can say. A special mention also to Buddy and Aimee, our chats helped a lot.

Next my thanks to another very important group of people, Rosa Serrano, Derek McCabe and Karin Petrini. Rosa you've been wonderful to work with and even better to go out for dinner with. Your involvement in finding patients and our subsequent friendship mean a great deal. Derek, despite your issues with red wine, you're a pleasure to know and your introduction to Rosa was extraordinarily well timed. And Karin, thank you for sharing in the ups and downs over the course of this PhD. Your crazy sense of humour and take on life has made no end of difference over the past three years. To each of you, a big thank you.

I would also like to thank Aisha Javaid for her involvement in coding some of the facial expressions in study 3 and the interviews in study 4. The time taken to become a FACS analyst and sift through pages of interviews is greatly appreciated, and I wish you all the very best for your future doctoral studies.

Acknowledgment is further given to; my second supervisor Marc Obonsawin, my panel member Tony Anderson and the technical assistance provided by Keith Edwards and Bill Woodside. Thank you all for being a part of my research and for your comments and suggestions throughout the past three years.

Of course, this PhD could not have been completed without the time and great effort of the men and women with depression who took part. Thank you all so much, it was a pleasure getting to know each of you and my love and best wishes to you all.

Finally, but very importantly, I want to thank all of my friends and everyone else who has been involved over the past three years, I hardly dare to say it but…it's finished!

Publication of Work Within This Thesis

A paper from chapter three has been submitted to the Journal of Abnormal Psychology as, Rice, N. M., Grealy, M. A., Obonsawin, M. C., & Millan Serrano, R. (Submitted). Traits, states and depression: Biases in affective information processing. My role in the paper was as first author, which included study conceptualisation, task development, recruitment, data collection, analysis and writing up. The second author, as first supervisor oversaw the study design and provided comments on analysis and manuscript drafts. The third author, as second supervisor was present for initial discussions regarding study design. The fourth author was the leading consultant psychiatrist who identified and contacted patients.

A paper from chapter four has been submitted to the Journal of Abnormal Psychology as, Rice, N. M., Grealy, M. A., Obonsawin, M. C., & Millan Serrano, R. (Submitted). Decoding and reasoning abilities: Theory of Mind functioning in unipolar depression. My role in the paper was as first author, which included study conceptualisation, task development, recruitment, data collection, analysis and writing up. The second author, as first supervisor oversaw the study design and provided comments on analysis and manuscript drafts. The third author, as second supervisor was present for initial discussions regarding study design. The fourth author was the leading consultant psychiatrist who identified and contacted patients.

A paper from chapter five has been submitted to the Journal of Nonverbal Behaviour as, Rice, N. M., Grealy, M. A., Obonsawin, M. C., Javaid, A., & Millan Serrano, R. (Submitted). To express or not to express: Factors influencing the facial responses of women with unipolar depression analysed using FACS. My role in the paper was as first author, which included study conceptualisation, task development, recruitment, data collection, FACS training, analysis and writing up. The second author, as first supervisor oversaw the study design and provided comments on analysis and manuscript drafts. The third author, as second supervisor was present for initial discussions regarding study design. The fourth author coded 5% of the video footage. The fifth author was the leading consultant psychiatrist who identified and contacted patients.

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Abstract

Depression has been shown to impair the ability of individuals to perform normal social roles, with past research and theory suggesting that impairments in social functioning may be related to a difficulty in the ability to identify and correctly interpret others social cues. The first two studies of this thesis were developed to investigate processes that may be underlying these perceptual problems with further investigations into the predictive contributions of depressive symptom clusters, personality traits and affective states, which have previously been neglected. The first study was based on social cognition research, which suggests that clinical depression itself may be associated with biased interpretations of emotional expressions. While depressive symptom clusters, personality traits and affective states were shown to be implicated in biasing responses to affective information, even in unison they only accounted for a small proportion of the variance suggestive of further influential factors. Study two explored two components of the Theory of Mind mechanism which refers to the everyday ability to ascribe mental states to others (Brune, 2003). Impairments in reasoning capabilities were found to be solely attributable to depression with decoding impairments independently attributable to personality traits, affective states and depressed mood. These factors, while influential, again did not affect a comprehensive influence. Social interactions involve the sending and receiving of information so the final two studies of this thesis were designed to explore verbal and non-verbal communications originating from the depressed individual. The third study showed that while individuals with depression generated fewer facial

responses to social interactions, measures of their habitual response tendencies demonstrated a greater intensity in the desire to emotionally express implying that individuals with depression were modulating the degree to which they displayed their emotions. Personality traits were proposed as affecting the regulation of emotional expression. Subjective discussions about the impact of depression on social functioning were lastly examined to provide a fuller understanding of the social impairments in this condition. With 50%-85% of people who suffer from one episode of depression suffering a relapse (American Psychiatric Association, 1994) and social communication abilities predictive of a higher risk of relapse (Inoue, Yamada, & Kanba, 2006), determining the factors inherent in social functioning problems may enable us to increase the success of social adjustment practices and therefore lessen the risk of relapse.

Chapter 1

Impaired Social Functioning and Unipolar Depression: An Introduction

The condition of depression not only precipitates substantial emotional distress but impairs an individual's ability to perform normal social functions, hindering their ability to interact with others. The occurrence of interpersonal difficulties is one of the most prevalent complaints of depression (Joiner & Coyne, 1999). Deficits in interpersonal functioning may instigate a withdrawal from social interactions resulting in a diminution of social support and serving to maintain the depressive episode and concurrently increasing the risk of relapse (Inoue et al., 2006). Individuals with this mood disorder themselves report, and are objectively reported, to be less socially competent during interactions (Dykman, Horowitz, Abramson, & Usher, 1991; Lewinsohn, Mischel, Chaplin, & Russell, 1980) encountering fewer positive and more negative engagements (Zlotnick, Kohn, Keitner, & Della Grotta, 2000), reporting lower levels of involvement in social activity, and reporting negative cognitions about personal interactions (Youngren & Lewinsohn, 1980a). This thesis presents a series of experiments designed to explore some possible processes involved in diminishing the social functioning of individuals with this condition.

Individuals with Major Depressive Disorder (here after referred to as depression) report feelings unsubstantiated by outside events demonstrating a wide variation of symptoms including disruptions in affect and mood, vegetative symptoms, altered cognitions and psychomotor activity (Gelder, Gath, & Mayou, 1990). Classified as a mood disorder by The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (American Psychiatric Association, 1994) this condition afflicts nearly one fifth of the world's population and is the leading cause of disability worldwide (as measured by years of life lived with disability) and the fourth leading contributor to the global burden of disease in 2000 (Gotlib & Hammen, 2002). Labelled the most common major biomedical condition in 'first world' countries (Fava & Kendler, 2000), by 2010 depression is projected to reach second place in the ranking of years of life lived with disability for both males and females, with only cardiovascular disease posing a greater health concern (Tylee, 1999). Today depression is already the second cause of disability for years of life lived for 15-44 year olds (World Health Organisation, 2001). The past decade has seen a dramatic increase in the number of reported cases of depression as well as a substantial, three decade drop in the age of onset from 55 years old in the 1960s to 24 years in 2000 (Cassano & Fava, 2002). In total, depression affects an estimated 121 million people worldwide, and is expected to affect between 25 to 45 per cent of adults with figures for children and adolescents rising. Furthermore depression is a chronic problem for the many afflicted by the condition, with recurrence rates ranging between 75% (Angst, 1992) and 87% (Keller & Boland, 1998). Cross sectional surveys additionally illustrate that the risk of relapse, once in remission of depression, will present as a reoccurring problem for half to two thirds of sufferers

throughout the rest of their lives (Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993; Weissman, Bruce, Leaf, Florio, & Holzer, 1991).

Beck (1967) categorised the symptoms inherent in depression into six distinct clusters; *Affective symptoms*: sadness, loss of pleasure, indecisiveness and crying; *Motivational*: pessimism and suicidal thoughts; *Cognitive*: loss of interest, concentration difficulties and memory impairments; *Cognitive distortions*: past failure, guilty feelings, punishment feelings, self-dislike, self-criticalness and worthlessness; *Behavioural*: agitation, loss of energy, irritability, tiredness or fatigue; and *Physiological or vegetative*: changes in sleep, changes in appetite and loss of interest in sex. Affective manifestations of depression alter the behaviour of an individual through increases in dejected mood, negative feelings towards themselves, a reduced ability to take satisfaction from activities, loss of emotional attachments, frequent crying spells and a loss of the ability to experience or display humour. Affective symptoms further weaken emotional attachments with a reduction in involvement and interest in other people and particular activities. When compared with a non-depressed sample 64% of severely depressed individuals reported a reduction in their interest in other people compared with 16% in the non-depressed group (Beck, 1967). Moving along a continuum, mild cases of depression result in a reduction in the reported levels of love or affection for partners and close family; moderate depression elevates this reduction in interest to feelings of indifference, with severe depression replacing reductions of interest and indifference with acutely negative feelings towards others (Kiloh, Andrews, & Neilson, 1988). Motivational manifestations arise as a loss of positive motivation. This loss of motivation can affect the desire to eat, to take medication and to take

actions towards eliminating distress and improving the depressive condition. Thoughts of avoidance and escapism are also features of depression leaving the individual with the belief that their work and duties are meaningless and burdensome. Suicidal thoughts, occurring more frequently with the depressive condition, may present as passive or active wishes and/or repetitive obsessive thoughts occurring sporadically or continuously (Angst & Preisig, 1995).

Cognitive disturbances of depression manifest as symptoms of low self-evaluation where an individual views themselves unsatisfactorily in areas personally deemed to be important, including intelligence, appearance, strength, health or financial status. Self-blame and self-recriminations are a central cognitive manifestation in depression, whereby individuals attribute outside occurrences and mistakes to flaws originating within themselves for which they extensively rebuke and self-criticise. Disrupted memory performance (Surtees & Barkley, 1994) is a further consequence of impaired cognitive functioning with individuals performing comparatively poorly on memory tasks and demonstrating significant improvements in recall after antidepressants or other non-pharmacologically based therapies (Cohen, Weingartner, & Smallberg, 1982). Autobiographical memory retrieval in depression is characterised by an over generality in recall whereby individuals tend to recall repeated or extended events rather than specific individual events (Williams, 1996). Further Lemogne et al. (2006) found that the deficit in autobiographical memory is most enhanced for positive memories, compared with neutral or negative. A meta-analysis by Burt, Zembar and Niederehe (1995), in which 99 studies were included, confirmed the presence of memory impairment in depression, specifically in reference to particular aspects of memory

and subsets of depressed individuals. By additionally examining the influence of moderator variables, Burt et al. (1995) explicated the variables exerting the greatest influence over the memory dysfunction-depression relationship. Age and patient status were revealed as the factors most consistently effecting recall with young depressed patients and inpatients demonstrating stronger associations with memory performance. Furthermore, Burt et al. (1995) posited that memory impairments, as opposed to being inherent to the depressive condition, may actually be associated with one or more factors common to various forms of psychopathology, such as the severity of illness, motivational deficits and effortful processing deficits (Dalgleish & Watts, 1990), rather than the condition of depression per se. Indecisiveness and distorted body image are further cognitive ramifications of depression (Surtees & Barkley, 1994). The behavioural or somatic symptoms of depression are common, with the majority of patients citing physical problems as the reason for an initial visit to a physician (Simon, VonKorff, Piccinelli, Fullerton, & Ormel, 1999). Associated with a high prevalence of comorbid anxiety in women, somatic symptoms include: bodily aches, joint pain, gastrointestinal problems, fatigue, psychomotor changes and appetite changes. Physiological or vegetative symptom manifestations include: sleep disturbances, loss of libido and fatigability.

The studies in this thesis are not only interested in understanding the involvement of depression in processes related to social dysfunction, but also in determining the combined role of personality traits and current affective states in conjunction with depressive symptoms. In relation to an individual's personal pattern of thinking, feeling and behaving (Gotlib & Hammen, 2002), there is a

growing body of literature which suggests that personality traits are associated with the depressive condition (Domken, Scott, & Kelly, 1994; Wilhelm, Parker, Dewhurst-Savellis, & Asghari, 1999). Of the different personality traits, neuroticism has arisen as the most pervasive (Costa & McCrae, 1988) and is recognised as one of the more reliable psychosocial predictors of recurrence (Angst, 1999; Mulder, 2002), with levels shown to be predictive of episode onset (Enns & Cox, 1997; Klein, Durbin, Shankman, & Santiago, 2002; Ormel & Wohlforth, 1991), and predictive of relapse and recurrence once in remission (Marks, Wieck, Checkley, & Kumar, 1992; Mulder, 2002; Surtees & Wainwright, 1996). The trait of neuroticism represents a tendency to experience negative emotional states such as anxiety, guilt, anger and depressive symptoms (Matthews & Deary, 1998), as well as a vulnerability to environmental stresses whereby situations are perceived as overly threatening and difficult (Lyness, Duberstein, King, Cox, & Caine, 1998). High neuroticism levels have been related to the severity of depressive episodes (Enns & Cox, 1997; Klein, Durbin, Shankman, & Santiago, 2002) with studies demonstrating markedly higher levels in depressed individuals than controls (Duggan, 1995; Eysenck & Eysenck, 1975; Kendler, Neale, Kessler, Heath, & Eaves, 1993; Ormel & Wohlforth, 1991), and predictive of the likelihood of a response to antidepressant medications (Alnaes & Torgersen, 1995; Berlanga, Heinze, Torres, Apiquián, & Caballero, 1999). Neuroticism levels have further been identified as one of four predictors of a major depressive episode in a longitudinal study with female twins (Kendler, Neale, Kessler, Heath, & Eaves, 1993). Additionally, individuals high in neuroticism report more medical complaints and somatic symptoms (Costa & McCrae, 1987). Studies such as these suggest that aside from being a concomitant, neuroticism may increase

the risk of developing depression. While individuals with higher levels of neuroticism have demonstrated enhanced recall for negative information, especially if it is self-referent, the influence of neuroticism over other cognitive processes such as attention, interpretation and response speed, show less consistent results (Rusting, 1998).

As high levels of neuroticism have been associated with depression, so too have low levels of extroversion. Extroversion is associated with positive cognitive biases, in relation to positive attributes about the self. A broad construct, trait extroversion encompasses positive emotionality, energy, affiliation and dominance (Clark, Watson, & Mineka, 1994). Depressed individuals report lower levels of extroversion than controls, with reduced levels implicated in the prediction of a poorer course of depression (Klein et al., 2002). Low extroversion individuals are typically reserved, independent and prefer to be alone whereas higher levels increase positive evaluations of situations, predisposing individuals to positive affects (Watson & Clark, 1992; Watson, Clark, & Carey, 1988), and increase social support seeking behaviours and active coping strategies (Amirkhan, Risinger, & Swickert, 1995; Costa, Somerfield, & McCrae, 1996; Vollrath, Torgersen, & Alnaes, 1995; Watson & Hubbard, 1996). Extroversion also appears to work in combination with other traits, enhancing the positive effects of low neuroticism, but only slightly diminishing the negative effects of high neuroticism (Vollrath & Torgersen, 2000). A number of studies have further demonstrated positive correlations for neuroticism and negative correlations for extroversion with affective, cognitive and motivational symptoms, but not with the vegetative symptoms of depression (Parker, Blignault, & Manicavasagar, 1988; Vaz Serra & Pollitt, 1975).

A further personality trait, conscientiousness positively correlates with underlying motivational goals of achievement and conformity values and is expected to alter mood due to this direct effect on performance and achievement (McCrae & Costa, 1991). Conscientiousness shows substantial stability across an individual's life (Costa & McCrae, 1988) and as such may represent a stable vulnerability factor for some depressive episodes with levels tending to be low in depressed individuals (Anderson, 1994; Trull & Sher, 1994). Low levels of conscientiousness manifest as irresponsible, disorganised and unscrupulous behaviours, with high levels characterised by careful, thorough, responsible and organised tendencies (McCrae & Costa, 1991). Trait conscientiousness may be divided into two distinct aspects; an inhibitive aspect which monitors and controls impulse behaviours; and a proactive aspect which pushes the individual to achieve (McCrae & John, 1992). Low conscientiousness may increase the occurrence of a depressive episode by contributing to the difficulty and stress of daily life (Hammen, 1991). Low levels of this trait relate to a higher preponderance of performance failures which will likely increase stress and contribute to the formation of negative outcome expectancies, and negative beliefs about the self. Such negative cognitive schemata are consistent with those characteristic of depression (Anderson & Skidmore, 1995).

Agreeableness and openness to experience are the two least explored traits out of the five-factor model (Dollinger, Leong, & Ulicni, 1996). The characteristics of trait agreeableness are most implicated in social perception and cognition however, due to the link between social evaluation and features of this trait (Graziano & Eisenberg, 1994). High levels of agreeableness engender good natured, compliant,

modest, gentle and cooperative individuals whereas low levels are characterised by irritable, ruthless, suspicious and inflexible tendencies (Roccas, Sagiv, Schwartz, & Knafo, 2002). Conforming to societal norms and values are important motivational goals for individuals high in agreeableness in line with the high regard for interpersonal relationships. Agreeableness was found to be the largest factor (Digman & Takemoto-Chock, 1981) and is the most important in terms of social relations being the most concerned with interpersonal relationships. Agreeable people are highly motivated to maintain positive relationships with others, which may alter evaluations of people and situations in a positive fashion. Individuals, who score highly on the trait of openness to experience however, tend to be imaginative, intellectual and sensitive, with high levels corresponding with higher levels of understanding and tolerance for people and new ideas, as well as an appreciation for art and nature. Low scores tend to reflect down to earth, insensitive and conventional dispositions (McCrae & Costa, 1991). In opposition to the motivational goal of adhering to social values and upholding the status quo in agreeableness, individuals high in openness are motivated to experience new and exciting events and people. Neither of these traits have been demonstrated to enact an important role or contribution to the depressive condition, with both being the least explored traits out of the five factor model (Dollinger et al., 1996). However it could be expected, given the manifested tendencies and the understanding that both traits include characteristics necessary for successful social engagements, that agreeableness and openness to experience would negatively correlate with depressive symptoms.

Current mood state is further altered in depression, with neuroticism and extroversion generally also implicated in affective state dimensions. Neuroticism and extroversion have been repeatedly and robustly associated with negative and positive affect respectively (Costa & McCrae, 1980; Larsen & Ketelaar, 1991; McFatter, 1994). Negative affectivity is a mood-dispositional dimension, said to reflect individual differences in negative emotionality (Watson & Clark, 1984). High levels of negative affect manifest as enhanced levels of distress and negative self-perceptions, with diminished disturbances and more secure self-perceptions ensuing from lower levels of negative affect. In contrast, positive affect reflects an individual's level of enthusiasm, activity, alertness and pleasurable engagement, with reductions in positive affect conversely characterised by sadness and lethargy (Watson et al., 1988). The personality dimension neuroticism has been found to predict negative affect in a person's everyday life, whereas extroversion is predictive of positive affect across much longer time periods (Magnus, Diener, Fujita, & Pavot, 1993). While positive and negative affect may initially be interpreted as two ends of a continuum, they are in fact individually distinct dimensions (Watson & Clark, 1988).

The remainder of this chapter has been divided into four sections, each of which reviews an area of literature pertinent to the discussion of the social dysfunction associated with depression. The first section (1.1 Social functioning and depression) discusses the different cognitive and interpersonal theories proposed to elucidate the processes underpinning social functioning. Attempts to understand the compromised interpersonal processes underlying this condition have attracted considerable research, with a substantial focus afforded to the assessment of the

involvement of cognitive variables. Some studies propose that depression may give rise to a tendency to process information in a disturbed manner, positing a difficulty in the ability of depressed individuals to identify and correctly interpret social cues, whereby depression is associated with biased interpretations of emotional expressions. The nature of emotion recognition difficulties is therefore discussed in this section and comprises the focus of the first study in this series (Chapter 3). The second section of this chapter (1.2 Theory of Mind abilities and social functioning) details the literature surrounding the Theory of Mind mechanism, a framework representative of processes, which may be implicated in altering an individual's ability to successfully interact with others. Referring to the everyday ability to ascribe mental states (e.g. beliefs, emotions, knowledge, intentions etc) to others to both understand and predict social behaviour (Wellman, 1990), the component processes of Theory of Mind, decoding and reasoning capabilities, are discussed and further examined in the second study in this series (Chapter 4). This is with a view to determining whether depression is disrupting these processes and consequently impairing social engagements.

The third section of chapter 1 (1.3 Emotion responsivity and social interactions), reviews the literature regarding the non-verbal communications originating from the depressed individual with specific reference to facial expressivity. Altered patterns of facial responses may be implicated in the higher frequency of negative and dissatisfying interactions in depression, with successful and enjoyable interactions necessitating competency in expressing subjective emotions and intent, alongside capabilities to interpret others' social cues and intentions. The involvement of disrupted responsivity during social interactions in

the impaired social functioning evident in depression is later explored in the third study of this series (Chapter 5). The final section of this first chapter (1.4 A qualitative approach to social functioning and depression) discusses the literature which has employed a qualitative approach in interpreting the subjective experiences of individuals with depression. While existing qualitative research has not specifically explored the personal experiences of social interactions in women with depression, some of the themes raised by previous research are of relevance to increasing our understanding of this matter. The final study presented in this thesis (Chapter 6), therefore reports the themes pertaining to social functioning difficulties in depression identified through discussions with women experiencing a depressive episode. As previously mentioned, the studies in this thesis are interested in determining the involvement of depressive symptoms and personality traits and affective states in processes related to social dysfunction. The relationships and influence of individual differences with the depressive condition and social behaviour are therefore discussed in section 1.3 in relation to levels of responsivity, and further in each of the studies detailed in chapters 3 to 5.

1.1 Social Functioning and Depression

Current conceptualisations of social skills note the ability to interact in an appropriate and effective manner, that is, behaving in a way which does not violate social norms, values or expectations, is not viewed negatively by others, and in a

way which achieves the person's intended goals for the interaction (Segrin, 1992; Spitzberg & Cupach, 1985). The occurrence of interpersonal difficulties is one of the most prevalent complaints of depression however (Brown & Harris, 1978; Joiner & Coyne, 1999; Weissman & Paykel, 1974), with reports of smaller social networks (Brim, Witcoff, & Wetzel, 1982), less frequent social interactions, poor social adjustment (Gotlib & Lee, 1989a) and an increased incidence of rejection by interaction partners, all demonstrated to accompany the depressive condition. Self-report inventories have evolved as one of the more effective methods for assessing social skill tendencies over a wide range of unobservable social behaviours and situations. A large number of studies demonstrate that depressed individuals rate their aptitude for social functioning more negatively than non-depressed people (Vanger, 1987). Observer and partner ratings also support the proposal of deficient social skills in depression, rating depressed individuals as less socially skilled (Dalley, Bolocofsky, & Karlin, 1994; Edison & Adams, 1992; McNamara & Hackett, 1986). Whilst some studies have not found a distinction between depressed and non-depressed observer ratings of social skills (Ducharme & Bachelor, 1993; Gotlib & Meltzer, 1987), looking across studies the effect size for depressed and non-depressed differences in observer ratings of social skills was (d = .30 to .61)(Segrin, 1990), a figure supportive of a perceived deficit in social functioning in depression.

1.1.1 Emotion Recognition and Depression

To explore the social functioning difficulties in depression studies have examined depressed individuals' perception of emotionally salient information to

determine how disturbances in processing affective information are derived or suppressed as a function of depression. Ekman (1992) claimed that the face is the primary source from which people perceive emotion, resulting in numerous studies examining emotion recognition in depressed patients and non-depressed individuals using facial expression stimuli (Gilboa-Schechtman, Ben-Artizi, Jeczemien, Marom, & Hermesh, 2004; Gur & Erwin, 1992; Mikhailova, Vladimiroa, Iznark, Tsusulkaya, & Sushko, 1996; Ridout, Astell, Reid, Glen, & O' Carroll, 2003). Since the face is a powerful source of social information with facial expressions accompanying most interactions (Buck, 1984; Miller, Caul, & Mirsky, 1967; Trower, Bryant, & Argyle, 1978), a bias or inability to correctly decipher facial cues could have a significant impact upon an individual's ability to function successfully during social interactions.

Bipolar patients have demonstrated impaired recognition of happy and sad facial expressions (Rubinow & Post, 1992) and increased bias towards emotional stimuli when compared with neutral stimuli (Gur & Erwin, 1992). Further studies have also reported a generalised emotion recognition deficit (Asthana, Mandal, Khurana, & Haque-Nizamie, 1998; Jaeger, Borod, & Peselow, 1987; Mikhailova et al., 1996; Persad & Polivy, 1993; Rubinow & Post, 1992) with patients demonstrating increased negative and positive biases (Lyon, Startup, & Bentall, 1999). Euthymic depression patients have demonstrated enhanced activation in specific brain regions for expressions of disgust and impaired levels of recognition for fearful expressions (Harmer, Grayson, & Goodwin, 2002; Yurgelun-Todd et al., 2000).

Studies with unipolar depressed patients have indicated towards accuracy deficits in recognising specific emotions, i.e. happiness, sadness, interest, fear, anger and surprise (Rubinow & Post, 1992; Surguladze et al., 2004), as well as more general emotion recognition deficits (Feinberg, Rifkin, Schaffer, & Walker, 1986; Zuroff & Colussy, 1986). Studies assessing deficits in information processing speed have predominantly indicated a negative attentional bias, in that depressed individuals take longer to respond to mood incongruent emotional expressions compared with healthy controls (Leppänen, Milders, Bell, Terriere, & Hietanen, 2004; Persad & Polivy, 1993). Other studies have reported impairments manifesting in emotion-specific perceptual biases, whereby depressive symptoms alter the perceptual evaluations of affective stimuli so that significantly more sadness is perceived in facial expressions compared with healthy volunteers (Bouhuys, Geerts, & Gordijn, 1999; Gur & Erwin, 1992; Hale, Jansen, Bouhuys, & Van Den Hoofdakker, 1998; Matthews & Antes, 1992). Discrepancies as to the whether behavioural responses to affective stimuli are biased in unipolar depression exist within the literature however.

A number of studies have failed to support the proposal of group differences between depressed and non-depressed individuals in accurately classifying emotional expressions (Gaebel & Wolwer, 1992; Gollan, Panea, McCloskeyb, & Coccarob, 2008; Walker, McGuire, & Bettes, 1984). The perceptual shifts in judgments of affective stimuli also appear to be relatively task dependent (Gotlib & Cane, 1987; Gotlib, McLachlan, & Katz, 1988; Hill & Dutton, 1989; MacLeod, Mathews, & Tata, 1986) and not consistently allocated to depressed participants, in that non-depressed participants have been found to favour positive stimuli and

depressed participants failing to demonstrate a bias of any kind (Gollan, Panea, McCloskeyb, & Coccarob, 2008; McCabe & Gotlib, 1995). While a biased or altered ability to interpret and respond to emotional cues may play an important role in the social functioning impairments in depression, and numerous studies exist to support the hypothesis that depression involves automatic negatively biased processing of information, further studies examining cognitive processes in depression have provided inconsistent support, failing to demonstrate facilitated mood congruent processing. The inconsistencies within this literature and the determination as to the influence of depressive symptoms over behavioural responses to affective stimuli, are further discussed in length in study 1 (Chapter 3).

1.1.2 Cognitive Theories of Social Impairment in Depression

Cognitive theories have been developed to account for the proposed differences in how emotional information is processed as a function of the presence of depression. These theories claim that all levels of processing (perception, attention and memory) are influenced by mood congruent biases, with attention attributed to negative aspects of events or interactions and a tendency to remember mood congruent information (Beck, 1967, 1976; Beck & Steer, 1987; Bower, 1981; Williams, Watts, Macleod, & Mathews, 1997). With 60% of communication being non-verbal it is reasonable to assume that the interpretation of another's non-verbal cues plays an important role in interactions (Burgoon, 1985). The idea that non-verbal processes play a role in the difficulties experienced by those with depression during social interactions has been proposed by several authors (Bouhuys &

Albersnagel, 1992; Gotlib & Robinson, 1982; Segrin, 1993 ; Segrin & Abramson, 1994).

Beck's cognitive theory of depression (1967, 1976) proposed that dysfunctional beliefs and attitudes generate negative automatic thoughts which themselves are the cause of depressive symptoms. Beck proposed that early adverse events set up negative schemas centring around feelings of loss, failure and abandonment (Beck, 1967). Later in life when stressful or upsetting events occur these schemas are reactivated and initiate the feelings associated with the initial trauma. These schemas, Beck proposed, take the form of rigid dysfunctional beliefs and attitudes about the self, the world and the future (Beck, Rush, Shaw, & Emery, 1979), influencing the perception, integration, interpretation and retrieval of information. Biases are generated by these schemas as they act as filters through which all environmental stimuli and information is perceived, evaluated, attended to and remembered (Gotlib & Krasnoperova, 1998). Biases are formed as, in order to achieve congruency between the incoming information and existing schemas, selective attention is given to particular aspects of information, distorting positive stimuli and perceiving negative stimuli in an enhanced way. Such biases and schemas, Beck suggested, are the root cause of depressive symptoms, with the dysfunctional beliefs and filters negatively impacting on social functioning and precipitating relapse. Kuiper and Derry (1982) supported the proposal that schemata facilitate the processing of congruent information and found that depressed individuals endorsed negative self-relevant information more frequently than non-depressed individuals as well as displaying a tendency to over-estimate the occurrence of negative events (Kuiper & MacDonald, 1982), and reduced levels

of efficiency in processing information pertaining to other people (Kuiper & MacDonald, 1982). Due to these cognitive distortions, it is expected that depressed individuals will attend to the negative features of an interaction or situation, experience positive aspects of their environment less positively than non-depressed individuals, and are likely to misinterpret ambiguous or neutral stimuli as emotionally meaningful, normally negatively biased (Hammen & Krantz, 1976).

Bower (1981) and Williams et al. (1997) also proposed models in which cognitive biases were central to the maintenance, severity and duration of depressive mood. Bower's network theory (Bower, 1981; Bower & Cohen, 1982; Bower & Forgas, 2000) proposed that concepts, emotions and events are represented as nodes within a network. Activation of one node may spread the activation to adjoining nodes depending on the proximity of accompanying nodes, the strength of the initial activation and the time lapsed since activation. Mood induction studies, which demonstrated mood-congruent memory performance, supported Bower's theory (1981) and were found to influence a range of processes including free association, social judgments about people and perceptual categorisations. Different biases were found to relate to different mood states (Williams et al., 1997) however, which did not fit with the schema theory of Beck or the network theory of Bower. Williams et al. (1997) proposed therefore that specific moods are attributable to specific biases. The attentional biases of depressed patients were, under this model, attributed to uncontrolled for anxiety levels (Gotlib & McCann, 1984; Williams et al., 1997). Biases were consistently found in depressed participants however, even though depressed individuals did not necessarily demonstrate comorbid anxiety or expected anxiety-related response patterns as proposed by this theory. Teasdale's

(1983, 1988) Differential activation hypothesis provided an elaboration of Bower's theory (1981) proposing that the activation of negative memories and constructs may subsequently influence the interpretation of new events and serve to maintain a depressive episode. Teasdale (1988; 1983) further postulated that the activation of these negative processes during mild depression will determine whether an individual's episode escalates in severity and duration. Support has been demonstrated for this theory with studies demonstrating that negatively valenced memories are more easily retrieved during mood inducement (Teasdale & Fogarty, 1979a; Teasdale, Taylor, & Fogarty, 1980), and that interrupting negative thoughts reduces depressive symptoms (Fennell & Teasdale, 1984; Fennell, Teasdale, Jones, & Damle, 1987; Teasdale & Rezin, 1979b; Teasdale & Rezin, 1979c).

1.1.3 Interpersonal Theories of Social Impairment in Depression

Interpersonal encounters can greatly affect whether a person becomes depressed, their subjective experience of the depression and resolution of the episode (Joiner, Alfano, & Metalsky, 1993; Joiner & Coyne, 1999). Interpersonal theorists have proposed a number of hypotheses for explaining the social difficulties in this condition. Lewinsohn (1974a) proposed that a reduced ability to initiate positive interactions coupled with a tendency to provoke negative outcomes, precipitates episodes of depression (Lewinsohn, 1974b, 1975). With depressed individuals experiencing difficulty in eliciting favourable impressions, they instead are viewed as inept, disengaged and dull (Lewinsohn, 1975). Studies carried out by Wierzbicki (1984) and Wierzbicki and Mccabe (1988) provided initial support for

Lewinsohn's Behavioural theory of depression (1974a), demonstrating that diminished social skills were predictive of worsening depression over a 1-2 month interval. Subsequent studies using diagnostic interviews (Hokanson, Rubert, Welker, Hollander, & Hedeen, 1989), an assortment of social skill measures (Segrin, 1996), interval periods of 4-12 months (Hokanson et al., 1989; Lewinsohn et al., 1994; Segrin, 1993, 1996), larger sample numbers (Lewinsohn, Hoberman, & Rosenbaum, 1988) and various stages of assessment (Segrin, 1999), were not able to support the findings of Wierzbicki (1984; Wierzbicki & McCabe, 1988) or Lewinsohn's Behavioural theory (1974a, 1975). Lewinsohn (1985) further proposed that poor social skills may be a consequence of depression as opposed to a cause. Referred to as the scar hypothesis, the proposal that depression would result in impaired social skills was demonstrated in a study by Rohde, Lewinsohn and Seeley (1990), which found that the social skill level of individuals who had previously been depressed remained lower than never depressed individuals even up to 1-2 years after episode remission. Subsequent studies provided mixed support for this hypothesis (Cole & Milstead, 1989).

Coyne proposed the Interactional theory of depression (Coyne, 1976a; Coyne, Burchill, & Stiles, 1990) maintaining that it is a depressed individual's constant reassurance seeking behaviour that disrupts and eventually erodes relationships and interactions. There are three main aspects to Coyne's theory; rejection elicitation, excessive reassurance seeking and negative mood inducement. The first of which, that depressed individuals elicit more rejection from others, has been supported by numerous studies (Amstutz & Kaplan, 1987; Elliott, MacNair, Herrick, Yoder, & Byrne, 1991; Gurtman, 1987; Segrin & Dillard, 1992). A possible

factor responsible for these increased rates of rejection, Coyne proposed, is the issue of inappropriate self-Disclosure. This refers to the tendency to share intimate thoughts and feelings with others (Coyne, 1976b). Individuals operate using norms of self-disclosure during social interactions. Positive disclosures are expected if conversing with non-intimate conversational partners (Chaikin & Derlega, 1974) but negative disclosures are not (Altman & Taylor, 1973). While the negative information is disclosed by the depressed individual so as to induce social support (Segrin & Abramson, 1994), the self-disclosure of personally relevant negative issues appears to be a central factor in eliciting rejection behaviours from others (Gurtman, 1987; Hooley, 1986). Coyne (1976b) further postulated that contributing to the breakdown of social interactions is the depressed individual's excessive reassurance seeking behaviour. Proposing that while initial requests for reassurance will generally be responded to with concern and support from other people, responders may become increasingly frustrated and resort to offering non-genuine support and reassurance, should requests persist. The depressed individual is said to detect the decrease in genuine compassion and as such engage in more reassurance seeking behaviours. As this cycle continues Coyne believed it would culminate in the total breakdown of social interactions and relationships (Coyne, 1976b). A substantial number of studies exist which demonstrate that reassurance seeking is common in depressed individuals and can have corrosive relational effects (Joiner, 1995; Katz & Beach, 1997). The third aspect of Coyne's theory (1976a) is that depressed individuals induce negative mood in interaction partners, a concept termed emotional contagion (Gotlib & Robinson, 1982). More recently Joiner and Katz (1999) demonstrated support for the proposal that depressed individuals induce

negative affect and depressive symptoms in responders in a meta-analysis of the literature.

The Diathesis-Stress model proposed by Segrin (1996) to account for impaired social skills in depression views deficiencies in social skills as a vulnerability factor in the development of depression (Segrin, 1996; Segrin & Flora, 2000). This theory predicts that individuals who have impaired social skills, and who subsequently experience events that are stressful, may become depressed as their poor social skills will have prevented the formation of a supportive social network of individuals to ease them through these challenging periods. Segrin therefore proposed that it is a combination of poor social skills and negative stressful life events which produce depression (Segrin, 1999), suggesting that individuals with adequate social skills will be able to obtain sufficient support to sustain them through negative events and as such would be less affected by them. Those without the abilities to obtain social support however are at an increased risk during stressful events. Segrin and Flora (2000) examined this theory with students starting university. Students measuring poorest on social skill abilities appeared to be most affected by stressful events and were at increased risk of experiencing a depressive episode. Cummins (1990) found similar results indicating that impaired social skills do interact with negative events to increase vulnerability to depression.

Theories of depression have traditionally been separated into cognitive (Beck, 1967, 1976) and interpersonal (Coyne, 1976b). Single factor theories however cannot be said to capture the complexity of human functioning, leading to the integration of cognitive and social factors in accounts of depression maintenance

(Hammen, 1997; Joiner, Schmidt, & Vohs, 2000). Interpersonal interactions are likely to combine with cognitive processes to increase or decrease negative mood e.g. cognitive processes such as biased attention or impaired memory performance will likely contribute to the probability of choosing to engage or disengage in social contact (Gilboa-Schechtman, Erhard-Weiss, & Jeczemien, 2002). Lewinsohn (1974a, 1975) and Segrin (1996) both postulated that social skill deficits act as vulnerability markers for depression. Segrin's theory (1996) proposed an amalgamation of social skill deficits and stressful life events. Beck's cognitive theory (1979) of depression however asserts that interpersonal difficulties are the consequence of a negative bias which alters the individual's view of themselves, the world and their future. This results in the perception and expression of predominantly negative emotions, which serve to distance the depressed individual from their interaction partner. Interactional theory (Coyne, 1976c; Coyne et al., 1990) however maintains that it is the depressed individual's constant reassurance seeking behaviours that disrupt and eventually terminates their interpersonal relationships and interactions. Whereas cognitive theory holds inaccurate interpretations and perceptions of interactions accountable for the dysfunctional relationships in depression, Interactional theory proposes that they are in fact the result of the depressed individual accurately perceiving a withdrawal of support and interest from their interaction partner. This then leads to an increased need for reassurance, which then ultimately overwhelms their partner into leaving. A social cognitive approach offers a combination of these theories, asserting that all people distort information under some conditions and perceive information accurately under other conditions (Fiske & Taylor, 1991; Nisbett & Ross, 1980). This approach contends that it is more likely

that depressed individual's perceptions are both accurate and inaccurate across different social contexts (Alloy, 1988; Kuiper & Higgins, 1985).

1.2 Theory of Mind Abilities and Social Functioning

Further to exploring the possibility of interpretative biases and altered emotion recognition, questions have been raised as to whether impairments in social functioning might be explained in terms of an underlying cognitive deficit in representing one's own and others intentions in impaired Theory of Mind capabilities. Theory of Mind is the ability to represent mental states, such as beliefs, intentions and desires, and to use these inferences to guide and direct one's own actions and beliefs (Brune, 2003; Premack & Woodruff, 1978; Wimmer & Perner, 1983). The concept of Theory of Mind can be divided into two separate aspects; the ability to decode mental states from social information such as body gestures, facial expressions and vocal tone, and the ability to deduce mental states through reasoning capacities, by integrating contextual and historical information about a person (Sabbagh, 2004). The acknowledgment and understanding of other people in this way is crucial for successful social communication and interactions. The Theory of Mind mechanism appears to have three main functions: Firstly, it enables us to comprehend and explain the behaviour and actions of others, preventing us from being confused and overwhelmed by the complexity of other people and social interactions. Secondly, Theory of Mind enables us to make predictions about other people's behaviour, removing a great deal of the complexity apparent in our everyday lives, thus allowing us to adapt correctly to social situations. Thirdly, this

mechanism allows us to exert influence and power over our interactions with others by monitoring our engagements and perceiving another's goals, desires and beliefs.

1.2.1 Assessments of Theory of Mind

Before discussing the research examining Theory of Mind abilities in depressed individuals it is important to examine the types of assessments available and their suitability to individuals with depression. Theory of Mind abilities may be tested by various tasks, with the most well known being first and second order false belief tasks (Dennett, 1978; Flavell, 1988; Wellman, Cross, & Watson, 2001; Wimmer & Perner, 1983). First order false belief tasks establish whether a person can predict the actions of a character based upon the attribution of a false belief to that character. For example, a first order false belief task scenario would be as follows; *Anne and John are playing together when John goes to find a toy from another room. While he is out of the room Ann takes his drink from the table and hides it behind the sofa*. In order to pass this task a person must be able to suspend their reality and the knowledge they have about a situation and instead answer the question '*where will John look for his drink'* based on the false knowledge of the other person. An individual with intact Theory of Mind would correctly predict that, upon re-entering the room, John would look for his drink on the table as he does not know that Ann has moved it. Children have been shown to typically have developed this ability by the age of three to four years (Wimmer & Perner, 1983). Second order false beliefs are a stage more difficult than first order. Here an individual is required to correctly attribute a false belief about a belief. Adapting the example above; '*if John*

looked back into the room while Ann was hiding his drink, but did not let Ann see him, where would Ann think John will look for his drink?' Children have been found to successfully pass these second order tasks at age six/seven (Wimmer & Perner, 1983). While suitable for examining Theory of Mind in children, and in some disorders such as autism, these types of tasks may not be appropriate for adult samples with depression due to ceiling effects (Corcoran & Frith, 2003).

Higher order tasks assessing the reasoning capabilities of Theory of Mind, those abilities which enable us to use contextual and historical information about a person or situation to predict mental states, have been designed to test the interpretation of non-literal language such as sarcasm, irony and deceit and are more suited to adult populations of normal intelligence. Such tasks are supported as Theory of Mind assessments in that the tasks involve understanding and inferring about a speaker's knowledge, beliefs or intentions (Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997; Happe, 1993; Winner, Brownell, Happé, Blum, & Pincus, 1998). Stone, Baron-Cohen and Knight (1998) developed a further higher order Theory of Mind reasoning task called the Faux Pas task, which assesses the ability to detect social faux pas in various situations. In a similar vein, Corcoran (2000) and Marjoram et al. (2005) devised a task called the Hinting task in which individuals are asked to determine whether someone is dropping a hint throughout the course of a brief exchange which is read to them.

In order to assess decoding abilities, an individual's ability to interpret physical cues to determine mental states, a separate set of tasks are required. Emotion recognition tasks may seem suitable however, while facial expressions of

emotion convey social responses, it is not clear whether the Theory of Mind system is responsible for individual's interpretations outside of facial recognition abilities. Baron-Cohen (1995) was the first to propose that the eyes are significant communication channels for emotions and mental states. The 'Reading the mind in the eyes' task (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001) (here after referred to as the Eyes task) examines the initial stages of the attribution of mental states based on photographs depicting only the eye region of a person's face, and enables the assessments of individual's decoding capabilities. Studies by Gallagher and Frith (2003, 2004) further investigated the neural correlates of different types of body movements, and demonstrated the existence of two dissociable neural networks for the perception of two types of gesture; expressive gestures which communicate an emotional mental state, and instrumental gestures which are merely instructive and contain no information pertaining to an actor's mental state. FMRI results confirmed that expressive gestures activate a neural network associated with Theory of Mind function (Gallagher & Frith, 2004), with instrumental gestures based more in left lateralised language and imitation networks. These types of tasks, unlike the first and second order false belief tasks, are far more sensitive to high-level Theory of Mind impairments. Participants who have performed normally on the false belief tasks have been found to demonstrate impairments when sitting these high-levels tasks, while performing well on other cognitive tasks (Stone et al., 1998).

1.2.2 Theory of Mind and Depression

Investigations into the Theory of Mind in depression have only recently begun (Bora et al., 2005; Doody et al., 1998; Inoue, Tonooka, Yamada, & Kanba, 2004; Inoue et al., 2006; Kerr, Dunbar, & Bentall, 2003; Lee, Harkness, Sabbagh, & Jacobson, 2005; Olley et al., 2005; Uekermann et al., 2008; Werden, Elikann, Linster, Dykierek, & Berger, 2008) with initial examinations generating conflicting results. Doody et al. (1998) studied Theory of Mind in a mixed sample of non-psychiatric controls, affective disorder patients, schizophrenic patients with normal pre-morbid IQ, schizophrenic patients with pre-morbid IQ indicating mild learning disability, and individuals with no prior history or current diagnosis of psychiatric illness but with mild learning disabilities. First and second order Theory of Mind tasks were used to assess impairments. People with schizophrenia and mild learning disabilities demonstrated impaired Theory of Mind abilities with the affective disorder patients failing to demonstrate any second order Theory of Mind impairments. Single sample studies however, with unipolar depressed participants have indicated decoding and reasoning deficits (Lee, Harkness, Sabbagh, & Jacobson, 2005; Werden, Elikann, Linster, Dykierek, & Berger, 2008). The study by Lee et al. (2005) used the Eyes task (Baron-Cohen et al., 2001) to examine the decoding capacity of clinically depressed patients, specifically female unipolar depression sufferers. This study concluded that women experiencing severe unipolar depression were substantially impaired in decoding complex mental states from pictures of the eyes across positively and negatively valenced mental states. Lee et al. (2005) further found that participants who demonstrated the greatest levels of impairment on the Eyes task were those who scored high on the affective

symptoms of depression. Such symptoms include depressed mood, guilt, anhedonia, retardation and suicidality. Lee et al. (2005) proposed that such a list of symptoms are very similar to those in the hopelessness subtype of depression. This subtype is characterised by the belief that negative events are likely to occur and that they will have a devastating effect on that person's life, and that there is nothing that can be done to prevent these events from occurring (Abramson, Metalsky, & Alloy, 1989). It has been proposed then that individuals who score high in these symptoms may have effectively given up, and no longer possess an interest in others or social situations (Bonner & Rich, 1988). By surrendering in such a way, cognitive resources may not be allocated to attending to processing social information, thus delivering the results in Lee et al.'s (Lee et al., 2005) study. Based on their study, it appears that Theory of Mind deficits may vary within depression as a function of the presence of certain affective symptoms indicative of certain subtypes of depression.

Inoue et al. (2004) assessed Theory of Mind in a mixed sample set of bipolar and unipolar patients currently in remission using first and second order false belief tasks. Across a battery of tests participants in remission from a mood disorders showed a significant deficit on the second order false belief task. Inoue et al. (2006) then followed these patients for one year and found that the patients who had previously demonstrated Theory of Mind deficits in second order false belief tasks relapsed significantly more frequently than those who had not previously demonstrated a deficit. Patients with second order false belief Theory of Mind deficits, when in remission, may be at a higher risk of relapse and lower social functioning after 1 year of remission. In a more recent study by Uekermann et al.

(2008) Theory of Mind and executive functioning were assessed in individuals with major depression, alongside a more socially complex task designed to examine humour processing. This study demonstrated social cognition deficits with the depression patients performing below the control group for affective and cognitive aspects of humour processing. The reduced ability to process humour is believed by this study to be associated with the impaired Theory of Mind ability to mentalise and perceive another person's perspective.

Bipolar disorder has received the highest level of attention however, with individuals demonstrating impairments across an array of decoding and reasoning task types, first and second order false belief tasks (Kerr, Dunbar, & Bentall, 2003), the Eyes task and the Hinting task (Bora et al., 2005), and verbal Theory of Mind tasks (Olley et al., 2005). Kerr et al. (2003) examined Theory of Mind decoding capabilities within bipolar affective disorder using a measure previously utilised with schizophrenic patients (Frith & Corcoran, 1996). The task involved six stories, each of which were designed to assess participant's ability to detect first and second order false beliefs and deceptions. The results demonstrated poor Theory of Mind performance in both the manic and depressed bipolar patients, remitted patients performed highly however. It may be conjectured from this study that Theory of Mind deficits within bipolar are most apparent during active phases of the disorder and absent when in remittance. Bora et al. (2005) examined decoding and reasoning Theory of Mind abilities in euthymic bipolar remit patients. This study used the Eyes task (Baron-Cohen et al., 2001) and the Hinting task (Marjoram et al., 2005) to which patients demonstrated impairments on both tasks. Bora et al. (2005) concluded that the apparent Theory of Mind deficit may be partially accounted for

by cognitive deficits including face matching. Olley et al. (2005) administered a battery of Theory of Mind tasks to euthymic bipolar depressed patients. Included in this battery were tests of verbal fluency, Stroop, a story comprehension task (Fletcher & Henson, 2001), and a cartoon comprehension task (Gallagher et al., 2000). Patients' performance was impaired, compared with controls, but the deficits appeared to be specific to verbal Theory of Mind abilities in this study. Across the battery of tests administered, deficits in euthymic bipolar patients were suggestive of fronto-subcortical pathway dysfunction which is involved in the regulation of normal mood and supports cognition (Olley et al., 2005).

1.2.3 Theory of Mind Theories

A number of theories have been developed to explain the processes underlying Theory of Mind capabilities. While each theory maintains the functional definition that Theory of Mind relates to the ability to ascribe mental states to others, they debate the actual structures and processes that constitute this ability. They propose the involvement of different neural structures and offer differing opinions as to whether these abilities stem from one specific location or whether they are the result of various executive functions as opposed to a separate cognitive ability. The Modular theory (Leslie, 1987; Leslie & Thaiss, 1992) asserts that Theory of Mind is a distinct, cognitive ability that is innate, and follows a pre-determined developmental course independent from other cognitive functions (Baron-Cohen, 1995; Leslie & Roth, 1993). Modular theorists make the distinction between inferences based on mental state attribution, which is believed to be a Theory of

Mind skill, and forming inferences based on the physical world which is not considered to be a Theory of Mind related skill.

Modular theory is based on the proposition that the origin of Theory of Mind lies in the existence of one or more neural structures, which are specific to this ability, and are not shared by other cognitive functions. The separation from other cognitive abilities means that Theory of Mind may be located in specific distinct neural structures, so that if these structures were compromised, a deficit in Theory of Mind would become evident outside of any other cognitive deficits. The domain specificity of this model has arisen largely due to the work conducted with autistic spectrum disorder (Baron-Cohen, 1985; Leslie & Roth, 1993; Leslie & Thaiss, 1992). In this disorder researchers have found Theory of Mind abilities to be selectively impaired relative to other high level cognitive functions, including executive functions (Baron-Cohen, 1995; Frith & Frith, 1999; Leslie & Thaiss, 1992). Evidence of this has provided strong support for the proposal that Theory of Mind may be a distinct, domain specific skill. Studies have also demonstrated a developmental sequence of Theory of Mind that is constant across cultures, general intelligence levels and is impaired or absent in children with autism (Avis & Harris, 1991; Jin, Jing, Morinaga, Su, & Chen, 2002).

Simulation theory (Davies & Stone, 1995a; Davies & Stone, 1995b; Langdon & Coltheart, 2001) is far less formulaic than the Modular theory (Leslie, 1987) and does not believe that we each possess a set of rules and laws which we follow, but rather that we understand another's actions by putting ourselves in someone else's shoes. In this way we may simulate another's thoughts and as such predict and

explain another's behaviour. In contrast to the Modular theory, Simulation theory does not distinguish between inferences based on mental state attribution and inferences based on the physical world, and does not uphold the belief of a specialised, distinct neural architecture (Leslie & Roth, 1993) pertaining to Theory of Mind processes. To date, little evidence has come forwards in support of this theory. The Theory theory (Churchland, 1991) further conceives Theory of Mind to be a developing and evolving theory about other minds, which expands and changes over time. This theory posits that different theories of mind replace one another as an individual becomes more aware of different cognitive perspectives, and becomes more sophisticated in their understanding (Gopnik & Wellman, 1994). Theory of Mind is therefore perceived of as an ability based on a set of innate capabilities, including a general theory formation mechanism or a primitive, mind orientated starting-state (Gopnik, Capps, & Meltzoff, 2000). Equally, this theory does not claim that one specific neural structure or domain is responsible for Theory of Mind capabilities, but rather that Theory of Mind is a specialised cognitive skill that is dependent upon more general theory-formation mechanisms (Gopnik et al., 2000). In broad terms, Theory theory asserts that our understanding of the mind is based on a framework of concepts and laws, which are extensive enough to cover the demands of everyday life (Churchland, 1991).

While Modular theory, Simulation theory and Theory theory all disagree on the extent to which Theory of Mind capabilities rely on more general cognitive abilities, they all agree that specialised Theory of Mind skills enable the attribution of mental states which is crucial for social interaction and communication. The Executive Function theory however, claims that Theory of Mind ability does not

exist. Theorist such as Hughes, Russell and Robbins (1994) and Ozonoff, Rogers and Pennington (1991) propose that executive functions are themselves capable of performing the mental state inferencing skills attributed to Theory of Mind by the other theories. The arguments are based upon the judgment that Theory of Mind tasks are essentially tests of executive function component skills, such as set shifting and response inhibition. Support for this theory may be found in the developmental time lines of executive functions and Theory of Mind in children, and in the difficulty of separating Theory of Mind tasks (Frye, Zelazo, & Palfai, 1995; Hughes et al., 1994; Ozonoff et al., 1991). Under this view, Theory of Mind as a distinct neural architecture does not exist, and Theory of Mind deficits with spared executive functions is not possible. To be disproved, studies will need to demonstrate impairments in Theory of Mind capabilities with executive functions remaining intact or a localisation of Theory of Mind ability.

The discovery of a type of visuomotor neuron in monkeys, called mirror neurons, are thought to be involved in the ability to imitate, acquire language and enable Theory of Mind (Rizzolatti & Craighero, 2004). These neurons have been found to activate when a monkey grasps or manipulates an object, and when the monkey observes an experimenter making a similar gesture. Gallese and Goldman (1998) have proposed that the function of such a set of neurons could be to enable an organism to ascertain certain mental states in an observed conspecies. In this way, mirror neurons could be a physiological way of putting ourselves in some else's shoes, and may be viewed as supportive of the belief that Theory of Mind capabilities are separate from executive functions.

1.3 Emotional Responsivity and Social Interactions

In a departure from the previously discussed literature pertaining to the interpretation and awareness of social cues, the remainder of this introduction will focus on the non-verbal cues and subjective experiences of individuals with depression. To interact successfully with others, individuals need to be able to express their own feelings and intentions as well as comprehending others' non-verbal signals. Keltner and Kring (1998) proposed that facial expressions act as ongoing cues that coordinate social interactions. Expressions convey subjective states, evoke corresponding emotional responses in others and reward or deter other people's behaviour. Facial expressions can also help to develop a sense of intimacy and relative status (Derlega, Metts, Petronio, & Margulis, 1993) with the social expression of distress tending to elicit support (Thoits, 1986; Thompson, 1994). Faces may therefore impact upon the interpersonal context by providing information about a person's emotional state, their intentions and further influence another's behaviour. This section will examine the function of facial displays in social interactions, and the suggested altered patterns of responsivity in depression. Davis (1982) has previously described responsivity as the likelihood that an individual will respond to another's verbal or non-verbal communications in a way that is related to the meaning of the ongoing interaction. Studies have shown that individuals who are responsive and attentive to their interaction partners are viewed as more attractive and engaging (Davis & Martin, 1978; Davis & Perkowitz, 1979; Riggio & Friedman, 1986). Whereas, those lacking in responsiveness are viewed unfavourably, and may be subject to rejection and disinterest being judged as unmotivated, unattractive and incompetent (Davis & Holtgraves, 1984).

1.3.1 Role of Facial Expressions in Social Interactions

Debate exists within the literature as to whether facial displays, the most prominent source of non-verbal communication, are first and foremost expressions of emotion (Buck, 1984a, 1988; Ekman, 1989, 1994; Ekman & Friesen, 1969b), or are primarily a means of communicating social signals (Fridlund, 1991a, 1994). The influential postulations of Darwin (1872) proposed that facial expressions, in their evolution, served direct adaptive functions in specific emotion-related situations. Based on Darwin's first principle, the principle of associated serviceable habits, he claimed that movements originally developed for a direct purpose, but over time came to be displayed even in the absence of the initial function. The second principle, the principle of antithesis, further proposed that movements opposite to those carried out in line with the first principle came to represent the contrasting feeling states. For example, the baring of teeth could have developed to signal aggression or antagonism. The opposite of this, hiding ones teeth may have therefore become associated with non-aggressive or non-antagonist feeling states. While Darwin postulated as to facial movements, practical functions and evolution, he did not extrapolate as to their influence over others. Mead (1934) extended Darwin's theory, examining the social impact of expressions, postulating that movements were symbols which enable mutual coordination and the development and maintenance of ongoing sequences of actions, concluding that the original meaning of emotional actions and expressions arises from their functional role in ongoing practical encounters.

Fridlund (1991a, 1994) was of a similar opinion to Mead (1934) in that he viewed movements as primarily orientated towards others. Fridlund further believed that movements developed through natural selection in that expressions provide relevant information to others. The co-evolution of individuals' sensitivity to expressions, according to Fridlund's theory, has ensured that facial expressions serve a communicative purpose. The Behavioural Ecology view proffered by Fridlund (Fridlund, 1991a, 1992a, 1994) therefore holds that the purpose of facial expressions is to communicate with another person as opposed to solely reflect an internal state. This approach is not interested in determining any underlying emotional features of expressions, but in elucidating the messages communicated through facial displays either when presented in isolation or in combination with gestures, words or intonations. While emotional states may be facially expressed, under the Behavioural Ecology view, these are one of many pieces of information conveyed through our expressions. This theory also denies that displays have an exact correspondence to emotions, as the same emotion under different circumstances may be accompanied by different social motives. Fridlund further postulated that when an emotion is displayed, the face does not express the emotion itself but rather the intention of the emotion (Fridlund, 1992b).

A further issue for consideration for the communicative accounts of facial movements pertains to the fact that faces are not static when individuals are alone. This would seem contrary to Fridlund's (1991a, 1994) proposal that expressions have evolved to serve as communicative signals for other people. However Fridlund (1991b), in agreement with Mead (1934), proposed that even when individuals are alone they conduct actions with others in mind. Fridlund (1991b)

conducted a study, which validated the 'implicit sociality' concept and showed that individuals' private displays are displayed for imagined others and further that the image of another person is more vivid if they are viewed as sharing in a similar experience. In support of this theory, a series of studies by Kraut and Johnston (1979) assessing 'audience effects' indicated that people smile more when other people are present and individuals are facing each other. The replication of these studies by Fernández-Dols and Ruiz-Belda (1995) provides additional corroboration as did Jones, Collins and Hong (1991). Subsequent studies have also supported this concept and demonstrated that emotional tone and social context further affect displays (Hess, Banse, & Kappas, 1995).

Ekman (1972b) and Ekman, Friesen and Ellsworth (1972) however, proposed the Neurocultural theory which proposes that facial expressions occur at the level of facial muscles. This theory postulates that when a specific emotion is elicited a specific set of facial muscles are activated by the Facial Affect Program, a biologically based storage centre which houses the facial muscle configurations accompanying emotions, resulting in the expression. Differences in facial expressivity are said to occur either due to the learned cultural differences about the antecedents of emotion, or the culturally learned rules regarding the appropriateness of showing certain emotions in certain situations. Ekman and Friesen (1969b) referred to these cultural rules as display rules referring to the learned rules of expression management. These rules are socially learned and relate to the control exerted over facial appearance. In line with these proposed display rules, emotional impulses to express an emotion may be suppressed, exaggerated or

masked depending on the situation, individuals present and the social norms in place.

Studies have suggested that those low in expressive displays tend to be more sensitive to display rules and as such, modulate their behaviour (Jones, 1950). Lanzetta and Kleck (1970) hypothesised that inhibiting expressive behaviour may come about automatically for low expressive people, as these individuals may have, during the course of their socialisation, received negative reinforcements for overt displays of emotionality and have thus learnt to inhibit personal expressions. An emotion regulatory process such as this may be internalised to such a degree in low expressive people that behavioural patterns are invoked relatively automatically. The values and norms of a person's culture also influence how emotions are expressed or experienced (Markus & Kitayama, 1991). In individualistic countries, emotions related to hindering a person's goal are expressed more whereas in collectivist societies, emotions pertaining to someone's failure in fulfilling social norms, such as guilt and shame, are expressed more. Between individuals raised in the same culture, there are further group differences where sub-group norms develop concerning the appropriateness of expression and experience, to which members are explicitly or implicitly socialised to observe. The Neuroculture theory (Ekman, 1972b; Ekman et al., 1972), unlike Mead (1934) or Fridlund (1991a, 1994) proposes that biological and learned factors affect facial expressions. Studies by Ekman (1972b) and Matsumoto and Ekman (1989) have offered support for this theory, demonstrating the cultural influences over facial expressions.

1.3.2 Responsivity and Depression

Reductions in levels of responsivity may be contributing to the social skill deficits apparent in depression with strong evidence that depressed individuals exhibit reduced facial expressions (Ellgring, 1989). A large component of the depressive condition is a dysfunction in affect, with reduced facial responsiveness identified as a sign of the affective flattening apparent in this condition (Andreasen, 1982). Depressed individuals have been found to display fewer emotional expressions (Wexler, Levenson, & Warrenburg, 1994), specifically a reduction in positive expressions (Jaeger, Borod, & Peselow, 1986), and a tendency to display more sad expressions (Brown & Harris, 1982). Eye contact, known to be important for conveying involvement in a conversation and for regulating the flow of a conversation (Kleinke, 1986), is also typically reported to be reduced in depression (Hinchliffe, Lancashire, & Roberts, 1970; Hinchliffe, Lancashire, & Roberts, 1971; Jones & Pansa, 1979; Natale, 1977) most prominently during speech (Rutter & Stephenson, 1972). Accompanying disrupted positive facial displays and avoidant gaze, studies have identified other facial characteristics of depressed individuals including: corrugated brows, squinty or closed eyes, differences in mouth positions (Waxer, 1974) and smiling frequencies (Ellgring, 1989; Fairbanks, McGuire, & Harris, 1982; Williams, Barlow, & Agras, 1972).

Gestures add an additional visual component to someone's utterance with posture further signifying how someone is feeling and their attitude towards an interaction partner (Bull, 1987). Studies have shown that depression is associated with certain gestural and postural tendencies (Dittman, 1987; Ekman & Friesen,

1974; Miller, Ranelli, & Levine, 1977), with depressed individuals exhibiting fewer gestural and head nodding movements than controls during conversations (Fossi, Faravelli, & Paoli, 1984), and a tendency to use illustrative gestures less often than non-depressed individuals (Kazdin, Sherick, Esveldt-Dawson, & Rancurello, 1985). Illustrators are gestures whose meaning is directly tied to what is being said and as such they act as accompaniments or visual exemplifications of the verbal message. Ekman and Friesen (1969b) found that the tendency to use illustrators increased as symptoms diminished. Depressed individuals also demonstrate increased body touching (Jones & Pansa, 1979) and hold their head in a downward position to a greater extent than non-depressed individuals (Waxer, 1974). Non-verbal behaviours such as facial expressions and gesturing are important signals of engagement in social interactions (Cappella & Greene, 1982; Coker & Burgoon, 1987; Patterson, 1983) facilitating intimacy, involvement and general positive social interaction (Segrin & Abramson, 1994). A failure to exhibit such behaviours and cues can result in withdrawal and/or termination of the interaction (Burgoon & Hale, 1988; Burgoon, Newton, Walther, & Baesler, 1989), and may offer another explanation as to the increased rates of rejection felt by depressed individuals.

Several views have been proposed to account for the impaired patterns of responsivity in depression. The Positive Attenuation hypothesis concerns the low positive mood which accompanies the depressive condition. This view suggests that a reduction in positivity contributes to an individual's tendency to exhibit reduced reactivity to positive emotional cues. Reduced anhedonia and motivational disturbances are viewed as exerting a further impact upon reactivity (Clark et al., 1994; Depue & Iacono, 1989). This supposition has been supported by a number of studies demonstrating reduced facial

responsiveness in depressed individuals for positive film and taste stimuli (Berenbaum & Oltmanns, 1992), pleasant slides (Sloan, Strauss, & Wisner, 2001) and reward stimulations (Henriques & Davidson, 2000). The Negative Potentiation view however, postulates that the negative mood apparent in depression serves to enhance emotional reactivity for negative emotional cues (Beck, 1976; Beck et al., 1979; Bylsma, Morris, & Rottenberg, 2007; Scher, Ingram, & Segal, 2005). The greatest proponents for this theory may be the cognitive theorists who characterise the depressive condition as originating or based upon cognitive schemas which serve to negatively distort affect recognition and processing (Beck, 1967; Beck et al., 1979; Bower, 1981). Sigmon and Nelson-Gray (1992), also demonstrated enhanced electro-dermal reactivity for negative social scenarios. A selection of studies with dysphoric participants further support this view (Golin, Terrell, & Johnson, 1977; Lewinsohn, Lobitz, & Wilson, 1973) however, results from dysphoric participants may not generalise to clinically depressed patients.

The third proposed theory is the Emotion Context Insensitivity view which asserts that depression reduces reactivity to emotional signals irrespective of valence (Rottenberg, Ray, & Gross, 2007; Rottenberg, Salomon, Gross, & Gotlib, 2005). This theory is based upon evolutionary views of depression, with the proposal that the reductions in the motivation of depressed individuals to engage with their environment is based on a self-protecting bias which serves to maintain distance between the depressed individual and situations for which the individual may not currently be capable of (Nesse, 2000). This view is perhaps the most in line with observational reports of individuals with depression who present with flattened affect (Rottenberg & Gotlib, 2004), and report that the world is dull and empty (Healy, 1993). Empirical evidence also exists which demonstrates that depressed individuals exhibit less affect modulation during picture viewing (Allen,

Trinder, & Brennan, 1999; Dichter, Tomarken, Shelton, & Sutton, 2004) and less electromyography modulation during affective imagery (Gehricke & Shapiro, 2000; Greden, Genero, Price, Feinberg, & Levine, 1986; Schwartz, Fair, Salt, Mandel, & KIerman, 1976) and facial stimuli (Wexler et al., 1994). In further support of this view, studies show reductions in the event related brain potentials for positively and negatively valenced stimuli (Deldin, Keller, Gergen, & Miller, 2001), comparable neural responses to emotionally valence facial stimuli (Gotlib, Sivers, Canli, Kasch, & Gabrieli, 2001), and reduced experiential reports for both sadness and amusement eliciting films (Rottenberg, Kasch, Gross, & Gotlib, 2002).

1.3.3 Responsivity and Personality Traits

Variability in the tendency to express emotional states is also influenced by personality traits which have been found to relate to the threshold and intensity of an initial expression tendency, as well as the subjective experience of the emotion (Gross, Sutton, & Ketelaar, 1998). Personality traits and psychological disorders are believed to relate to response tendencies (Ekman, 1984; Goldsmith, 1993; Izard, 1972; Keltner, 1996; Malatesta, 1990), which during the course of an individual's development can result in habitual patterns of social perception, communication and interactions. Research consistently demonstrates stable correlations between the 'big five' personality traits, and expressed and experienced emotion (Keltner, 1996). While links have been determined however, it is not clear whether personality traits are differentially linked to the expression of different emotions (Trierweiler, Eid, & Lischetzke, 2002). For example, extroversion was found to relate to the experience of

positive emotions, happiness and joy but not love. Conscientiousness has been demonstrated to relate to happiness, with openness to experience failing to demonstrate a relationship with any emotion (Eid & Diener, 1999). When dealing with the 'big five' personality traits, numerous studies have shown consistent correlations between extroversion, agreeableness, conscientiousness and openness, for self-reports of increased positive emotion, and between neuroticism and self-reports of increased negative emotion (Keltner, 1996).

Extroversion has consistently predicted facial expressions associated with social approach behaviour (Keltner, 1997), demonstrating positive correlations with Duchenne smiles of enjoyment and amusement. Extroversion is also correlated with increased facial displays of sadness, possibly serving to elicit social approach and supportive behaviours (Keltner, 1995). This suggestion by Keltner (1995) was supported by the finding that bereaved adults' facial expressions of sadness were positively correlated with the size of their social network ($r=.30$, $p<0.05$), suggesting that displays of sadness in individuals with high levels of extroversion, are associated with increased social contact. Agreeableness, in accordance with its definition, has been found to correlate with facial expressions that encourage cooperative and friendly interactions. High ratings of this trait correlate positively with Duchenne laughter, which has been found to reduce social tension and increase approachability (Ruch, 1993). Conversely, agreeableness is negatively correlated with expressions of anger and disgust. Agreeable people are more likely to show sympathy for someone who has been embarrassed, by including the empathetic components of a facial display (increase oblique eyebrows of sadness, head movements forwards, concerned gaze) (Eisenberg et al., 1989).

Conscientiousness also has an impact on facial responses in accordance with the defining characteristics of this trait, impulse control, conversationality and adherence to social norms. This has been demonstrated with reduced displays of negative emotion, increased Duchenne laughter, increased embarrassment (controlled smiling), gaze aversion, downward head movements and face touching (Keltner, 1995).

Neuroticism has equally been associated with responsive tendencies related to increased expressions of negative emotions, demonstrating correlations with increased displays of anger, contempt and fear. When neurotic individuals were over praised in order to elicit the common Duchenne response, a negative correlation was found with higher levels of neuroticism, relating to lower levels of Duchenne laughter (Keltner & Bonanno, 1997). Personality types high in negative affect represent a disposition to experience unpleasant emotional states generally associated with reports of anxiety, frustration, sadness, irritability and anger even in the absence of obvious stressors (Clark & Watson, 1991; Watson, 2000; Watson & Clark, 1984). As individuals with high negative affect experience a great deal of distress, they tend to express a great deal of distress. Importantly, for individuals with depression, studies have shown that these expressions may actually compound rather than alleviate distress, as individuals report experiencing a lot of interpersonal conflict and can exhibit hostile and demanding behaviours (Clark & Watson, 1991). Due to this individuals, tend to evoke more negative reactions and behaviours from others. The occurrence of high levels of neuroticism in depression may therefore be contributing to the patterns of expressivity and the social difficulties demonstrated by those with this condition. Studies of personality further

show that traits may be related to the absence or inhibition of emotional expression, with neuroticism relating to reduced positive emotion, and both agreeableness and conscientiousness related to reduced negative emotion. In any emotional expressivity research therefore it is important to consider the involvement of personality traits so as to correctly attribute the possible causes of the over-abundance or absence of socially significant behaviour. The involvement of personality traits, in conjunction with depressive symptoms in altering patterns of facial responsivity, is further discussed and examined in study 3 (Chapter 5).

1.3.4 Measuring Facial Responsivity

Numerous systems exist to identify and code facial expressions including: The Facial Action Scoring Technique (Ekman, Friesen, & Tomkins, 1971), Affect Expressions by Holistic Judgment (Izard, Dougherty, & Hembree, 1983), Monadic Phases (Tronick, Als, & Brazelton, 1980), and the Maximally Descriptive Facial Movement Coding System (Izard, 1979). A number of problems have been identified among these systems in that different labels are used to code expressions, the relationship between expression and subjective experience is assumed to have an exact correspondence, and the dismissal of numerous facial movements not involved in emotional depiction. To overcome these problems certain comprehensive systems, such as The Facial Action Coding System (Ekman & Friesen, 1978b) have been developed.

The Facial Action Coding System (FACS), developed by Ekman and Freisen (Ekman & Friesen, 1978a), is the most comprehensive system developed to measure

complex facial expressions. This system codes facial expressions in terms of component movements, termed action units (AUs). 46 AUs exist, each attributed to an independent muscle movement in the face. FACS is designed to measure all muscle movements in the face including, but not limited to, those related to emotional expressions. FACS was designed to detect the muscular actions that underlie facial expressions, as opposed to other systems, which aim to classify images and movements into emotion categories (happy, sad, surprised). By focusing on the muscular movements, FACS is able to assess real facial signals which are composed of subtly different movements, blended movements and movements of varying intensity as well as the ability to determine if individuals are attempting to control or conceal expressions (Hager &Ekman, 1995). After the development of FACS (1978b) Ekman and Friesen, attempted to determine which AU combinations are associated with different emotions (Ekman & Friesen, 1978a). Wiggers (1982) also conducted research into identifying emotion specific AU combinations. The Emotion Facial Action Coding System (EMFACS) is a version of FACS that was developed to enable limited inferences about emotional states to be extracted from facial movements using the FACS scoring technique.

By assessing facial expressions dynamically the intensity, strength and depth of an individual's subjective state, as well as the truthfulness of the communication, can be inferred (Ekman, 1993). Exploring expressions dynamically also allows the detection of subtle facial movements, which would be otherwise missed (Ambadar, Schooler, & Cohn, 2005). A study carried out by Gotlib, Krasnoperova and Yue (2004) additionally indicated that assessment of dynamic affect responses provides measures of subtle shifts in emotional experience across small time intervals which

may characterise the reactions of a depressed individual. Gaebel and Wolwer (2004) examined facial expressivity in schizophrenia and depression patients using the FACS technique and showed that depressed and schizophrenic participants demonstrated comparable patterns of activity with reduced facial activity in the upper face and in facial activity used for communication and signs of positive emotion. Reed, Sayette and Cohn (2007) further designed a study to examine emotional suppression in depressed individuals, specifically to positive stimuli using smile control. Keltner (1995) proposed that smile controls involve facial actions, which serve to counter act the facial actions used to smile; that is acting against the upward pull of the corners of the mouth or obscuring the smile in some way. FACS analysis showed that individuals currently experiencing a depressive episode were more likely to carry out smile controls while watching the comedy clip. Reed et al. (2007) showed that even when smiles were elicited, symptomatic participants were more likely than asymptomatic participants to express negative facial actions that would counteract their original positive response. It can further be deduced from this study that it is the current depressive state of an individual, rather than a stable tendency, that is affecting the positive affect responses. Smile controls may therefore be a factor, which is increasing the alienation of depressed individuals in social settings. Studies such as this may be extremely beneficial in developing our understanding of why depressed individuals elicit hostility and rejection from others (Coyne, 1990).

The Emotional Facial Action Coding System has also been utilised to explore the facial responsivity patterns in depression. Berenbaum and Oltmanns (1992) examined emotional experience and expression in schizophrenic and depressed

individuals, showing that depressed individuals were significantly less responsive compared with the schizophrenic patients to the positive stimuli. Renneberg, Heyn, Gebhard and Bachmann (2005) also using EMFACS showed participants two short movie sequences, one designed to induce positive affect the other to induce negative affect, and recorded facial responses. For the positive movie sequence in this study, analysis showed that depressed participants showed significantly less happy expressions compared to the control group, with women in the control group displaying up to five times as many happiness expressions as a depressed participant. Depressed individuals did not differ from controls for the frequency of surprise expressions. In response to the negative movie sequence, the number of facial expressions was again reduced in the depressed group compared with controls. Dynamic measures may enable us to develop our understanding of the mechanisms underlying depression as it may be the case that, combined with a reduction in the ability to experience pleasure, there is an active suppression of positive affect in individuals with depression (Reed et al., 2007). Using an objective approach such as FACS and EMFACS (Ekman & Friesen, 1978a), researchers are able to code subtle facial muscle movements to deliver an account of frequency, intensity and emotion.

1.4 Qualitative Accounts and Depression

Whereas previous research has examined social functioning in depression by assessing competencies with self-report measures, and investigating deficiencies in emotion perception and responsivity, some researchers are increasingly attending to

the subjective and experiential accounts of individuals to explore possible influencing factors in order to provide a fuller understanding of the interpersonal impact of a depressive episode. The qualitative literature to date does not specifically focus on the social functioning difficulties experienced by individuals with depression, but explores a multitude of areas including the experience and perceived causes of depression (Crowe, 2002; Etowa, Keddy, Egbeyemi, & Eghan, 2007; Gammel & Stoppard, 1999; Mauthner, 1999; Scattolon & Stoppard, 1999), and explorations into how a diagnosis of depression is perceived, and the ramifications of treatment (Gammel & Stoppard, 1999). Further qualitative investigations have focused more closely on the dysfunctional attitudes (Tam & Wong, 2007) and individual coping strategies (Etowa, Keddy, Egbeyemi, & Eghan, 2007; Scattolon & Stoppard, 1999) of those with depression. While not precisely designed to examine experiences of social interactions, the studies in existence do report themes of relevance such as those pertaining to accounts of social isolation (Jack, 1999; Scattolon & Stoppard, 1999), alienation and the strain of complying with social pressures (Crowe, 2002; Crowe & Luty, 2004). Qualitative analysis focuses on individuals' subjective experiences of events and situations, and may therefore enable researchers to gain a perspective of events as experienced and interpreted by individuals with depression. In this section, some of the qualitative studies that have been conducted to explore the experiences of individuals with depression will be reviewed.

A study by Etowa et al. (2007) explored the factors associated with depression in middle aged African Canadian women and showed how important having a close friend and being able to talk to someone who could understand was

to the women during their episodes. Intimacy was important in this relationship, but the emphasis was placed on the listener being able to fully understand what they were going through. Scattolon and Stoppard (1999) also reported that seeking support from similar others was a tool used by women with depression to cope. Support was sought from family members, friends and sometimes strangers who had similar experiences. This appeared to be preferable to seeking help from a doctor, as again the women seemed to value people who had been through similar experiences and not abstracted professionals. Another form of coping was to withdraw and socially isolate. For some this was a very positive experience, which meant time for self. For others it was a choice based on the social stigma of having depression, the shame of having 'mental problems and not being quite right' (Scattolon & Stoppard, 1999). Discussing their problems meant exposing themselves, and most of the women felt that this would make them too vulnerable in such a close community. Another reason for not wanting to talk about it was the fear that other people would minimise the woman's experience or blame her for being depressed. A difficulty in rebalancing negative positioning during social interactions was proposed by Drew, Dobson and Stam (1999) as a further factor contributing the difficulties experienced by women with depression when interacting with others. Individuals with depression collectively reported that the 'negative self-image' view was a position in which they are incorrectly placed by society. Drew et al. (1999) proposed that this might play an influential role in the development and longevity of a negative attribution style affecting interpersonal interactions. The narratives in this study portrayed a picture where the participants did not accept or attribute any personal blame for suffering with depression. In

contrast to cognitive theories, the women instead perceive the negative self-concept that is deemed to be central to how a depressed individual views himself or herself, as an unjustified portrayal of who they are and of their condition.

Crowe, (2002) explored women's experience of mental distress, specifically investigating the effects of cultural expectations of normality and how such pressures may promote the development of a sense of detachment from others, and excessive self-reflexivity (Crowe, 2002). Many of the women included in this study raised the issues of detachment and alienation. Crowe (2002) proposed that the women's sense of detachment might be exacerbated by a heightened inability to adequately convey their experiences. This failure to communicate one's feelings and experience may lead to a sense of emptiness or a loss of identity. When this occurs, developing connections and commonalities with others can become increasingly difficult, resulting in further feelings of alienation and detachment. Crowe and Luty (2004) carried out a further study to explore themes of societal pressures and detachment, and their relationship to the interpersonal difficulties experienced by individuals with depression. The effectiveness of Interpersonal Psychotherapy (IPT) sessions, that focused on the interpersonal issues that may be enmeshed in a person's depression (Klerman, Weissman, Rounsaville, & Chevron, 1984) were explored using discourse analysis. The successful resolution of the depression was anchored in an understanding of the women's social and cultural expectations of reflexivity and detachment, with reflexivity referring to states of self-consciousness, self-referentiality and introspection, and detachment referring to individuals' disengagement and alienation from others. This study proposed that the more a person is pushed to focus on themselves and their consciousness through

ruminative tendencies and isolation, the more detached they will become. Developing connections based on commonality then becomes increasingly difficult. A cyclical pattern can develop where people feel further degrees of alienation and detachment, which increases the amount of self-reflexivity resulting in greater levels of detachment. This study showed that by using IPT to focus on re-evaluating the woman's positions in relation to others, the woman was aided in recovering from depression. Discourse analysis showed that the psychotherapist was able to successfully do this through seeking information and exploring beliefs/values and assumptions. Further the communication patterns, affective responses and alternative subject positions were also explored. These studies demonstrate the importance of successful interpersonal interactions for coping strategies and recovery. As well as highlighting the importance of using qualitative and quantitative methodologies to determine the underlying motivations or processes involved in disturbing the social functioning of individuals with depression.

1.5 Organisation of Thesis

Following on from this general introduction, chapter 2 details methodological issues, which apply to the four studies included in this thesis. Chapters 3, 4, 5 and 6 then present experiments, which address specific questions pertinent to furthering our understanding of the social functioning difficulties in unipolar depression. This thesis is concluded with a general discussion in chapter 7.

In chapter 3 two emotion perception tasks are used to address the past research and theory which suggests that impairments in social functioning may be related to a difficulty in identifying and correctly interpreting others social cues. In addition to exploring the manifestation of recognition bias for facial and gestural depictions of emotion, the influence of individual differences personality traits, affective states and depressive symptoms are examined. It is proposed that by incorporating dynamic non-verbal cues and including possible confounds that we may be able to account for the inconsistencies within the perception bias literature.

The second study of this thesis discussed in chapter 4 is designed to explore a second possible mechanism that may be underlying perceptual problems. This mechanism or framework is Theory of Mind. This study looks at both aspects of Theory of Mind functioning using a variety of higher order decoding and reasoning tasks. Once again individual differences in personality traits, affective states and depressive symptoms are collectively assessed. The influence of depressive symptoms and individual differences for Theory of Mind performance has not been established in the literature and it is hoped that that the inclusion of higher order tasks and individual differences will highlight performance deficits in this area.

In chapter 5 the focus of the thesis changes from examining the interpretation of non-verbal cues to the expression of emotions when depressed. In this study the facial expressivity of individuals is assessed to dynamic scenes of social interactions. Facial movements are analysed using the Facial Action Coding System. Measures of experienced emotion, habitual expressivity tendencies and personality traits are taken with a view to explaining the pattern of expressivity in

depression. The previous literature in this area suggests that reductions in facial expressivity accompany depression. This study proposes that display rule adherence may be contributing to these previous findings.

The final study of this series is presented in chapter 6. Again exploring the social cues originating from the depressed individual. In this study a qualitative methodology is employed. Research examining social functioning in depression has not previously been carried out using qualitative analysis. It is hoped that this form of exploration will provide new directions for research and the development of intervention procedures. Chapter 7 is composed of a general discussion. This section provides detailed summaries of the research and explores the ramifications of the four studies results for future research in this area.

Chapter 2

General Method

2.1 Ethics

All of the research conducted for this PhD was in accordance with the British Psychological Society's code of ethical conduct. Further ethical approval was given by NHS Forth Valley Research Ethics Committee and the University of Strathclyde Ethics Committee. All participants provided written consent and results are stored anonymously.

2.2 Design and participants

The same eighty-five participants completed studies 1 and 2. Thirteen of the depressed participants, who completed studies 1 and 2, also completed study 3. Study 4 was further completed by 10 of the depressed participants, who had previously taken part in studies 1, 2 and 3 as well as two new participants who had not completed the previous studies. A separate control group of non-depressed participants was recruited for study 3. Participants with unipolar depression were

recruited from outpatient clinics in the Forth Valley area of Scotland. Psychiatrists referred patients with ICD-10 diagnosis of unipolar depression currently experiencing a depressive episode. Individuals with a history or present condition of schizophrenia, alcoholism, bipolar disorder, obsessive-compulsive disorder, comorbid anxiety or drug problems were not eligible to participate. Individuals with unipolar depression comprised 15% of the total sample recruited for studies 1 and 2.

The International Classification of Diseases (ICD-10) (WHO, 1992), and the DSM-IV (American Psychiatric Association, 1994) are two systems used to assess the occurrence and severity of a major depressive episode. Both require a fundamental disturbance in mood in their classification of depressive disorders, with the requirement of a further eight symptoms in common: depressed mood, loss of interest, decrease in energy or increased fatigue, sleep disturbance, appetite disturbance, recurrent thoughts of death, inability to concentrate or indecisiveness, psychomotor agitation or retardation. The ICD-10 has two additional items: reduced self-esteem or self-confidence, and ideas of guilt and unworthiness. The DSM-IV combines inappropriate or excessive guilt with feelings of worthlessness. While the two systems provide a great number of similarities in defining an episode, the structure of how an episode is diagnosed differs. The ICD-10 is divided into two sets: one containing three items (depressed mood, loss of interest and decreased energy) and the second set containing the remaining seven items. A diagnostic threshold is then determined by the number of items required from each set. The DSM-IV has all the symptoms in one category, but indicates that either depressed mood or loss of interest is required for diagnosis of major depressed episode. The

construction of the ICD-10 enables grades of severity ranging from mild to severe, with separate diagnostic thresholds to differentiate between mild, moderate and severe episodes depending on the number of symptoms, type of symptoms and severity of symptoms. The DSM-IV does not; instead the severity of an episode is assigned after the criteria for a major depression episode has been determined, based on the number of symptoms and level of functional impairment.

2.3 Materials

The assessment measures used are detailed in the method section of each of the individual studies.

2.4 Procedure

During two sessions, each participant taking part in studies 1 and 2 completed: a set of questionnaires; NEO-FFI (Costa & McCrae, 1992), DASS-21 (Lovibond & Lovibond, 1995), BDI-II (Beck, Steer, & Brown, 1996), PANAS (Watson & Clark, 1988), BEQ (Gross & John, 1997), HAM-D (Hamilton, 1960), followed by three computer tasks; dynamic Face task (Golan, Baron-Cohen, & Hill, 2006), dynamic Gesture Task and the Eyes task (Baron-Cohen et al., 2001) and two reasoning tasks; the Faux Pas task (Stone et al., 1998) and the Hinting task (Marjoram et al., 2005). Participants were also asked to complete two rating scales after each stimulus presentation in each of the computer tasks.

Individuals participating in study 3 completed two questionnaires; the BDI-II (Beck et al., 1996), and the Berkeley expressivity questionnaire (BEQ) (Gross & John, 1997), and watched 22 video clips of social interactions. While watching the video clips, participants' facial expressions were video recorded.

Tape recorded interviews were conducted for participants taking part in study 4, with each participant completing the BDI-II (Beck et al., 1996) prior to the interview. Testing sessions were no longer than two weeks apart.

Chapter 3

Traits, States and Depression: Biases in Affective Information Processing

3.1 Introduction

Studies have examined how disturbances in processing affective information (such as deficits in the recognition of facial expressions, evaluations of intensity and valence, and processing speed) are derived or suppressed as a function of depression. Collectively the literature appears to suggest that depressive symptoms facilitate the processing of negative affective information such as sad facial expressions, with reports of stronger affective mood states increasing attention to negative information and facilitating the processing of mood congruent stimuli. The empirical evidence is far from consistent however, and the presence and origin of possible facial affect recognition deficits remain equivocal.

Previous studies have examined the manifestation of impairments in the perception of facial expressions in depressed patients. Those exploring participants' accuracy in identifying facial emotion stimuli, have indicated towards deficits in recognising specific emotions i.e. happiness, sadness, interest, fear, anger and

surprise (Jaeger et al., 1987; Mandal & Bhattacharya, 1985; Persad & Polivy, 1993; Rubinow & Post, 1992; Surguladze et al., 2004), as well as more general emotion recognition deficits (Feinberg et al., 1986; Zuroff & Colussy, 1986). A plethora of studies however have failed to find any evidence of significant group differences in accurately classifying emotional expressions between depressed patients and healthy controls, (Archer, Hay, & Young, 1992; Cooley & Nowicki, 1989; Gaebel & Wolwer, 1992; Walker et al., 1984). Studies assessing deficits in information processing have predominantly indicated a negative attentional bias, in that depressed individuals take longer to respond to mood incongruent emotional expressions compared with healthy controls (Feinberg et al., 1986; Gollan et al., 2008; Leppänen et al., 2004; Persad & Polivy, 1993; Zuroff & Colussy, 1986).

Other studies have reported impairments manifesting in emotion-specific perceptual biases whereby depressive symptom alter the perceptual evaluations of affective stimuli, so that significantly more sadness is perceived in facial expressions compared with healthy volunteers (Bouhuys et al., 1999; Gur & Erwin, 1992; Hale et al., 1998; Matthews & Antes, 1992). Depression appears to impair recognition of positive facial expressions (Suslow, Junghanns, & Arolt, 2001), whereby expressions are perceived less positively and responses to pleasant pictorial stimuli are diminished (Sloan, Strauss, Quirk, & Sajatovik, 1997; Sloan et al., 2001). These perceptual shifts appear to be relatively task dependent however, with researchers using tasks like the emotional Stroop, demonstrating that depressed individuals attend more to negative than to neutral or positive emotion stimuli (Gotlib & Cane, 1987; Gotlib & McCann, 1984). Studies using multiple stimulus attention tasks, such as the dot probe task (Hill & Dutton, 1989; MacLeod, Mathews, & Tata, 1986) and

the deployment of attention task (Gotlib, McLachlan, & Katz, 1988), have indicated that depressed individuals do not demonstrate attentional biases. Further, the attentional biases are not consistently allocated to the depressed participants. McCabe and Gotlib (1995), using a deployment of attention task, found a positive bias in the non-depressed participants whereby they favoured the positive stimuli, and the depressed participants failed to demonstrate a bias of any kind. Gollan et al. (2008) demonstrated biases for both depressed and non-depressed participants. This study showed that depressed participants interpreted neutral facial expressions as sad significantly more often than non-depressed participants, thus demonstrating a negative bias, and the non-depressed controls interpreted neutral faces as happier significantly more than depressed patients indicating a positive bias.

There are several potential explanations for the discrepant findings. First, different types of patient populations were recruited and examined in the studies. In some studies, patients were restricted to those with unipolar depression (Feinberg et al., 1986; Jaeger et al., 1987; Persad & Polivy, 1993), in other both unipolar and bipolar depressed patients were examined (Gur & Erwin, 1992; Rubinow & Post, 1992). Studies have also included comorbid diagnoses which are problematic for results as demonstrated by Gotlib, Krasnoperova and Yue (2004) who found that clinically depressed patients without comorbid diagnosis orientated towards sad faces whereas those with comorbid anxiety did not. Secondly, there are differences in the types of stimuli used. Some studies use facial expressions from a standardised series (Ekman, 1976; Feinberg et al., 1986; Persad & Polivy, 1993) whereas others used novel series of photographs (Asthana, Mandal, Khurana, & Haque-Nizamie, 1998; Gur & Erwin, 1992) or schematic faces (Bouhuys, Geerts, & Gordijn, 1999;

Suslow, Junghanns, & Arolt, 2001). Facial expressions on such static faces might not be as readily recognisable as actual expressions, and might not constitute an effective paradigm by which to study emotion recognition. Kan, Mimura, Kamijima and Kawamura (2004) showed that depressed participants recognised dynamic faces as capably as non-depressed controls, implying that if there is enough information available in the stimulus, depressed people demonstrate comparable perceptual abilities. Dynamic facial expressions are likely to be a particularly powerful type of pictorial stimuli for depressed individuals, given their considerable difficulties in interacting socially (Carter, Turovsky, & Barlow, 1994; Feldman & Gotlib, 1993; Mathews & MacLeod, 1994), and may therefore yield more consistent results than other forms of stimuli.

Thirdly, the BDI-II is composed of six symptom dimensions: affective, motivational, cognitive, behavioural, and physiological as well as cognitive distortions (Beck et al., 1979). A large number of studies have performed factor analyses and principle component analyses on the BDI-II, of which only a small percentage support the original categorisation proposed by Beck and colleagues. The predominant finding is for two primary factors, cognitive and somatic. Cohen (2008) proposed that these results are due to the stringent requirements of factor analysis which do not lend themselves well to the BDI-II (Byrne, 2005; Cohen, 2008; Dunn, Sham, & Hand, 1993; Russo, 1994). Multidimensional scaling, which represents variables as points in Euclidian space, has fewer restrictions and may be more suited to the symptoms of the BDI-II (Cohen, 2008). In his 2008 study, Cohen identified six disturbance dimensions which coincide and validate Beck's original six-symptom categorisation. The dimensions include; basic needs satisfaction,

energy regulation, focused attention, regulation of emotion, motivation and cognitive distortions in self-evaluation. Using the BDI-II as a total score will not only diminish the specificity of results, but may deliver inaccurate results due to high levels of specific symptom groups (i.e. high levels of primary needs, emotion regulatory and attention symptom may be less related to affective information processing deficits than high levels of mood regulation, self perceptions and motivational disturbances).

A further factor that might be influential in the differential results found in the literature is the involvement of personality traits and affective states. The presence of personality pathology in depression has long been acknowledged by clinicians and researchers, with depressed individuals demonstrating elevated levels of neuroticism, negative affectivity (Bagby & Ryder, 2000; Beck, 1983; Blatt, D'Afflitti, & Quinlan, 1976), and reduced levels of extroversion, conscientiousness and positive affectivity (Bagby & Ryder, 2000; Enns & Cox, 1997). Elevated levels of neuroticism have been shown to evoke negative interpersonal events and interpersonal distress (Clark et al., 1994; Ormel & Wohlforth, 1991; Poulton & Andrews, 1992), and similarly low levels of extroversion decrease the reported satisfaction of interactions (Clark et al., 1994). Both mood states and personality traits appear to act in an emotion congruent manner, resulting in individuals who score highly on positive emotion traits (extroversion, positive affect) demonstrating more positive judgements. The contrary is true for individuals scoring high in negative emotion traits (neuroticism, negative affect) (Mathews & Bradley, 1983; Mayo, 1983; Okun, Stock, Snead, & Wierimaa, 1987; Seidlitz & Diener, 1993). It may be that both temporary mood states and stable personality traits are related to the

processing of affective stimuli, whereby personality traits are stable individual differences which influence the direction and strength of mood-cognition relationships (Josephson, Singer, & Salovey, 1996; Smith & Petty, 1995). Although there is evidence for the impact of mood states on judgment as discussed previously, and for the impact of personality traits on judgement as noted above, the majority of studies examining these effects have included only one of these variables (either moods or traits). It is likely that mood and traits interact to influence judgement with certain emotion-relevant traits, possibly enhancing mood-congruency effects. By incorporating both simultaneously in research, the independence and relative strengths of mood and trait effects on affective information processing will be determinable (Rusting, 1998), and will most likely provide a clearer and more accurate account of how the way in which we feel influences our perceptions and evaluations in daily life.

The aims of the present research were to study the combined effects of moods and traits on affect recognition, focusing on recognition accuracy, processing speed, perceptual evaluations and confidence levels. By including personality traits, affective states and mood states the influence of each will be determinable and enable the exploration of possible mediating effects. The division of the BDI, in the manner described earlier, will also enable a truer allocation of deficits to specific dimensions of depression, and ensure dominant symptoms do not overshadow further effects. Dynamic facial and gestural expressions are used, as dynamic portrayals facilitate subjective emotional responses (Lundqvist & Dimberg, 1995) and induce higher emotional arousal than static presentations (Detenber & Simons, 1998; Simons, Detenber, Reiss, & Shults, 2000; Simons, Detenber, Roedema, & Reiss,

1999) which may therefore provide greater ecological validity and more meaningful emotional signals.

3.2 Method

Participants

Eighty-five participants were included in the study. Eighteen of the participants were diagnosed by a consultant psychiatrist as having unipolar depression (ICD-10 criteria) and had BDI-II scores between 21 and 42 indicating moderate to severe depression. A further fourteen participants were not assessed according to ICD-10 criteria however demonstrated BDI-II scores above 12 indicating they were experiencing elevated levels of depressive symptoms and as such were considered dysphoric. The fifty three remaining participants had BDI-II scores less than 11 and did not report depressive symptoms. The mean age was 26 (SD=10.86) and ranged from 18 to 59. The gender ratio was 50:30 with a larger number of women participants. Of the clinically depressed participants two were experiencing their first episode of depression, with the remainder having previously experienced at least one prior episode of depression. 50% of patients were currently taking SSRIs, 27% were taking SNRIs and the remainders were taking NaSSAs.

Measures

Personality and Affective states: The NEO Five Factor Personality Inventory (NEO-FFI) (Costa & McCrae, 1992) was used to assess levels of the Big five

personality traits (neuroticism, extroversion, conscientiousness, openness to experiences and agreeableness). This is a self-report measure and is composed of 60 items. The DASS-21 short form (Lovibond & Lovibond, 1995) is also a self-report measure composed of 21 items. This questionnaire can be validly used to assess the dimensions of depression, anxiety and stress.. The Positive and Negative Affect Schedule (PANAS) (Watson & Clark, 1988) was used to assess mood (Watson & Clark, 1988). This scale is composed of 20 items, 10 of which assess levels of positive affect and ten which assess negative affect. Seven versions of the scale exist and are used to assess levels of mood over different time periods. For the purpose of this study participants were asked to rate how they felt on that day providing a measure of their current mood state.

Depression measures: The 21-item Hamilton Rating Scale for Depression interview (Hamilton, 1960) and the 21-item Beck Depression Inventory (Beck et al., 1996) were administered to determine the presence and severity of depressive symptoms. Both of these measures have been used extensively in depression and mood disorder research, and have been demonstrated to possess strong psychometric properties (Beck, Steer, & Garbin, 1988; Rehm & O'Hara, 1985).

Experimental Tasks

Dynamic Faces Task: The Faces task utilised dynamic facial expressions from the Cambridge Mindreading Face Voice Battery (Golan et al., 2006). This battery is composed of a library of 412 discreet emotional concepts presented as facial, vocal and

written expressions of emotion. For the purpose of this study only the dynamic facial expressions were used. The 412 emotional concepts are grouped in this battery into 24 exclusive emotion categories. The emotions expressed in these 24 emotion groups are further divided into age appropriate levels (levels 1-6). For this current task, an expression was chosen from each of the 24 emotion groups from either level 5 or 6 (Appendix I). This was to ensure that the words and states provided and covered were from the adult emotion repertoire.

Stimuli were presented using Superlab Pro version 4.0. When designing the experiment in Superlab two types of trials were constructed. The first trial type was composed of three events, the first was a screen informing the participant of the trial number, e.g. 4/24. This screen was displayed for a fixed time of 2000 milliseconds. The second event was a blank buffer screen, which was displayed for 50 milliseconds and the third event was the face clip, which played until a response was given, or for 19000 milliseconds. The second set of trials was composed of two events each. The first event was a screen presenting four adjectives, from which participants were to select the one best matching the expression. The second event was an instruction page asking participants to complete two paper and pencil rating scales and then press a button on the button box to move onto the next trial. This screen was displayed until a response was given. The sequence of events was the following; trial number screen, blank buffer screen, face clip, four adjectives, instruction page, next trial. Each video clip measured 90mm by 70mm on the screen. The stimuli were designed so that the same facial expression was played three times in each trial. To achieve this, individual expressions were replicated and stitched

together using QuickTime player before being inserted in Superlab Pro version 4.0 for presentation. Text was Times New Roman font, size 24 bold.

The selected emotional expressions were counterbalanced across trials for valence, and the gender of the actor in the clip. Each clip was attributed four descriptive adjectives (the standardised correct response and three distracters). The distracters were chosen so that they matched the valence of the correct response and were of the same difficulty level. The chosen facial expressions and descriptors were piloted before being included in the final study (Appendix 1).

Dynamic Gestures Task: The Gesture task was designed to examine responses to emotional expressions communicated via body movements. Based on the findings of Gallagher et al. (2003, 2004), three types of gestures were designed; positive expressive, negative expressive and instrumental. Expressive gestures are those, which communicate an emotional mental state such as fed up, scared, and excited. Instrumental gestures communicate an instruction or a command for someone to change their movements (such as look up, over there, turn around) and do not contain or communicate any emotional mental states. The instrumental gestures were therefore deemed, emotionally neutral. Only the results for the expressive gestures are included in this study. The results of the instrumental gestures are detailed in study 2 (chapter 4). The gesture stimuli were developed using the infrared Qualysis motion tracking system. Six infrared cameras were arranged in a semi-circle in front of the demonstrator who had 14 light reflecting balls attached to specifically chosen joints on the body namely the top of the head, temples, chin, shoulders, elbows, wrists, index finger tip and hips. Point-light was

used so as to eliminate all contextual information so judgments would be based solely on the information communicated via the biological motion itself. Each recording was edited using the Camtasia editing suite. Each clip was edited so that a gesture was played three times with duration of 1100 milliseconds. Clips were then inserted into Superlab Pro version 4.0. Stimuli were again presented using Superlab Pro version 4.0. The experiment was designed in the same format as the Face task above.

47 gesture video clips were developed and piloted alongside the facial expressions for the Face task on 14 never before depressed participants (Appendix I). Based on the results of this pilot study, 17 expressive (emotionally valenced) gesture clips (Table 3.1) were chosen and counterbalanced for apparent meaning of action, the speed of the gesture, level of difficulty, and the valence of the movement. Additionally 7 emotionally neutral gestures (instrumental) were selected during the same pilot study and used in study 2 (Table 4.1).

Table 3.1 Expressive Gestures

Positive Expressive	Blow a kiss, Well done, Salute, Come over here, Touched, Kiss on cheek, Got it, Hug.
Negative Expressive	No, Cold, Pleading, Bold, Angry, Fearful, No more, Back away, Give up.

Procedure

Participants completed the procedure laid out in chapter 2 whereby each completed a series of questionnaires followed by the dynamic Face task, the dynamic Gesture task and three Theory of Mind tasks. The dynamic Face and

Gesture task results will be discussed in this chapter. The Theory of Mind tasks are discussed in chapter 4.

Before each of the tasks, participants were provided with instructions, which were then reiterated by the instructor. Preceding each task, participants completed three practice trials (Appendix I). Stimuli included in the practice trials were not included in the final task. Each experimental task was designed so that the stimuli were each presented in a single block of 24 randomly ordered trials. Participants were instructed to press the button labelled 'R' on a provided button box to indicate that they had recognised the emotion. Following this participants' were presented with four descriptor words and asked to select the adjective that they believed matched the facial expression/gesture being expressed in the clip, by pressing the correspondingly numbered button on the button box. In all tasks participants were asked to complete two rating scales after each stimulus presentation. The first rating scale consisted of a continuous 12cm line. The left side of the line was marked negative and the right side was marked positive. 'N' was placed at the center of the line to indicate the neutral central point. This first scale was a measure of how positive or negative participants viewed the emotion being expressed. The second scale also consisted of a continuous 12cm line. This time the left hand side of the line was marked not confident and the right hand side was marked confident. This scale was therefore used to a measure how confident participants were that the adjective they had chosen was the correct match to the emotion expressed in the stimuli. Participnats were instructed to place a mark

anywhere on the scale. After completing the scales participants pressed 'N' on the button box to move on to the next stimulus. Four response measures were therefore taken from each participant for each stimulus presentation; a response time measure, accuracy score, a valence judgment and a confidence rating.

Statistical Analysis

To explore the relationships between depression, personality traits, current affective states and the behavioural response measures to the affective stimuli, Pearson correlation coefficients are reported among measures of personality (NEO-FFI, DASS-21), affective states (PANAS) and depression (BDI-II), followed by further analyses using regression techniques.

BDI-II items were divided into the six disturbance domains, outlined previously by Cohen (2008), for analysis. Three of the dimensions related to the affective and cognitive symptoms of depression, three to the physical or somatic complaints associated with this condition. The expectation was that the affective/cognitive symptoms would be primarily responsible for impairments in affect recognition. Symptom dimensions were then combined to form two domains for analysis; an affective/cognitive domain comprised of; mood regulation, motivational and self-perceptual symptoms, and a physical/somatic domain comprised of; primary need disturbances, energy regulation and attentional symptoms.

To ensure the four assumptions necessary for regression analyses were satisfied (linearity, equality of variance, normality and collinearity), a number of transformations were carried out. Neuroticism, extroversion, DASS-21 (stress subscale), physical/somatic variable, confidence scores in recognising negative gestures and valence ratings for positive gesture scores were all transformed using the square root transformation function. Negative affect, response times to negative and positive gestures and faces, valence ratings for negative gestures and negative and positive faces, and accuracy of scores for positive and negative faces, were transformed using the inverse function. The affective/cognitive variable and the accuracy level variables for positive and negative gestures were transformed using the log transformation function. By reducing symptom domains of the BDI-II into two domains, collinearity was removed. Simultaneous regression and mediation analyses were then carried out.

3.3 Results

Correlations and Regression Analyses

Relationships between depression and behavioural measures

To assess whether depression scores directly predicted patterns of responding on the Face and Gesture tasks, a series of correlations were performed. The significant correlations are summarised in table 3.2. As there are a large number of correlations

Bonferroni corrections are needed to ensure against type I errors. The correlations displayed in Table 3.2 were conducted in three sets of tests. The first four tests explored the relationships between depression scores and positive and negative behavioural measures for faces and gestures. In order to reduce the risk of type I errors alpha values need to be reduced to 0.01. The next four correlation tests carried out examined relationships between the affective states and the behavioural measures for facial and gestural stimuli. Alpha values again need to be lowered to 0.01. The final six tests were carried out to explore the relationships between personality traits (neuroticism, extroversion and conscientiousness) and the behavioural measures. As a higher number of correlation tests were conducted alpha levels need to be reduced to 0.00. The corrected p-values are displayed in Table 3.2 in brackets next to the uncorrected values.

Depression scores predicted three of the eight behavioural measures; accuracy of decoding positive gestures, the degree of negativity seen in negative faces, and response times. Both the affective/cognitive and physical/somatic components of depression negatively correlated with the accuracy scores for positive gestures (accounting for 13% and 12% of the variance in accuracy scores respectively), and no other variables correlated with this behavioural measure.

The degree of negativity seen in the negative faces (valence) was significantly predicted by the affective/cognitive (accounting for 5% of the variance) and physical/somatic (5%) components. However, negative affect and neuroticism also positively correlated with this measure and accounted for 13% and 6% of the variance respectively. The relationships with response times were more complicated

with the affective/cognitive depressive component showing a significant positive correlation with response time to faces, but a negative correlation with response times to gestures. Moreover, response times for positive gestures were positively correlated with positive affect and extroversion, whilst response times to positive faces significantly negatively correlated with neuroticism. For response times to negative stimuli, the affective/cognitive score of depression was the only variable to correlate with response times to faces, whilst affective/cognitive depression and extroversion scores both significantly correlated with response times to negative gestures.

Table 3.2 Pearson's Correlation Coefficients for Behavioural Measures, Depression, Affective States and Personality Traits

Behavioural Measures	Depression				Affective States				Traits					
	AC		PS		Negative(A)		Positive(A)		Neuroticism		Extroversion		Conscientious	
Face	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	Positive
Accuracy							.236* (.029)							
Confidence								.345** (.001)		-.246* (.023)	.251* (.021)	.328** (.002)		
Response Time	.255* (.019)	.285** (.008)										-.418** (.000)		
Valence	.221* (.044)		.229* (.036)		.354** (.001)				.250* (.022)					
Gesture														
Accuracy		-.357** (.001)		-.340** (.001)			-.290** (.007)							
Confidence								.298** (.006)	-.234* (.031)			.235* (.031)	.254* (.019)	
Response Time		-.372** (.000)						.271* .271*			.307** (.004)	.440** (.000)		
Valence						-.242* (.026)		.331** (.002)		-.291** (.007)			-.274* (.011)	

Note. NEO-Five Factor Personality Inventory=NEO-FFI; Positive and Negative Affect Schedule=PANAS; Neuroticism=NEO-FFI domain; Extroversion=NEO-FFI domain; Conscientiousness=NEO-FFI domain; Negative(A)=PANAS Negative Affect subscale; Positive(A)=PANAS Positive Affect subscale; AC=BDI-II Affective/Cognitive subscale; PS=BDI-II Physical/Somatic subscale. N=85, pairwise deletion was used. Uncorrected *p<0.05 level **p<0.01 level. P-values for Bonferroni corrected alpha levels are included in brackets.

This shows a significant response bias in accurately identifying positive gestures which is related to both aspects of depression, and a further significant bias in response times to negative faces is related to the affective/cognitive component. Response times to positive faces and negative gestures were related to depression, but they were also related to aspects of affects and personality. This was also true for the degree of negative valence seen in negative faces. To assess whether levels of depression could account for the relationships of affective states and personality traits with measures of response times and negative valence, a series of mediation analyses were undertaken.

Mediation analyses

The standard procedure to test for mediator effects (Baron & Kenny, 1986) was carried out. The first step in mediation analysis requires that the regression between the independent variable (i.e. affective states) and dependent variable (i.e. behavioural measure) show a significant effect. If true, a regression between the proposed mediator (i.e. depressive component) and the independent variable is carried out to test for a significant relationship. If both of these conditions are satisfied, the dependent variable is then regressed onto both the independent variable and the proposed mediator. If the mediator variable retains a significant effect on the behavioural response, and the effect of the independent variable on the behavioural response is weakened or disappears, then partial or complete mediation is shown. That is, the mediator is said to account for some, or all, of the relationship between the independent and dependent variables.

The first analysis undertaken was to assess whether the relationships between personality traits, and response times to positive facial expressions, could be accounted for by the affective/cognitive component of depression. To determine this the response time variable was regressed onto the personality trait extroversion (Figure 3.1 diagram 1a). This first step was satisfied with extroversion significantly predicting response times to positive facial expressions ($\beta = -0.418$, $p<0.001$). The second condition to establish mediation was also satisfied as the affective/cognitive scores regressed onto extroversion ($\beta = -0.365$, $p<0.001$). The third condition necessary for mediation effect was not satisfied however, when the response time variable was regressed on both the affective/cognitive and extroversion variables.

The affective/cognitive component no longer had a statistically significant independent effect on response times for positive facial expressions ($\beta = 0.152$, $p = 0.156$). The relationship between extroversion and response time ($\beta = -0.363$, $p<0.001$) was weaker than in the first regression model, but remained a statistically significant predictor. These results show that the extroversion-response time relationship for positive facial expressions was not mediated by the affective/cognitive component of depression, and both variables independently account for some of variance in response times.

In the same manner, the relationship between extroversion and response times to negative gestures was examined to determine whether the affect/cognitive symptom of depression had a mediating effect (Figure 3.1 diagram 1b).

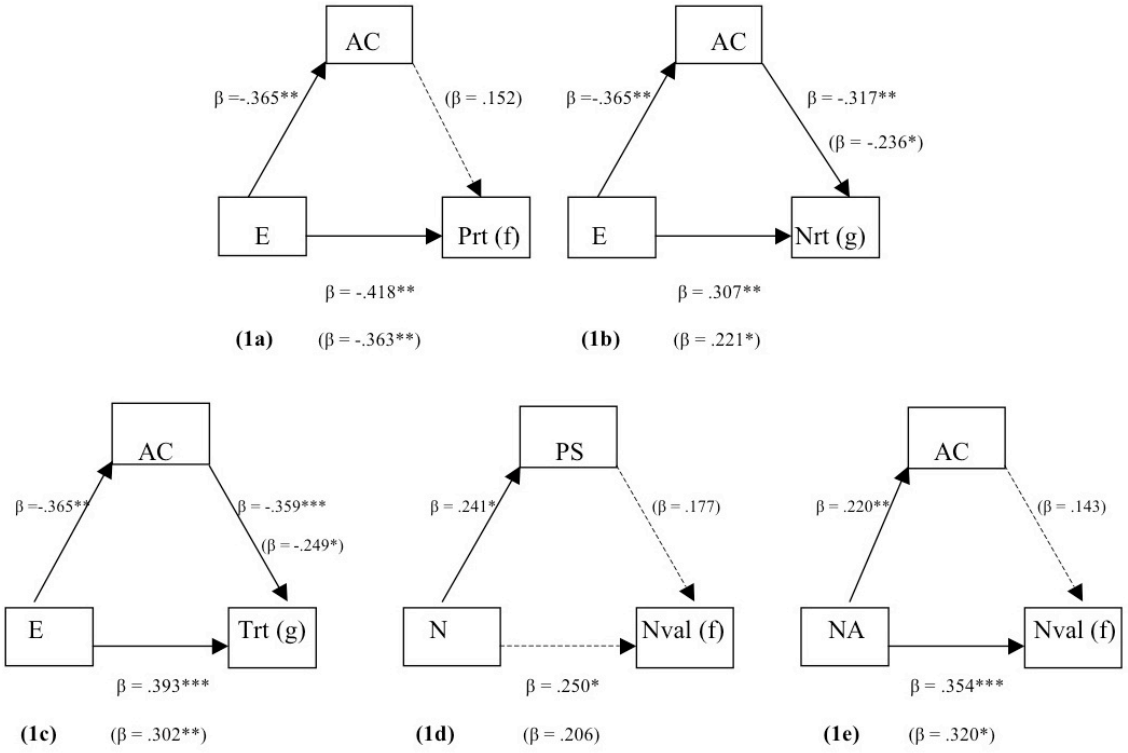

Figure 3.1 Mediation of the effects of personality traits on behavioural measures by the components of depression.

Note. AC=Affective/cognitive component of depression; PS=Physical/somatic component of depression; N=Neuroticism; E=Extroversion; NA=Negative Affectivity; Prt(f)= Response times for positive facial expression; Nrt(g)= Response times for negative gestures; Trt (g)= Total response times for gestures; Nval (g)=Valence ratings for negative facial expressions;. *p<0.05. **p<0.01. ***p<0.001.

When the response times for negative gestures were regressed on extroversion, the first condition necessary to establish a mediation effect was satisfied (β = 0.307, p<0.005). The second condition was also satisfied when the affective/cognitive variable was regressed onto extroversion (β = -0.365, p<0.001). The third condition was also met when the response time variable for negative gestures was regressed on to the

affective/cognitive and extroversion variables. As shown in Figure 3.1 diagram 1b, the affective/cognitive component had a statistically significant independent effect on response times ($\beta = -0.236$, $p<0.05$). The relationship between extroversion and response time ($\beta = -.221$, $p<0.05$) was weaker than in the first regression model but remained a statistically significant predictor. This shows that the affective/cognitive component of depression has a partial mediating effect whereby it accounts for some, but not all, of the extroversion-response time relationship for negative gestures. Diagram 1b demonstrates that extroversion accounts for 5% of the variance after mediation, with the affective/cognitive component of depression accounting for 6% of the variance in response time scores.

To further explore the extroversion-response time relationship, positive and negative response times were averaged to give total response times (Figure 3.1 diagram 1c). Significant relationships were found when the total response time for gestures was regressed onto extroversion ($\beta = 0.393$, $p<0.001$), and when the affective/cognitive was regressed onto extroversion ($\beta = -0.365$, $p<0.01$). A mediation effect was then established when the total response times for the gesture stimuli were regressed on affective/cognitive variable and extroversion. The affective/cognitive depression scores retained a statistically significant relationship with response times ($\beta = -0.249$, $p<0.05$), and the relationship between extroversion and response time ($\beta = -0.302$, $p<0.01$) was weaker than in the first regression model, but remained a statistically significant predictor. This showed that, within this data set, the affective/cognitive

component of depression partially mediated the extroversion-response time relationship for gestures irrespective of valence.

A further mediation analysis was then carried out to assess whether the relationships between neuroticism and valence ratings to negative facial expressions could be accounted for by the physical/somatic component of depression (Figure 3.1 diagram 1d). The valence ratings were regressed onto neuroticism ($\beta = 0.250$, $p<0.05$) and then the physical/somatic depression scores were regressed onto neuroticism ($\beta = 0.241$, $p<0.05$). Finally, the valence ratings for negative faces were regressed on to both the physical/somatic and neuroticism variables. The physical/somatic component no longer had a significant relationship with valence ratings ($\beta = .177$, $p = 0.108$), and the effect of neuroticism on valence ratings was also no longer statistically significant ($\beta = .206$, $p = 0.064$). Therefore, the physical/somatic component of depression did not have a mediating influence on the neuroticism-valence ratings relationship for negative facial expressions, with both factors relating to valence rating independently. Negative affective state was also influential in effecting a person's perception of negatively valenced facial expressions (Figure 3.1 diagram 1e). Whilst the first two stages of mediation were established, the third criterion was not met. This implied that the affective/cognitive component of depression does not have a mediating influence, and both negative affect and the affective/cognitive component of depression had independent significant effects on valence ratings for negative facial expressions.

Correlations and Regression Analyses

Relationships between personality, affective states and behavioural measures

Personality traits were further examined to determine their influence on response behaviour, independent of depression. DASS-21 scores did not correlate with any behavioural measures and were therefore not further included in the analysis. Table 3.3 shows significant correlations between traits, affective states and response measures.

Traits directly predicted four out of the eight behavioural measures; confidence in recognising facial expressions, the degree of negativity seen in both negative and positive gestures, and the total time taken to respond to gestures. Confidence in recognising positive faces was positively correlated with positive affect (accounting for 12% of the variance), neuroticism (6%) and extroversion (11%). Extroversion was also significantly correlated with confidence in recognising negative facial expressions, accounting for 6% of the variance in scores. Confidence in recognising positive gestures was positively correlated with positive affect (accounting for 9% of the variance) and extroversion (6%). Negative gestures were negatively correlated with neuroticism (5%) and positively correlated with conscientiousness (accounting for 6% of the variance). The perceived level of negativity in negative gestures was negatively correlated with conscientiousness (8%).The reported level of positivity perceived in positive gestures

was negatively correlated with neuroticism (8% of variance) and negative affect (6%). The total time taken to respond to gestures was significantly positively correlated with extroversion (15% of variance) and positive affect (6%). Neuroticism was significantly correlated with valence ratings for the positive gestures variable, as well as positive and negative affective states. Extroversion and positive affect were also correlated with total response times for gestures.

Mediation analyses

Further mediation analyses were therefore carried out to determine whether the relationships between personality traits and behavioural measures could be accounted for by affective states.

The analysis for negative affect, mediating the relationship between neuroticism and valence ratings for the positive gestures (Figure 3.2 diagram 2a), revealed no mediation. The analysis of positive affect, mediating the neuroticism-valence ratings relationship for positive gestures (Figure 3.2 diagram 2b), showed that positive affect fully mediated the relationship between neuroticism and valence ratings for positive gestures. This retained a significant relationship with the valence rating variable ($\beta = 0.265$, $p < 0.05$), while the relationship between neuroticism and valence ratings for positive gestures was no longer significant ($\beta = -0.205$, $p = 0.06$) after mediation had been carried out.

Table 3.3 Significant Pearson's Correlation Coefficients for Variables used in Mediation Analyses

Variable	Neuroticism	Extroversion	Conscientiousness	Negative Affect	Positive Affect	Affect/Cognitive	Physical/Somatic
1. RT positive faces		-.418**				.285**	
2. RT negative faces		.307**				-.317**	
3. Total RT gestures		.393**			.248*	-.359**	
3. Valence negative faces	.250*			.354**		.221*	.229*
4. Valence positive gestures	-.291**			-.242*	.331**		
5. Valence negative gestures			-.274*				

Note. NEO-Five Factor Personality Inventory=NEO-FFI; Positive and Negative Affect Schedule=PANAS; Neuroticism=NEO-FFI domain; Extroversion=NEO-FFI domain; Conscientiousness=NEO FFI domain; Negative affect=PANAS Negative affect subscale; Positive affect=PANAS Positive affect subscale; Affective/Cognitive=BDI-II affective/cognitive subscale; Physical/Somatic=BDI-II physical/somatic subscale. N=85, pairwise deletion was used.

*p<0.05 level. **p<0.01 level.

The analysis for the role of positive affect as a mediator in the relationship between extroversion and total response time for gestures (Figure 3 2 diagram 2c) revealed no mediation.

Two mediation analyses examined the behavioural measure of confidence in recognising positive facial expressions. The first (Figure 3.2 diagram 2d), determining the mediating influence of positive affect on the neuroticism-confidence relationship, found a mediating effect of positive affect ($\beta = 0.296$, $p < 0.01$). The second (Figure 3.2 diagram 2e) mediation analyses, looking at the mediating effect of positive affect on the relationship between extroversion and confidence for positive facial expressions, did not find a mediating effect ($\beta = 0.233$, $p = 0.06$). For the relationship between extroversion and confidence in recognising positive gestures (Figure 3.2 diagram 2f) analysis showed that positive affect does not mediate this relationship ($\beta = 0.243$, $p = 0.062$).

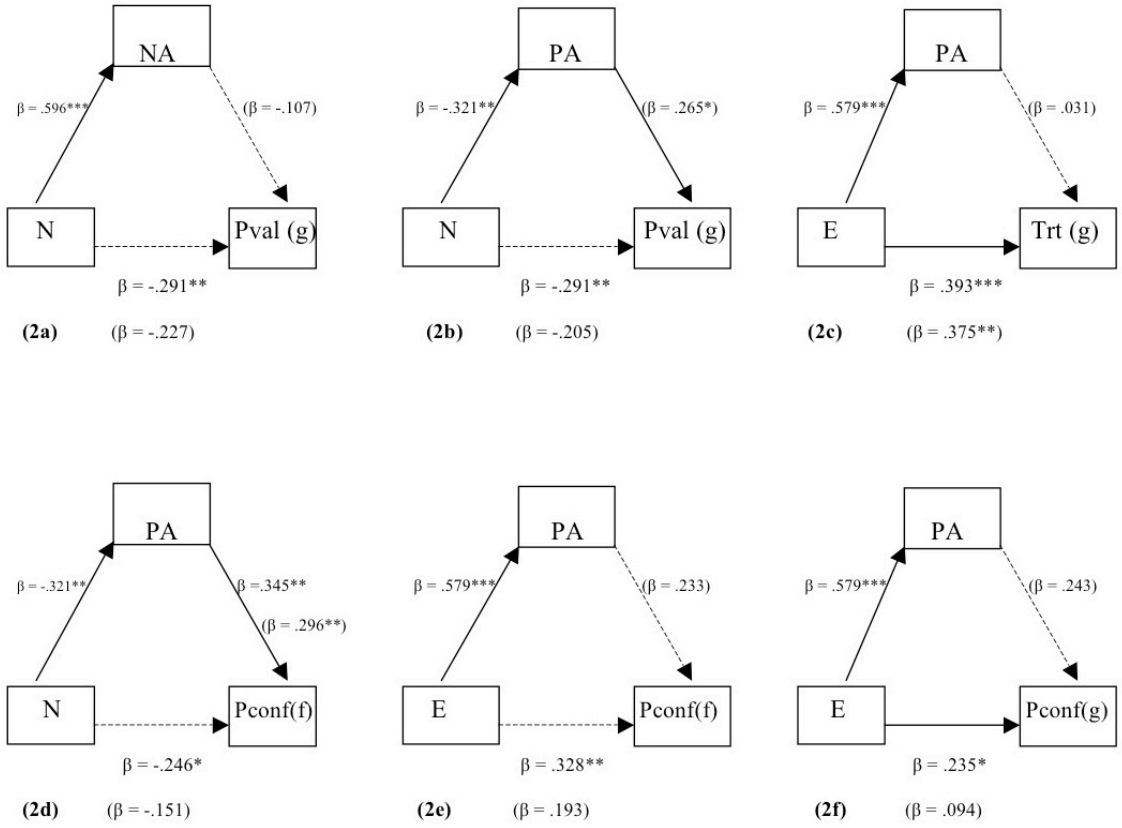

Figure 3.2 Mediation of the effects of personality traits on behavioural measures by affective states.

Note. NA=Negative affect; PA=Positive affect; N=Neuroticism; E=Extroversion; Pval (g)=Valence ratings for positive gestures; Trt (g)= Total response times for gestures; Pconf (f)= confidence scores for positive facial expressions; Pconf (g)= confidence scores for positive gestures. **p<0.01. ***p<0.001.

*Summa*ry

Accuracy measure: The affective/cognitive and physical/somatic components of depression, negative affect and the personality traits neuroticism, extroversion and conscientiousness did not demonstrate significant relationships with accuracy for

identifying facial expressions. Positive affect accounted for 6% of the variance in accuracy scores for negative facial expressions. Accuracy in the recognition of gestures was directly predicted by the two components of the depressive condition with the affective/cognitive component accounting for 13% of the variance and the physical/somatic component, accounting for 12% of the variance. Positive affect also accounted for 8% of the variance in accuracy scores. Personality traits and negative affect were not directly related to accuracy scores for gestures.

Valence measure: Components of the depressive condition significantly predicted sensitivity to negative facial expressions. Valence ratings for positive facial expressions were not predicted by either the personality traits, affective states or depressive components included in this analysis. The affective/cognitive component accounted for 5% of the variance in valence seen in negative facial expressions, as did the physical/somatic component of depression. Sensitivity in rating negative facial expressions was also predicted independently by neuroticism (accounting for 6% of the variance) and negative affect (12%). Depression scores did not predict valence rating scores of gestural expressions. For negative gestures the sensitivity, previously demonstrated for negative facial expressions, was predicted by conscientiousness which accounted for 7% of the variance. For positive gestures, positive affect explained the largest portion of the variance (11%), then neuroticism (8%), and negative affect (6%).

Response time measure: Only the affective/cognitive aspect of depression predicted response times to facial expressions. The affective/cognitive component of depression explained 8% of the variance for response times to positive faces, and 7% for negative faces. Extroversion also predicted response times for positive and negative facial expressions, accounting for 18% and 14% of the variance respectively. For gestural expressions, the affective/cognitive component predicted response times for positive gestures (5% of the variance), but extroversion (19%) and positive affect (7%) were also predictors. Negative gestures response times were predicted by the affective/cognitive component (10%) and extroversion (10%) with the affective/cognitive component of depression acting as a mediator in the relationship between extroversion and response times to negative gestures.

Confidence measure: Neither component of depression predicted confidence scores for positive or negative facial expressions. Positive affect accounted for 12% of the variance in scores for positive facial expressions and extroversion (11%) and neuroticism (6%) were also significantly correlated. Extroversion was the only variable to predict confidence in recognising negative facial expressions (6%). Depression scores were not predictive of confidence scores for positive or negative gestures. Positive affect again predicted confidence scores this time for positive gestures (9%). The three personality traits, neuroticism (5%), extroversion (6%) and conscientiousness (6%) also accounted for portions of the variance in scores.

3.4 Discussion

The aims of the present study were to contribute to the existing mood congruency literature by focusing on the effects of depressed mood, affective states and personality traits on affect recognition. An individual's ability and confidence in accurately identifying emotional expressions, the speed at which these signals are processed and how they are evaluated appears to be influenced not only by depressive disturbances, but also by personality traits neuroticism, extroversion and conscientiousness and current positive and negative affective states.

Previous research suggests that depressive symptoms are associated with facilitated processing of negative affective information, response time deficits and biases in perceived levels of negativity and positivity. The initial correlation analyses within this study sought to determine whether depression scores predicted processing speed, valence and expression judgements, and confidence of judgements. Biased accuracy scores in recognising positive gestures were associated with both the affective/cognitive and physical/somatic components of depression. However, previous studies demonstrating impaired recognition of positive facial expressions in depression (Sloan, Strauss, Quirk, & Sajatovik, 1997; Sloan, Strauss, & Wisner, 2001; Suslow, Junghanns, & Arolt, 2001) were not supported, in that neither component of depression directly correlated with accuracy scores, valence judgments or confidence scores. Partial agreement was found for response time deficits with the affective/cognitive component positively correlating with positive facial expressions.

The postulation by Cooley and Nowicki (1989) that a slowing in processing facial expressions in depression would impair the ability to follow continually changing arrays of facial signals during interactions thereby increasing the difficulty of engaging with others, is in line with these results for facial expressions, but not for response times to gestures for which the affective/cognitive component of depression was negatively correlated indicating faster responding.

Perceptual shifts have been shown to be task dependent (Gotlib & McCann, 1984; Gotlib & Meltzer, 1987; Hill & Dutton, 1989; MacLeod et al., 1986) and not consistently attributed to depression (Gollan et al., 2008; McCabe & Gotlib, 1995). Indeed in this study the affective/cognitive component of depression was related to response time and valence judgment biases for facial expressions, but accuracy score and response time biases for the gestural expressions. The physical/somatic component was related to valence biases for the facial stimuli but not accuracy score biases for the gesture stimuli. While reduced levels of confidence in engaging in social interactions have been found to be strongly associated with depression (Brown, Campbell, Lehman, Grisham, & & Mancill, 2001; Ingram, 1989; Pe´tursdo´ttir & Porsteinsdo´ttir, 2001), neither component of depression was associated with confidence levels in identifying facial or gestural expressions of emotion in this study.

Broadening the appraisal of influential factors in emotion recognition to include personality traits and affective states, this study demonstrates that focusing solely on the effects of depression reveals only part of this complex picture with current affective

states demonstrating relationships with recognition accuracy, valence ratings, response times and confidence levels. Rather than a result of depressed mood or negative affect (Jaeger et al., 1987; Mandal & Bhattacharya, 1985; Persad & Polivy, 1993; Rubinow & Post, 1992; Shannon, 1970; Surguladze et al., 2004), biases in accurately recognising negative emotional signals were reflective of current levels of positive affect irrespective of stimuli type. Positive affectivity is related to enthusiasm, accuracy in processing emotional information and pleasurable engagements (Watson & Clark, 1992), therefore deficits in accuracy may reflect a reduction in allocated attention to negative gestures, and an enhanced perception of facial expressions. While the response times were positively correlated with positive gestural expressions, the perceived positivity of positive gestures was increased, indicative of levels of social interest (Tellegen, 1985) and pleasurable engagement characteristic of positive affect (Watson & Clark, 1984). Positive affect also fully mediated a relationship between neuroticism and valence ratings for positive gestures, and a relationship between neuroticism and confidence in identifying positive facial expressions, showing that when current levels of positive affectivity were taken into account neuroticism no longer had a significant impact. Individuals' levels of confidence in recognising facial expressions and negative gestures were also positively correlated with positive affectivity, possibly illustrative of the high levels of alertness and the efficient processing of emotional information indicative of positive affect.

The influence of current negative affectivity was apparent for valence ratings only. Negative affectivity was negatively correlated with valence ratings for positive gestures, and positively correlated with valence ratings for negative facial expressions. Perceiving more negativity and less positivity in facial expressions is in accordance with reports of increased levels of distress and frequent unpleasant engagements, characteristic of negative affectivity (Watson & Clark, 1992). The three personality traits exhibiting significant relationships with emotion recognition in this study, demonstrated influence over confidence levels, judgments of emotional valence and, in the case of extroversion, response times. In relation to confidence, neuroticism was positively correlated with confidence reports for negative gestures, most likely a product of the enduring tendency to experience negative emotional states present in neuroticism, and increased attention allocation for negative aspects of emotional scenes (Caughlin, Huston, & Houts, 2000; Costa & McCrae, 1992; Terman, Buttenwieser, Ferguson, Johnson, & Wilson, 1938). Accompanying positive affect, extroversion increased confidence in accurately recognising positive and negative faces as well as positive gestures. Conscientiousness, a trait which directly effects task performance and achievement (McCrae & Costa, 1991), only demonstrated a positive correlation with confidence levels in identifying negative gestures, while neuroticism and extroversion displayed relationships with both facial expressions and gestures.

Turning to valence ratings, neuroticism scores negatively correlated with judgments of valence for gestures, and positively correlated with judgments for facial

expressions demonstrating the same influence as negative affect. The only measure to predict a bias to negative gestures was conscientiousness, which negatively correlated with valence judgements for gestures, diminishing the perceived negativity of the expression. With response times, the influence of trait extroversion was apparent alongside the influence of affective/cognitive disturbances and positive affectivity whereby, extroversion negatively correlated with response times for facial expressions but positively correlated with responses to gestures. Individuals who report high levels of extroversion are more sensitive to signals of reward and enjoyment (Clark et al., 1994) and may therefore respond faster to facial expressions, the dominant signalling system for rewards, and more slowly to gestural expressions, which do not provide as immediate an indication of reward or enjoyment. The relationship between extroversion and response time for gestural expressions was partially mediated by the affective/cognitive component of depression, demonstrating the influential involvement of levels of trait extroversion and depressive disturbances in delaying responses to gestural emotional displays.

It is therefore apparent that the affect recognition biases reported by previous studies are not generated by depressive symptoms in isolation, but are formed through a combination of depressed mood, affective states and personality traits. Since many studies have used total BDI-II scores instead of splitting the scale into affective/cognitive and physical/somatic components, the analyses for this study were re-run using total BDI-II scores. As expected, using the BDI-II as a total score

diminished the specificity of results and masked significant effects related to the different symptom domains. In contrast to the previously discussed findings, which demonstrated relationships between affective/cognitive and physical/somatic components for accuracy levels for recognising gestures, response time biases for faces and gestures and perceptual judgements of facial expressions, the use of the total BDI-II score resulted in only two findings. Firstly, a response time bias for positive gestures whereby BDI-II scores positively correlated with response times. Secondly, a negative correlation with valence judgements for positive gestures demonstrated a reduction in the perceived level of positive emotion in positive gestures. This indicates that people high in depressive symptoms recognise positive gestures faster than individuals with low scores, but report perceiving them as less positive. Total BDI-II scores did not correlate with any behavioural measures for the facial stimuli. The expectation that the affective/cognitive symptoms are primarily responsible for impairments in affect recognition, being composed of mood regulation, motivational and self-perceptual symptom, was supported for the response time measure. Here the affective/cognitive component, but not the physical/somatic component was related to processing speed for facial and gestural expressions. Both components however were predictive of the perceptual evaluations of negative faces, for which the total BDI-II score was not. The decomposition of this measure into its constituent symptoms has proven to be beneficial in enabling a more accurate determination symptom-behavioural manifestation effects.

The effects of diagnostic parameters (single versus recurrent unipolar depressive episodes) were not examined, nor were the effects of medications in this study. Considerations such as these will benefit future research in this area. Affective disorders may also alter self-reports of personality traits, particularly neuroticism, although only small indications of effects have been indicated (De Fruyt, De Clercq, Van De Wiele, & Van Heeringen, 2006; Santor, Bagby, & Joffe, 1997). Considerations of discrepancies between self-report and observer reports of personality should also be examined by future studies. In conclusion, the findings demonstrated by this study suggest that mood congruency effects are rooted in, and at times exacerbated, by not only depressive mood states but also personality traits and affective states which may function as initial contributors to social interaction difficulties and later precursors to mood disturbances. Including each aspect in studies of this nature, will therefore enable the development of a far more accurate and complete picture regarding affect recognition difficulties than either can alone.

Chapter 4

Decoding and Reasoning Abilities: Theory of Mind Functioning in Unipolar Depression

4.1 Introduction

Impaired social functioning in depression has been demonstrated by numerous studies reporting fewer social interactions (Youngren & Lewinsohn, 1980b), reduced numbers of friends (Brim et al., 1982; Gotlib & Lee, 1989b), and the perception of social interactions as less enjoyable, less rewarding and less intimate, during episodes of depression (Nezlek, Christianne, Hampton., & Shean, 2000; Nezlek, Imbrie, & Shean, 1994). The proposition that non-verbal processes play a role in the paucity and dissatisfaction surrounding social engagements in depression, has been advocated by several authors (Bouhuys & Albersnagel, 1992; Bouhuys, Geerts, & Mersch, 1995; Gotlib & Robinson, 1982; Segrin, 1993). With non-verbal behaviours accounting for over sixty percent of the information received and communicated during interactions (Burgoon, 1985) the ability to interpret and understand the meaning of another's behavioural

signals is essential for effective and enjoyable interactions to occur (Burgoon, 1985; DePaulo & Friedman, 1998). However, the underlying mechanisms responsible or related to impairments, in inferring meaning from non-verbal signals, are still unclear with some studies suggesting perceptual biases (Gollan et al., 2008; Gur & Erwin, 1992; Hale et al., 1998; Leppänen et al., 2004; Surguladze et al., 2004), and other studies failing to demonstrate impaired recognition (Archer et al., 1992; Cooley & Nowicki, 1989; Gaebel & Wolwer, 1992; Walker et al., 1984). Contrary to previous studies, which predominantly imply that the depressive condition in isolation engenders facilitated processing of negative facial expressions, the first study in this thesis (Chapter 3) demonstrated that an individual's ability and confidence in accurately identifying facial and gestural emotional expressions is influenced not only by depressive disturbances, but also by stable personality traits and current affective states. Further, study 1 (chapter 3) demonstrated that levels of depression, mood states and personality traits only explained a relatively small proportion of the variance in the scores of tests of perceptual bias. This suggests that whilst perceptual biases may be present in depression, their contribution to impaired emotion recognition may be minimal, with factors existing outside of mood and individual differences affecting a greater influence over the perception of emotional signals. A possible fundamental factor contributing to social functioning difficulties inherent in this condition may be an impairment in the ability to determine another's mental state (Deldin, Keller, Gergen, & Miller, 2000). The impairments in emotion recognition and variability in reports of deficits may therefore be further elucidated in terms of an underlying cognitive deficit in representing one's

own and others' intentions in impaired Theory of Mind (Baron-Cohen, 1989; Langdon, Davies, & Coltheart, 2002; Richell et al., 2003). The aim of this study therefore was to explore the relationships between depressed mood, personality traits and affective states on Theory of Mind capabilities to determine the extent to which they may be contributing to social functioning difficulties.

The term Theory of Mind refers to an individual's ability to the represent mental states (beliefs, intentions and desires) of others, and to use these inferences to guide and direct one's own actions and beliefs (Brune, 2003; Brune & Brune-Cohrs, 2006; Premack & Woodruff, 1978). The acknowledgment and understanding of other people in this way is crucial for successful social communication and is composed of two separable aspects; the ability to decode mental states, and the ability to reason about mental states, which ordinarily work in accordance with one another to produce reliable judgments about others' mental states. With each relying on fundamentally different kinds of social information processing skills, it is important to examine each component separately. Mental state decoding relies on social information that is determinable from the immediate and observable environment (facial expression, tone of voice, body posture). Mental state reasoning requires amalgamating contextual and historical information about a person to reach an understanding of behaviour (Sabbagh, 2004). Both components are therefore essential to negotiating social interactions with impairments resulting in poor social judgment, a reduction in social interactions, and a difficulty in understanding

non-literal language (Baron-Cohen & Ring, 1994), many of which accompany depression (Fisher-Beckfield & McFall, 1982; Levendosky, Okun, & Parker, 1995; Nezlek et al., 2000).

Traditionally first and second order false belief tasks (Dennett, 1978; Wimmer & Perner, 1983) were used to determine Theory of Mind reasoning abilities. While suitable for examining Theory of Mind in children, and in some disorders such as autism, these types of tasks may not be appropriate for adult samples with depression due to ceiling effects (Corcoran & Frith, 2003). For such populations higher level Theory of Mind tasks, testing the interpretation of non-literal language such as sarcasm, irony and deceit, requiring an understanding of speaker knowledge, beliefs and intentions, are more suited (Baron-Cohen et al., 1997; Happe, 1993; Marjoram et al., 2005; Stone et al., 1998; Winner et al., 1998). To assess decoding abilities, emotion recognition tasks may seem suitable, however, while facial expressions of emotion convey social responses it is not clear whether the Theory of Mind system is responsible for individuals' interpretations outside of facial recognition abilities. Baron-Cohen (1995) was the first to propose that the eyes are significant communication channels for emotions and mental states. The Eyes task (Baron-Cohen, 1995), described as an advanced test of Theory of Mind decoding ability, examines the initial stages of the attribution of mental states and is suitable for adult populations of normal intelligence. Individuals also disclose aspects of mental states through posture and movement, for example slumped shoulders and a lowered head indicate that someone is upset. Studies by Gallagher and Frith (2003, 2004) investigated the neural correlates of different types of body movements, and

demonstrated the existence of two dissociable neural networks for the perception of two types of gesture; expressive and instrumental. Expressive gestures are those, which communicate an emotional mental state whereas instrumental gestures are merely instructive and contain no information pertaining to an actor's emotional mental state. These gestural categories were confirmed with FMRI results which demonstrated that expressive gestures activate a neural network associated with Theory of Mind function and as such, might be used to assess levels of Theory of Mind decoding ability (Gallagher & Frith, 2004). Instrumental gestures however did not, and may be used to provide a control for the comparison between Theory of Mind impairments and possible deficits in the recognition of biological motion.

The Theory of Mind framework has proven very useful in understanding the social deficits associated with schizophrenia, autism and psychopathy (Craig, Hatton, Craig, & Bentall, 2004; Frith & Corcoran, 1996; Greig, Bryson, & Bell, 2004; Janssen, Krabbendam, Jolles, & Van Os, 2003; Kington, Jones, Watt, Hopkin, & Williams, 2000; Mazza, De Risio, Surian, Roncone, & Casacchia, 2001; Oguz, Rita, Miklósné, Szabolcs, & Zoltán, 2003), but examinations of impairments in depression are relatively few. As with the emotion recognition research, the existing Theory of Mind literature for depression is somewhat confused by various methodologies, mixed samples and limited numbers of studies examining depression types in isolation. Doody et al. (1998) studied a mixed sample of affective disorder, schizophrenic and psychotic participants and, using a second order false belief task, did not demonstrate Theory of Mind

impairment. Single sample studies with unipolar depressed participants however, have indicated decoding deficits (Lee et al., 2005; Werden et al., 2008) and reasoning impairments associated with reasoning about others' actions and thoughts in social interactions (Werden et al., 2008). Lee et al. (2005) found that individuals indicating high scores for the affective symptoms of depression were particularly impaired on the Eyes task. Study 1 (chapter 3) also showed significant correlations between affective symptoms and accuracy in recognising positive gestures, response speed and perceptual valence judgments for facial expressions. As with the recognition of emotional expressions, Theory of Mind deficits may also therefore vary with the presence of certain affective symptoms. Individuals who had exhibited Theory of Mind difficulties on second order false belief tasks, when assessed one year after remission, relapsed significantly more frequently than those without deficits (Inoue et al., 2004; Inoue et al., 2006). In contrast, a study exploring decoding abilities in dysphoric participants using the Eyes task, demonstrated enhanced mental state decoding ability (Harkness, Sabbagh, Jacobson, Chowdrey, & Chen, 2005). Bipolar depression has received the highest level of attention however, with individuals demonstrating impairments across an array of decoding and reasoning task types; first and second order false belief tasks (Kerr et al., 2003), the Eyes Task and the Hinting Task (Bora et al., 2005), and verbal Theory of Mind tasks (Olley et al., 2005).

Alongside mixed methodologies and samples, research in this area has yet to examine the contribution of individual differences in the ability to determine mental

states (Cronbach, 1957; Funder, 1991; Funder, 1995; Funder, 2001; Revelle, 1987). Study 1 (chapter 3) demonstrated the independent and mediated relationships between depression and the individual differences extroversion, neuroticism and conscientiousness on emotion recognition abilities, supporting research which acknowledges the influence of personality traits in social functioning (Clark et al., 1994; Ormel & Wohlforth, 1991; Poulton & Andrews, 1992). Traits refer to an individual's personal pattern of thinking, feeling and behaving (Gotlib & Hammen, 2002), and there is a substantial body of literature which suggests that a number of traits, notably extroversion and neuroticism, are associated with the depressive condition (Domken et al., 1994; Wilhelm et al., 1999). Many personality traits may alter the processing of information by affecting the ability to detect cues, enhancing or diminishing the perceived saliency of information, and an individual's motivation in processing information (Funder, 1991; 1995; McCrae & Costa, 1990). For example, extroversion is associated with a greater sensitivity to social dynamics and an enjoyment of social interactions , with extroverted individuals actively seeking out opportunities to be socially and emotionally engaged (Ashton, Lee, & Paunonen, 2002; Lucas & Fujita, 2000). Cokely and Feltz (2009) also demonstrated extroversion to be a personality trait, which accounts for judgments pertaining to the intentionality of behaviours.

Conversely neuroticism appears to be part of an involuntary surge of mental state attributions, associated with a tendency to experience negative events and to interpret situations negatively (Clark & Watson, 1991), with individuals high in trait

openness exhibiting a stronger awareness of their own feelings and a curiosity and unreserved openness to new experiences (Watson & Clark, 1984). Alongside personality traits, relationships were demonstrated between current affective states, particularly positive affectivity, and the accuracy, speed, confidence and perceived valence of processed emotional information in study 1. Positive affectivity also demonstrates strong relationships with extroversion, manifesting in reports of pleasurable engagements and an enthusiastic approach to being with others. Negative affectivity demonstrates strong correlations with neuroticism, characterised by high levels of distress and un-pleasurable engagements (Watson & Clark, 1984), further suggesting that affective states may equally impact Theory of Mind capabilities. Different traits and affective states may, therefore, be related to important differences in the attribution and perception of mental states in social judgments. In a similar manner depression incorporates affective, motivational, cognitive, behavioural, physiological as well as cognitive distortions (Beck et al., 1979) which may be differentially affecting mental state processes and attributions, as the results of study 1 (chapter 3) and Lee et al. (2005) demonstrated, where the components of depression varied the manifestation and level of impairment in emotion recognition and decoding tasks.

The first goal of the current investigation is to examine the combined effects of depressive symptoms, personality traits and affective states on Theory of Mind abilities. By including personality traits, affective states and depression, the influence of each will be determinable and enable the exploration of possible mediating effects. The BDI-II,

used to measure levels of depression, will also be deconstructed into its constituent parts to enable a truer allocation of deficits to specific dimensions of depression. It is predicted that depressed individuals will demonstrate impairments in the employment of decoding and reasoning abilities in determining the mental states of others. In particular it is predicted that the affective/cognitive components of depression will be more strongly associated with both decoding and reasoning performance whereas the personality traits and affective states will primarily demonstrate relationships with decoding task performance.

4.2 Method

As detailed in chapter 2 participants completed a series of computer tasks and personality and mood questionnaires over two sessions. Study 1 has previously discussed the results pertaining to the Face and Gesture tasks. In this results section the results relating to the Theory of Mind decoding and reasoning tasks will be discussed alongside the personality and mood questionnaire results. Task order was randomised and included: Theory of Mind decoding tasks; the Eyes task (Baron-Cohen et al., 2001) and the dynamic Gesture task: and Theory of Mind reasoning tasks; the Faux Pas task (Stone et al., 1998) and the Hinting task (Marjoram et al., 2005), as well as a selection of mood and personality questionnaires detailed in chapter 3. The Gesture task was composed of emotionally communicative expressive gestures, and emotionally neutral

instrumental gestures. Data pertaining to the expressive gestures are described in study 1, but are discussed in this study alongside performance on the instrumental gestures.

Participants and Measures

The same eighty-five participants who participated in study 1 also completed the tasks for this study. The mood and personality measures completed by participants are detailed in study 1 (chapter 3).

Experimental Tasks

Decoding tasks

The Eyes task (Baron-Cohen et al., 2001) measures a participant's ability to identify another's mood state based on an image depicting only the eye region of a face. Participants are shown 36 photographs of the eye region of a face and asked to choose which emotion they think is being shown from a choice of four adjectives. Each of the 36 sets of eyes communicates a different emotion posed by male and female actors. The original version of the Eyes task was designed as a paper and pencil task. For this study the photographic images were adapted for computerised presentation and response recording. Stimuli were presented on a Toshiba Portege laptop with a 12″ screen using SuperlabPro version 4.0. Each trial was composed of three events. The first was a screen

informing the participant of the trial number, e.g. 5/24, which was displayed for a fixed time of 2000 milliseconds. The second event was the image of a pair of eyes with an adjective placed at each corner. This screen was displayed until the participant selected an adjective using a button box. The third screen was an instruction page asking participants to complete two paper and pencil rating scales and then press a button on the button box to move onto the next trial. Each image measured 150mm by 60mm and the four descriptor adjectives were placed in the four corners surrounding the image of the eyes and were in Times New Roman font, size 24 bold. Adjectives were equidistant from the centre of the screen. The stimuli were divided into three valence categories: positive, negative and a neutral emotion group based on the study by Harkness et al. (2005).

Dynamic Gesture task: The expressive and instrumental gestures were included in this study (Table 4.1). The expressive gestures have previously been described in study 1 (chapter 3). During the gesture stimuli pilot study, the gestures that were allocated neutral valence ratings, as well as being assigned an instructive meaning, were labelled instrumental (Appendix I). By including both expressive and instrumental gestures in this study it is possible to infer as to the impairment of Theory of Mind decoding abilities separable from emotion recognition deficiencies.

Table 4.1 Instrumental and Expressive Gestures

Instrumental	Positive Expressive	Negative Expressive
Down there	*Blow a kiss*	*No*
Full	*Well done*	*Cold*
Turn around	*Salute*	*Pleading*
Come quick	*Come over here*	*Bold*
Raise up	*Touched*	*Angry*
Over there	*Kiss on cheek*	*Fearful*
Time out	*Got it*	*No more*
	Hug	*Back away*
		Give up

Note: Results pertaining to the items in italics are reported in study 1 (chapter 3)

Reasoning tasks

The Faux Pas task (Stone et al., 1998) assesses the ability to detect social faux pas in various situations and is composed of 20 short stories. The task is designed to examine an individual's ability to use information outside of physical expressions to determine how someone is feeling thereby assessing the reasoning component of Theory of Mind.

The Hinting test (Marjoram et al., 2005) was further used to assess reasoning abilities. In this task, individuals are asked to determine whether someone was dropping a hint throughout the course of a brief exchange, again assessing abilities by using contextual information to determine another person's emotional state. This task is made up of ten short passages.

Procedure

Participants completed the procedure previously discussed in chapter 2. The results from the dynamic Gesture task, the Eyes task, and two reasoning tasks (the Faux Pas task and the Hinting task) are discussed in this study. As discussed in study 1 (chapter 3) preceding each of the computer tasks, participants completed practice trials, which included stimuli that were not included in the final tasks. Participants were also asked to complete two rating scales after each stimulus presentation in the Eyes task and the Dynamic Gesture task (see study 1 section 3.2 for full details of rating scales). For the Faux Pas and Hinting tasks, each short story was read to the participant and a number of questions asked. Participants were provided with a copy of the stories and allowed to re-read as necessary.

Statistical Methods

The same type of statistical analyses were carried out as are detailed in study 1. Pearson's correlation coefficients and regression analyses were conducted to explore the relationships between depression, personality traits and affective states and Theory of Mind decoding and reasoning capabilities. As with study 1 the depression scores were divided into affective/cognitive and physical/somatic clusters for analysis. For full details regarding the transformations made to satisfy the assumptions of regression analysis see study 1 (chapter 3, section3.3)

4.3 Results

Theory of Mind Reasoning Tasks

Faux Pas task: correlations between the affective/cognitive and physical/somatic components of depression, affective states (negative and positive affect), personality traits (neuroticism, extroversion, conscientiousness, openness, and agreeableness) and scores on the Faux Pas task, did not demonstrate any significant relationships. This indicated that performance on this task was not predicted by any of these variables.

Hinting task: to assess whether depression scores directly predicted scores on the Hinting task, a series of correlations were performed, and the significant correlations are summarised in Table 4.2

Table 4.2 Significant Pearson's Correlation Coefficients for Variables used in Hinting Task Regression Analyses

Variable	Affective/Cognitive	Physical/Somatic	Hinting Task
Neuroticism			-.218*
Extroversion		-.368**	.244*
Openness	.324*		-.238*
Negative Affect	.220*		-.236*
Affective/Cognitive		.709**	-.311**
Physical/Somatic			-.301**

Note: NEO-Five Factor Personality Inventory = NEO-FFI; Positive and Negative Affect Schedule = PANAS; Neuroticism = NEO-FFI domain; Extroversion = NEO-FFI domain; Openness = NEO-FFI domain; Negative Affect = PANAS negative affect subscale; Affective/Cognitive = BDI-II affective/cognitive subscale; Physical/Somatic = BDI-II physical/somatic subscale. N = 85, pairwise deletion was used. *p<0.05 level **p<0.01 level.

Both the affective/cognitive and physical/somatic components of depression predicted Hinting task accuracy scores, negatively correlating with task scores (accounting for 10% and 9% of the variance respectively). This shows a small but significant bias in accurately identifying when another person is Hinting during conversation, which is related to both aspects of depression. However Hinting task scores were also related to

aspects of affect and personality. Extroversion, openness and negative affectivity each accounted for same amount of variance in task performance (6%) followed by neuroticism, which explained 5% of the variance in the Hinting task scores. To assess whether the relationships between affective states or personality traits and Hinting task scores could be accounted for by levels of depression, a series of mediation analyses were undertaken.

The first analysis undertaken was to assess whether the relationships between extroversion and Hinting task scores could be accounted for by the affective/cognitive component of depression (Table 4.3). This first step was satisfied with extroversion significantly predicting Hinting scores (= 0.241, $p < 0.05$). The second condition to establish mediation was also satisfied as the affective/cognitive scores regressed onto extroversion (= -0.365, $p < 0.01$). The third condition necessary for mediation effect was also satisfied when the Hinting task variable was regressed on both the affective/cognitive and extroversion variables. The affective/cognitive component had a statistically significant independent effect on Hinting scores (= -0.255, $p = 0.05$). The relationship between extroversion and Hinting task (= 0.148, $p < 0.188$) was no longer a significant predictor of Hinting scores. These results show that the extroversion Hinting task relationship was mediated by the affective/cognitive component of depression.

Next, the Hinting task variable was regressed onto openness (Table 4.3). The results showed that the openness-Hinting task relationship was mediated by the

affective/cognitive component of depression (= -0.259, $p = 0.05$). The affective/cognitive variable also mediated the relationship between negative affect and Hinting task scores (= -0.271, $p < 0.01$). The analysis for the physical/cognitive component of depression, mediating the relationship between extroversion and Hinting task scores (Table 4.3), also revealed a full mediation with physical/cognitive variable accounting for 6% of the variance after mediation (Table 4.3). The physical/cognitive component also fully mediated the relationship between neuroticism and Hinting task scores (Table 4.3), accounting for 7% of the variance of Hinting scores. Both components of depression independently predicted Hinting task scores, and fully mediated the relationships found between personality traits and current affective states.

Table 4.2 Mediation Analyses Results for the Hinting Task, Eyes Task and the Gesture Task

Predictor – Outcome Relationship	Mediator	Step 1	Step 2	Step 3 (Predictor)	Step 3 (mediator)	Mediation
Hinting Task						
Extroversion - Hinting Score	Affective/Cognitive	0.241*	-0.365	0.148	-0.255*	Full Mediation
Openness - Hinting Score	Affective/Cognitive	-0.240*	0.324**	-0.156	-0.259*	Full Mediation
Negative Affect - Hinting Score	Affective/Cognitive	-0.233*	0.220*	-0.174	-0.271**	Full Mediation
Extroversion - Hinting Score	Physical/Somatic	0.241*	-0.368**	0.152	-0.244*	Full Mediation
Neuroticism - Hinting Score	Physical/Somatic	-0.219*	0.241*	-0.156	-0.262*	Full Mediation
Eyes Task						
Extroversion - Neutral RT	Affective/Cognitive	-0.237*	-0.365**	-0.169	0.187	No Mediation
Extroversion - Negative RT	Affective/Cognitive	-0.290**	-0.365**	-0.198	0.252*	Full Mediation
Negative Affect - Neutral RT	Affective/Cognitive	0.289**	0.220*	0.246*	0.197	No Mediation
Extroversion - Neutral RT	Physical/Somatic	-0.237*	-0.368**	-0.177	0.163	No Mediation
Extroversion - Negative RT	Physical/Somatic	-0.209**	-0.368**	-0.204	0.236*	Full Mediation
Neuroticism - Neutral RT	Physical/Somatic	0.252*	0.241*	0.209	0.178	No Mediation
Gesture Task						
Extroversion – Negative RT	Affective/Cognitive	0.307**	-0.365**	0.221*	-0.236*	Partial Mediation
Extroversion – Total RT	Affective/Cognitive	0.393**	-0.365**	0.302**	-0.249*	Partial Mediation
Extroversion – Instrumental RT	Affective/Cognitive	-0.424**	-0.365**	0.340**	0.229*	Partial Mediation
Positive Affect – Instrumental RT	Affective/Cognitive	-0.274*	-0.190*	-0.215*	0.313**	Partial Mediation

Note. Step 1= outcome measure regressed onto predictor variable; Step 2= outcome measure regressed onto mediator variable; Step 3 (predictor) = effect of the predictor variable on the outcome measure after mediation; Step 3 (Mediator) = effect of the mediator variable on the outcome variable after mediation; RT= Response times. Italics show results reported in study 1. *** p <0.001 level, ** p < 0.01 level, * p < 0.05 level.

Theory of Mind Decoding Tasks

Eyes task: to assess whether depression scores directly predicted scores on the Eyes task, a series of correlations were performed, and the significant findings are summarised in Table 4.4. Due to the large number of correlations performed, Bonferroni corrections were apply to ensure against type I errors.

Table 4.4 Significant Pearson's Correlation Coefficients for Variables used in The Eyes Task Regression Analyses

Behavioural Measures	Depression		Affective State	Personality Traits	
	A/C	P/S	Negative (A)	Neuroticism	Extroversion
Confidence					
Neutral Eyes					.273*(.012)
Response Times					
Neutral Eyes	.249*(.020)	.228*(.036)	.289**(.007)	.252*(.020)	-.237*(.029)
Negative Eyes	.324**(.002)	.310**(.004)			-.290**(.007)
Valence Ratings					
Negative Eyes			-.395**(<.00)	-.314**(.003)	

Note: NEO-Five Factor Personality Inventory = NEO-FFI; Positive and Negative Affect Schedule = PANAS; Negative (A) = PANAS negative affect subscale; A/C = BDI-II affective/cognitive subscale; P/S = BDI-II physical/somatic subscale; Neuroticism = NEO-FFI domain; Extroversion = NEO-FFI domain. N = 85, pairwise deletion was used. Uncorrected values*p<0.05 level **p<0.01 level. P-vales for Bonferroni corrected alpha levels are displayed in brackets.

No significant relationships existed for depression scores and abilities to decode portrayed positive mental states. However, the affective/cognitive and

physical/somatic components of depression did positively correlate with response times to the negative and neutral Eyes task stimuli (accounting for 10%, 6% and 10%, 5% of the variance within the response time data respectively). Depression scores did not predict any of the other behavioural responses (accuracy, confidence, valence ratings). This indicates that high levels of depression may be associated with a significant processing bias in identifying another person's negative and neutral mental state based on emotion present in the eyes. However, negative affect, neuroticism and extroversion also correlated with response times. To assess whether these had an independent influence, or could in fact be accounted for by depressive symptoms a series of six mediation analyses were undertaken the results of which are summarised in Table 4.3.

The first analysis examined the mediating influence of the affective/cognitive aspect of depression on the relationship between extroversion and response times for neutral eyes. The affective/cognitive component failed to mediate this relationship (= 0.187, p =0.103), showing the extroversion has an independent influence on these response times. The same was found for physical/somatic depression in that it did not mediate the extroversion-response time relationship either (= 0.163, p =0.156). Both the physical/somatic and affective/cognitive components fully mediated the relationship between extroversion and response times for negative mental states, however (= 0.236, $p < 0.05$ and = 0.252, $p < 0.05$ respectively) (Table 4.3). The affective/cognitive component failed to mediate the relationship between negative

affectivity and response times to depictions of neutral mental states (Table 4.3), with the influence of negative affectivity remaining significant (= 0.246, $p < 0.05$) and the affective/cognitive component failing to do so (= 0.194, $p = 0.071$). The final analysis examined the mediating influence of the physical/somatic component on the neuroticism-response time relationship for neutral emotional states. No mediation was evident (= 0.178, $p = 0.104$). No depression or individual difference variables correlated with responses to positive mental states. Depression related to the response times for neutral and negative mental states with negative affectivity, neuroticism and extroversion all independently correlating with the speed individuals responded to neutral mental states. Depression also fully mediated the relationship between extroversion and response times for negative mental states. It appears that personality traits and current negative affectivity relate to the speed at which neutral mental states are determined, with depression relating to the decoding of negative mental states.

Dynamic Gesture task: the gestures used in this study were divided into three categories so as to assess Theory of Mind decoding abilities. The first two, positive and negative expressive gestures convey emotional cues. The third, instrumental gestures, do not communicate any emotional information but are neutral instructive signals. The analyses reported in study 1 showed that both aspects of depression were independent predictors of accuracy in recognising positive gestures. The affective/cognitive component also predicted response times to positive and negative gestures. However,

extroversion and positive affectivity were also predictors even when the affective/cognitive component of depression was accounted for as shown in Table 4.3.

Table 4.5 Pearson's Correlation Coefficients for Gesture Task Behavioural Measures, Depression and Affective States

Behavioural Measures	Depression		Affective State	Personality trait
	A/C	P/S	Positive (A)	Extroversion
Accuracy				
Positive Stimuli	-.357**	-.340**		
Response Time				
Positive Stimuli	-.372**		.271*	.440**
Negative Stimuli	.317**			.307**
Total Expressive Gestures	-.359**		.248*	.393**
Instrumental Stimuli	.353**		-.274*	-.424**
Valence				
Positive Stimuli			.331**	

Note: A/C = BDI-II affective/cognitive subscale; P/S = BDI-II physical/somatic subscale; Positive and Negative Affect Schedule = PANAS; Positive (A) = PANAS Positive affect schedule; NEO-Five Factor Personality Inventory = NEO-FFI; Extroversion = NEO-FFI domain. N = 85, pairwise deletion was used. *p<0.05 level **p<0.01 level.

Turning to the instrumental gestures, no relationships existed between any of the measures and accuracy in indentifying instrumental gestures. There were significant relationships with response time scores however, with the

affective/cognitive component of depression accounting for 12% of the variance in scores, and both positive affect and extroversion demonstrating negative correlations with relationships explaining 7% and 18% respectively. Both positive affect and extroversion were also positively correlated with confidence scores (7% and 8% of the variance respectively). Positive affect also correlated with valence judgments for the instrumental gestures (6%).

As the response times to instrumental gestures were related to the affective/cognitive component of depression, as well as to aspects of affects and personality, a series of mediation analyses were undertaken. Partial mediation was demonstrated between the extroversion-instrumental response time relationship with the affective/cognitive component accounting for 5% of the variance and extroversion accounting for 12% after mediation (Table 4.3). Partial mediation was also found for the positive affect-instrumental response time relationship. Here the affective/cognitive variable accounted for 10% and positive affect 5% of the variance after mediation (Table 4.3).

The affective/cognitive and physical/somatic components independently predicted: expressive gesture accuracy scores, the speed at which expressive gestures were identified, and partially mediated the relationships between extroversion and positive affectivity with response times for instrumental gestures. Positive affectivity also independently related to the valence judgments and confidence scores for the instrumental gestures.

4.4 Discussion

The aim of this current study was to explore the relationships between depressed mood and decoding and reasoning Theory of Mind capabilities. In line with the impaired reasoning capabilities evidenced by Werden et al. (2008) using narrative Theory of Mind tasks, reasoning abilities in this current investigation appeared to be attributable to the depressive condition with both the affective/cognitive and physical/somatic components of depression fully mediating relationships between personality traits and Hinting task performance. Only one of the reasoning tasks reflected a Theory of Mind deficit however, with the Faux Pas task demonstrating a lack of significant relationships with any of the variables included in the study. Differential performance on the Faux Pas task, which assesses the ability to detect socially inappropriate speech and behaviour, and the Hinting task, which requires an awareness of the subtly communicated desires of another person, indicates that depression reduces the latter awareness while maintaining the comprehension of inappropriate behaviour. Studies using second order false belief tasks with unipolar depressed patients have demonstrated impaired reasoning abilities similar to those outlined by this study (Inoue et al., 2004; Lee et al., 2005). The finding that depression did not influence an individual's ability to detect social faux pas may reflect a heightened concern for inappropriate behaviours and speech acting to enhance the ability to detect such social faux pas in others. This is further explored in study 4 (chapter 6).

The Eyes decoding task showed that depressive disturbances were related to response times for identifying negative and neutral emotional states; no relationships were evident for positive mental states indicating a significant decoding bias in recognising how another person is feeling. Both components of depression further mediated the relationship between extroversion and response times for negative mental states. These results are in contrast to those by Lee et al. (2005) which found that depressed participants were significantly less accurate on the Eyes task but indicated no response time differences. Lee et al. (2005) also found that the affective disturbances of depression were negatively related to the Eyes task performance but that somatic symptoms were not. The results from this study however show that both components of the depressive condition relate to the speed at which an individual responds to negative and neutral mental states. Depressive symptoms in the current investigation were divided into affective/cognitive and physical/somatic components based on the divisions suggested by Cohen (2008). It is possible that the disagreement in results is due to the differential classification of symptoms as affective and somatic. Future investigations of the influence of individual symptoms may highlight a combination of disturbances representative of a clinical subtype particularly vulnerable to decoding impairments. The expressive gestures, designed to activate Theory of Mind networks, further provided an indication of Theory of Mind impairment with recognition accuracy predicted by both components of depression for expressive but not instrumental gestures. Together, these findings indicate the involvement of deficits in decoding and reasoning capabilities however, the amount of explained variance in

scores by the depressive condition is relatively small implying the existence of other contributing factors.

A second goal of this current study was to investigate the relationships between individual differences and Theory of Mind abilities. Research is just beginning to explore the ways in which traits might be represented within Theories of Mind and, while personality traits demonstrated independent relationships with Hinting task scores, their contributions to reasoning task performance were fully mediated by the depressive condition indicating that it is the disturbances inherent within depression that are in part responsible for Theory of Mind reasoning task performance. Performance on the Eyes task, in conjunction with the components of depression, was related to extroversion, neuroticism and negative affect which all showed independent relationships with response times for neutral mental states. It appears that in determining the neutral emotional state of another person based solely on the subtle signals communicated with the eyes, personality traits and negative affectivity correlate with the speed at which this is performed. When determining negative mental states however, depression was related to response times. Decoding abilities required for the expressive gestures showed independent relationships with personality traits and affective states. Both positive affectivity and extroversion have previously been reported to be correlated with displays of emotional engagement and social interaction seeking behaviours accompanied by enhanced sensitivity to social dynamics (Ashton et al., 2002; Clark & Watson, 1991; Cokely & Feltz, 2009; Lucas & Fujita, 2000). In

accordance with this, positive affect was related to the perception of higher levels of positivity and reports of higher levels of confidence for positive gestures, with extroversion also relating to reports of confidence in recognising positive gestures. An enhanced ability to identify gestures communicating negative mental states was related to positive affect possibly serving to inform against entering into an engagement. Unexpectedly, positive affect was related to slower response times for positive gestures with extroversion relating to slowed response times across all expressive gestures. It appears that to maintain positive feeling and to achieve enjoyment and social engagement, positive affectivity and extroversion serve to predominantly navigate an individual away from negative social signals as opposed to towards positive signals.

Confidence in social interactions and engagements is reportedly diminished in depression, and associated with an increased frequency in misinterpreting vague or neutral social cues as negative (Rapee & Heimberg, 1997). Such misinterpretations are likely to further diminish social confidence however, the involvement of reduced confidence levels is not generally assessed in emotion recognition and Theory of Mind investigations. Neither component of depression directly related to confidence ratings in the decoding tasks, however relationships between current affective states and personality traits and confidence ratings were evident. In responding to instrumental gestures, designed as emotionally neutral communications, positive affect and extroversion both demonstrated positive relationships. With both of these features often absent in the depressive condition, the absence of the enhanced social awareness

characteristic of positive affect and extroversion may be related to reports of diminished confidence as opposed to features of the depressive condition itself. Confidence was further increased for the expressive gestures by extroversion, positive affect and conscientiousness. Neuroticism, a trait intimately related to the depressive condition (Angst, 1999; Costa & McCrae, 1988; Mulder, 2002) however, was negatively correlated with confidence in interpreting positive expressions. Elevated levels of neuroticism have been shown to evoke negative interpersonal events and interpersonal distress (Clark et al., 1994; Ormel & Wohlforth, 1991; Poulton & Andrews, 1992), and similarly low levels of extroversion decrease the reported satisfaction of interactions (Clark et al., 1994). In accordance with a tendency to experience negative events and to interpret situations negatively (Clark & Watson, 1991; Watson & Clark, 1984), neuroticism and negative affectivity were related to reduced valence judgments for positive gestures. Further positive affectivity demonstrated a relationship with the valence judgments of the instrumental gestures. Conscientiousness alone related to the reduced valence ratings for gestures expressing negative mental states. The relationships for both positive affect and extroversion with response times for instrumental gestures however were, partially mediated by the affective/cognitive component of depression.

The results from this study and those in the previous chapter (study 1) suggest that while perceptual biases and Theory of Mind impairments are implicated in social functioning problems, neither appears to be affecting a comprehensive influence. While

it is evident that the various facets of the depressive condition and specific individual differences are contributing to impairments in responding to social cues, these only account for a small percentage of variance in performance scores. Evolutionary theories propose that Theory of Mind abilities have evolved to enable the understanding and prediction of behaviour in an increasingly complex social environment by reducing the complexity of people and situations thereby enabling us to adapt correctly to social situations. Both of the decoding tasks used in this current investigation were highly complex, displaying only a diminished and limited portion of information from which to infer a mental state. These advanced Theory of Mind tasks only examined the initial stages of the attribution of mental states however, and research into the later stages of mental state attribution, where individuals infer the content or reason behind the attributed mental state (Baron-Cohen et al., 2001), may help elucidate further deficits associated with depression. Studies focusing on the experiential accounts of social interactions may help to inform such research. Depressed individuals have also been found to demonstrate reduced behavioural responsiveness, with studies showing reduced levels of animation, enthusiasm and attention to their interaction partner (Segrin & Abramson, 1994). A lack of responsiveness may be implicated in the breakdown of conversations and the deterioration of interactions with those lacking in appropriate responsivity viewed as unfavourable interaction partners and subject to rejection and disinterest (Davis & Holtgraves, 1984). Consideration of such factors by future research will aid the understanding of these important interpersonal deficits.

Chapter 5

To Express or Not to Express: Factors Influencing the Facial Responses of Women with Unipolar Depression Analysed Using FACS

5.1 Introduction

The interpretation and recognition of facial expressions during interactions provides information fundamental to our understanding of the social environment within which we exist. The face is the primary provider of information, conveying personal characteristics such as identity, gender and age as well as the more socially necessary cues with which we can determine another's emotions and intentions. To function socially however, we not only need to be able to comprehend another's expressions and non-verbal communications, we also need to be able to express our own emotions and intentions. Emotional expressivity incorporates behavioural, experiential and physiological response systems (Dolan, 2002; Ekman, 1992; Lang &

Öhman, 1988; Lazarus, 1991; Levenson, 1994), and occupies an important role in regulating social interactions (Ekman, 1984, 1993; Izard, 1977; Izard & Malatesta, 1987; Plutchik, 1980). It enables individuals to appraise another's emotional state and adjust behaviour accordingly, as well as communicating personal emotional states (Mandler, 1975) avoiding conflict (Hansen & Hansen, 1994) and affecting receiver's behaviour (Camras, 1977; Klinnert, 1984). Individuals vary in their ability to express facial cues however (Thompson & Meltzer, 1964), and there is evidence to suggest that different disorders are associated with different emotion profiles (Field, 1995; Kring, Kerr, Smith, & Neale, 1993; Marcus & Wilson, 1996). Individuals with depression demonstrate impairments in the production of facial expressions, with reductions apparent for both positive and negative displays, alongside a reduction in the overall number and intensity of expressions (Allen, Tinder, Rae, & Brennan, 1995; Brown & Harris, 1978; Jaeger et al., 1986; Schwartz, Fair, Salt, Mandel, & KIerman, 1976).

Three mood facilitation views exist to explain the disrupted patterns of facial expressivity in depression, whereby the moods inherent in the condition promote like-valenced emotional responses (Rottenberg et al., 2005). The negative potentiation view parallels the literature on emotion recognition biases, which postulates that the negative mood apparent in depression enhances recognition for negative emotional cues (Beck et al., 1979; Scher, Ingram, & Segal, 2005), proposing that the high negative mood inherent in depression will increase the individual's expressiveness to negative stimuli. The positive attenuation theory similarly proposes that the low positive mood, which accompanies the

depressive condition, contributes to an individual's tendency to exhibit reduced levels of expressivity to positive emotional cues, with reduced anhedonia and motivational disturbances further impacting on emotional displays (Clark et al., 1994; Depue & Iacono, 1989). The emotion context insensitivity view, however, asserts that depression reduces expressive displays to emotional cues irrespective of valence (Rottenberg et al., 2007; Rottenberg et al., 2005). Predicated on evolutionary views of depression, the emotion context insensitivity view relates symptoms which reduce the motivation of individuals to interact with others, to a self-protecting bias whereby individuals disengage from their environment (Nesse, 2000) serving to protect against adverse situations, for which the individual may not currently be capable.

A meta-analysis of nineteen studies conducted by Bylsma et al. (2007) provided insights into the relative merits of these three approaches. The findings indicated consistent reductions in positive and negative emotional expressivity in major depression for each of the three main emotional response systems; behavioural, experiential, and physiological. In contrast to the negative potentiation view which proposes enhanced displays of negative emotions, a reduction in negative emotional displays was reported by some studies. The positive attenuation view was also supported though with a number of studies showing reduced displays to positive emotional signals, and indications of a greater degree of blunted positive emotional responses than negative. It appears that the emotion context insensitivity view garnered the most support however, predicting responses to negative stimuli and demonstrating

overall reductions in emotional displays. In opposition to previous accounts of comparable self-report ratings of experienced emotion between depressed and healthy controls (Brown, Sweeney, & Schwartz, 1979; Gehricke & Shapiro, 2000; Rottenberg, Kasch, Gross, & Gotlib, 2002; Sloan et al., 1997) this pattern of reduced displays to positive and negative stimuli was further maintained across reports of experienced emotion (Bylsma et al., 2007). Reductions in experienced emotion may be in line with the emotional context insensitivity view, which implicates social disengagement (Friesen & Ekman, 1987) as an underlying cause of diminished facial expressions (Bylsma et al., 2007). Reductions in experienced emotion may further be reflective of a fundamental reduction in interest levels as discussed in study 4 (chapter 6), or emotional avoidance strategies which enable individuals to regulate their emotional state to cope with personal responsibilities (Kennedy-Moore & Watson, 2001).

With research consistently demonstrating stable correlations between the 'big five' personality traits and expressed and experienced emotion (Keltner, 1996), personality traits might also be involved in altering patterns of expressivity in depression. Personality traits, proposed to originate early in development and evolving into habitual patterns of social engagement, perception and communication, relate to the threshold and intensity of an initial expression tendency as well as the subjective experience of the emotion (Gross et al., 1998). Extroversion has been shown to be predictive of social approach facial expressions (Keltner, 1997) and increased Duchenne smiles of enjoyment and amusement, whereas neuroticism is conversely associated with the tendency to express anger, contempt, fear and distress

(Eisenberg et al., 1989). While conscientious individuals exhibit reduced displays of negative emotions with a preponderance for face touching, gaze aversion and head lowering, as well as increases in positive Duchenne laughter (Keltner, 1995), individuals high in trait agreeableness invite positive interactions with expressions designed to encourage cooperative and friendly engagements and further facial displays found to reduce social tension and conflict (Ruch, 1993).

Accompanying individual differences in varying the extent to which individuals express or suppress their emotional tendencies are social display rules (Ekman, 1972a). Display rules determine that, in general, the expression of positive emotions are more acceptable than negative emotions (Sommers, 1984; Trierweiler et al., 2002). This is demonstrated by increased experiential reports of positive emotional states compared with negative (Gross & John, 1995), and the implication of negative emotions when asked which emotional displays individuals attempt to suppress (Grossman et al., 2000). Governed by unwritten rules of social appropriateness, emotional displays and behavioural responses are evaluated, and either expressed or internalised depending on their concurrence with the cultural or social display rules in existence (Ashforth & Humphrey, 1993; Ekman, 1973; Grandey, 2000; Hochschild, 1983; Morris & Feldman, 1996). That is, a negative response to an event or stimuli may be suppressed if the expression of it is evaluated, in terms of the social environment, as inappropriate. Expression of positive emotions as the more socially accepted type of emotional display may be used to mask negative responses or be displayed more often than genuinely felt. While objectively instilled, over time display rules may become implicit with

interpretations of societies norms and emotion regulation capabilities altered by different individual differences. For individuals high in extroversion, the rule to display a greater number of positive emotions seems most salient whereas the rule of suppressing the expression of negative emotions appears most salient for neurotics. Extroversion positively correlates with the aspect of display rules concerning the expression of positive emotions, whilst neuroticism correlates with the aspect that discourages the expression of negative emotions (Diefendorff & Richard, 2003). Extroversion, which positively relates to emotion regulation capabilities whereby active attempts are made to convert negative emotions into positive, affects behaviour so that individuals high in this trait can be expected to positively relate to the expression of naturally felt emotions. Conversely for neuroticism, the most dominant trait in affecting expressive behaviour, the inhibition of felt emotion is the preferred emotional strategy. Negatively related to emotion regulation abilities, neuroticism is negatively associated with expressing feelings and consequently positively related to higher rates of emotional suppression and social acting (Diefendorff & Richard, 2003). With higher levels of neuroticism and lower levels of extroversion generally associated with depression, an individual's appraisal of their environment and consideration of appropriate responses may bring about important differences in expressivity.

Guided by the influence of depressive symptoms and personality traits, an individual's evaluation of events and interpretation of societal rules may have ramifications for their level of expressiveness. While it has been shown that the extent to which individuals conform to display rules, accordingly modulating their expressive tendencies, varies with specific

personality traits, the influence of depression on the interpretation and adherence of such rules has not been established. Given the high reliance placed upon non-verbal signals during engagements, inappropriate implementation of display rules may be exerting an influence over the degree of expressed emotion, negatively impacting the success and maintenance of social interactions in depression. The current study was designed to explore this possibility by firstly establishing the influence of unipolar depression on behavioural and experiential emotional response systems using dynamic portrayals of social interactions, and secondly determining the relationship between personality traits and display rules in altered levels of facial responsivity evident in depression.

5.2 Method

Participants

Thirteen of the clinically assessed depressed participants, who had previously taken part in studies 1 and 2, also took part in this study. All of the participants had experienced at least one previous episode of depression. As well as the exclusion criterion detailed in chapter 2 (section 2.2), males were excluded from this study with sex differences continually reported in studies examining emotional experience and expression (Berenbaum & Oltmanns, 1992; Berenbaum & Rotter, 1992; Berenbaum, Snowhite, & Oltmanns, 1987; Hall, 1979, 1984 ; Kring & Gordon, 1998). Gender has been

demonstrated to influence the use of display rules with males being more likely to emotionally express when under stress or fear, whereas women tend to display their emotions under numerous circumstances. Twenty-seven individuals took part in the study; of the depressed participants diagnosed according to ICD-10 criteria one individual presented with a BDI-II depression score of 17, indicating mild depression with the remaining 12 indicating moderate to severe depression with scores between 21 and 42. One depressed participant was excluded from the study due to the occurrence of psychotic symptoms. A separate group of non-depressed individuals was recruited from advertisements in the community. Individuals in this group had BDI-II (Beck et al., 1996) scores below 10. For data analysis the final sample consisted of 13 depressed and 13 non-depressed control participants. The mean age for the depressed group was 31 (SD=9.9) and ranged from 18 to 50. Seven of the women were taking SSRIs, two were taking NaSSAs and three were currently taking SNRIs.

Measures

As in studies 1 and 2, the Beck Depression Inventory II (BDI-II) (Beck et al., 1996) was used to assess levels of depression. As well as calculating total BDI-II scores, a total somatic symptom value was also calculated. This was achieved by summing the scores for the items of the BDI-II that pertain to somatic symptoms. Somatic complaints are believed to represent an alternative way of expressing problematic emotional

impulses (Watson & Pennebaker, 1989) and have been linked to neuroticism (Costa & McCrae, 1987; Watson & Pennebaker, 1989). Since no defined criterion exists for splitting this somatic subset of BDI-II scores into low and high groups, scores ranging from zero to seven were taken to represent low levels of somatic symptoms with scores between nine and twenty were considered reflective of high somatic symptoms. The NEO Personality Five Factor Inventory (NEO-FFI) (Costa & McCrae, 1992) evaluated levels of neuroticism, extroversion, conscientiousness, openness to experiences and agreeableness.

The Berkeley Expressivity Questionnaire (BEQ) (Gross & John, 1997) measured dispositional expressivity which refers to an individual's emotionally expressive behaviour (Gross & John, 1995; King & Emmons, 1990; Kring, Smith, & Neale, 1994). This self-report measure of dispositional expressivity has been found to predict ratings of expressivity made by peers (King & Emmons, 1990) and family members (Kring, Smith, & Neale, 1994). The questionnaire is composed of 16 items assessing an individual's tendencies towards behaviourally expressing how they are feeling, and the strength of their impulse to display emotions providing a measure of adherence to display rules. Three subscales of expressive behaviour are included in this measure; impulse strength which refers to the intensity of impulses to express (e.g. "I have strong emotions"), negative expressivity which measures the tendency to exhibit specific negative emotions including anger, fear, nervousness and upset (e.g. "Whenever I feel negative emotions, people can easily see exactly what I am feeling")

and a positive expressivity factor which is related to the expression of positive affect such as warmth and friendliness ("When I'm happy my feelings show"). The impulse strength subscale represents the difficulties experienced in dealing with strong emotional impulses, specifically undesirable impulses such as crying. A high impulse strength score is therefore representative of coping responses, which are strained by overwhelmingly negative impulses (Gross & John, 1997). Inappropriate leakage of negative emotions loads onto the BEQ subscale negative expressivity, with expressions of positive affect loading onto the positive expressivity subscale. Responses are rated on a 7-point Likert scale ranging from 1 ('strongly agree' with the statement) to 7 ('strongly disagree'). Studies have demonstrated support for these subscales (Gross, 1998; Gross & John, 1997)and 2-month test-retest reliability of .86 provides support for this measures strong psychometric properties (Gross & John, 1995).

Stimuli

Stimuli consisted of 22 film clips, not longer than 67 seconds, designed to elicit positive and negative emotions. Films have been found to be invariant across participants and enable the unobtrusive recording of their facial expressions, as well as enabling participants to report their experience straight after each clip. Dynamic presentations also appear to facilitate subjective emotional responses (Lundqvist & Dimberg, 1995) inducing higher emotional arousal than static presentations (Detenber

& Simons, 1998; Simons, Detenber, Reiss, & Shults, 2000; Simons, Detenber, Roedema, & Reiss, 1999), therefore possibly providing more meaningful emotional messages. Few studies in this area however have used films to assess levels of reactivity (Kaviani et al., 2004; Rottenberg & Gross, 2003; Rottenberg et al., 2002; Rottenberg et al., 2005; Tsai, Pole, Levenson, & Munoz, 2003), with the majority measuring responses to sad and happy images (Allen, Trinder, & Brennan, 1999; Dichter, Tomarken, Shelton, & Sutton, 2004; Dunn, Dalgleish, Lawrence, Cusack, & Ogilvie, 2004; Forbes, Miller, Gohn, Fox, & Kovacs, 2005; Sloan et al., 1997; Sloan et al., 2001), and others using stress tasks (Albus, Muller-Spahn, Ackenheil, & Engel, 1987; Dawson, Schell, & Catania, 1977; Guinjoan, Bernabo, & Cardinali, 1995). Clips were selected from movies using five criteria: (i) a clip had to depict two or more people engaged in an interaction, (ii) all characters faces and bodies had to be visible for the entire clip, (iii) clips could not be used if the background music was dominant and possibly mood inducing, (iv) scenes could not include disturbing or violent interactions and (v) all clips were in colour. Selected clips were divided into scenes which elicited happiness and scenes which elicited sadness, as previously determined during a pilot study (Appendix II). These two emotions were chosen as they are representative exemplars of the broad domains of positive and negative emotion and each is associated with clear signs of emotion and expressive behaviour.

Table 5.1 Film Titles for Clips Used in Task

1. Curb your Enthusiasm	8. Children of Men
2. Prime	9. Goodwill Hunting
3. About a Boy	10. Melinda and Melinda
4. A Good Year	11. In Good Company
5. Beaches	12. The Company
6. Groundhog Day	13. Something's Gotta Give
7. Mrs Doubtfire	14. When a Man Loves a Woman

More than one clip was taken from films numbered 3, 4, 5, 6, 7, 9, 10, and 11.

Experiential self-reports

Following each film clip, participants rated their subjective experience of the film using two ten-point Likert scales. The first of which was designed to assess whether the clip had changed their level of happiness or positivity, and the second to assess their current level of sadness or negativity. Ratings provided for happiness-eliciting clips and sadness-eliciting clips were totalled providing two values of felt emotion for each participant.

Procedure

After completing mood and personality questionnaires, participants were instructed that they would be watching a selection of short film clips depicting social interactions between two or more people and would be asked to complete two self-report scales after each clip. Participants were also informed that they would be video recorded for the duration of the task. Two example clips were shown before the task to ensure participants understood how to complete the rating scales. Each clip was started by pressing the space bar and all instructions were displayed on the computer screen and on paper. The experimenter left the room while the participant completed the task. Participants were tested individually and the session lasted approximately 45 minutes. After the experimental session participant's expressions were coded from the video footage by two certified coders, one of which was blind to the film clip valence (i.e. positive/negative) and participant category (i.e. depressed/non-depressed).

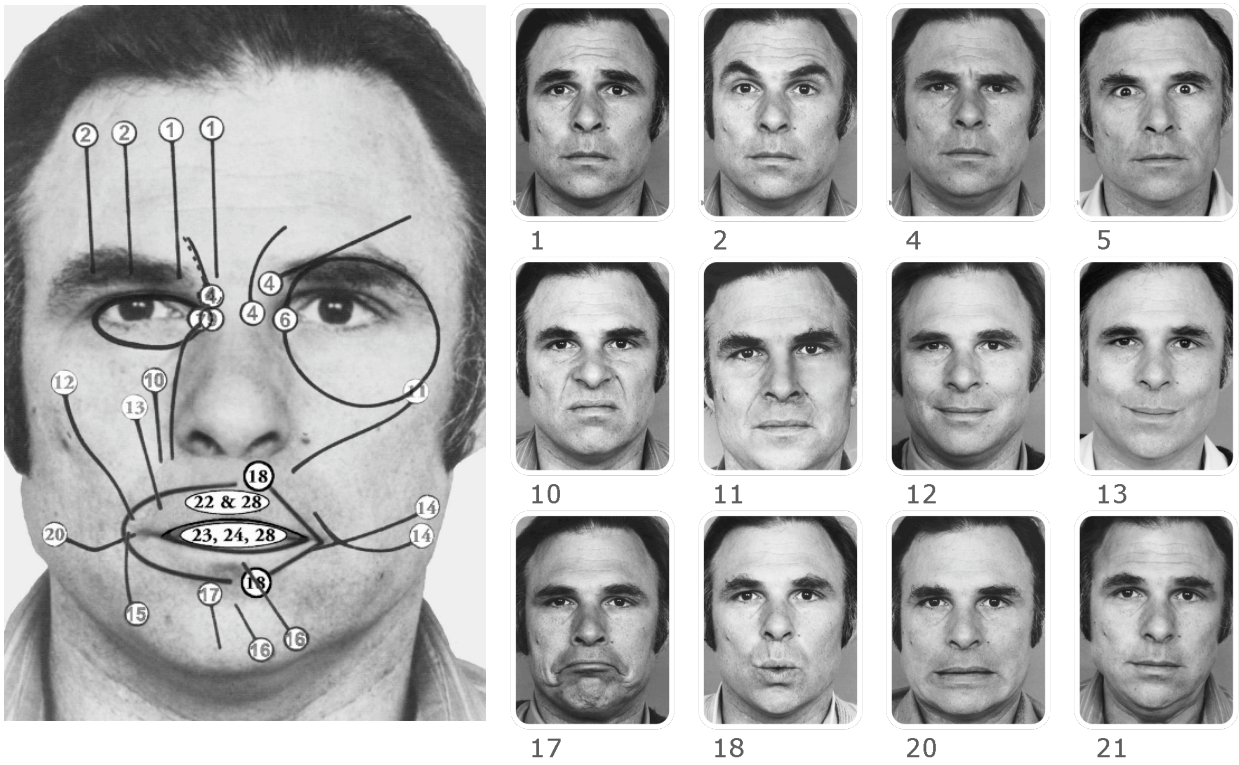

Figure 5.1 Examples of Facial Action Coding System action units

Coding Facial Expressions

Video footage of each participant was coded using the Facial Action Coding System (FACS) (Ekman, Friesen, & Hager, 2002). This is the most comprehensive system developed to measure complex facial expressions and has previously been used to study facial expressivity in normal and psychiatric groups (Ekman, Friesen, & M., 1988; Frank, Ekman, & Friesen, 1993; Gaebel & Wolwer, 2004; Kring et al., 1993; Kring &

Sloan, 1991; Reed et al., 2007). As depicted above in figure 5.1, this system codes facial expressions in terms of component movements termed action units (AUs). 46 AUs exist, each attributed to an independent muscle movement in the face, 12 examples of individual action units are shown above (Figure 5.1). FACS is designed to measure all muscle movements in the face, including but not limited to, those related to emotional expressions. Each action unit is further attributed an intensity level value during coding which range from A indicating that only a trace amount of the movement was evident to E indicating that the movement was performed to its maximum potential. Once all facial movements were coded into corresponding action units and accompanying intensity levels, results were converted into quantitative data for use in further analysis. To do this the number of action units pertaining to the upper face, lower face and whole face were summed, providing three total numbers of movements per clip. Further the intensity values ascribed to each action unit were converted into numerical values (A=1, B=2, C=3, D=4 and E=5) and also summed giving a total intensity value for the upper region, lower region and whole face per clip.

After training to become a certified FACS coder, I coded all muscle movements with 5% of the video footage further coded by a second FACS trained coder to ensure reliability. To become a certified coder approximately 100 hours of training must be completed, after which a standardised exam must be sat and an agreement ratio of at least .70 attained. Both coders completed this training program and obtained sufficient levels of accuracy to qualify as FACS coders. Coding of all facial movements was

performed within three months of completing the training and examination. The reliability level of .70 has been demonstrated to extend to experimental settings where spontaneous expressions are assessed (Sayette, Cohn, Wertz, Perrott, & Parrott, 2001) removing the necessity of performing intra-rater reliability. A Pearson's correlation coefficient of 0.97 ($p<0.01$), and a Cronbach's alpha value of 0.98, were achieved for the 5% of videos that were second coded validating the accuracy of coding.

5.3 Results

The analysis was carried out with four objectives; (i) to establish whether facial expression responsivity levels, as measured with FACS, differ between depressed and non-depressed groups for dynamic portrayals of social interactions, (ii) to determine whether self-reports of expressive tendencies as measured with the BEQ, differ between depressed and non-depressed groups, (iii) to establish whether self-reports of experienced emotion differed between groups and were related to self-reports of expressive behaviours and, (iv) finally to explore the relationships between personality traits, self-reports of expressive behaviours and actual facial expression responsivity in depression.

Facial Responsivity

To determine whether facial responsivity levels differed between depressed and non-depressed groups, two 2 (depressed versus non-depressed group) x 2 (positive versus negative clip) mixed ANOVAs were carried out on the number of whole facial movements and the intensity of the movements. ANOVAs were also carried out for the facial movements in the upper and lower regions of the face separately, but no significant differences were found between the participant groups, so only the results from the whole face movements are discussed here.

Table 5.2 Depressed and Non-Depressed Groups Facial Responsivity

	Group	N	Mean	SD
Number				
Positive Clip	Depressed	13	3.19	1.60
	Non-Depressed	13	4.90	2.10
Negative Clip	Depressed	13	3.93	1.57
	Non-Depressed	13	4.69	2.22
Intensity				
Positive Clip	Depressed	13	4.31	2.75
	Non-Depressed	13	8.15	3.73
Negative Clip	Depressed	13	5.19	3.17
	Non-Depressed	13	1.02	5.50

The ANOVA for the mean number of facial movements did not reveal a significant main effect of clip valence ($F_{1, 24} = 0.17$, $p = 0.68$, ES= 0.01) but a significant main effect of group ($F_{1, 24} = 5.54$, $p = 0.02$, ES= 0.18) was found, with depressed participants demonstrating reduced levels of responsivity (Table 5.2). There was no significant interaction between group and clip valence ($F_{1, 24} = .112$, $p = 0.74$, ES= 0.01).

From Table 5.2 it appears that the intensity of facial movements was influenced by the valence of the film clip and the presence of depression. The non-depressed group showed higher levels of intensity for the positive stimuli (mean = 8.15) than the negative stimuli (mean = 1.02), and the depressed group showed higher levels of intensity for negative clips (mean = 5.19) compared with positive stimuli (mean = 4.31). To examine this a further 2 x 2 mixed ANOVA was carried out with a between subjects factor of group (depressed versus non-depressed group) and a within-subjects factor of clip valence (positive versus negative) on the intensity of facial movements. A significant main effect of clip valence ($F_{1, 24} = 5.55$, $p = 0.02$, ES= 0.18) resulted where positive clips produced greater overall intensity of facial movements. There was also a significant main effect of group ($F_{1, 24} = 9.78$, $p < 0.001$, ES= 0.29) showing that the intensity of the facial movements was higher for the non-depressed group than the depressed group. However, no significant interaction was found ($F_{1, 24} = 0.88$, $p = 0.35$, ES= 0.04).

Self-Reports of Expressive Tendencies

Table 5.3 indicates that individuals with depression reported experiencing stronger emotional reactions, demonstrating higher impulse strength scores, and a tendency to express more negative emotions. To examine whether self-reports of levels of impulse strength, negative expressivity, positive expressivity and total expressivity scores differed between depressed and non-depressed groups, four univariate ANOVAS were carried out.

No significant differences were found between groups for negative ($F_{1, 24} = 7.49$, $p = 0.13$, ES= 0.09), positive ($F_{1, 24} = 0.06$, $p = 0.80$, ES= 0.00), or total expressivity scores ($F_{1, 24} = 2.61$, $p = 0.11$, ES= 0.09). The variation in impulse strength scores between groups however was significant ($F_{1, 24} = 4.22$, $p = 0.04$, ES= 0.15). Non-depressed participants reported lower levels (mean = 24.92) than depressed participants (mean = 32.15). High impulse strength scores are representative of a higher level of difficulty in dealing with strong emotional impulses, especially when undesirable.

Table 5.3 Expressive Tendencies Between Depressed and Non-Depressed Participants

Expressivity	Group	N	Mean	SD
Impulse Strength	Depressed	13	32.15	8.88
	Non-Depressed	13	24.29	9.05
Negative Expressivity	Depressed	13	26.15	3.78
	Non-Depressed	13	23.92	3.40
Positive Expressivity	Depressed	13	20.61	6.41
	Non-Depressed	13	20.07	4.38
Total Expressivity	Depressed	13	78.92	17.32
	Non-Depressed	13	68.92	14.03

Participants were also grouped into high and low somatic symptom groups and compared across the expressivity measures (positive, negative and total expressivity and impulse strength). It was expected that impulse strength and negative expressivity levels would vary for high and low somatic complaints, with those experiencing higher levels of somatic symptoms demonstrating increased impulse strength and negative expressivity. T-tests however failed to demonstrate significant differences ($t=-1.78$, $df = 24$, $p = 0.08$, two tailed; $t=-1.59$, $df = 24$, $p = 0.12$, two tailed respectively).

Table 5.4 Depressed and Non-Depressed Groups Experiential Reports

	Experienced Emotion	N	Mean	SD
Depressed				
Positive Clip	Positive	13	3.73	1.16
	Negative	13	1.99	0.73
Negative Clip	Positive	13	2.30	1.25
	Negative	13	3.41	1.61
Non-Depressed				
Positive Clip	Positive	13	4.28	1.76
	Negative	13	1.70	0.76
Negative Clip	Positive	13	1.90	0.67
	Negative	13	4.14	1.99

Further analysis was conducted to establish whether self-reports of experienced emotion differed between groups. The congruency of the reported levels of positive emotional experience and negative emotional experience were compared between groups i.e. experiencing higher levels of positive emotion for positive clips and negative emotion for negative clips. Table 5.4 indicates that depressed participants reportedly experienced lower levels of positive emotion (mean = 3.37) for positive clips compared

with non-depressed participants (mean = 4.28) viewing positive clips. Further depressed participants reported lower levels of experienced negative emotion for the negative clips (mean = 3.41), than non-depressed participants (mean = 4.14). A 2 (group) x 2 (clip valence) x 2 (congruency) mixed ANOVA was then carried out and revealed no significant main effect of clip valence ($F_{1, 24} = 1.32$, $p = 0.261$, ES= 0.05), or group ($F_{1, 24} = 0.14$, $p = 0.704$, ES= 0.01) however, a main effect of congruency was significant ($F_{1, 24} = 62.68$, $p < 0.001$, ES= 0.72). None of the interactions; clip x group ($F_{1, 24} = 0.12$, $p = 0.73$, ES= 0.005), congruency x group ($F_{1, 24} = 4.06$, $p = 0.055$, ES= 0.14), clip x congruency ($F_{1, 24} = 0.007$, $p = 0.93$, ES= 0.00) or clip x congruency x group ($F_{1, 24} = 0.02$, $p = 0.88$, ES= 0.00) were significant.

To explore whether participants' self-reports of emotional experience related to their self-reports of expressivity tendencies, Pearson's correlational analyses were carried out however no significant correlations were found (Table 5.5).

Table 5.5 Pearson's Correlation Coefficients for Experienced Emotion and Expressive Tendencies

	Non-matched	Impulse strength	Positive tendencies	Negative tendencies
Matched	0.473*	-0.089	0.06	-0.293
Non-matched		-0.219	-0.082	-0.134
Impulse Strength			0.59**	0.65**
Positive tendencies				0.59**

Note: Matched scores were derived by summing positive experience ratings given to positive clips and negative experience ratings given to negative clips; Non-matched scores were derived by summing the positive experience ratings given to negative clips and the negative experience ratings given to positive clips; Impulse strength, positive and negative tendencies scores were derived from the BEQ subscales.

Personality Traits, Reports of Expressive Tendencies and Actual Facial Responsivity in Depression

In order to infer about the influence of personality traits and expressive tendencies over responsivity levels between depressed and non-depressed groups, five t-tests were firstly conducted to determine whether levels of the personality traits differed between the depressed and non-depressed groups.

Table 5.6 Personality Trait Levels in Depressed and Non-Depressed Groups

Personality Trait	Group	N	Mean	SD
Neuroticism	Depressed	13	35.00	7.11
	Non-Depressed	13	22.23	7.27
Extroversion	Depressed	13	19.53	7.90
	Non-Depressed	13	30.30	5.15
Agreeableness	Depressed	13	32.76	6.55
	Non-Depressed	13	34.61	4.68
Conscientiousness	Depressed	13	29.61	8.74
	Non-Depressed	13	32.61	9.68
Openness	Depressed	13	32.69	6.14
	Non-Depressed	13	30.84	5.66

From table 5.6, it appears that depressed individuals reported higher levels of neuroticism and openness (mean = 35.0, mean = 32.69), whereas non-depressed participants exhibited higher levels of extroversion, agreeableness and conscientiousness (mean = 30.30, mean = 34.61 and mean = 32.61). To ensure against type I errors Bonferroni corrections were applied. If no correction was applied the chance of finding one or more significant differences would be 22.62%. For five t-tests the alpha levels needs to be reduced to 0.01. The depressed group had significantly higher levels of neuroticism (t=-4.525, df = 24, p <0.001 two tailed) and the non-depressed group higher levels of extroversion (t=4.116, df = 24, p < 0.001, two tailed). No significant differences existed between groups for agreeableness (t= 0.826, df = 24, p = 0.417, two tailed), conscientiousness (t= 0.850, df = 24, p = 0.403, two tailed) or openness to experience (t= -0.796 df = 24, p = 0.434, two tailed). With levels of neuroticism and extroversion being significantly different between depressed and non-depressed groups, ANCOVAs were carried out to examine their influence on the significant difference that was found between impulse strength scores for depressed and non-depressed groups, where depressed participants reported higher levels of impulse strength. After adjusting for neuroticism scores, there was no longer a significant effect of the between subjects factor (depressed/non-depressed) ($F_{1,23} = 0.02$, p = 0.88, ES = 0.00). Adjusted impulse strength scores suggests that attributes associated with trait neuroticism may be accounting for the initially reported group differences. When extroversion scores were adjusted for, the previously reported significant effect

of the group (depressed/non-depressed) on the intensity of facial movements was also no longer significant ($F_{1,23} = 1.90$, $p = 0.18$, ES = 0.07) again suggesting that characteristics of this personality trait might be responsible for the difference between groups.

Further ANCOVAs were to be carried out to explore the influence of the covariates, personality traits extroversion and neuroticism, on the dependent measures, reports of experienced emotion and the number of facial movements. The relationships between the covariates and dependent measures however were not linear therefore violating a fundamental assumption of the analysis. Subsequent to this the use of MANOVAs were also considered however due to assumption violations this form of analysis was also not suitable. Using MANOVAs with highly correlated dependent variables and a small sample size would weaken the power of the analysis and reduce the possibility of finding significant effects even if present. MANOVAs also assume linear relationships between dependent variables and covariates which was not the case in this study and as such would have further reduced the power of the calculations. MANOVAs are also sensitive to outliers and their impact on type 1 errors. Given the difference between the groups in this study and the within group variation this was a further concern in considering this form of analysis. The removal of outliers was not suitable in this instance given the potentially informative nature of outliers performance in exploring the impact of depression on reports of experienced emotion and facial movements.

The Pearson's correlation analyses demonstrate high correlations between the personality traits and BDI-II scores. The BDI-II scores correlated with neuroticism ($r = 0.74$, $p<0.01$) and extroversion ($r = -0.78$, $p<0.01$), further demonstrating correlations with impulse strength scores ($r = 0.44$, $p<0.05$). Impulse strength scores were also correlated with neuroticism, ($r = 0.59$, $p<0.01$). Given the high correlations between these factors, an overlap in influential characteristics between the personality traits and depressive symptom is most likely. The use of regression analyses would enable further dissemination of these relationships.

5.4 Discussion

The aims of this study were to explore patterns of facial expressivity to dynamically presented scenes of social interactions in depression, and further to assess the involvement of personality traits and adherence to display rules in reduced levels of expressivity. The results demonstrated support for the Emotion Context Insensitivity view of emotional expressivity in depression (Rottenberg et al., 2005), with scenes of social interactions eliciting reduced numbers and intensities of facial movements irrespective of stimuli valence. Self-reports of expressive tendencies further showed that, while depressed and non-depressed groups did not differ in the degree to which they tended to express negative or positive emotions, the intensity with which they

experienced the impulse to express how they are feeling was increased in the depressed group. An overall reduction in the number and intensity of facial displays, accompanied by reports of a greater intensity in the desire to emotionally express, and the finding that groups did not significantly differ in their experiential reports of felt emotion, implies the involvement of mood regulatory processes whereby individuals are modulating the degree to which they display their emotions.

This study proposes that the enhanced levels of neuroticism and reduced levels of extroversion present in depression are related to adherence to display rules and consequently to regulating levels of emotional expression. Display rules as previously discussed are standards of appropriate emotional expression (Ashforth & Humphrey, 1993; Ekman, 1973; Morris & Feldman, 1996) associated with the use of emotion regulation strategies (Brotheridge & Grandey, 2002; Brotheridge & Lee, 2003; Diefendorff, Croyle, & Gosserand, 2005). Emotional regulatory capabilities are positively related to extroversion and negatively related to neuroticism. Where extroversion is associated with the expression of emotion, and neuroticism, conversely, is related to surface acting whereby a required emotion is simulated while the real but less appropriate emotion is suppressed (Austin, Dore, & O'Donovan, 2008). Individuals who are most likely to use emotional suppression and social acting strategies have been characterised as those high in neuroticism, low in extroversion and conscientiousness (Diefendorff & Richard, 2003). This study significantly demonstrated this pattern of results for higher levels of neuroticism and lower levels of extroversion in the

depressed group. Neuroticism was further positively correlated with impulse strength indicating that participants higher in this trait also experience increased difficulty in dealing with strong emotional impulses, specifically socially undesirable impulses such as crying. With higher levels of neuroticism associated with an increased propensity for suppressing negative emotional displays, and low extroversion levels reducing the desire to express positive emotions, high levels of neuroticism and low levels of extroversion accompanying the depressive condition may serve to restrict emotional displays due to the over adherence to display rules.

A number of considerations for future studies in this area should be noted; firstly in the absence of a formal measure of display rule adherence the results in this study should be interpreted with caution and viewed as suggestive of a promising avenue for future studies to pursue. Future research requires the development of a suitable measure of display rule adherence enabling an exploration into the traits, states and depressive symptoms that appear to be most influential in an individual's propensity to conform to societal norms. Secondly, and perhaps more importantly, given the overlap between traits such as neuroticism and the depressive condition as shown in this study, future studies would benefit from the use of regression analyses. Studies in this area typically use between-group designs to show the discrepancies between depressed and non-depressed participants however, the use of regression techniques with larger samples will enable an assessment of the extent to which adherence to display rules, alongside other factors, may be exerting influence over a

depressed individual's emotional displays, and further their desire to engage in social interactions.

Emotional expression, determined by an individual's reaction to an event, and their attempt to manipulate their displayed emotion (Scher et al., 2005), has been found to reduce distress (Ogden & Von Sturmer, 1984), enable further insights into causes or reasons for distress and play a key role in the formation and maintenance of relationships. Providing the continually evolving cues that enable the coordination of social interactions, facial expressions inform our conversational partners as to our intentions, understanding, attendance and empathy providing the necessary reinforcements or deterrents for others' behaviour. With facial expressions functioning as the antecedents and consequences of social exchanges, awareness of the impression being displayed and assessments of personal display rule interpretations may influence the social functioning patterns evident in the depressive condition. Numerous theories have been proposed as to the origin and function of the wide range of facial expressions displayed during social engagements (Darwin, 1872; Dewey, 1894; Ekman, 1972b; Fridlund, 1994; Frijda & Tcherkassof, 1997). However, researchers who determine the processes and possible motivational strategies underlying these movements may better elucidate the discrepancies apparent in the depressive condition. Adherence to display rules, influenced by the presence of personality traits, are proposed as one such process whereby the occurrence of negative and therefore inappropriate emotional impulses inherent in depression are suppressed resulting in the reduced levels of expressivity evident in this condition.

Chapter 6

Standing Apart: A Qualitative Account of Social Functioning in Unipolar Depression

> 'Whoever it is who wrote this, have you really, really been down to our level? Do you know how we live? How we feel? Because so much of it is way up in the clouds, and just doesn't apply to us. And there's nothing we can use to help us'[1]

6.1 Introduction

Depression has been shown to impair the ability of individuals to perform normal social roles, with sufferers found to encounter more negative family and stranger interactions (Benezon & Coyne, 2000; Gotlib, 1982; Gotlib & Beach, 1995;

[1] Quote taken from a qualitative interview with a woman named Evelyn in, 'Legacy of betrayal: A grounded theory of becoming demoralised from the perspective of women who have been depressed,' Susan A. Hurst. Copyright 1999. Canadian Psychological Association.

Hokanson, Hummer, & Butler, 1991), report less frequent social engagements (Youngren & Lewinsohn, 1980a), and exhibit poorer social adjustment (Gotlib & Lee, 1989c). As discussed throughout this thesis past research has suggested that a dysfunction in a depressed person's ability to recognise and correctly respond to the social cues of others may be contributing to the social functioning impairments evident in depression. Overall however results have been equivocal. With social interactions being bi-directional in nature, examinations have also been performed to explore non-verbal signals originating from the depressed individual, to determine whether alterations in these signals may be disturbing social engagements. These studies have found that the production of facial expressions, the most dominant source of non-verbal communication, is impaired in depression (Allen, Tinder, Rae, & Brennan, 1995; Brown & Harris, 1978; Jaeger et al., 1986; Schwartz et al., 1976). Study 3 (chapter 5) further found that while depressed individuals demonstrated a reduction in the number and intensity of displayed facial expressions, individuals also conversely reported an increased habitual desire to express their emotional impulses. With the implication that individuals with depression are modulating the extent to which they emotionally express, study 3 proposed that varying levels of personality traits may be exerting an influence over the extent to which depressed individuals, specifically women, adhere to social display rules altering their patterns of facial expressivity. In order to explore this issue further, and with a view to determining additional factors implicated in the difficulties experienced during social interactions, this study employed a qualitative

method of analysis to allow for the subjective experiences of individuals with unipolar depression to be examined.

Researchers are noting the importance of attending to the subjective and experiential accounts of individuals to fully understand the impact of a depressive episode. Existing qualitative research explores: the perceived causes of an episode of depression (Etowa et al., 2007; Gammel & Stoppard, 1999; Mauthner, 1999; Scattolon & Stoppard, 1999), women's experiences of a depressive episode (Crowe, 2002; Mauthner, 1999; Scattolon & Stoppard, 1999), perceptions of diagnosis and treatment (Gammel & Stoppard, 1999), and the dysfunctional attitudes (Tam & Wong, 2007), and coping strategies (Etowa et al., 2007; Scattolon & Stoppard, 1999) accompanying the depressive episode. While not specifically conducted to explore social functioning difficulties a number of the qualitative studies have identified pertinent themes. Etowa et al. (2007) and Scattolon and Stoppard (1999) for example identified the importance of reaching out to understanding others in a depressed individuals ability to cope and recover from an episode. Being able to confide in other individuals who had also experienced mental health issues was very important to women in these studies. Further issues included feelings of vulnerability when in public and an apprehension that other people would belittle their depressive state or stigmatise them for having the condition (Drew et al., 1999; Gammel & Stoppard, 1999; Scattolon & Stoppard, 1999). Qualitative research has further identified themes pertaining to social isolation (Kuwabara, Van Voorhees, Gollan, & Alexander, 2007; Schiller & Bennett, 1994), aloneness (Etowa et al., 2007;

Hurst, 1999), a fear of being judged (Mauthner, 1999) and the suppression of anger (Jack, 1999; Scattolon & Stoppard, 1999). Crowe (2002) proposed that cultural expectations of normality accompanied by enhanced levels of introspection in depression may induce feeling of detachment. Should this occur it would be more difficult for individuals to establish and maintain relationships further exacerbating feelings of isolation. Crowe's (2002) and Crowe and Luty's (2004) studies demonstrated reports of social alienation and the strain of complying with social pressures when depressed. Their results support the proposal of study 3, that societal display rules may be contributing to the social functioning difficulties experienced by depressed individuals.

Display rules refer to the values and norms of a person's culture which serve to instruct the rules and behaviour of emotional communication (Anderson & Guerrero, 1998), and are used by people to varying degrees to modulate the extent to which they interact and display their subjective state. While display rules vary across cultures, in general the expression of positive emotions are understood to be more acceptable than negative emotions (Sommers, 1984; Trierweiler et al., 2002). The natural tendency to express how one is feeling either through physical displays or through words during interactions may be, suppressed when certain emotions are deemed inappropriate, here people strategically alter the emotions being presented, so as to express signals consistent with rules of social pertinence (Ekman & Friesen, 1978b; Saarni, 1993). A negative response to an event or stimuli may therefore be suppressed if the expression

of it is evaluated, in terms of the social environment, as inappropriate. However, the expression of positive emotions, which are more socially acceptable, may be used to mask negative responses or be displayed more often than genuinely felt (Ekman & Friesen, 1969a). Display rules tend to be learnt at an early age, internalised and automatically affect behaviour in adulthood. The first rules acquired are those from within a person's family, added to which, in later life, are the norms and appropriate behavioural rules of the society or culture within which the person lives (Anderson & Guerrero, 1998). Between individuals raised in the same culture, inter-individual differences form in emotional expression due to personality types and small sub-cultures. Within the parameters of these sub-cultures, peoples' tendency and pattern of expressing emotions can vary greatly from those outside. People then follow, or are influenced by the societal norms in which they were raised, as well as the norms of their sub culture and individual differences.

For individuals suffering from depression, a condition characterised by its high preponderance of negative thoughts and responses, the pressure to adhere to such societal norms may contribute to the difficulty reported in engaging in social interactions. Outside of close family and friends, social norms may dictate that depressed individuals do not display the negative emotions with which they are currently concerned. Crowe (2002) proposed that the masking of genuine emotions in this way may increase self-reflexivity and feelings of detachment. Sass (1992) described self-reflexivity as; self-consciousness, self-referentiality and introspection, with the term

detachment being used to refer to an individual's level of disengagement and a sense of alienation. Crowe (2002) postulated that a suppression of, and hence a failure to communicate one's feelings and experiences, might lead to a sense of emptiness or a loss of identity. When this occurs, developing connections and commonalities with others can become increasingly difficult, as possibly demonstrated by the wealth of studies which show that depressed individuals have smaller social networks (Youngren & Lewinsohn, 1980b), fewer social intimates (Gotlib & Lee, 1989a), fewer friends (Brim et al., 1982), and rate social interactions as less enjoyable and less intimate than those without depression (Nezlek et al., 2000; Nezlek et al., 1994). Further, the perceived necessity of complying with societal norms, which might not adhere to a person's sense or view of himself or herself, can create great inner conflict (Crowe & Luty, 2004). This can create further feelings of alienation, and taint the experience of being with others, possibly contributing to depressed individual's reports of social interactions as less rewarding than non-depressed individual's (Nezlek et al., 2000; Nezlek et al., 1994).

This study was carried out to explore the social difficulties in depression using the qualitative methodology of thematic analysis (Lewis, 1995; Lewis & Nicolson, 1998), a broad method for identifying, analysing and reporting themes within data. The inductive analysis approach was used to enables an assessment and elaboration of themes identified by previous studies, alongside an investigation of novel themes which might be contributing to the interpersonal difficulties experienced by individuals with this condition. Qualitative analysis, with its central focus on the acknowledgement

of the subjective experiences of individuals, enabling an investigation of this specific issue (Halland & Africa, 2007; Parker, 2005; Rapmund & Moore, 2000; Robertson, Venter, & Botha, 2005; Smith, 1999) (Halland & Africa, 2007; Parker, 2005; Rapmund & Moore, 2000; Robertson, Venter, & Botha, 2005; Smith, 1999) providing novel insights into the underlying nature of social functioning difficulties, creating a more complete picture of the complexities social engagements present for individuals with depression.

6.2 Method

Research design

A semi-structured interview schedule was developed and information pertaining to the experience of social functioning in depression was ascertained through open-ended questions. This topic has not been specifically explored by the qualitative literature in this area and as such, data was analysed in a descriptive manner to expose underlying themes.

Participants

Ten of the participants who had taken part in the previous three studies again took part. Two further women who had not previously been recruited also took part in the interviews. These additional women were recruited in the same manner as the

previous depressed participants as detailed in study 1 (chapter 3, section 3.2). All of the women in this study had been diagnosed as experiencing a depressive episode according to ICD-10 criteria by a consultant psychiatrist. As with study 3 (chapter 5) males were again excluded from the study with sex differences frequently reported in studies examining emotional experience and expression (Berenbaum et al., 1987; Hall, 1984). Sample size was determined using the saturation criterion in grounded theory (Glaser and Strauss, 1967). . Saturation was determined when, after 12 women, no novel topics were raised during the interviews.

The 12 women that took part in the study were from a variety of socio-economic backgrounds, with assorted employment histories and life circumstances. They ranged in age from 27 to 54, with the predominant age being between 30 and 40. Of the 12 women, two were divorced, six were single, three were married and one was engaged. All but five were currently working and all achieved a minimum of a secondary school education. Both May and Kat, despite experiencing recurrent depressive episodes, were currently working as cashiers in banks. Jude and Pamela also experiencing recurrent episodes of depression, worked as teachers in third level education, and both Olivia and Lucy worked in offices and reported a history of depressive episodes. Ann (first episode) and Ruth (recurrent depression) had been working as nurses but, alongside Kat (recurrent depression), Michelle (first episode) and Karen (first episode), were on leave due to their current episode of depression. Each woman completed the Beck Depression Inventory II (BDI-II) (Beck et al., 1996) prior to the interview. Nine women

were in the severely depressed range (scores 30-63) and three demonstrated moderate depression (scores: 17-29). The average score was 34, indicative of severe depression. While 12 women were interviewed one was not included in the analysis due to the previously unknown involvement of psychosis in her condition.

Procedure

Each woman was asked to complete the BDI-II (Beck et al., 1996) prior to the start of the interview. An interview schedule, comprising of a flexible list of topics to be covered during the interview, had been developed before meeting the women (Appendix III). The interview schedule questions were developed based on the current literature, with questions kept general to ensure that they were not leading. Questions therefore pertained to, how the women felt in social situations, whether they experienced difficulties while interacting with people and how they felt when they came away from interactions. These issues were raised conversationally during the interviews which lasted between 40 and 120 minutes. Each interview was audio taped and then transcribed verbatim for analysis. After each interview, novel topics which had arisen were added to the interview schedule. To ensure complete anonymity the women's names have been changed. The interviews were conducted and analysed concurrently with the running and analysing of study 3.

Analytic procedure

Thematic analysis (Lewis, 1995; Lewis & Nicolson, 1998) was employed to analyse the women's interviews. This approach uses the theory of the grounded approach (Glaser & Strauss, 1967) whereby themes are identified in individual's accounts, but does not use these themes in an interpretative way to develop theories. Themes in the data can be identified through two different types of thematic analysis, inductive (Frith & Gleeson, 2004) and deductive (Boyatzis, 1998; Hayes, 1997). The inductive approach is most similar to the grounded theory in that the identified themes that are strongly linked or grounded in the data itself (Patton, 1990). Deductive or theoretical thematic analysis is conversely motivated by the aims of the research, whereby themes are identified which fit into a pre-conceived model or theory. Inductive analysis was employed in this study. This enabled a broader investigation of themes to evolve from depressed individuals' accounts of social functioning, from which the involvement of display rule adherence, the emergence of novel themes and those identified by previous qualitative studies could be determined and further explored.

Interviews were analysed using the 5 phases outlined in Braun and Clarke (2006). During phase 1 the interviews were listened to several times and detailed memo notes taken before the interviews were transcribed. Phase 2 involved the generation of codes from the data, where each interview was broken down into line-by-line sections and each sentence compared against the conceptual labels that had been developed

during the memo taking and detailed reading in phase 1. In phase 3 the individual codes were grouped into potential themes. The entire data set was then re-read to ensure that no codes had been missed and that the themes developed amounted to a good representation of the data set. In phase 4 the themes were reviewed and revised to determine the final set of themes. In phase 5, the final phase, the identified themes and sub-themes were assessed to ensure that the themes were clearly defined in the concepts they represented. During this phase the themes were also relabelled to aid the reader in understanding the content of each (Appendix III).

To ensure against first coder bias (Rice) a second researcher, using the process outlined above, coded four of the eleven interviews. After coding the interviews, the two coders met to discuss the transcripts. At this time evolving themes were highlighted. Both coders however were in agreement with the themes derived from the interviews. Some labels did not exactly correspond however upon discussion they were found to be referring to the same theme or sub-theme.

6.3. Findings and Discussion

Analysis of the transcripts revealed a number of underlying themes, as the women discussed their motivation and ability to engage with others. All of the women reported difficulty in interacting and being around other people when they were depressed. The transcripts uncover five main themes (Table 6.1). The first two themes

detailed in this section contain novel issues relating to the difficulties these women experienced when interacting with others. Following this, themes are discussed which provide additional support for the tentative proposals put forward by (Crowe, 2002; Crowe & Luty, 2004) that display rules and the pressure to adhere to social norms may be impacting upon an individual's desire and ability to socially interact, as well as an elaboration of issues relating to themes previously identified in the qualitative literature.

3.1 *Themes previously not reported in the qualitative literature*

Some of the topics that were raised by the women have not previously been discussed in the qualitative literature will be reported in this section. Two main themes emerged the first of which, fear of social interactions, had three sub-themes; being a burden to others, emotionally overloaded and satisfactory self-presentation. The second theme, a diminished desire to socially interact, captured a further three sub-themes; lack of interest, ignorant others/special self, and jealous and resentful.

Fear of social interactions

Fear of being a burden: Six of the women discussed the importance of not being perceived of as a burden by their friends or family. The responsibility of being part of a family unit meant to some that the condition was something that they had to personally deal with so as not to disrupt their family. For example, Pat and Lucy spoke about the effect they believed their depression would have on other people, and felt strongly that other people could only be expected to tolerate a small amount of their low mood.

Table 6.1 Main Themes and Sub-Themes Identified with Exemplifying Quotes

Theme	Sub-theme	Exemplifying quote
Previously Unreported Themes		
Fear of Social Interactions	Fear of Being a Burden	"You dinnea want to burden anybody with kinda, 'oh I feel low today'"[2]
	Emotionally Overloaded	"I definitely want to just shut the door and I think I can't, I can't really sort of bear to be with you" [3]
	Satisfactory Self-Presentation	"When it came to the day, I just, the thought of actually organizing myself to do something"[4]
Diminished Desire to Socially Interact	Lack of Interest	"Yea all they had to talk about was being pointless and they wouldn't get what I would talk about…"[6]
	Ignorant Others/ Special Self	"I like to think that I have a wee bit more going on in my head than other people can understand"[11]
	Jealousy and Resentment	"They could find happiness and I suppose I kind of resented other people for it"[10]
Display Rules	The Social Mask	"It's just too much in a social situation best just act like everything alright as best I can"[1]
	Fear of Public Displays	"I'd love to be able to control this it's embarrassing it sorta comes out and bubbles over"[3]
	Sub-Culture Norms	"I can talk about anything, she's totally understanding (Community Psychiatric Nurse)"[8]
Previously Reported Themes		
Perceptions of Others	Stigma	"People's perceptions… I've traveled the world… and to achieve all that and be labeled"[11]
	Being Judged	"I'm constantly thinking, what are they thinking"[2]
	Fear of Being Vulnerable	"It's like people are going to be able to see me for what I really am, I'm not going to be able to hide"[7]
Isolation	Detachment	"I guess I felt strange and alien… not sure that you would follow along properly"[4]
	Alone and Lonely	"Just the loneliness of it no being able to speak so others can understand"[5]

Note: 1= Ann; 2= Olivia; 3= Ruth; 4= Mary; 5= Pat; 6= Karen; 7= Jude; 8= Pamela; 9= Kat; 10= Lucy; 11= Michelle.

Pat

"You donnea want to bother then so you just, it's not that I cannea be bothered, just self conscious, you dinnae want to be seen to be needy… You dinnea want to burden anybody with kinda, 'oh I feel low today"

Lucy

"I think it's a mixture of if I feel really down and I don't want to put that onto them, you know to be visibly upset in front of people, they might think, 'oh goodness what do I do with her now' or, 'oh dear what have I done"

Emotionally overloaded: Five of the women also talked a lot about dealing with their own emotions, and how this required so much of them that they were left unable to cope with other peoples' emotional difficulties. This inability to manage another person's emotional states left the women feeling as though they were unable to interact with others, for fear of being overwhelmed and getting upset and angry with other people. Pamela talked about her inability to converse with her husband and son for fear that she would become overwhelmed and angry:

Pamela

"It's too much to take in (people talking about their day), it's, it's, it's too much on top of how I already feel…It's just I lose it, it's just I either feel so bad or if I get really stressed…and it would come out…and then I feel bad about it and I feel guilty about that" Pat

'It's like, 'I just cannea deal with hearing all your troubles today, I've got enough to deal with on my own', just trying to keep myself afloat'

Pat further illustrates this sense of being overloaded by other peoples' problems:

> Pat
>
> "It's like, 'I just cannea deal with hearing all your troubles today, I've got enough to deal with on my own', just trying to keep myself afloat"

Satisfactory self-presentation: A smaller sub-theme that was raised by four of the women, as a prohibitive reason for interacting with others, was the difficulty they experienced in preparing themselves to go out and meet people. The problem appeared to stem from a lack of self-confidence whereby the women were not able to achieve a level of self-presentation which was satisfactory, and prevented a number of the women from going out or arranging engagements. The quotes below, taken from Ann and Ruth's interviews, demonstrate the pressure felt when preparing to meet other people.

> Ann
>
> "When it came to the day (of going out to meet someone), I just, the thought of actually organising myself to do something… I couldn't actually fully get myself ready and come up it it was just it was just too much pressure for me"

> Ruth
>
> "I couldn't, you you just can't, it's like you can't get your hair right, you've got nothing to wear, nothing seems right, no confidence"

Diminished desire to socially interact

Lack of Interest: An overarching theme which was reported by all eleven of the women, and seemed to capture a very important and central feature of the social

functioning difficulties in depression, was a lack of interest in other people. While a lack or reduction of interest is a symptom of a depressive episode, it has not previously been examined in the qualitative literature, and listening to the women's accounts makes apparent the implication of lowered interest levels in social functioning difficulties. A number of the women discussed removing themselves from conversations due to the perception that other people's discussions and lives were trivial and not of relevance. The women spoke about a complete loss of interest in other people's conversational topics, with a number discussing how the numbness that presented with a severe depressive episode unfastened any feelings or emotions that they may have had for another person, erasing the need or desire to be with others. Some of the women however found it easier to allow the in consequentialness of the conversations to pass them by in an effort to blend into the interaction, while waiting for it to end. Ruth talked about the need to physically remove herself from conversations due to their trivial nature, whereas Michelle talked about how the conversations with others could actually affect a lowering of her mood.

> Ruth
> "Sometimes when I'm low, I feel like what people talk about is trivial and irrelevant… I just, I'd rather just take myself off out of it… I'm not interested in what they're doing"

> Michelle
> "They were just sometimes they were just boring and so boring that they were actually depressing you know…I guess depressing because I was finding them boring and I would feel trapped"

Ignorant others/ special self: Two women talked about how their episode of depression altered their perception of themselves and other people. Karen and Jude viewed individuals without depression as somewhat ignorant and less intelligent, while they conversely viewed themselves as 'special' and in receipt of a gift which, while making them unhappy, also afforded them a level of insight unobtainable to those without depression. As the quotes demonstrate, this perception affected their desire to interact with other people, as they did not feel that individuals without depression would be able to understand or be of interest to them.

Karen

> "I feel like other people are ignorant of things that I can pick up on… I think, I don't think I see things more, in more detail than other people do, I think everybody sort of doesn't think about things…I think it's the feeling that people aren't on the same level, I think I just don't think other people know how to think the same way I do, I think I have something going on in my head that they don't get…I just pass them all off as being ignorant"

Jude

> "You get very self important when you're depressed and you've been given this like gift even although it makes you absolutely miserable you can see the truth and all this sort of stuff and nobody else could live up to that"

Jealous and resentful: Accompanying the distance between how the women felt inside, and how they believed they needed to behave, was a deep sense of isolation and loneliness, exacerbated by being surrounded by other people not experiencing the same difficulties. This sense of distance developed into feelings of resentment and jealousy for five of the women. Pamela and Ann explained how the sense that others were able

to enjoy a part of life that was not currently available to them, increased the stress and sadness that being with others exposed.

> Pamela
>
> "I think that's one of the reasons also, I didn't feel I fitted in with other people, I thought other people could see something I couldn't you know they could find happiness and things and I I couldn't find that at all…I kind of resented other people for it a bit"
>
> Ann
>
> "I felt resentful and jealous of other people… Just the loneliness of not being able to speak so others can understand"

3.2 Display rules and societal pressures

A number of sub-themes emerged which supported the proposal that conforming to social display rules increases the difficulty experienced by individuals with depression in engaging with others.

The social mask: Nine of the women spoke about feeling as though they needed to wear a mask in order to present an acceptable image when in public. In accordance with the unspoken rules of social norms the women spoke about suppressing their real emotional states in favour of more socially acceptable personas when with other people. Olivia, Mary and Ann are quoted below talking about the function of the social mask.

Olivia

"It's like there's two different yous…what, what you think people expect to see for ya even though you're, might be dyin inside, folk are still wantin to talk to ya still… so the act kicks in"

Mary

"Yea it's, it's very, I think ever since I discovered that being lonely was something that people looked down on (started hiding how she felt)…it's not socially acceptable to be lonely"

Ann

"You don't want to make them not want to be around you so you kinda take yourself away until you feel a bit better… until I'm socially more acceptable and then there's actually going to be friends there that I can go out with"

Five of the women further spoke about the constant strain of having to hide how they were truly feeling, and that the suppression of unacceptable emotions and the corresponding presentation of socially acceptable displays left them exhausted. Kuwabara et al. (2007) also reported dialogues of adolescents speaking about the exhausting nature of having to uphold an act when in public. Here Olivia speaks about the dominant nature of her social mask.

Olivia

"I'm actually being someone else all the time (when in public)… The whole public face thing deals with the vast majority of things…it's exhausting…"

Karen discussed how being with others and wearing a mask meant her true self was necessarily absent when she was in public. As the quote below suggests, Karen's social mask left her feeling as though she was not fully engaging in interactions, leaving her little enjoyment in social encounters to the extent that being alone became preferable.

> Karen
> "Yeah I'm putting it on (pretense of enjoyment). I prefer being able to be myself as opposed to keeping on just to please… I'd prefer going somewhere where I didn't feel like I had to put on the mask, I prefer being by myself as opposed to this person"

For one of the women, the persona was used to inadvertently reassure other people that they did not need to concern themselves with her even though she was in a depressed state. To do this Lucy disguised her true negative emotional state with positive displays of humour. Lucy describes how her use of humour helped to ensure that her conversational partners were comfortable and not worried by her condition.

> Lucy
> "I would try and use humour to kinda lighten…because I've learned that, it does disguise how I'm feeling and it doesn't give the game away or it, it, it might, I might be giving the game away but it'll make the other person feel more comfortable instead of, 'Oh God how am I going to deal with her today if she's feeling like this?'…I'm making it nicer for them"

Fear of public displays: As discussed previously, expressing positive emotions is generally more socially acceptable than publically expressing negative emotions. Five of the women in this study were very conscious of how close to the surface their negative emotions were and expressed fears of becoming overly emotional in public and making other people uncomfortable. The very prospect of becoming upset in front of someone was enough of a reason to deter some of the women from engaging in social interactions of any kind. Kat specifically talked about the fear that she would become upset in front of someone and therefore make them feel uncomfortable. Kat explained how this featured in her decisions to interact with others.

> Kat
>
> "I feel maybe a bit teary you know and someone says, 'how are you', I dread people asking me cause it just pushes me over the edge and I would start to cry and then I'm embarrassed you know… Not even cause me embarrassment, but if I was to get upset and start to cry I would cause them embarrassment as well… it's embarrassing… it sorta comes out and bubbles over and sometimes it's easier to dive into a shop door"

Display rules appeared to also alter the subjects and topics that these women felt they could discuss, as Michelle spoke about censoring her verbal communications:

> Michelle
> "It's like I have a list in my head and I go 'right, no cannea talk about that subject, cannea talk about that subject, Oh I can talk about this to this person', I shut myself away, I censor myself"

Sub-culture norms: Eight of the women further spoke about groups of people with whom they did not need the social mask. The women felt they could be open and interact freely, without censoring displays or conversation topics, with individuals in qualified health positions or people who had personally experienced mental health problems. This may in part be explained by the inter-individual sub-culture norms, whereby the social norms within the sub-culture may not discourage the expression of negative emotions, enabling the women to express how they are feeling without the necessity of regulating their responses. Etowa et al. (2007) also reported how important it was for the women in their study to speak to someone who understood, as opposed to just speaking to a doctor or family member. Scattolon and Stoppard (1999) additionally indicated that the seeking out and speaking to others who understood was a tool used by some women to cope with their episode of depression. In this study Ann and Jude talked about how they felt less restrained when with others who had experienced mental health problems, possibly due to the different sub-culture norms, and therefore felt more able to be themselves and discuss openly how they were feeling.

> Ann
>
> "My cousin stayed across the road, she helped me through an awful lot… cause she went through it herself… I could be very open with her… unless you've had something happen to you you really cannea comprehend it because you cannea feel that… I have one friend who I can speak to like this, she's a really good friend, she's got bipolar"

Jude

"I think the conversations I did hold were ones with other people who were feeling miserable you know … it's easier to be with people who've been there and you can be how you are"

3.3 Elaboration of themes raised by previous qualitative research

Of the themes raised by previous qualitative studies, which pertain to the difficulties in social interactions in depression, those also raised by the women in this study are further elaborated in this section with specific reference to how they disrupt social interactions and the women's desire to engage with others. Two themes evolved out of the transcripts, the first of which, the perceptions of others contains three sub-themes; stigma surrounding the condition, being judged and a fear of being vulnerable with others. The second theme, isolation, contained two sub-themes; detached and alone and lonely.

The perceptions of others

Stigma: The inhibitory effect of the social stigma which exists within depression was raised by four of the women. The women discussed how this stigma made it more difficult to be open with people, and how they sometimes felt patronised and belittled by people's responses and perceptions of them. Scattolon and Stoppard (1999) also reported accounts regarding the stigma surrounding depression, discussing how this increased the loneliness of some women. Further reiterated by Drew et al. (1999), the negative self-image and social stigma accompanying depression was viewed as unfair

and inaccurate by individuals currently experiencing an episode. Here Olivia discussed the effects of her depression on her work colleague's perceptions of her:

> Olivia
>
> "My work know that I've been ill, well they know that I see Heather (Community Psychiatric Nurse; CPN), they know that I'm on medication but they dinnea seem to class me as being a normal person and I cannea just have a bad day like anybody else, if I dinnea have a good day it's something's wrong with Olivia…it's it's still a weakness, like it's a weakness that I've got a CPN it's a weakness that I'm on medication"

Three of the women further illustrated the impact of the social stigma discussing the lack of understanding that surrounds depression as a condition. They went on to describe how a lot of the time they were unable to determine the root cause of their emotional state which caused frustration in others and resulted in people again thinking negatively of them reducing their desire to interact as Pat states below.

> Pat
>
> "Why do you feel low?" well "I don't know", if you're upset and you cannea explain why a lot of people's tolerance, they haven't got the… Cause even trying to explain that to somebody, "I've got no energy", "well what have you done today", "nothing" and I cannea like, even that they're like, "come on you're lazy get up"

Being judged: Outside of the social stigma associated with depression, eight of the women talked about the perception that other people were, in general, thinking negatively of them and judging them during interactions, even when their condition

was not known. Mauthner et al. (1999) also reported this theme from discussions with women with depression, in which women spoke about feeling as though they were failing and inadequate as individuals. This expectation that people would negatively evaluate them was enough to dissuade some of the women from engaging with others, and made it increasingly difficult to enjoy social interactions as illustrated below by the quotes from Ruth and Pat.

> Ruth
> "Quite often I would think that people were thinking negative thinkings about me…I always found it easier to get on with people online, 'cause they can't judge me"

> Pat
> "If I'm no' prepared for it and I bump into somebody I I usually feel kinda 'God I dunnea look right', what are they gonna be thinking, what are they… It's like you're scared to even, it's like you're scared to say something in case they think the wrong thing … It's, I'm feared to say anything in case that draws automatic attention to what, like back on to me and they start to like think bad of me and I I wouldn't know"

The women further discussed the self-criticisms and recriminations that resulted from interacting with other people. A constant stream of self-censorships and criticisms appeared to occupy the women's thoughts when engaging with other people, with recriminations, dissection of the engagement, and chastisement for perceived faults continuing after the interaction. Mary talks about all of the negative thoughts that flood her mind during and after interacting with someone.

Mary

"What did I say that for, what did I do that for, oh my god I hope nobody saw me do this, oh my god I hope nobody saw me do that… Worry… I would think sometimes em they don't like me, they hate me, they wish I wasn't here, I'm a pain in the neck, I annoy them I'd have thoughts like that"

For Lucy, she decided that interacting with others brought too many self-criticisms and anxieties. Constantly trying to please other people and hide how she was feeling so as not to appear different, meant being alone was less stressful and preferable;

Lucy

"It's just easier to be in your own company and not attend to other people and think about other people, it's just easier"

Fear of being vulnerable: Alongside the feeling that other people were negatively judging them, a further fear, of being vulnerable was raised in seven of the interviews, which actively discouraged the women from engaging in social interactions. Scattolon and Stoppard (1999) also raised the issue of vulnerability with reference to the stigma surrounding depression. In their study the women spoke about the shame of having depression and how the humiliation of this, coupled with the associated social stigma of depression, made the women feel vulnerable. In this current study, the issue of vulnerability was raised with reference to how the women felt in public; during an episode of depression they would feel transparent and the fact that people would be

able to see how they were feeling inside made them feel very exposed. Pamela describes this sense of vulnerability:

> Pamela
>
> 'I just feel as if everybody knows and that how bad I'm feeling you know? You know that feeling sometimes if you go into a new place and you go up to the bar and order a drink and you feel everybody's looking at you, that sort of feeling…really vulnerable'

Isolation

Detachment: Providing support for the studies by Crowe (2002) and Crowe and Luty (2004), which examined the effects of cultural expectations of normality and whether perceived pressures to conform would lead to increased self-reflexivity, the women in this study spoke about how separate from other people they felt as well as their ruminative tendencies. Crowe (2002) postulated that not being able to express one's self may lead to feelings of emptiness and detachment. Here the women discussed how other people appeared normal and socially competent, whereas they felt out of sync with the natural flow of interactions leading to a fear that they would not therefore be able to act appropriately, and the sense that they were not part of society. The women, in a study by Kuwabara et al. (2007), also discussed the difficulty surrounding not being properly understood, and how this increased the level of detachment they felt with other people, and the negative impact it had upon interacting with others. Ruth spoke about how her detached feelings resulted in feeling apprehensive and misplaced during social interactions.

Ruth

"Oh I just dread it (going out), I think just not fitting in, not being on the right wavelength…like I was sticking out like a sore thumb"

Mary and Ann spoke about how separate from the world they felt, as though existing in a bubble and only able to watch as the world progressed by.

Mary

"There was no real connection… you feel like you're talking and you're doing everything you should be doing but you're not really there… it's like you're removed from yourself so you're doing all this stuff and going through the motions but you weren't really connecting with other people"

Ann

"It's sort of you go into your own bubble… it's like standing on the pavement and watching the whole world going by ya, and everyone's got their own lives and you can only watch them all"

Seven of the women discussed how the ruminative tendencies, which accompanied their depression, affected their ability to connect with other people. Talking about their self-reproach, and how being lost in their own thoughts resulted in them feeling detached from others, being completely focused on their own pain and thought processes. Kat explains how difficult she finds interacting with other people due to her introspective thoughts.

Kat

"I just couldn't be with anybody, I couldn't socially interact, I couldn't hold a conversation, I just, everything came through ma brain, I'm tryin change the subject but ma brain's telling me worry about this worry about that and the next thing I couldn't concentrate on anything else 'sept what was in my head"

Alone and lonely: Reports also included discussions of a sense of loneliness that a lot of the women were left with after they had been with other people. Scattolon and Stoppard (1999) and Etowa et al. (2007) also raised the theme of loneliness in their studies, exploring the experiences and coping strategies of women with depression. The women in their studies reported that depression was a private process that could not be shared with family or friends, which increased their sense of isolation and loneliness. The accounts by the women in this current study have enabled a further elaboration of this issue. The women talked about how they perceived that other people were successfully living in a world unattainable to them, one in which they could not understand or find happiness in and how after engaging with people they were left with the realisation of how 'down' they were, with the awareness that other people were moving on with their lives. Ann described being with others as, 'going from a depressive state into reality' and how difficult this is, as it brings with it all the cognizance of why she is hurting, of how much she is missing in life, and how depressed she is. When not with other people this recognition appears to be suppressed but, when faced with the opportunity of comparison, the effect is overwhelming.

Pat

"Just being with other people, just knowing that you can't have what they have and then thinking about what your life's like it's just, it's just, it just makes everything worse and you just try and avoid it… you're aware of everything that's going on, you're aware of that you're off sick, you're aware of, all of these things come into your mind about why you hurt and things like that"

6.4 Conclusion

This study supports and elaborates themes identified by previous qualitative research, which highlighted: the prohibitive involvement of the social stigma, the negative expectations, the fear of vulnerability, and the sense of being detached, alone and without sufficient explanation for the depression, all of which contribute to the reduced levels of social interaction in individuals with depression. In addition, the proposition that the pressure to adhere to social display rules, may be affecting an individual's ability and desire to interact socially. This appears to be supported by reports from the women of the tendency to withdraw from others until the episode of depression had diminished at which point, perceiving themselves as more socially acceptable, they felt more able to handle social interactions and engagements. Issues which further supported the involvement of social pressures in diminishing interactions included: the necessity of wearing an all encompassing social mask so as to present a socially acceptable persona, the fear of inappropriate emotional displays, and

the reassurance of being with other individuals in similar situations. Outside of the previously raised themes and issues relating to social pressures, the women in this study referred to further matters implicated in engaging with others including: a lack of interest in topics and affairs that interest other people, the perception that due to their condition they would be a burden to friends and family, the apprehension of becoming emotionally overloaded, the organisational problems faced by many of the women when attempting to go out socially, the enhanced self-perception of some women alongside the diminished perception of others capabilities, the jealousy expressed at not being able to enjoy life, and the ruminative tendencies which keep the women in a 'bubble of self thought'.

While quantitative research has provided a wealth of information pertaining to the factors underpinning social difficulties in depression, a qualitative approach has enabled an exploration into how depression alters the experience of social engagements, and provided information that may not be identifiable by objective measures (Derlega et al., 1993; Kelly & McKillop, 1996; Nolen-Hoeksema & Davis, 1999). From this study, it is clear that a pressure to adhere to social norms alongside a number of other important themes is implicated in a depressed individual's motivation to interact with others. Further individuals who have previously encountered mental health problems or those in a professional capacity, especially community psychiatric nurses (CPN), appear to be greatly relied upon, fulfilling an extremely important role for these women. A lot of the women discussed how helpful talking about their depression and feelings were while they were experiencing the episode. The women in unison spoke most highly of their CPN, viewing this member of their mental health team as a stable, consistent, non-judgmental figure to which they could openly and

honestly discuss their difficulties, to gain comfort and support. The effortful avoidance of certain expressions and features such as emotional control (Rogers & Jamieson, 1988; Rogers & Nesshoever, 1987) and self-concealment (Larsen & Chastain, 1990), may be physically and/or psychologically exhausting. With social functioning levels appearing to be influential in the incidence, course, and risk of relapse of a depressive episode, it is important to use information resulting from quantitative and qualitative investigations to ensure a full understanding of this condition. This will enable the development of effective and targeted intervention programs and support groups, which are able to provide individuals with the care they require during and after their episode of depression.

Chapter 7

General Discussion

Depression is a major mental health problem with biological (Hoffmann, Gonze, & Mendlewicz, 1985), environmental (Lloyd, 1980a, 1980b) and cognitive (Abramson et al., 1989) factors all identified as causative agents. Initially denied precedence in the literature, with the proclamation that pharmacological agents could remedy the depressive condition, extensive research into the interpersonal aspects of depression has demonstrated that consideration of dysfunctional social abilities is imperative, with empirical evidence consistently indicating that the impaired social skills and psychological problems of depression are inexorably linked. This thesis explored two fundamental aspects of social interactions; the receiving and the sending of social information, to determine how depressive symptoms, personality traits and affective states may alter an individual's ability to interpret and respond effectively during social engagements. The first study showed that a bias in interpreting and responding to emotional cues was evident, however, its presence was insubstantial and attributable to not only the depressive symptom clusters but also to personality traits and an

individual's current affective state. In search of a further disrupted process implicated in altering an individual's ability to correctly interpret and respond to social cues, the second study demonstrated that Theory of Mind functioning is impaired in depression. While depressive symptoms directly affected reasoning capabilities, the responsibility for impaired decoding abilities was shared once again between depressive symptoms and individual differences. These two studies supported the presence of a bias, and impaired Theory of Mind capabilities, however neither accounted for a sufficient level of variance in responses to adequately be labelled culpable for the social difficulties so clearly demonstrated in the literature. Attention was therefore turned to those signals communicated by a depressed individual with further consideration of personality traits. The third study clearly demonstrated that the facial displays presented by women with depression do not reflect underlying subjective states, indicating instead that expressions were being suppressed. The proffered suggestion that adherence to display rules was involved in the emotion suppression was advanced by the fourth study. As a qualitative investigation, this study disassembled the experiences of social interactions in women, with depression enabling the discovery of numerous novel factors for future investigation, and offered support for the implication of the social pressures to abide by display rules, in diminishing the ability and desire to engage in social interactions.

7.1 Current conceptualisations

Studies in this area have typically treated depression as a single commodity in that a total score, representative of symptom severity, is used in between-group designs

to show the behavioural discrepancies between depressed and non-depressed participants. Not all of the symptoms of depression, however, have immediate implications for the interpretation and response to affectively valenced stimuli. The specific affectively rooted symptoms including loss of pleasure, sadness, pessimism and indecisiveness, may be proposed to serve as disruptors to behavioural responses, whereas those pertaining to the more somatic aspects of depression such as changes in appetite, irritability and loss of interest in sex may not. Studies therefore, that have taken a single BDI-II measure or a diagnostic criterion level to represent depression, may be reporting inaccurate results (Gur & Erwin, 1992; Hale et al., 1998; Surguladze et al., 2004). The first two studies presented in this thesis clearly illustrated the importance of this point by demonstrating that relationships between single BDI-II depression scores and behavioural response measures, amounted to only those between depression and the recognition speed and evaluation of positive gestures, and Hinting task scores. In contrast, the division of BDI-II symptoms into affective/cognitive and somatic/ physical symptom groups elucidated relationships between depressive symptoms and recognition accuracy, response times and valence judgments for facial and gestural emotional portrayals, as well as relationships with the higher order Hinting and Eyes tasks (Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997; Marjoram et al., 2005).

To complicate the picture further, previous studies are also guilty of limiting their investigations into response biases by assessing only one type of stimuli (facial expression), on only one or two behavioural measures (response time/recognition accuracy) at a time (Gur & Erwin, 1992; Mathews, Ridgeway, & Williamson, 1999; Matthews & Antes, 1992). This is problematic as the first two studies of this thesis

further showed that not only do the symptoms of depression result in different response biases, but the nature of the task also results in different response biases. Both depressive symptom clusters related to negatively biased evaluations of facial stimuli, with the affective/cognitive symptoms further impacting the speed of responding to facial expressions. For the gesture task however, the biases manifested by both symptom clusters were accuracy levels, with the affective/cognitive symptoms again further altering response times to positive, negative and instrumental gestures. For the higher order tasks (Hinting and Eyes task) however, both components of depression enacted the same influence, negatively relating to Hinting tasks scores, and impacting the speed of responses to neutral and negative mental states as depicted by the Eyes task.

Individuals high in affectively based depressive symptoms may therefore demonstrate slower responses to facial expressions, and view negative facial cues more negatively. For gestures, affective symptoms decrease accuracy for positive movements, while increasing the speed of responses to positive movements and slowing responses to negative gestures. For individuals exhibiting high levels of somatically based depressive symptoms, negative facial expressions are also likely to be viewed more negatively, and again positive gestures incorrectly recognised. The skill of determining how another person is feeling by reading between the lines of a person's dialogue, as represented by the Hinting task, is equally affected by both affectively and somatically based symptoms. The speed at which individuals understand how someone is feeling, based on the limited signals provided by the eyes, for neutral and negative mental states also related to both symptom clusters.

It would appear that the affective/cognitive symptoms are the most influential in affecting the speed at which individuals recognise emotional expressions, whether they are communicated facially or as gestures. Additionally, facial expressions appear to engender slower response speeds and more negative evaluations of negative expressions. The gesture task however garnered reductions in accuracy, and varied response speeds, depending on the valence of the movement, with positive gestures receiving increased processing and negative gestures slower responses. Studies which are using the total value of the BDI-II, failing to separate affectively rooted symptoms from those that are somatically based, and examining only one mode of expression, are most likely masking results and therefore reaching inaccurate conclusions.

7.2 Receiving Social Information in Depression

Depression has been demonstrated to possess specific deficits in the recognition of emotional facial expressions, and a propensity for focusing attention on negative expressions of emotion (Gur & Erwin, 1992). A deficiency in the capacity to recognise emotions from faces has been proposed as a factor contributing to the social difficulties exhibited in depression (Deldin et al., 2001), with research examining decoding deficits within depression focused on the attentional biases exhibited to facial emotional expressions (Gotlib et al., 2004). As discussed in the introduction of this thesis, studies have however failed to show consistent support for the proposal that depression; impairs the ability to accurately identify emotional cues (Archer, Hay, & Young, 1992; Persad & Polivy, 1993), biases the evaluations of emotionally valenced displays

(Bouhuys et al., 1999; Gotlib et al., 1988) and alters the speed at which expressions are processed (Gollan et al., 2008; Leppänen et al., 2004).

Responses to facial expressions in the first study, in agreement with Gaebel and Wolwer (1992), Gollan et al. (2008) and Kan, Mimura, Kamijima and Kawamura (2004) were not found to imply group differences, in that depressive symptom clusters did not relate to accuracy levels for recognising facial displays. The findings, by studies such as Persad and Polivy (1993), and Mikhailova, Vladimiroa, Iznark, Tsusulkaya, & Sushko (1996), of more general overall errors in recognising facial expressions may be explained by the differences in the stimuli used, where emotion perception was assessed with static pictures depicting basic emotions. Further, it is proposed that instead of a deficiency in the perceptual skills required for recognising emotions, the generalised errors indicated by Persad and Polivy (1993) and Mikhailova et al. (1996), may instead be representative of a depressed individual's preoccupation with their depression which reduces their attentiveness to aspects of social interactions, such as facial expressions. In agreement with the first study's facial results, Leppanen et al. (2004) also showed that positively and negatively valenced facial displays did not reveal group differences. Their results further suggested however that depression may specifically affect the processing of emotionally neutral faces. The dynamic expressions selected for study 1 did not include neutral displays, as this study's focus was on examining socially complex emotional communications, which do not tend to include neutral expressions. Kan et al. (2004), who also failed to demonstrated accuracy deficits for dynamic facial displays aside from expressions of surprise, proposed that if sufficient information is present depressed individuals may recognise expressions to the same level as non-depressed individuals. It may be therefore that the interpretation

of neutral or ambiguous expressions is impaired in depression, as opposed to the interpretation of emotional expressions. With more complex stimuli and depressive symptom divisions, it will be possible to determine whether the deficits reported by previous studies are in fact due to insufficient levels of information in the static stimuli. In general however, the proposal of accuracy deficits in recognising facial expressions in depression does not appear to be founded for negatively or positively valenced emotional expressions, but may be present for emotionally neutral or ambiguous displays.

Deficits in recognition accuracy were evident for the gestural movements and Hinting task scores in this thesis however. Accuracy deficits were only found for the positive movements however, highlighting the task and valence dependent nature of the relationship. Both depressive symptom clusters related to reductions in the ability to recognise positive gestures and correctly infer the meaning behind another person's utterance. The level of information portrayed in the gesture task was diminished, in that the gestures were shown in point light. It is possible that accuracy levels were therefore reduced as previously mentioned, due to insufficient levels of information (Kan et al., 2004). However, as depressive symptoms increased, positive gestures were responded to more quickly. It is proposed therefore that an accuracy deficit, apparent only for positive gestures, indicates that positive movements were rapidly assessed, and due to the nature of their valence, deemed irrelevant and as such received reduced levels of attention resulting in higher error rates. Reduced levels of accuracy on the Hinting task, but not on the Faux Pas task, may also demonstrate an important distinction within the Theory of Mind reasoning component. The Faux Pas task assesses an individual's awareness of social appropriateness which appears unimpaired. The

Hinting task however reflects a more subtle ability in detecting disguised and ambiguous intentions. As suggested above, it is possible that depression may only be influencing very distinct capabilities, specifically the ability to extract the correct meaning from equivocal cues. It appears that detecting ambiguities and aspects of subtly communicated desires are affected in depression.

Response time biases, in agreement with previous studies (Gollan et al., 2008; Leppänen et al., 2004; Persad & Polivy, 1993), were found. The results however, again highlight the importance of dividing the symptoms of depression, and considering the mode of expression with only the affective/cognitive symptoms relating to slower responses to all facial expressions, and varied response speed biases depending on the valence of the gesture. The findings from the first study and those by Leppanen et al. (2004), Persad and Polivy (1993), Feinberg et al. (1986) and Cooley and Nowicki (1989), all show a generalised slowing in recognising facial expressions. As facial cues are a vital component of social interactions, slowed responses may result in more misunderstandings and a higher incidence of negative engagements. The picture emerging from the responses to the gestures in studies 1 and 2 however, in comparison to the existing cognitive research, is slightly more complicated in that the mood incongruent movements (positive) were responded to the fastest, and the mood congruent movements (negative) more slowly. However this may show, as proposed by Gollan et al. (2008) in reference to facial expressions, that depressed individuals make instinctive or spontaneous inferences about positive displays, but engage in more complex and therefore lengthy thinking processes about negative displays (Krull & Dill, 1998). The study by Gotlib et al. (2004), using the dot probe technique, may be viewed as supporting this proposal, whereby depressed individuals displayed longer

response latencies when the dot was positioned behind the sad stimuli. This line of thinking is also proposed to elucidate the results from the Eyes task, which showed that depressed individuals again demonstrated a slower response speed for negative mental states, but a faster response speed for neutral mental states. As discussed above, it may be that neutral mental states are responded to with increased speed as they do not hold the individuals attention, whereas negative mental states might thus prolong the time taken to respond.

Also proposed as possibly contributing to a depressed individual's impaired social functioning, is the postulation that depression is accompanied by negatively biased judgments of facial expressions (Gur & Erwin, 1992; Hale, Jansen, Bouhuys, & Van Den Hoofdakker, 1998). In line with this proposal, study 1 showed a negative bias to facial expressions, in that negative displays were judged to be more negative with increases in both components of the depressive condition. However, this mood congruent bias appears to only exist for facial expressions of emotion and was absent for the gestural movements. Further studies are needed to examine why body movements are not responded to with the same biased evaluations as facial expressions. It may be that more visual information was available in the facial videos, as the gestures were presented in point light possibly making the movements harder to judge. Or it may be that facial expressions are relied upon more heavily as communication cues and as such, receive a greater level of attention thus possessing a more emotive impact.

The use of regression techniques in studies 1 and 2, to assess the extent to which depression predicts recognition of emotional stimuli and social cues, most importantly demonstrated that, in contrast to previous studies, the 'depression bias' is relatively

small. The biases demonstrated by these two studies were found to be minimal across tasks and symptom clusters, and therefore cannot be proposed as responsible for the impaired social skills of individuals with depression. While both studies 1 and 2 provided further information and direction as to the factors and mechanisms involved in the impaired social skills in depression, a large portion of the variance in responses to affective stimuli and Theory of Mind tasks was left unclaimed, disputing the impression portrayed in this area that depression may be impairing social functioning due to the presence of a negative bias in interpreting and responding to affective stimuli. The use of dynamic communications, both facial and gestural, as well as more subtle communications in the form of hints and eye displays, enabled the extraction of a far truer reflection of the influence of depression over an individual's ability to socially interact. The combination of tasks and symptom division in the first two studies shows that the two clusters of depression affect recognition accuracy, valence judgments and the ability to read between the lines. Additionally affective/cognitive symptoms specifically affect processing speed to faces and gestures, further reinforcing the proposal that use of the BDI-II as a total value diminishes the specificity of results and masks significant effects. Even in combination however, neither symptom cluster demonstrated a substantial response bias as previously suggested in the literature.

A number of additional factors may be implicated in accounting for some of the unexplained variance in responses and should be considered by future studies. Firstly the use of medication may be responsible for accounting for a proportion of the variance in responses. Psycho-stimulants such as amphetamine's and methylphenidate as well as anti-depressants have been shown to reverse or improve the negative perceptions of interpersonal cues (Janowsky, 2007). The inclusion of medication types

as mediators may help to elucidate whether medication is influencing emotion perception and specifically which behavioural response measures are most affected (response time, accuracy, confidence, accuracy). An individual's personal and family history of depression may also be exerting an influence on their ability to identify and correctly interpret social cues. Learnt behaviours and environmental conditioning may be combining with depressive symptoms to influence perception. Examining the nature of the depressive episode itself may also uncover influential components for future studies to explore. The inclusion of the duration of an episode, type of episode (first episode or recurrent) and cause of the episode (result of a specific event such as abuse or unprompted) in regression analysis would be beneficial in uncovering further influential factors.

Consideration of an individual's self-concept and level of self-esteem need also to be examined. Generally people react to situations and events by either attributing the cause of the experience to an external force or an internal source. The determination that negative situations and events occur due to an internal source increases a negative self-concept. This may have repercussions for the interpretation of outside events especially social signals, which are directed towards the individual. Beck (1976) proposed that a negative self-concept would distort an individual's view of themselves, their environment and the world. An assessment of an individual's self-concept may therefore provide a further insight into whether an individual's view of himself or herself alters their response behaviour. Regression analysis would enable us to determine whether a negative view of the self may be combining with depressive symptoms to bias their interpretation of signals. In the same way an individuals level of self esteem should be considered as another factor which may be affecting individuals

speed of response to emotional cues, their confidence in answers and their level of accuracy in correctly attributing mental states. Finally culture and gender effects may also be responsible for altering response behaviour.

With regards to the generlaisability of the results reported in this thesis it is again important to note the possible influence of culture and gender effects. Culture has been found to influence the manifestation of symptom components in depression. In Western cultures the affective/cognitive symptoms of depression are most prominent (Leff, 1988). In Eastern cultures however depression is more commonly recognised for its somatic symptoms. How differences in the symptomatic composition of a depressive episode would impact emotion perception is unclear and should be considered before generalising across cultures. Gender effects should also be born in mind when generalising about the results in this thesis. As discussed in study 3 and 4 patterns of expressivity are greatly altered between men and women. It is unclear whether such marked differences exist for the identification and interpretation of the emotional cues in study 1 and 2.

7.3 The Importance of Personality Traits in Receiving Information

Former studies have largely implied that depressed mood itself alters the interpretation of emotional stimuli however, The regression analyses in studies 1 and 2 and the group design analysis in study 3 demonstrated that aspects of personality are also contributing to individuals' recognition and response to emotional cues, and their Theory of Mind functioning. The association between personality traits, specifically

neuroticism and extroversion, and depression has been established robustly in the literature (Domken et al., 1994; Wilhelm et al., 1999). Neuroticism has been shown to relate to depression onset, with levels also predictive of relapse and recurrence (Enns & Cox, 1997; Marks, Wieck, Checkley, & Kumar, 1992; Mulder, 2002; Surtees & Wainwright, 1996). Extroversion is further predictive of effective functioning in cognitive performances (Matthews, 1992) and social endeavours. Lower levels of extroversion are further implicated in depression, and predictive of a poorer course of an individual's episode (Klein et al., 2002). Studies however have not explicitly considered the involvement of traits in the altered patterns of emotion perception.

In contrast to the depressive symptom clusters, neuroticism related positively to individuals' evaluations of faces, where negative expressions were rated less negatively. The bias apparent for the positive gestures however, showed the perhaps more expected negative bias, with neuroticism reducing the level of positivity perceived. Unlike depression then, neuroticism appears to lower perceptions of positivity as well as negativity in emotional displays. Confidence, a measure not related to depression, was reduced across both types of stimuli for higher levels of neuroticism. Individuals exhibited reduced confidence in responding to positive faces and negative gestures. The contribution of neuroticism to a depressive episode therefore may reduce a person's ability to perceive positive signals in a positive manner, as well as reducing the confidence in correctly interpreting the emotional expressions of others.

Extroversion however was found to influence individuals' response speed as well as their confidence in responding to facial and gestural displays. Positive facial expressions demonstrated a negative bias, in that positive faces were responded to more quickly with increased levels of extroversion. Response speed for negative faces

and positive and negative gestures however, were responded to more slowly with higher levels of extroversion. Extroversion's association with positive stimulation seeking behaviours (Ashton et al., 2002) was therefore supported by the increased recognition of positive displays. However, the prolonged response latencies evident for the other stimuli show a different side to the spontaneous impulsive extrovert and may be suggestive of a number of factors. Firstly, extroversion has been found to interact with neuroticism (Vollrath & Torgersen, 2000) but it is not clear whether other traits alter the effects of extroversion. On the same point, depression itself may combine with low levels of extroversion to alter the perceptions of emotional expressions, as will be discussed later. Finally, the results may also represent an individual's level of involvement in the tasks. Highly extroverted individuals have been found to demonstrate enhanced enjoyment and interest in social engagements and interactions (Ashton et al., 2002; Franken & Muris, 2006), and may therefore take longer to disengage from emotion stimuli. The prospect of praise for performance has also been found to motivate individuals high in extroversion (Murray, 1938). A desire to perform well may also therefore have lengthened response times while individuals ensure they have correctly identified the display. Associations were further found between extroversion and increased confidence levels in recognising positive and negative faces and positive gestures. Increased levels of confidence may be viewed as reflective of the characteristics of trait extroversion, whereby individuals exhibit more optimism and assertiveness (Costa & McCrae, 1992).

Of the five traits examined, conscientiousness was the only other trait to be shown to relate to emotion perception. This trait was demonstrated to relate to the evaluation of negative gestures, with individuals high in conscientiousness interpreting

these movements more negatively. Confidence in recognising negative gestures however, was increased with rising levels of conscientiousness. McCrae and Costa (1991) proposed that conscientiousness may engender low mood due to its direct effect on performance and achievement. The demonstration by study 1, that conscientious individuals confidently perceive a greater level of negativity in negative gestures, may further impact difficulties in engaging with others and successfully navigating social interactions, further propagating low mood.

Neuroticism, extroversion and openness to experience also related to Theory of Mind capabilities. Neuroticism was associated with the slowed recognition of neutral mental states and biased judgments of negative mental states, wherein more negatively was perceived. The speed at which negative and neutral mental states and instrumental gestures were recognised related to extroversion, with states recognised faster as extroversion levels increased. Additionally, reports of increased confidence in identifying the neutral mental states were also related to this trait. Low levels of extroversion may therefore be contributing to the previously noted relationships between depressive symptoms and difficulties in interpreting neutral states. Individuals who are higher in extroversion however, took longer to recognise the expressive gestures. As discussed previously, this may be due to task involvement or the influence of depressive symptoms. Openness, the least well explored trait, was found to only relate to the Hinting task which will be discussed next with consideration of the combined influence of depressive symptoms.

The use of mediation analyses in studies 1 and 2 enabled a further exploration into the independent and shared involvement of personality traits and depressive symptoms on emotion perception. A number of the independent effects discussed

above were found to be altered with the consideration of depressive symptoms. Hinting task scores related to neuroticism, extroversion, conscientiousness and openness to experience. All of these relationships however were found to be fully accounted for by the affective/cognitive component of depression. This demonstrates that the deficits in Theory of Mind reasoning, or more specifically the deficits in detecting subtly disguised desires, is the product, of the affectively based symptoms of depression, and not personality traits or the physical/somatic components of depression. Also, fully accounted for by both components of depression, was the relationship between extroversion and the speed of responding to negative mental states in the Eyes task. A combination of traits and depressive symptoms was further evidenced with extroversion and the affective/cognitive component of depression involved in the response speed for negative and instrumental gestures.

The majority of the effects found between personality traits and responses to the emotional stimuli however, were attributable to the personality traits, and not the depressive condition. Extroversion, alongside the affective/cognitive depressive symptoms, especially appears to share in the relationships concerning the speed at which individuals recognise facial and gestural displays. Neuroticism and conscientiousness however, appear to be more implicated in the evaluations of emotional stimuli. Varying confidence levels were also highlighted by the personality traits. Confidence in one's ability to respond and interpret social cues may be very important in the study of emotion biases, as reduced levels may prolong responses and negatively bias evaluations. These findings have important ramifications for studies in this area which have failed to consider the involvement of personality traits, instead solely concentrating on depression. These studies also help to explain why there is such

inconsistency within the literature, and reinforces the benefits of using regression techniques in this area of research.

7.4 The Importance of Current Mood State in Receiving Information

In addition to the involvement of depressive symptoms and personality traits, also considered in influencing the receipt of social information was an individual's current mood state. Research exists to suggest that mood states influence our memory (Bower, 1981), as well as a range of social and cognitive processes (Bower, 1983; Clark & Isen, 1982). As with the personality traits however, consideration of someone's current mood state, separable from the depressive symptoms, has not been examined with reference to emotion perception and depression. Affective states may be expected to play an important part in affecting how an individual responds to social encounters and the interpretations they form, with studies such Forgas, Bower and Krantz (1984) showing that the judgments and recall of interactive behaviours were related to an individual's affective state at the time of testing. It is further acknowledged in the literature that current mood state is altered in depression, and that neuroticism (but not extroversion) and extroversion (but not neuroticism) are associated with negative affect and positive affect respectively (Costa & McCrae, 1980; Eysenck & Eysenck, 1985; Larsen & Ketelaar, 1991; McFatter, 1994; Watson & Clark, 1992). Given that both extroversion and neuroticism were implicated in task performance, it would be expected that current mood states would demonstrate relationships with emotional stimuli. Indeed studies 1 and 2 demonstrated a range of associations between current affective states and response measures, as well as highlighting which of these

relationships are mediated by depressive symptoms, and additionally, which personality and response-measure relationships are mediated by current affective states.

Negative affect demonstrated independent relationships with the evaluations of negative facial expressions and positive gestures, rating faces less negatively and gestures less positively. These results match those found with neuroticism for the decreased evaluation of negativity in the facial expressions, but did not match the results for the depressive components, which rated negative faces more negatively. Negative affect further reflected neuroticism, demonstrating a reduction in the perceived positivity of gestures. It appears that while depressive symptoms taint negative expressions making them more negative, neuroticism and negative affect reduce the level of positivity apparent in displays and reduce the degree of negativity. Positive gestures were also recognised more quickly with higher levels of negative affect, with positive and neutral mental states being responded to more slowly. Here the results of negative affect match those of the affective/cognitive symptoms, with both showing faster responses to positive gestures.

Positive affect instead was associated with recognition accuracy for negative facial expressions and negative gestures, demonstrating a higher degree of errors for facial expressions but higher accuracy levels for negative gestures. This association between positive affect and accuracy deficits suggests that levels of current positive affect may be in part responsible for the accuracy deficits in recognising facial expressions in the literature, and not as previously proposed depression. In agreement with findings for extroversion, increases in positive affect were associated with longer response times to positive gestures, but individuals were more confident in their

recognition of these signals. The opposite pattern of results was displayed by the affective/cognitive component of depression however, which showed faster responses to positive gestures and slower responses to negative gestures.

The use of regression techniques also afforded the opportunity to determine whether relationships between affective states and response measures were attributable to depressive symptom clusters, as well as exploring whether the relationships between personality traits and response measures could be accounted for by affective states. The relationship between negative affect and Hinting task scores was fully accounted for by the affective/cognitive symptom cluster of depression, again supporting the proposal that the ability to detect subtle cues from others is impaired due to depressive symptoms and not traits or affective states. The relationship between positive affect and individuals' speed in recognising instrumental gestures was also in part accounted for by the affective/cognitive symptoms, demonstrating a further combined effect of affective state and depressive symptoms. Aside from demonstrating independent relationships positive affect further accounted for some of the relationships that existed between personality traits and response measures. The relationships between neuroticism and an individual's confidence in accurately recognising a positive facial expression, and the relationship between neuroticism and an individual's evaluations of positive gestures, were actually attributable to positive affect.

The results of studies 1 and 2 highlight the importance of assessing, not only the relationships between depression and emotion perception, but also the relationships between personality traits and affective states. Additionally, the benefits of using regression analysis as opposed to between group designs is evident and shows that previous studies have greatly over estimated the direct relationship between

depression and emotion recognition deficits which, whilst statistically significant, may be questionable as to their clinical significance. These are the first studies which clearly show that personality traits and affective states are also implicated in emotion processing but, even when examined in unison with depressive symptoms, only account for a small proportion of the variance. However, it is apparent that when investigating the relationships between depression and behavioural responses to emotional cues, that consideration of individual and grouped depressive symptoms, alongside current affective states and personality traits need to be afforded for a truer attribution of influences.

7.5 Communicating Social Information in Depression

While the first half of this thesis considered the influence of depressive symptoms, traits and current mood states on incoming social cues, the latter half focused on the generation of cues originating from the depressed individual. Successful and enjoyable interactions require that individuals convey their own feelings effectively, as well as determining the non-verbal cues of other people. As important as correctly interpreting social cues is for successful social interactions, the ability to communicate personal subjective states may be viewed of as equally important. This has been demonstrated by studies which have found that emotional expression is beneficial in alleviating distress (Stanton et al., 2000; Stanton, Danoff-Burg, Cameron, & Ellis, 1994) while conversely, failed or suppressed expression can intensify distress (Ebbesen, Duncan, & Konecni, 1975) and interfere with active coping (Carver, Scheier,

& Weintraub, 1989; Nolen-Hoeksema, 1991), which may detrimentally impact upon interpersonal relationships (Tavris, 1984, 1989).

Chapter 5 explored how depression and personality traits might manifest in the behavioural component of emotional expression. Unlike previous studies, which have used static images or limited video presentations (Persad & Polivy, 1993; Rottenberg & Gross, 2003; Sloan et al., 1997), this third study used a wide variety of dynamic scenes of social interactions between two or more people, analysing the facial behaviour with the Facial Action Coding System (Ekman & Friesen, 1978b), as opposed to relying on observer reports. Due to the labour intensive nature of the facial analysis, and a restrictive sample size, the use of regression techniques was not possible. The division of depressive symptoms into affective/cognitive and somatic/physical was also not possible due to the size of sample. Future studies would naturally benefit from including both in subsequent studies of this nature. This study however did use novel scenes of socially complex interactions as opposed to static pictures, again increasing the ecological validity and enabling a truer representation of responsive behaviour. Also strengthening this study, was the previously mentioned form of facial analysis. The Facial Action Coding System (Ekman & Friesen, 1978b) is one of the most comprehensive systems for determining the number and intensity of facial expression. The stimuli in this study were designed so that each clip lasted for under 67 seconds. Neither the depressed nor non-depressed participants however generated a large enough array of facial responses to enable an assessment of how genuine or controlled elicited expressions were. Future studies should consider lengthier film clips such as those used by Reed et al. (2007), while maintaining the array of social scenes portrayed

in this study, so as to enable a more in depth analysis of facial displays in response to socially varied scenes.

The results of study 3 demonstrated reductions in the number and intensity of facial expressions for women with depression, alongside comparable experiential reports. A reduction in facial responses for both positively and negatively valenced stimuli is a finding supported by a number of studies (Rottenberg & Gotlib, 2004; Wexler et al., 1994). The further reduction in the intensity of facial displays, across both positive and negative stimuli, suggests support for the emotion context insensitivity view of altered facial responses in depression whereby, irrespective of valence, a self-protecting biases reduces facial movements in an effort to ensure distance from others (Nesse, 2000; Rottenberg et al., 2007; Rottenberg et al., 2005). While studies such as Gaebel and Wolwer (2004) and Berenbaum and Oltmanns (1992) demonstrated reductions in specific facial regions, and for stimuli of specific valence, the overall reduced facial displays fits with the observational reports of Rottenberg and Gotlib (2004), in which depressed individuals are rated as emotionally inexpressive. This generalised flattening of facial displays appears to be relatively robust therefore, in terms of stimuli type. Studies using an array of tasks from static facial expressions (Wexler et al., 1994) to affectively valenced slides (Gehricke & Shapiro, 2000; Greden et al., 1986; Schwartz et al., 1976) comedy film sequences (Reed et al., 2007) and the interpersonal social scenes of study 3, demonstrate a generalised reduction in levels of facial responsivity.

More contentiously perhaps, was the finding in study 3 that depressed individuals reported comparable experiential ratings, demonstrating that while they expressed less they experienced the same level of emotion as non-depressed

individuals. Brown, Sweeney and Schwartz (1979) agree with these results however, the meta-analysis performed by Bylsma et al. (2007), showed that across studies, the pattern of reduced facial responsivity extended to include experiential reports, in which depressed individuals reported lower levels of emotional experience in response to affectively valenced stimuli. While a number of the studies included in the meta-analysis examined facial responses to affective pictures (Dichter et al., 2004; Dunn, Dalgleish, Lawrence, Cusack, & Ogilvie, 2004; Forbes, Miller, Gohn, Fox, & Kovacs, 2005; Gehricke & Shapiro, 2000; Sloan et al., 1997; Sloan et al., 2001), studies using film clips, to elicit responses (Reed et al., 2007; Rottenberg & Gross, 2003; Rottenberg et al., 2002; Tsai, Pole, Levenson, & Munoz, 2003) also demonstrated reduced experiential reports. The discrepancy in results may however reside in the type of stimuli used. The film clips in the studies mentioned above were specifically valenced to depict sad, amusing and fearful scenes. The social interactions scenes in study 3 however were selected to convey negative and positive interpersonal engagements and as such, may have provided a measure of how individuals with depression respond to social settings where a mixture of emotions may be elicited during an interaction. The use of an expressive tendency measure also showed that while the depressed individuals expressed less during the task, they reported a greater intensity in their habitual desire to express their emotional states. It was proposed by study 3 that the nature of this discrepancy between experienced and expressed emotion might be understood by examining the influence of personality traits. The involvement of personality traits in the behavioural responses to affective stimuli in studies 1 and 2, as well as research which demonstrates relationships between traits and psychological disorders and response tendencies (Ekman, 1984; Goldsmith, 1993; Izard, 1972; Malatesta, 1990), support the likelihood of trait involvement in facial displays.

Regression analysis would have enabled an examination of the contribution of traits to facial responsivity, however, the group design utilised showed higher levels of neuroticism accompanied by lower levels of extroversion in the depressive condition. While research has shown correlations between the 'big five' personality traits, and expressed and experienced emotion (Keltner, 1996), only neuroticism and extroversion were of apparent interest in study 3. As discussed in the introduction, both of these traits are linked with expressive tendencies, specifically with Duchenne smiles and social approach eliciting expressions for extroversion (Keltner, 1995) and conversely, with displays of anger and reductions in Duchenne behaviours for neuroticism (Keltner & Bonanno, 1997). These traits further relate to an individual's understanding and adherence to social displays rules. Extroverts show enhanced concern for rules applying to increasing positive displays when in public, and neuroticism with decreasing negative emotional displays (Diefendorff & Richard, 2003). With the proposal that depressed women were suppressing their emotional responses, given their comparable experience ratings and flattened affect, study 3 postulated that the enhanced levels of neuroticism, and reduced levels of extroversion present in depression, may be exerting an influence over the extent to which depressed women adhere to social display rules by altering their level of facial expressivity. This posits that the involvement of higher levels of neuroticism may result in compliance with the rule of suppressing the expression of negative emotions, reducing an individual's amount of negative displays. Low levels of extroversion would conversely lower the consideration given to the aspect of display rules concerned with increasing displays of positive emotional states when in public, reducing an individual's positive expressions and resulting in the generalised pattern of reduced facial displays apparent in study 3 and previous other studies (Allen et al., 1999; Gehricke & Shapiro, 2000; Rottenberg et

al., 2002; Wexler et al., 1994). The restrictions of study 3 however, mean that the proposal of display rule adherence reducing facial responses requires further investigation to determine its validity.

7.6 Subjective Accounts of Social Functioning in Depression

Studies 1 and 2 demonstrated alterations in behavioural responses suggesting that perceptual biases and Theory of Mind impairments are implicated in the social functioning problems in depression, however neither appeared to be affecting a comprehensive influence. Study 3 explored the facial responses of individuals with depression, demonstrating reduced numbers and intensities of facial movements and comparable experiential reports. A greater intensity in the desire to emotionally express in individuals with depression was also found, implying that the women were modulating the degree to which they displayed their emotions. With the first three studies in this thesis therefore generating as many questions as they answered, study 4 sought to further understand the impact a depressive episode may extend over a person's desire and ability to function socially using a qualitative form of assessment. In this study five main themes emerged: (1) fear of social interactions, (2) diminished desire to socially interact, (3) display rules, (4) perceptions of others, and (5) isolation. In line with previous qualitative studies conducted with depressed individuals, the use of a qualitative method allowed for a deeper investigation into the difficulties experienced during a depressive episode, providing a novel insight into the struggles and challenges individuals face.

The sub-themes, contained in the perceptions of others theme, included issues which have previously been addressed in the literature, namely; stigma, being judged and fear of being vulnerable. Gammell and Stoppard (1999) and Scattolon and Stoppard (1999) also reported accounts of women discussing the stigma surrounding depression. In their studies, women talked about being ashamed of being diagnosed with depression, stating that they would prefer instead to have a physical illness (Gammel & Stoppard, 1999). For Scattolon and Stoppard (1999), the rural lives of the women prevented some from seeking treatment as they were embarrassed and did not want people in the community to find out. Drew, Dobson, & Stam (1999) reported accounts of women dissuading the issue of stigma, stating that the negative concept portrayed of depression was inaccurate and unfair. In study 4, the women spoke about stigma from the view point of being misunderstood and no longer being treated as normal. The women themselves were not ashamed of having the condition, but felt others treated them differently and found the condition frustrating.

Mauthner (1999) conducted a study in which women's experiences of postpartum depression were explored. As with study 4, the theme of being judged by others was raised. The women in Mauthner's (1999) study spoke about feeling as though they would be judged poorly for their ability to keep the house clean and be a good mother. The women further reported that they craved positive judgments but were never able to internalise them for fear of bad judgments. While Mauthner (1999) was considering postpartum depression, some of the issues discussed were the same, as the women in study 4 spoke about the expectation that others would view them negatively and criticise them. During interactions the women reported that they would be continually worrying about the other person's perceptions of how they were dressed

and of what they were saying. This made starting new conversations and enjoying meeting people increasingly difficult. The subtheme of vulnerability in study 4, expanded on reports by Scattolon and Stoppard (1999). In their study, the women talked about feeling vulnerable with respect to the stigma surrounding depression. In study 4 however, the women elaborated on this talking about how, when in public, they felt as though they were transparent and people were able to see everything that was going on within them. This made them feel exposed and extremely vulnerable in social settings.

The second theme which contained issues previously dealt with in the qualitative literature, was isolation covering discussions of detachment and alone and lonely. Crowe (2002) discussed how an individual's engagement in self-reflective and self-conscious behaviours may develop into a sense of alienation and disconnectedness from others which, in turn, may make the formation of relationships and connections more difficult. In agreement with this, the women in study 4 spoke about feeling detached from others, and explained the extent to which ruminative tendencies made it increasingly difficult to engage as they had a constant flow of negative thoughts in their minds, and felt out of sync and unsure of their speech and actions. Schiller and Bennett (1994) reported dialogues pertaining to a similar issue in which women reported a difficulty in the ability to decipher others meaning and intent, which served to further alienate them. The women in study 4, and young adults in Kuwabara et al. (2007) study, also spoke about a lack of understanding from other people, explaining how this can further lead to feelings of detachment and alienation.

Loneliness is commonly raised in qualitative accounts of women's depression. In study 4, the women spoke about the feeling of loneliness in response to the

awareness of everyone elses non-depressed state and the freedom that living in a world of happiness and opportunity afforded other people. The women talked about becoming increasingly lonely after interacting with others as they would be reminded of the contrast between their lives and their interaction partners. Mauthner (1999) talked about loneliness with postpartum depressed women, where they reported feeling too numb to reach out to other people and were without control. For the women in Hurst's (1999) study however, loneliness arose from the feeling of being left out of the world, where the women had no supportive relationships or networks. For the women in Scattolon and Stoppard's (1999) study however, the perception of loneliness was different for different women. For some it was a positive aspect of depression which afforded them time out to reflect and be with themselves, for others it was born out of the necessity of avoiding stigma and was perceived of negatively. While loneliness appears to be a feature of depression, the women in study 4 brought attention to the fact that interacting with other people can actually have the effect of worsening this loneliness, which was why some of the women chose not to interact when they were feeling particularly low.

A third theme raised in study 4 pertained to display rules and the pressure women with depression felt to adhere to them. The three sub-themes regarding the pressures to conform to societies norms were; the social mask, fear of public displays and sub-culture norms. The women reported that they felt the need to mask their true expressions when in public, irrespective of how low they felt. In agreement with Kuwabara et al. (2007), the women spoke about how exhausting the facade was, and that during very negative phases of their episode they would not go out publically as they did not have the energy to act. This fatigue and somewhat detached self may also

have contributed to the reduced number and intensity of facial movements in study 3. Also included in the display rules theme was a fear of public displays. In this sub-theme, the women discussed why they would hide themselves as opposed to entering into an interaction with someone. The fear of becoming upset in public and making other people feel uncomfortable motivated their choices to jump into shop doorways and avert gazes. As with the social mask, the avoidance of people if susceptible to becoming upset, was not for the benefit of the depressed individuals themselves but so that their interaction partner would not feel uncomfortable. A lot of the behaviours were motivated by the desire to not upset other people, as one of the women clearly showed in her use of humour to reassure other people that while she was depressed they did not have to be worried about her. The third sub-theme of display rules referred to the sub-culture norms of society. The dialogues of the women in study 4 were in agreement with those in Mauthner's (1999) study, where the women talked about being able to discuss their emotions and experiences openly with other people who were in the same position or who had been through depression. The sense that they were among people who understood, enabled them to find support and encouragement to aid their recovery. Etowa et al. (2007) and Stoppard (2000) also reported accounts of women speaking about the importance of being with people who understand, and the comfort that can be gained from those individuals. These sub-themes may be viewed as supportive of the proposal in study 3 that depressed women were suppressing their emotional responses. The remainder of the themes evolving out of the interviews; fear of social interactions and diminished desire to socially interact, provided new insights into a depressed individual's experiences of social interactions deepening, our understanding of the struggles and challenges that engaging with others poses for individuals with depression.

The question of whether impaired social skills are a proximal cause, a symptom of depression, or a vulnerability factor need not be an either/or question. Research exists which supports all of the models, suggesting that the relationship between depression and social skills are multi-formed. For some individuals with chronically poor social skills, depression may occur as a consequence as proposed by Lewinsohn's (1974a, 1975) Behavioural Theory. For other individuals, the experience of depression itself may result in ineffective and inappropriate patterns of social behaviour. For some, problematic social behaviour may serve as a vulnerability factor that, during times of distress or when stressors are present, leads an individual to experience an episode of depression. Poor social skills are inarguably associated with the difficulties in establishing and maintaining successful interactions, with interpersonal functioning influential in the etiology of depression. Impairments in social communication have been found to be predictive of a higher risk of relapse and a lower level of social functioning once in remission (Inoue et al., 2006). With 50%-85% of people who suffer from one episode of depression suffering a relapse (American Psychiatric Association, 1994), determining the factors involved in these interpersonal deficits is instrumental in enabling a complete understanding of this condition. While it is apparent that social skill problems are concomitants to depression, consideration of further factors, which may interact with social skills and depression, may create a clearer view of the underlying causes of dysfunctional behaviours. Factors such as personality traits, current affective states and suppressive tendencies will provide a better understanding of the interpersonal aspects and social skills of those afflicted with this condition.

References

Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory based subtype of depression. *Psychology Review*, 358-372.

Albus, M., Muller-Spahn, F., Ackenheil, M., & Engel, R. R. (1987). Psychiatric patients and their response to experimental stress. *Stress Medicine, 3*, 233–238.

Allen, N. B., Trinder, J., & Brennan, C. (1999). Affective startle modulation in clinical depression: Preliminary findings. *Biological Psychiatry, 46*, 542–550.

Alloy, L. B. (1988). *Cognitive processes in depression*. London: Guilford Press.

Alnaes, R., & Torgersen, S. (1995). Personality and personality disorders predict development and relapses of major depression. *Acta Psychiatrica Scandinavica, 95*, 336–342.

Altman, I., & Taylor, D. (1973). *Social penetration: The development of interpersonal relationships*. New York: Holt, Rinehart & Winston.

Ambadar, Z., Schooler, J. W., & Cohn, J. F. (2005). Deciphering the enigmatic face: The importance of facial dynamics in interpreting subtle facial expressions. *Psychological Science, 16*(5), 403-410.

American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders (4th Edition (DSM-IV)*. Washington, DC: American Psychiatric Association.

Anderson, K. W. (1994). Personality factors associated with negative affect: Application of the Big Five taxonomy to depression and anxiety. Utah State University.

Anderson, K. W., & Skidmore, J. R. (1995). Empirical analysis of factors in depressive cognitions: The Cognitive Triad Inventory. *Journal of Clinical Psychology, 51*, 603–609.

Anderson, P. A., & Guerrero, L. K. (1998). Principles of communication and emotion in social interaction. In P. A. Anderson & L. K. Guerrero (Eds.), *Handbook of communication and emotion* London: Academic Press.

Andreasen, N. C. (1982). Negative symptoms in schizophrenia: Definition and reliability. *Archives of General Psychiatry, 39*, 784–788.

Angst, J. (1992). How recurrent and predictable is depressive illness? In S. Montgomery & F. Rouillon (Eds.), *Long-term treatment of depression*. New York: John Wiley.

Angst, J. (1999). Major depression in 1998: Are we providing optimal therapy? *Journal of Clinical Psychiatry, 60*, 5-9.

Angst, J., & Preisig, M. (1995). Course of a clinical cohort of unipolar, bipolar and schizoaffective patients. Results of a prospective study from 1959 to 1985. *Archives of Neurological Psychiatry, 146*, 5-16.

Archer, J., Hay, D. C., & Young, A. W. (1992). Face processing in psychiatric conditions. *British Journal of Clinical Psychology, 31*, 45–61.

Ashforth, B. E., & Humphrey, R. H. (1993). Emotional labor in service roles: The influence of identity. *Academy of Management Review, 18*, 88-115.

Ashton, M., Lee, K., & Paunonen, S. (2002). What is the central feature of extraversion? Social attention versus reward sensitivity. *Journal of Personality and Social Psychology, 83*, 245–252.

Asthana, H. S., Mandal, M. K., Khurana, H., & Haque-Nizamie, S. (1998). Visuospatial and affect recognition deficit in depression. *Journal of Affective Disorders, 48*(1), 57-62.

Austin, E. J., Dore, T. C. P., & O'Donovan, K. M. (2008). Associations of personality and emotional intelligence with display rule perceptions and emotional labour. *Personality and Individual Differences, 44*, 679-688.

Avis, J., & Harris, P. L. (1991). Belief–desire reasoning among Baka children: Evidence for a universal conception of mind. *Child Development, 62*, 460-467.

Bagby, R. M., & Ryder, A. G. (2000). Personality and the affective disorders: Past efforts, current models, and future directions. *Current Psychiatry Reports, 2*, 465-472.

Baron-Cohen, S. (1985). Does the Autistic child have a Theory of Mind. *Cognition, 21*, 37-46.

Baron-Cohen, S. (1995). *Mind blindness: An essay on Autism and Theory of Mind*. Cambridge: MIT Press.

Baron-Cohen, S., Jolliffe, T., Mortimore, C., & Robertson, M. (1997). Another advanced test of Theory of Mind: Evidence from very high functioning adults with Autism or Asperger Syndrome. *Journal of Child Psychology and Psychiatry, 38*, 813–822.

Baron-Cohen, S., & Ring, H. (1994). *A model of the mind-reading system: Neuropsychological and neurobiological perspectives*. Hove: Erlbaum.

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The `Reading the mind in the eyes' test revised version: A study with normal adults, and adults with Asperger Syndrome or high-functioning Autism. *42*, 241-251.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182.

Beck, A. (1967). *Depression causes and treatment*. Philadelphia, PA: University of Pennsylvania Press.

Beck, A. (1976). *Cognitive therapy and the emotional disorders*. Madison, CT: International Universities Press.

Beck, A., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York, NY: Guilford.

Beck, A., Steer, R. A., & Garbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8*, 77 - 100.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for Beck Depression Inventory II (BDI-II)*. San Antonio, TX: Psychology Corporation.

Berenbaum, H., & Oltmanns, T. F. (1992). Emotional experience and expression in schizophrenia and depression. *Journal of Abnormal Psychology, 101*, 37–44.

Berenbaum, H., & Rotter, A. (1992). The relationship between spontaneous facial expressions of emotion and voluntary control of facial muscles. *Journal of Nonverbal Behaviour, 16*, 3.

Berenbaum, H., Snowhite, R., & Oltmanns, T. F. (1987). Anhedonia and emotional responses to affect evoking stimuli. *Psychological Medicine, 17*, 677–684.

Berlanga, C., Heinze, G., Torres, M., Apiquián, R., & Caballero, A. (1999). Personality and clinical predictors of recurrence of depression. *Psychiatric Services, 50*, 376-380.

Bonner, R. L., & Rich, A. R. (1988). A prospective investigation of suicidal ideation in college students: A test of a model. *Suicide life-threat Behaviour, 18*, 245-258.

Bora, E., Vahip, S., Gonul, A. S., Akdeniz, F., Alkan, M., Ogut, M., et al. (2005). Evidence for Theory of Mind deficits in euthymic patients with bipolar disorder. *Acta Psychiatrica Scandinavia, 112* (2), 110 - 116.

Bouhuys, A. L., Geerts, E., & Gordijn, C. M. (1999). Depressed patients perceptions of facial emotions in depressed and remitted states are associated with relapse: A longitudinal study. *Journal of Nervous and Mental Disease, 187*, 595–602.

Bower, G. H. (1981). Mood and memory. *American Psychologist, 36*, 129–148.

Bower, G. H. (1983). Affect and cognition. *Philosophical transactions of the Royal Society, 302*, 387-403.

Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*.

Braun, V., & Clark, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77-101.

Brim, J. A., Witcoff, C., & Wetzel, R. D. (1982). Social network characteristics of hospitalised depressed patients. *Psychological Reports, 50*, 423–433.

Brotheridge, C. M., & Grandey, A. A. (2002). Emotional labor and burnout: Comparing two perspectives of 'people work'. *Journal of Vocational Behavior, 60*, 17–39.

Brotheridge, C. M., & Lee, R. T. (2003). Development and validation of the emotional labour scale. *Journal of Occupational and Organizational Psychology, 76*, 365–379.

Brown, G. W., & Harris, T. O. (1978). *Social origins of depression: A study of psychiatric disorder in women*. New York: Free Press.

Brown, G. W., & Harris, T. O. (1982). Fall off in the reporting of life events. *Social Psychiatry, 17*, 23-28.

Brown, S. L., Sweeney, D. R., & Schwartz, G. E. (1979). Differences between self-reported and observed pleasure in depression and schizophrenia. *Journal of Nervous and Mental Disease, 167*, 410-415.

Brune, M. (2003). *Social cognition and behaviour in schizophrenia*. Chichester, U.K: Wiley and Sons.

Brune, M., & Brune-Cohrs, U. (2006). Theory of Mind – evolution, ontogeny, brain mechanisms and psychopathology. *Neuroscience and Behavioural Reviews, 30*, 437-355.

Buck, R. (1984). *The physiological bases of nonverbal communication*. New York: Springer Verlag.

Bull, P. E. (1987). *Posture and gesture*. Oxford: Pergamon Press.

Burgoon, J. (1985). Nonverbal signals. In M. L. Knapp & G. R. Miller (Eds.), *Handbook of interpersonal communication* (pp. 344-390). Beverly Hills: Sage publications.

Burgoon, J., & Hale, J. L. (1988). Nonverbal expectancy violations: Model elaboration and application to immediacy behaviors. *Communication Monographs, 55*, 58-79.

Burgoon, J., Newton, D. A., Walther, J. B., & Baesler, E. J. (1989). Nonverbal expectancy violations and conversational involvement. *Journal of Nonverbal Behavior, 13*, 97-119.

Burt, D. B., Zembar, M. J., & Niederehe, G. (1995). Depression and memory impairment: A meta-analysis of the association, its pattern, and specificity. *Psychological Bulletin, 117*, 285–305.

Bylsma, L. M., Morris, B. H., & Rottenberg, J. (2007). A meta-analysis of emotional reactivity in major depressive disorder. *Clinical Psychology Review, 28*, 676-691.

Camras, L. (1977). Facial expressions used by children in a conflict situation. *Child Development, 48*, 1431-1435.

Cappella, J. N., & Greene, J. O. (1982). A discrepancy-arousal explanation of mutual influence in expressive behavior for adult and infant-adult interaction. *Communication Monographs, 49*, 89-114.

Carver, C. S., Scheier, M. R., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*, 267-283.

Cassano, P., & Fava, M. (2002). Depression and public health: An overview. *Journal of Psychosomatic Research, 53*(4), 849–857.

Chaikin, A. L., & Derlega, V. J. (1974). Liking for the norm-breaker in self-disclosure. *Journal of Personality, 42*, 117–129.

Churchland, P. M. (1991). Folk psychology and the explanation of human behaviour. In J. D. Greenwood (Ed.), *The future of folk psychology* (pp. 51-69). Cambridge: Cambridge University Press.

Clark, L. A., & Watson, D. (1991). General affective dispositions in physical and psychological health. In C. R. Snyder & D. R. Forsyth (Eds.), *Handbook of social and clinical psychology*. New York: Pergamon Press.

Clark, L. A., Watson, D., & Mineka, S. (1994). Temperament, personality, and the mood and anxiety disorders. *Journal of Abnormal Psychology, 103*, 103–116.

Clark, M. S., & Isen, A. M. (1982). Towards understanding the relationship between feeling states and social behavior. In A. H. Hastorf & A. M. Isen (Eds.), *Cognitive social psychology* (pp. 73–108). New York: Elsevier-North Holland.

Cohen, A. (2008). The underlying structure of the Beck Depression Inventory II: A multidimensional scaling approach. *Journal of Research in Personality, 42*(3), 779-786.

Cohen, R., Weingartner, H., & Smallberg, S. (1982). Effort and cognition in depression. *Archives of General Psychiatry, 39*, 593 -598.

Cokely, E. T., & Feltz, A. (2009). Individual differences, judgment biases, and Theory of Mind: Deconstructing the intentional action side effect asymmetry. *Journal of Research in Personality, 43*, 18-24.

Coker, D. A., & Burgoon, J. K. (1987). The nature of conversational involvement and nonverbal encoding patterns. *Human Communication Research, 13*, 463-494.

Cole, D. A., & Milstead, M. (1989). Behavioral correlates of depression: Antecedents or consequences? *Journal of Counselling Psychology, 36*, 408–416.

Cooley, E. L., & Nowicki, S. (1989). Discrimination of facial expressions of emotions by depressed subjects. *Genetic, Social, and General Psychology Monographs, 115*, 451-465.

Corcoran, R. (2000). *Theory of Mind in other clinical conditions: Is a selective Theory of Mind deficit exclusive to Autism?* (Vol. 2). Oxford, U.K: Oxford University Press.

Corcoran, R., & Frith, C. D. (2003). Autobiographical memory and Theory of Mind: Evidence of a relationship in schizophrenia. *Psychological Medicine, 33*, 897-905.

Costa, P. T., & McCrae, R. R. (1987). Neuroticism, somatic complaints, and disease: Is the bark worse than the bite? *Journal of Personality, 55*, 299–316.

Costa, P. T., & McCrae, R. R. (1988). Personality in adulthood: A six-year longitudinal study of self-reports and spouse ratings on the NEO Personality Inventory. *Journal of Personality & Social Psychology, 54*, 853–863.

Costa, P. T., & McCrae, R. R. (1992). *The revised NEO Personality Inventory (NEO-PI-R) and NEO Five Factor Inventory (NEO-FFI) professional manual*. Florida: Psychological Assessment resources Inc.

Coyne, J. C. (1976a). Depression and the response of others. *Journal of Abnormal Psychology, 85*, 186-193.

Coyne, J. C. (1976b). Toward an interactional description of depression. *Psychiatry, 39*, 28-40.
Coyne, J. C. (1976c). Toward and interactional description. *Psychiatry and Clinical Neurosciences, 39*, 28-40.
Coyne, J. C. (1990). Interpersonal processes in depression. In G. I. Keitner (Ed.), *Depression and families: Impact and treatment*. Washington, DC: American Psychiatric Press.
Coyne, J. C., Burchill, S. A. L., & Stiles, W. (1990). An interactional perspective on depression. In C. R. Snyder & D. O. Forsyth (Eds.), *Handbook of social and clinical psychology: The health perspective*. New York: Pergamon Press.
Cronbach, L. J. (1957). The 2 disciplines of scientific psychology. *American Psychologist, 12*, 671–684.
Crowe, M. (2002). Reflexivity and detachment: A discursive approach to women's depression. *Nursing Inquiry, 9*(2), 216-132.
Crowe, M., & Luty, S. (2004). Recovery from depression: A discourse analysis of interpersonal psychotherapy. *Nursing Inquiry, 12*(1), 43-50.
Cummins, R. (1990). Social insecurity, anxiety, and stressful events as antecedents of depressive symptoms. *Behavioral Medicine, 13*, 161–164.
Dalgleish, T., & Watts, F. N. (1990). Biases of attention and memory in disorders of anxiety and depression. *Clinical Psychology Review, 10*, 589–604.
Darwin, C. R. (1872). *The origin of species by means of natural selection, or the preservation of favoured races in the struggle for life* (6th ed.). London: Eleventh thousand.
Davies, M., & Stone, M. J. (1995a). *Folk psychology: The Theory of Mind debate*. Blackwell: Oxford Press.
Davies, M., & Stone, T. (1995b). Mental simulation. In *Mental simulation* (pp. 1-18). Oxford: Blackwell.
Davis, D. (1982). *Determinants of responsiveness in dyadic interaction*. New York: Springer-Verlag.
Davis, D., & Holtgraves, T. (1984). Perceptions of unresponsive others: Attributions, attraction, understandability, and memory of their utterances. *Journal of Experimental Social Psychology, 20*, 383-408.
Dawson, M. E., Schell, A. M., & Catania, J. J. (1977). Autonomic correlates of depression and clinical improvement following electroconvulsive shock therapy. *Psychophysiology, 14*, 569–577.
De Fruyt, F., De Clercq, B., Van De Wiele, L., & Van Heeringen, K. (2006). The validity of Cloninger's psychobiological model versus the five-factor model to predict DSM-IV personality disorders in a heterogeneous psychiatric sample: Domain facet and residualized facet descriptions. *Journal of Personality, 74*, 479-510.

Deldin, P. J., Keller, J., Gergen, J. A., & Miller, G., A. (2000). Right posterior face processing anomaly in depression. *Journal of Abnormal Psychology, 109*, 116–121.

Deldin, P. J., Keller, J., Gergen, J. A., & Miller, G. A. (2001). Cognitive bias and emotion in neuropsychological models of depression. *Cognition and Emotion, 15*, 787–802.

Dennett, D. (1978). Beliefs about beliefs. *Behavioral and Brain Sciences, 1*, 568–570.

DePaulo, B. M., & Friedman, H. S. (1998). Nonverbal communication. In D. Gilbert, S. T. Fiske & G. Lindzey (Eds.), *Handbook of social psychology* (4 ed., Vol. 2, pp. 3-40). New York: Random House.

Depue, R. A., & Iacono, W. G. (1989). Neurobehavioral aspects of affective disorders. *Annual Review of Psychology, 40*, 457–492.

Derlega, V. J., Metts, S., Petronio, S., & Margulis, S. T. (1993). *Self-disclosure*. Newbury Park: Sage.

Detenber, B. H., & Simons, R. F. (1998). Roll 'em!: The effects of picture motion on emotional responses. *Journal of Broadcasting Electronic Media 42*, 112-126.

Dewey, J. (1894). The theory of emotion: Emotional attitudes. *Psychological Review, 1*, 553–569.

Dichter, G., Tomarken, A., Shelton, R., & Sutton, S. K. (2004). Early and late onset startle modulation in unipolar depression. *Psychophysiology, 41*, 433–440.

Diefendorff, J., & Richard, E. (2003). Antecedents and consequences of emotional display rule perceptions. *Journal of Applied Psychology, 88*, 284-294.

Diefendorff, J. M., Croyle, M. H., & Gosserand, R. H. (2005). The dimensionality and antecedents of emotional labor strategies. *Journal of Vocational Behavior, 66*, 339–359.

Digman, J. M., & Takemoto-Chock, N. K. (1981). Factors in the natural language of personality: Re-analysis, comparison and interpretation of six major studies. *Multivariate Behavioral Research, 16*(2), 149-170.

Dolan, R. J. (2002). Emotion, cognition, and behavior. *Science, 298*, 1191–1194.

Dollinger, S. J., Leong, F. T. L., & Ulicni, S. K. (1996). On traits and values: With special reference to openness to experience. *Journal of Research in Personality, 30*, 23-41.

Domken, M., Scott, J., & Kelly, P. (1994). What factors predict discrepancies between self and observer ratings of depression. *Journal of Affective Disorders, 31*, 253-259.

Doody, G. A., Gotz, M., Johnstone, E. C., Frith, C. D., Cunningham., & Owens, D. G. (1998). Theory of Mind and psychoses. *Psychological Medicine, 28*, 397-405.

Drew, M. L., Dobson, K. S., & Stam, H. J. (1999). The negative self concept in clinical depression: A discourse analysis. *Canadian Psychology, 40*(2), 192-204.

Ducharme, J., & Bachelor, A. (1993). Perception of social functioning in dysphoria. *Cognitive Therapy and Research, 17*, 53–70.

Dykman, B. M., Horowitz, L. M., Abramson, L. Y., & Usher, M. (1991). Schematic and situational determinants of depressed and nondepressed students' interpretation of feedback. *Journal of Abnormal Psychology, 100*, 45–55.

Ebbesen, E. B., Duncan, B., & Konecni, V. J. (1975). Effects of content of verbal aggression on future verbal aggression: A field study. *Journal of Experimental Social Psychology, 11*, 192-204.

Eid, M., & Diener, E. (1999). Intraindividual variability in affect: Reliability, validity, and personality correlates. *Journal of Personality and Social Psychology, 76*, 662–676.

Eisenberg, N., Fabes, R. A., Miller, P. A., Fultz, J., Shell, R., Mathy, R. M., et al. (1989). Relation of sympathy and personal distress to prosocial behavior: A multi-method study. *Journal of Perception and Social Psychology, 57*, 55–66.

Ekman, P. (1972a). *Universals and cultural differences in facial expressions of emotion* (Vol. 19). Lincoln, NE: University of Nebraska Press.

Ekman, P. (1972b). *Universals and cultural differences in facial expressions of emotion* (Vol. 19). Lincoln, NE: University of Nebraska Press.

Ekman, P. (1973). *Darwin and facial expression: A century of research in review*. New York: Academic Press.

Ekman, P. (1976). *Pictures of facial affect*. Palo Alto, CA: Consulting Psychologists Press.

Ekman, P. (1984). Expression and the nature of emotion. In K. Scherer & P. Ekman (Eds.), *Approaches to Emotion*. Hillsdale: Erlbaum.

Ekman, P. (1992). Facial expressions of emotion: New findings, new questions. *Psychological Science, 3*(1), 34-38.

Ekman, P. (1993). Facial expression of emotion. *American Psychologist, 48*, 384-392.

Ekman, P., & Friesen, W. V. (1969a). Nonverbal leakage and clues to deception. *Psychiatry, 32*, 88—105.

Ekman, P., & Friesen, W. V. (1969b). The repertoire of nonverbal behavior: Categories, origins, usage, and coding. *Semiotica, 1*, 49- 98.

Ekman, P., & Friesen, W. V. (1978a). *The Facial Action Code: A manual for the measurement of facial movement*. Palo Alto, CA: Consulting Psychologists Press.

Ekman, P., & Friesen, W. V. (1978b). *Facial Action Coding System: A technique for the measurement of facial movement*. Palo Alto, California: Consulting Psychologists Press.

Ekman, P., Friesen, W. V., & Ellsworth, P. (1972). *Emotion in the human face: Guide-lines for research and an integration of findings*. New York: Pergamon Press.

Ekman, P., Friesen, W. V., & Hager, J. C. (2002). *The Facial Action Coding System*. Salt Lake City: Research Nexus, Network Research Information.

Ekman, P., Friesen, W. V., & M., O. S. (1988). Smiles when lying. *Journal of Personality and Social Psychology, 54*, 414—420.

Ekman, P., Friesen, W. V., & Tomkins, S. S. (1971). Facial Affect Scoring Technique (FAST), a first validity study. *Semiotica, 3*(1), 37-38.

Ellgring, H. (1989). *Nonverbal communication in depression*. Cambridge, England: Cambridge University Press.

Enns, M. W., & Cox, B. J. (1997). Personality dimensions and depression: Review and commentary. *Canadian Journal of Psychiatry, 42*, 274-284.

Etowa, J., Keddy, B., Egbeyemi, J., & Eghan, F. (2007). Depression: The 'invisible grey fog' influencing the midlife health of African Canadian women. *International Journal of Mental Health Nursing, 16*, 203-213.

Fairbanks, L. A., McGuire, M. T., & Harris, C. J. (1982). Nonverbal interaction of patients and therapists during psychiatric interviews. *Journal of Abnormal Psychology, 91*, 109-119.

Fava, M., & Kendler, K. S. (2000). Major depressive disorder. *Neuron 28*, 335–341.

Feinberg, T. E., Rifkin, A., Schaffer, C., & Walker, E. (1986). Facial discrimination and emotional recognition in schizophrenia and affective disorders. *Archives of General Psychiatry, 43*, 276-279.

Fernández-Dols, J. M., & Ruiz-Belda, M. A. (1995). Are smiles a sign of happiness? Gold medal winners at the Olympic games. *Journal of Perception and Social Psychology, 69*, 1113-1119.

Field, T. (1995). Infants of depressed mothers. *Infant Behavioural Development, 18*, 1–13.

Fiske, S. T., & Taylor, D. (1991). *Social cognition* (2nd ed.). New York McGraw-Hill.

Fletcher, P. C., & Henson, R. N. (2001). Frontal lobes and human memory: Insights from functional neuroimaging. *Brain, 124*, 849-881.

Forgas, J. P., Bower, G. H., & Krantz, S. E. (1984). The influence of mood on perceptions of social interactions. *Journal of Experimental Social Psychology, 20*, 497–513.

Fossi, L., Faravelli, C., & Paoli, M. (1984). The Ethological approach to the assessment of depressive disorders. *Journal of Nervous and Mental Disease, 172*, 332-341.

Frank, M. G., Ekman, P., & Friesen, W. V. (1993). Behavioral markers and recognizability of the smile of enjoyment. *Journal of Personality and Social Psychology, 64*, 83–93.

Franken, I. H. A., & Muris, P. (2006). Gray's impulsivity dimension: A distinction between reward sensitivity versus rash impulsiveness. *Personality and Individual Differences, 40*(7), 1337-1347

Fridlund, A. (1991a). Evolution and facial action in reflex, social motive, and paralanguage. *Biological Psychology, 32*, 3-100.

Fridlund, A. (1991b). Sociality of solitary smiling: Potentiation by an implicit audience. *Journal of Personality and Social Psychology, 60*, 229-240.

Fridlund, A. (1992a). The behavioral ecology and sociality of human faces. In M. S. Clark (Ed.), *Emotion* (pp. 190–221). Newbury Park, CA: Sage.

Fridlund, A. (1992b). The behavioral ecology and sociality of human faces. *Review of Personality and Social Psychology, 13*, 90-121.

Fridlund, A. (1994). *Human facial expression: An evolutionary view*. San Diego: Academic Press.

Friesen, W. V., & Ekman, P. (1987). Dictionary - Interpretation of FACS scoring.

Frijda, N. H., & Tcherkassof, A. (1997). Facial expressions as modes of action readiness. In J. A. Russell & J. M. Fernández-Dols (Eds.), *The psychology of facial expression* (pp. 78-102). Cambridge: Cambridge University Press.

Frith, C. D., & Corcoran, R. (1996). Exploring Theory of Mind in people with schizophrenia. *Psychological Medicine, 26*, 521-530.

Frith, C. D., & Frith, U. (1999). Interacting minds: A biological basis. *Science, 289*, 1692–1695.

Frith, H., & Gleeson, K. (2004). Clothing and embodiment: Men managing body image and using thematic analysis in psychology. *Psychology of Men and Masculinity, 5*(40).

Frye, D., Zelazo, P. D., & Palfai, T. (1995). Theory of Mind and rule-based reasoning. *Cognitive Development, 10*, 483-527.

Funder, D. (1991). Global traits: A Neo-Allportian approach to personality. *Psychological Science, 2*, 31–39.

Funder, D. (1995). On the accuracy of personality judgment: A realistic approach. *Psychological Review, 102*(4), 652-670.

Funder, D. (2001). Personality. *Annual Review of Psychology, 52*, 197–221.

Gaebel, W., & Wolwer, W. (1992). Facial expressions and emotional face recognition in schizophrenia and depression. *European Archives of Psychiatry and Clinical Neuroscience, 242*, 46-52.

Gaebel, W., & Wolwer, W. (2004). Facial expressivity in the course of schizophrenia and depression. *European Archives of Psychiatry and Clinical Neuroscience, 254*(5), 335-342.

Gallagher, H. L., & Frith, C. D. (2003). Functional imaging of Theory of Mind. *Trends in Cognitive Sciences, 7*(2), 77-83.

Gallagher, H. L., & Frith, C. D. (2004). Dissociable neural pathways for the perception and recognition of expressive and instrumenal gestures. *Neuropsychologia, 42*, 1725-1736.

Gallagher, H. L., Happe, F., Brunswich, N., Fletcher, P. C., Frith, U., & Frith, C. D. (2000). Reading the mind in cartoons and stories: An FMRI study of Theory of Mind in verbal and nonverbal tasks. *Neuropsychologia, 38*, 11-21.

Gallese, V., & Goldman, A. (1998). Mirror neurons and the simulation of Theory of Mind reading. *Trends in Cognitive Sciences, 2*, 493-501.

Gammel, D. J., & Stoppard, J. M. (1999). Women's experiences of treatment of depression: Medicalisation or empowerment? *Canadian Psychology, 01*(5).

Gelder, M. G., Gath, D., & Mayou, R. (1990). *Oxford textbook of psychiatry* (2nd ed.). Oxford: Oxford University Press.

Gilboa-Schechtman, E., Erhard-Weiss, D., & Jeczemien, P. (2002). Interpersonal deficits meet cognitive biases: Memory for facial expressions in depressed and anxious men and women. *Psychiatry Research, 113*, 279–293.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine.

Golan, O., Baron-Cohen, B., & Hill, J. (2006). The Cambridge Mindreading (CAM) Face-Voice Battery: Testing complex emotion recognition in adults with and without Asperger Syndrome. *Journal of Autism and Developmental Disorders, 36*(2), 169-183.

Golin, S., Terrell, F., & Johnson, B. (1977). Depression and the illusion of control. *Journal of Abnormal Psychology, 86*, 440-442.

Gollan, J. K., Panea, H. T., McCloskeyb, M. S., & Coccarob, E. F. (2008). Identifying differences in biased affective information processing in major depression. *Psychiatry Research, 159*(1-2), 18-24.

Gopnik, A., Capps, L., & Meltzoff, A. N. (2000). Early theories of mind: What the theory can tell us about Autism. In S. Baron-Cohen, H. Tager-Flusberg & D. J. Cohen (Eds.), *Understanding other minds: Perspectives from developmental cognitive neuroscience* (2 ed., pp. 50-72). Oxford: Oxford University Press.

Gopnik, A., & Wellman, H. M. (1994). The 'Theory theory'. In L. Hirschfield & S. Gelman (Eds.), *Domain Specificity in Culture and Cognition*. New York: Cambridge University Press.

Gotlib, I., & Cane, D. (1987). Construct accessibility and clinical depression: A longitudinal investigation. *Journal of Abnormal Psychology, 96*, 199–204.

Gotlib, I., & Hammen, C. (2002). *Handbook of depression*. New York: The Guilford Press.

Gotlib, I., & Krasnoperova, E. (1998). Biased information processing as a vulnerability factor for depression. *Behavior Therapy, 29*, 603–617.

Gotlib, I., Krasnoperova, E., & Yue, D. (2004). Attentional biases for negative interpersonal stimuli in clinical depression. *Journal of Abnormal Psychology, 113*(1), 127-135.

Gotlib, I., & Lee, C. (1989a). The social functioning of depressed patients: A longitudinal assessment. *Journal of Social and Clinical Psychology, 8*, 223–237.

Gotlib, I., & Lee, C. (1989b). The Social Functioning of Depressed Patients: A Longitudinal Assessment

Journal of Social and Clinical Psychology, 8, 223–237.

Gotlib, I., & McCann, C. (1984). Construct accessibility and depression: An examination of cognitive and affective factors. *Journal of Personality and Social Psychology, 47*, 427-439.

Gotlib, I., McLachlan, A., & Katz, A. (1988). Biases in visual attention in depressed and nondepressed individuals. *Cognition and Emotion, 2*, 185-200.

Gotlib, I., & Meltzer, S. (1987). Depression and the perception of social skill in dyadic interaction. *Cognitive Therapy and Research, 11*, 41–53.

Gotlib, I., & Robinson, L. (1982). Responses to depressed individuals: Discrepancies between self-report of observer rated behavior. *Journal of Abnormal Psychology, 91*, 231-240.

Gotlib, I. H., & Lee, C. M. (1989c). The Social Functioning of Depressed Patients: A Longitudinal Assessment. *Journal of Social and Clinical Psychology, 8*, 223–237.

Gotlib, I. H., Sivers, H., Canli, T., Kasch, K. L., & Gabrieli, J. D. E. (2001). *Neural activation in depression in response to emotional stimuli.* Paper presented at the annual meeting of the society for research in psychopathology: New directions in the neurobiology of affective disorders, Madison, WI.

Grandey, A. (2000). Emotion regulation in the workplace: A new way to conceptualize emotional labor. *Journal of Occupational Health Psychology, 5*, 95-110.

Graziano, W. G., & Eisenberg, N. H. (1994). Agreeableness: A dimension of personality. In S. Briggs, R. Hogan & W. Jones (Eds.), *Handbook of personality psychology*. San Diego, CA: Academic Press.

Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*, 224-237.

Gross, J. J., & John, O. P. (1995). Facets of emotional expressivity: Three self-report factors and their correlates. *Personality and Individual Differences, 26*, 159–174.

Gross, J. J., & John, O. P. (1997). Revealing feelings: Facets of emotional expressivity in self-reports, peer ratings, and behavior. *Journal of Personality and Social Psychology, 74*, 170-191.

Gross, J. J., Sutton, S. K., & Ketelaar, T. (1998). Relations between affect and personality: Support for the affect-level and affective-reactivity views. *Personality and Social Psychology Bulletin, 24*, 279-288.

Grossman, E., Donnelly, M., Price, R., Pickens, D., Morgan, V., Neighbor, G., et al. (2000). Brain areas involved in perception of biological motion. *Journal of Cognitive Neuroscience, 12*, 711-720.

Guinjoan, S. M., Bernabo, J. L., & Cardinali, D. P. (1995). Cardiovascular tests of autonomic function and sympathetic skin responses in patients with major depression. *Journal of Neurology, Neurosurgery and Psychiatry, 59*, 299–302.

Gur, R. C., & Erwin, R. J. (1992). Facial emotion discrimination II: Behavioural findings in depression. *Psychiatric Research, 42*, 241-251.

Gurtman, M. B. (1987). Depressive affect and disclosures as factors in interpersonal rejection. *Cognitive Therapy and Research, 11*, 87–99.

Hale, W. W., Jansen, H. C. J., Bouhuys, L. A., & Van Den Hoofdakker, R. H. (1998). The judgment of facial expressions by Depressed patients, their partners and controls. *Journal of Affective Disorders, 47*, 63-70.

Hall, J. A. (1979). Gender, gender roles, and nonverbal communication. In R. Rosenthal (Ed.), *Skill in Nonverbal Behaviour* (pp. 32-67). Cambridge: Gunn & Hain.

Hall, J. A. (1984). *Nonverbal sex differences*. Baltimore: The Johns Hopkins University Press.

Halland, J., & Africa, A. (2007). A Thematic Analysis of narratives of depression. University of Cape Town.

Hamilton, M. A. (1960). A rating scale for depression. *Neurosurgery and Psychiatry, 23*, 56–62.

Hammen, C. (1991). Generation of stress in the course of unipolar depression. *Journal of Abnormal Psychology, 100*, 555–561.

Hammen, C. (1997). *Depression*. London: Psychology Press.

Hammen, C. L., & Krantz, S. (1976). Effect of success and failure on depressive cognitions. *Journal of Abnormal Psychology, 85*, 577-586.

Hansen, C. H., & Hansen, R. D. (1994). Automatic emotion: Attention and facial efference. In P. M. Niedenthal & S. Kitayama (Eds.), *The heart's eye: Emotional influences in perception and attention*. New York: Academic Press.

Harkness, K. L., Sabbagh, M. A., Jacobson, J., Chowdrey, N., & Chen, T. (2005). Sensitivity to subtle social information in dysphoric college students: Evidence for an enhanced Theory of Mind. *Cognition and Emotion, 19*, 999-1026

Harmer, C. J., Grayson, L., & Goodwin, G. M. (2002). Enhanced recognition of disgust in bipolar illness. *Biological Psychiatry, 51*, 298-304.

Hayes, N. (1997). *Theory-led thematic analysis: Social identification in small companies*: Psychology Press.

Healy, D. (1993). *Dysphoria*. New York: Wiley.

Henriques, J. B., & Davidson, R. J. (2000). Decreased responsiveness to reward in depression. *Cognition and Emotion, 14*, 711-724.

Hess, U., Banse, R., & Kappas, A. (1995). The intensity of facial expression is determined by underlying affective state and social situation. *Journal of Personality and Social Psychology, 69*, 280-288.

Hill, A. B., & Dutton, F. (1989). Depression and selective attention to self-esteem threatening words. *Personality and Individual Differences, 10*, 915–917.

Hochschild, A. R. (1983). *The managed heart: The commercialization of human feeling*. Berkeley, CA: University of California Press.

Hoffmann, G. M. A., Gonze, J. C., & Mendlewicz, J. (1985). Speech pause time as a method for the evaluation of psychomotor retardation in depressive illness. *British Journal of Psychiatry, 146*, 535-538.

Hokanson, J. E., Rubert, M. P., Welker, R. A., Hollander, G. R., & Hedeen, C. (1989). Interpersonal concomitants and antecedents of depression among college students. *Journal of Abnormal Psychology, 98*, 209-217.

Hooley, J. M. (1986). Expressed emotion and depression: Interactions between patients and high versus low expressed emotion spouses. *Journal of Abnormal Psychology, 95*, 237-246.

Hughes, C., Russell, J., & Robbins, T. W. (1994). Evidence for executive dysfunction in Autism. *Neuropsychologia, 32*, 477–492.

Hurst, S. A. (1999). Legacy of betrayal: A grounded theory of becoming demoralized from the perspective of women who have been depressed. *Canadian Psychology*.

Inoue, Y., Tonooka, Y., Yamada, K., & Kanba, S. (2004). Deficiency of Theory of Mind in patients with remitted mood disorder. *Journal of Affective Disorders, 82*, 403–409.

Inoue, Y., Yamada, K., & Kanba, S. (2006). Deficit in Theory of Mind is a risk for relapse of major depression. *Journal of Affective Disorder, 95*(1-3), 125-127.

Izard, C. E. (1977). *Human emotions*. New York: Plenum Press.

Izard, C. E. (1979). The maximally discriminative facial movement coding system (MAX). University of Delaware, Instructional Resource Center.

Izard, C. E., Dougherty, L., & Hembree, E. (1983). A system for identifying affect expression by holistic judgements (AFFEX). University of Delaware, Instructional Resources Center.

Izard, C. E., & Malatesta, C. Z. (1987). Perspectives on emotional development I: Differential emotions theory of early emotional development. In J. D. Osofsky (Ed.), *Handbook of infant development*. New York: Wiley.

Jack, D. C. (1999). Ways of listening to women in qualitative research: Interview techniques and analysis. *Canadian Psychology*.

Jaeger, J., Borod, J. C., & Peselow, E. (1986). Facial expression of positive and negative emotions in patients with unipolar depression. *Journal of Affective Disorders, 11*, 43-50.

Janowsky, J, S. (2007) Depression and dysphoria effects on the interpersonal perception of negative and positive moods and caring relationships: Effects of antidepressants, amphetamine, and methylphenidate. Current Psychiatric Reports. 5(6), 451-459

Jin, Y., Jing, J., Morinaga, R., Su, X., & Chen, X. (2002). A comparative study of Theory of Mind in Chinese and Japanese children. *Chinese Mental Health Journal, 16*(7), 446-448.

Joiner, T. (1995). The price of soliciting and receiving negative feedback: Self-verification theory as a vulnerability to depression theory. *Journal of Abnormal Psychology, 104*, 364-372.

Joiner, T., Alfano, M. S., & Metalsky, G. I. (1993). Caught in the crossfire: Depression, self-consistency, self-enhancement, and the response of others. *Journal of Social and Clinical Psychology, 12*, 113-134.

Joiner, T., & Coyne, J. C. (1999). *The interactional nature of depression: Advances in interpersonal approaches*. Washington, DC: American Psychological Association.

Joiner, T., & Katz, J. (1999). Contagion of depressive symptoms and mood: Meta-analytic review and explanations from cognitive, behavioral, and interpersonal viewpoints. *Clinical Psychology and Science Practice, 6*, 149-164.

Joiner, T., Schmidt, N., & Vohs, K. (2000). Social regard as correlate, antecedent, and consequence of mental and physical health outcomes. *Journal of Social & Clinical Psychology, 19*, 336-351.

Jones, H. E. (1950). The study of patterns of emotional expression. In M. Reymert (Ed.), *Feelings and emotions*. New York: McGraw-Hill.

Jones, J. H., & Pansa, M. (1979). Some nonverbal aspects of depression and schizophrenia occurring during the interview. *Journal of Nervous and Mental Disease, 167*, 402–409.

Jones, S. S., Collins, K., & Hong, H. W. (1991). An audience effect on smile production in 10 month old infants. *Psychological Science, 2*(1), 45–49.

Josephson, B. R., Singer, J. A., & Salovey, P. (1996). Mood regulation and memory: Repairing sad moods with happy memories. *Cognition and Emotion, 10*, 437–444.

Kan, Y., Mimura, M., Kamijima, K., & Kawamura, M. (2004). Recognition of emotion from moving facial and prosodic stimuli in Depressed patients. *Journal of Neurology and Neurosurgery Psychiatry, 75*, 1667-1671.

Katz, J., & Beach, S. R. H. (1997). Romance in the crossfire: When do women's depressive symptoms predict partner relationship dissatisfaction? *Journal of Social and Clinical Psychology Review, 16*, 243-258.

Kaviani, H., Gray, J. A., Checkley, S. A., Raven, P. W., Wilson, G. D., & Kumari, V. (2004). Affective modulation of the startle response in depression: Influence of the severity of depression, anhedonia, and anxiety. *Journal of Affective Disorders, 83*, 21–31.

Kazdin, A. E., Sherick, R. B., Esveldt-Dawson, K., & Rancurello, M. D. (1985). Nonverbal behavior and childhood depression. *Journal of the American Academy of Child Psychiatry, 24*, 303-309.

Keller, M. B., & Boland, R. J. (1998). The implications of failing to achieve successful long-term maintenance treatment of recurrent unipolar major depression. *Biological Psychiatry, 44*, 348-360.

Kelly, A. E., & McKillop, K. J. (1996). Consequences of Revealing Personal Secrets. *Psychological Bulletin, 120*, 450-465.

Keltner, D. (1995). Signs of appeasement: Evidence for the distinct displays of embarrassment, amusement, and shame. In P. Ekman & E. L. Rosenberg (Eds.), *What the face reveals: Basic and applied studies of spontaneous expression using the Facial Action Coding System (FACS)* (pp. 441-454). New York: Oxford University Press.

Keltner, D. (1996). Facial expressions of emotion and personality. In C. Magai & S. H. McFadden (Eds.), *Handbook of emotion, adult development, and aging* (pp. 385–402). New York: Academic Press.

Keltner, D. (1997). Facial expression, personality and psychopathology. In P. Ekman & E. L. Rosenberg (Eds.), *What the face reveals: Basic and applied studies of spontaneous expression using the Facial Action Coding System (FACS)*. New York: Oxford University Press.

Keltner, D., & Bonanno, G. A. (1997). A study of laughter and dissociation: Distinct correlates of laughter and smiling during bereavement. *Journal of Personality and Social Psychology, 73*, 687-702.

Keltner, D., & Kring, A. M. (1998). Emotion, social function and psychpathology. *Review of General Psychiatry, 2*, 320-342.

Kendler, K. S., Neale, M. C., Kessler, R. C., Heath, A. C., & Eaves, L. J. (1993). A longitudinal twin study of personality and major depression in women. *Archives of General Psychiatry, 50*, 853-862.

Kennedy-Moore, E., & Watson, J. C. (2001). How and when does emotional expression help? *Review of General Psychology, 3*, 187–212.

Kerr, N., Dunbar, R. I., & Bentall, R. P. (2003). Theory of Mind deficits in bipolar affective disorder. *Journal of Affective Disorders, 73*, 253-259.

Kessler, R. C., McGonagle, K. A., Swartz, M., Blazer, D. G., & Nelson, C. B. (1993). Sex and depression in the National Comorbidity Survey: I. Lifetime prevalence, chronicity and recurrence. *Journal of Affective Disorders, 29*(2-3), 85-96.

Kiloh, L. G., Andrews, G., & Neilson, M. (1988). The long term outcome of depressive illness. *British Journal of Psychiatry, 153*, 752-757.

King, L. A., & Emmons, R. A. (1990). Conflict over emotional expression: Psychological and physical correlates. *Journal of Personality and Social Psychology, 58*, 864-877.

Klein, D. N., Durbin, C. E., Shankman, S. A., & Santiago, N. J. (2002). *Depression and personality: In handbook of depression*. New York: Guilford Press.

Kleinke, C. L. (1986). Gaze and eye contact: A research review. *Psychological Bulletin, 100*, 78-100.

Klerman, G. L., Weissman, M. M., Rounsaville, B. J., & Chevron, E. S. (1984). *Interpersonal psychotherapy of depression*. Northvale, New Jersey: Jason Aronson Inc.

Klinnert, M. D. (1984). The regulation of infant behavior by maternal facial expression. *Infant Behavior and Development, 7*, 447-465.

Kraut, R. E., & Johnston, R. E. (1979). Social and emotional messages of smiling: An ethological approach. *Journal of Personality and Social Psychology, 37*, 1539-1553.

Kring, A. M., & Gordon, A. H. (1998). Sex differences in emotion: Expression, experience, and physiology. *Journal of Personality and Social Psychology, 74*, 686-703.

Kring, A. M., Kerr, S. L., Smith, D. A., & Neale, J. M. (1993). Flat affect in schizophrenia does not reflect diminished subjective experience of emotion. *Journal of Abnormal Psychology, 102*, 507–517.

Kring, A. M., & Sloan, D. (1991). The Facial Expression Coding System (FACES): A user's guide.

Kring, A. M., Smith, D. A., & Neale, J. M. (1994). Individual differences in dispositional expressiveness: Development and validation of the emotional expressivity scale. *Journal of Personality and Social Psychology, 66*, 934–949.

Krull, D. S., & Dill, J. C. (1998). Do smiles elicit more inferences than do frowns? The effect of emotional valence on the production of spontaneous inferences. *Personality and Social Psychology Bulletin, 24*, 289–300.

Kuiper, N. A., & Derry, P. A. (1982). Depressed and nondepressed content self-reference in mild depressives. *Journal of Personality, 50*, 67–79.

Kuiper, N. A., & Higgins, E. T. (1985). Social cognition and depression: A general integrative perspective. *Social Cognition, 3*, 1–15.

Kuiper, N. A., & MacDonald, M. R. (1982). Self and other perception in mild depressives. *Social Cognition, 1*, 223–239.

Kuwabara, S. A., Van Voorhees, B. W., Gollan, J. K., & Alexander, G. C. (2007). The qualitative exploration of depression in emerging adulthood: Disorder, development and social context. *General Hospital Psychiatry, 29*, 317-324.

Lang, P. J., & Öhman, A. M. (1988). *The international affective picture system*. Gainsville: University of Florida

Langdon, R., & Coltheart, M. (2001). Visual perspective taking and schizotypy: Evidence for a simulation based account of mentalising in normal adults. *Cognition, 92*, 1–26.

Lanzetta, J. T., & Kleck, R. E. (1970). Encoding and decoding of nonverbal affect in humans. *Journal of Personality and Social Psychology Bulletin, 16*, 2-19.

Larsen, D., & Chastain, R. L. (1990). Self-concealment: Conceptualization, measurement, and health implications. *Journal of Social and Clinical Psychology, 9*, 439-455.

Lazarus, R. (1991). *Emotion and adaptation*. New York: Oxford University Press.

Lee, L., Harkness, K. L., Sabbagh, M. A., & Jacobson, J. A. (2005). Mental state decoding abilities in clinical depression. *Journal of Affective Disorders, 86*, 247-258.

Leff, J. (1988). Psychiatry around the globe: A transcultural view. London: Gaskell.

Lemogne, C., Piolino, P., Friszer, S., Claret, A., N., G., & Jouvent, R. (2006). Episodic autobiographical memory in depression: Specificity, autonoetic consciousness, and self-perspective. *Consciousness and Cognition, 15*, 258–268.

Leppänen, J. M., Milders, M., Bell, J. S., Terriere, E., & Hietanen, J. K. (2004). Depression biases the recognition of neutral faces. *Psychiatry Research, 128*, 123–133.

Leslie, A. M. (1987). Pretense and representation: The origins of Theory of Mind. *Psychological Review, 94*, 412-426.

Leslie, A. M., & Roth, D. (1993). What Autism teaches us about metarepresentations. In S. Baron-Cohen, H. Tager-Flusberg & D. Cohen (Eds.), *Understanding other minds: Perspectives from Autism*. Oxford: Oxford University Press.

Leslie, A. M., & Thaiss, L. (1992). Domain specificity in conceptual development: Neuropsychological evidence from Autism. *Cognition, 43*, 225–251.

Levenson, R. W. (1994). Emotional control: Variation and consequences. In P. Ekman & R. J. Davidson (Eds.), *The Nature of Emotion: Fundamental Questions* (pp. 273–279). New York: Oxford University Press.

Lewinsohn, P. (1974a). A behavioural approach to depression. In R. J. Friedman & M. M. Katz (Eds.), *The psychology of depression: Contemporary theory and research* (pp. 157-185). Washington, DC: Winston-Wiley.

Lewinsohn, P. (1974b). *Clinical and Theoretical Aspects of Depression.* New York, NY: Wiley.

Lewinsohn, P. (1975). The behavioural study and treatment of depression. In M. Hersen, R. M. Eisler & P. M. Miller (Eds.), *Progress in behaviour modification* (Vol. 1, pp. 19-64). New York: Academic Press.

Lewinsohn, P., Hoberman, H., Teri, L., & Hautzinger, M. (1985). An integrative theory of depression. In S. Reiss & R. R. Bootzin (Eds.), *Theoretical issues in behaviour therapy* (pp. 331-359). New York: Academic Press.

Lewinsohn, P., Hoberman, H. M., & Rosenbaum, M. (1988). A prospective study of risk factors for unipolar depression. *Journal of Abnormal Psychology, 97*, 251–264.

Lewinsohn, P., Lobitz, W. C., & Wilson, S. (1973). Sensitivity of depressed individuals to aversive stimuli. *Journal of Abnormal Psychology, 81*, 259-263.

Lewinsohn, P., Mischel, W., Chaplin, W., & Russell, B. (1980). Social competence and depression: The role of illusory self-perceptions. *Journal of Abnormal Psychology, 89*(2), 203-212.

Lewis, S. (1995). *The social construction of depression: Experience, discourse and subjectivity.* University of Shefield, Shefield.

Lewis, S., & Nicolson, P. (1998). Talking about early motherhood: Recognising loss and reconstructing depression. *Journal of Reproductive and Infant Psychology, 16*, 177–197.

Lloyd, C. (1980a). Life events and depressive disorder reviewed: 1. Events as predisposing factors. *Archives of General Psychiatry, 37*, 529–535.
Lloyd, C. (1980b). Life events and depressive disorder reviewed: 2. Events as precipitating factors. *Archives of General Psychiatry, 37*, 541–548.
Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales* (2 ed.). Sydney: Psychology Foundation.
Lucas, R., & Fujita, F. (2000). Factors influencing the relation between extraversion and pleasant affect. *Journal of Personality and Social Psychology, 79*, 1039–1056.
Lundqvist, L. O., & Dimberg, U. (1995). Facial expressions are contagious. *Journal of Psychophysiology, 9*, 203-211.
Lyness, J. M., Duberstein, P. R., King, D. A., Cox, C., & Caine, E. D. (1998). Medical illness burden, trait neuroticism, and depression in older primary care patients. *American Journal of Psychiatry, 155*, 969-971.
Lyon, H. M., Startup, M., & Bentall, R. P. (1999). Attributions, selective attention and self schema in bipolar affective disorder. *Journal of Abnomal Psychology, 108*, 273-282.
MacLeod, C., Mathews, A., & Tata, P. (1986). Attentional bias in emotional disorders. *Journal of Abnormal Psychology, 95*(1), 15-20.
Magnus, K., Diener, E., Fujita, F., & Pavot, W. (1993). Extraversion and neuroticism as predictors of objective life events: A longitudinal analysis. *Journal of Personality and Social Psychology, 65*, 1046–1053.
Mandler, G. (1975). *Mind and emotion*. New York: Wiley.
Marcus, D. K., & Wilson, J. R. (1996). Interpersonal perception of social anxiety: A social relations analysis. *Journal of Social and Clinical Psychology, 15*, 471–487.
Marjoram, D., Gardner, C., Burns, J., Miller, P., Lawrie, S., & Johnstone, E. (2005). Symptomatology and social inference: A Theory of Mind study of schizophrenia and psychotic affective disorder. *Cognitive Neuropsychiatry, 10*(5), 347–359.
Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224–253.
Matsumoto, D., & Ekman, P. (1989). American-Japanese cultural differences in intensity ratings of facial expressions of emotion. *Motivation and Emotion, 13*, 143-157.
Matthews, G. (1992). Extroversion. In A. P. Smith & D. M. Jones (Eds.), *Handbood of human performance* (Vol. 3: State and trait, pp. 95-126). San Diego, CA: Academic Press.
Matthews, G., & Deary, I. J. (1998). *Personality traits*. Cambridge: Cambridge University Press.

Mauthner, N. S. (1999). Feeling low and feeling really bad about feeling low": women's experiences of motherhood and postpartum depression. *Canadian Psychology*.

McCabe, S. B., & Gotlib, I. (1995). Selective attention and clinical depression: Performance on a deployment of attention task. *Journal of Abnormal Psychology, 104*(1), 241-245.

McCrae, R., & Costa, P. (1990). *Personality in adulthood*. New York: Guilford Press.

McCrae, R. R., & Costa, P. T. (1991). Adding liebe and arbeit: The full five factor model and well being. *Personality and Social Psychology Bulletin, 17*, 227-232.

McCrae, R. R., & John, O. (1992). An introduction to the five factor model and its applications. *Journal of Personality, 60*(2), 174-214.

Mead, G. H. (1934). *Mind, self and society from the standpoint of a social behaviourist*. Chicago: University of Chicago Press.

Mikhailova, E. S., Vladimiroa, T. V., Iznark, A. F., Tsusulkaya, E. J., & Sushko, N. V. (1996). Abnormal recognition of facial expression of emotions in depressed patients with major depression disorder and schizotypal personality disorder. *Biological Psychiatry, 40*, 697-705.

Miller, R. E., Caul, W. F., & Mirsky, I. A. (1967). Communication of affects between feral and socially isolated monkeys. *Journal of Personality and Social Psychology, 7*, 231-239.

Morris, J. A., & Feldman, D. C. (1996). The dimensions, antecedents, and consequences of emotional labor. *Academy of Management Review, 21*, 986-1010.

Mulder, R. T. (2002). Personality pathology and treatment outcome in major depression: A review. *American Journal of Psychiatry, 159*, 359-371.

Murray, H. A. (1938). *Explorations in personality*. New York: Oxford University Press.

Nesse, R. M. (2000). Is depression an adaptation? *Archives of General Psychiatry, 57*, 14–20.

Nezlek, J. B., Christianne, P., Hampton., & Shean, G. D. (2000). Clinical depression and day-to-day social interaction in a community sample. *Journal of Abnormal Psychology, IO9*(1), 11-19.

Nezlek, J. B., Imbrie, M., & Shean, G. D. (1994). Depression and everyday social interaction. *Journal of Personality and Social Psychology, 67*, 1101-1111.

Nisbett, R., & Ross, L. (1980). Assigning weights to data: The 'vividness criterion'. In R. Nisbett & L. Ross (Eds.), *Human inference: Strategies and shortcomings of social judgment* (pp. 43–62). Englewood Cliffs Prentice-Hall.

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100*, 569-582.

Nolen-Hoeksema, S., & Davis, C. G. (1999). "Thanks for Sharing That": Ruminators and their Social Support Networks. *Journal of Personality and Social Psychology, 77*, 801-814.

Ogden, J. A., & Von Sturmer, G. (1984). Emotional strategies and their relationship to complaints of psychosomatic and neurotic symptoms. *Journal of Clinical Psychology, 40*, 773–779.

Olley, A. L., Malhi, G. S., Bachelor, J., Cahill, C. M., Mitchell, P. B., & Berk, M. (2005). Executive functioning and Theory of Mind in euthymic bipolar disorder. *Bipolar Disorders, 7*(5), 43-52.

Ormel, J., & Wohlforth, T. (1991). How Neuroticism, long-term difficulties, and life situation changes influence psychological distress: a longitudinal model *Journal of Personality and Social Psychology 60* 744–755.

Ozonoff, S., Rogers, S. J., & Pennington, B. (1991). Asperger's Syndrome: Evidence of an empirical distinction from high-functioning Autism. *Journal of Child Psychiatry Psychology, 32*, 1007–1122.

Parker, G., Blignault, I., & Manicavasagar, V. (1988). Neurotic depression: delineation of symptom profiles and their relation to outcome. *The British Journal of Psychiatry 152*, 15-23.

Parker, I. (2005). *Qualitative Psychology: Introducing Radical Research*. Buckingham: Open University Press.

Patterson, M. L. (1983). *Nonverbal behavior: A functional perspective*. New York: Springer-Verlag.

Patton, M. Q. (1990). *Qualitative evaluation and research methods*: Sage.

Persad, S., & Polivy, J. (1993). Differences between depressed and non-depressed individuals in the recognition of and response to facial cues. *Journal of Abnormal Psychology, 102*, 358-368.

Plutchik, R. (1980). A general psychoevolutionary theory of emotion. In R. Plutchik & H. Kellerman (Eds.), *Emotion: Theory, Research, and Experience: Vol. 1. Theories of emotion* (pp. 3-33). New York: Academic Press.

Poulton, R. G., & Andrews, G. (1992). Personality as a cause of adverse life-events. *Acta Psychiat. Scand., 85*, 35–38.

Premack, D. G., & Woodruff, G. (1978). Does the chimpanzee have a Theory of mind? *Behavioral and Brain Sciences, 1*, 515-526.

Rapee, R. M., & Heimberg, R. G. (1997). A Cognitive-Behavioral Model of Anxiety in Social Phobia. *Behaviour Research & Therapy, 35.*, 741–756.

Rapmund, V., & Moore, C. (2000). Women's Stories of Depression: A Constructivist Approach. *South African Journal of Psychology, 30*, 20-30.

Reed, L. I., Sayette, M., & Cohn, J. F. (2007). Impact of depression on response to comedy: A dynamic facial coding analysis. *Journal of Abnormal Psychology, 116*(4), 804-809.

Rehm, L. P., & O'Hara, M. W. (1985). Item characteristics of the Hamilton rating scale for depression. *Journal of Psychiatry Research, 19*, 31–41.

Renneberg, B., Heyn, K., Gebhard, R., & Bachmann, S. (2005). Facial expression of emotions in borderline personality disorder and depression. *Journal of Behavioural Therapy Experiments in Psychiatry, 36*, 183-196.

Revelle, W. (1987). Personality and motivation–sources of inefficiency in cognitive performance. *Journal of Research in Personality, 21*(4), 436–452.

Rhode, P., Lewinsohn, P. M., & Seeley, J. R. (1990). Are people changed by the experience of having an episode of depression? A further test of the scar hypothesis. *Journal of Abnormal Psychology, 99*, 264–271.

Rizzolatti, G., & Craighero, L. (2004). The mirror neuron system. *Annual Review in Neuroscience, 27*, 169-192.

Robertson, A., Venter, C., & Botha, K. (2005). Narratives of depression. *South African Journal of Psychology, 35*, 331-345.

Roccas, S., Sagiv, L., Schwartz, S. H., & Knafo, A. (2002). The big five personality factors and personal values. *Personality and Social Psychology Bulletin, 28*, 789.

Rogers, D., & Jamieson, J. (1988). Individual differences in delayed heart-rate recovery following distress: The role of extraversion, neuroticism, and emotional control. *Personality and Individual Differences, 9*, 721-726.

Rogers, D., & Nesshoever, W. (1987). The construction and preliminary validation of a scale for measuring emotional control. *Personality and Individual Differences, 8*, 527-534.

Rottenberg, J., & Gotlib, I. H. (2004). Socioemotional functioning in depression. In M. Power (Ed.), *Mood disorders: A handbook of science and practice* (pp. 61-77). New York: Wiley.

Rottenberg, J., & Gross, J. J. (2003). When emotion goes wrong: realizing the promise of affective science. *Clinical Psychology: Science and Practice, 10*, 227–232.

Rottenberg, J., Kasch, K. L., Gross, J. J., & Gotlib, I. (2002). Sadness and amusement reactivity differentially predict concurrent and prospective functioning in major depressive disorder. *Emotion, 2*, 135–146.

Rottenberg, J., Ray, R. D., & Gross, J. J. (2007). Emotion elicitation using films. In J. A. Coan & J. J. B. Allen (Eds.), *The handbook of emotion elicitation and assessment*. London: Oxford University Press, London.

Rottenberg, J., Salomon, K., Gross, J., & Gotlib, I. H. (2005). Vagal withdrawal to a sad film predicts subsequent recovery from depression. *Psychophysiology, 42*, 277–281.

Rubinow, D. R., & Post, R. M. (1992). Impaired Recognition of Affect in Facial Expression in Depressed Patients. *Biological Psychiatry, 31*, 947-953.

Ruch, W. (1993). Exhilaration and humor. In M. Lewis & J. M. Haviland (Eds.), *The handbook of emotion* (pp. 605-616). New York: Guilford.

Rusting, C. L. (1998). Personality, mood, and cognitive processing of emotional information: Three conceptual frameworks. *Psychological Bulletin, 124*, 165-196.

Rutter, D. R., & Stephenson, G. M. (1972). Visual interaction in a group of schizophrenic and depressive patients. *British Journal of Social and Clinical Psychology, 11*, 57-65.

Saarni, C. (1993). Socialization of Emotion. In M. Lewis & J. M. Haviland (Eds.), *Handbook of Emotions* (pp. 435–446). New York: Guilford Press.

Sabbagh, M. A. (2004). Recognising and reasoning about mental states: Understanding orbitofrontal contributions to Theory of Mind and Autism. *Brain and Cognition, 55*, 209-219.

Santor, D. C., Bagby, R. M., & Joffe, R. T. (1997). Evaluating stability and change in personality and depression. *Journal of Personality and Social Psychology, 73*, 1354-1362.

Sass, L. (1992). *Madness and modernism*. New York: Basic Books.

Sayette, M., Cohn, J. F., Wertz, J. M., Perrott, M. A., & Parrott, D. J. (2001). A psychometric evaluation of the Facial Action Coding System for assessing spontaneous expression. *Journal of Nonverbal Behavior, 25*(3).

Scattolon, Y., & Stoppard, J. M. (1999). Getting on with life: Women's experiences and ways of coping with depression. *Canadian Psychology, 40*(2), 205-219.

Scher, C. D., Ingram, R. F., & Segal, Z. V. (2005). Cognitive reactivity and vulnerability: Empirical evaluation of construct activation and cognitive diatheses in unipolar depression. *Clinical Psychology Review, 25*, 487–510.

Schiller, L., & Bennett, A. (1994). *The quiet room*. New York: Time Warner.

Segrin, C. (1990). A meta-analytic review of social skill deficits associated with depression. *Communication Monographs, 57*, 292-308.

Segrin, C. (1992). Specifying the nature of social skill deficits associated with depression. *Human Communication Research, 19*, 89–123.

Segrin, C. (1996). The relationship between social skills deficits and psychosocial problems: A test of a vulnerability model. *Communication Research, 23*, 425-450.

Segrin, C. (1999). Social skills, stressful life events, and the development of psychosocial problems. *Journal of Social and Clinical Psychology, 18*, 14-34.

Segrin, C., & Abramson, L. Y. (1994). Negative reactions to depressive behaviors: A communication theories analysis. *Journal of Abnormal Psychology, 103*, 655–668.

Segrin, C., & Flora, J. (2000). Poor social skills are a vulnerability factor in the development of psychosocial problems. *Human Communication Research, 26*, 489-514.

Sigmon, S. T., & Nelson-Gray, R. O. (1992). Sensitivity to aversive events in depression: Antecedent, concomitant, or consequent? *Journal of Psychopathology and Behavioral Assessment, 14*(3), 225-246.

Simon, G. E., VonKorff, M., Piccinelli, M., Fullerton, C., & Ormel, J. (1999). An international study of the relation between somatic symptoms and depression. *New England Journal of Medicine, 341*, 1329–1335.

Simons, R. F., Detenber, B. H., Reiss, J. E., & Shults, C. W. (2000). Image motion and context: A between- and within-subjects comparison. *Psychophysiology, 37*, 706-710.

Simons, R. F., Detenber, B. H., Roedema, T. M., & Reiss, J. E. (1999). Emotion processing in three systems: the medium and the message. *Psychophysiology, 36*, 619-627.

Sloan, D. M., Strauss, M. E., Quirk, S. W., & Sajatovik, M. (1997). Subjective and expressive emotional responses in depression. *Journal of Affective Disorders, 46*, 135–141.

Sloan, D. M., Strauss, M. E., & Wisner, K. L. (2001). Diminished pleasurable response in depressed women. *Journal of Abnormal Psychology, 110*, 488 – 493.

Smith, B. (1999). The abyss: Exploring depression through a narrative of the self. *Qualitative Inquiry, 5*, 264-281.

Smith, S. M., & Petty, R. E. (1995). Personality moderators of mood congruency effects on cognition: The role of self-esteem and negative mood regulation. *Journal of Personality and Social Psychology, 68*, 1092–1107.

Sommers, S. (1984). Adults evaluating their emotions: A cross-cultural perspective. In C. Z. Malatesta & C. E. Izard (Eds.), *Emotions in Adult Development* (pp. 319–338). Beverly Hills: Sage.

Spitzberg, B. H., & Cupach, W. R. (1985). Conversational skill and locus of perception. *Journal of Psychopathology and Behavioural Assessment, 7*, 207-220.

Stanton, A. L., Danoff-Burg, S., Cameron, C. L., Bishop, M., Collins, C. A., Kirk, S. B., et al. (2000). Emotionally expressive coping predicts psychological and physical adjustment to breast cancer. *Journal of Consulting and Clinical Psychology, 68*, 875-882.

Stanton, A. L., Danoff-Burg, S., Cameron, C. L., & Ellis, A. P. (1994). Coping through emotional approach: Problems of conceptualization and con-founding. *Journal of Personality and Social Psychology, 66*, 350-362.

Stone, V. E., Baron-Cohen, S., & Knight, R. T. (1998). Frontal lobe contributions to Theory of Mind. *Journal of Cognitive Neuroscience, 10*, 640–656.

Stoppard, J. M. (2000). *Understanding depression: Feminist social constructionist approaches*. London: Routledge.

Stoppard, J. M., & Scattolon, Y. (1999). "Getting on with life": women's experiences and ways of coping with depression. *Canadian Psychology*.

Surguladze, S., Young, A. W., Senior, C., Brebion, G., Travis, M. J., & Phillips, M. L. (2004). Recognition accuracy and response bias to happy and sad facial expressions in patients with major depression. *Neuropsychology, 18*, 212-218.

Surtees, P. G., & Barkley, C. (1994). Future imperfect: The long term outcome of depression. *British Journal of Psychiatry, 164*, 327-341.
Suslow, T., Junghanns, K., & Arolt, V. (2001a). Detection of Facial Expressions of Emotions in Depression. *Percept Mot Skills, 92*, 857-868.
Suslow, T., Junghanns, K., & Arolt, V. (2001b). Detection of facial expressions of emotions in depression. *Perceptual Motor Skills, 92*, 857–868.
Tam, P. W. C., & Wong, D. F. K. (2007). Qualitative analysis of dysfunctional attitudes in Chinese persons suffering from depression. *Hong Kong Journal of Psychiatry*.
Tavris, C. (1984). On the wisdom of counting to ten: Personal and social dangers of anger expression. *Review of Personality and Social Psychology, 5*, 170-191.
Tavris, C. (1989). *Anger: The misunderstood emotion*. New York: Simon and Schuster.
Teasdale, J. (1988). Cognitive vulnerability to persistent depression. *Cognition and Emotion, 2*, 247–274.
Teasdale, J. D. (1983). Negative thinking in depression: Cause, effect, or reciprocal relationship? *Advances in Behavior Research and Therapy, 5*, 27–49.
Teasdale, J. D., & Fogarty, S. J. (1979). Differential effects of induced mood on retrieval of pleasant and unpleasant events from episodic memory. *Journal of Abnormal Psychology, 88*, 248–257.
Teasdale, J. D., Taylor, R., & Fogarty, S. J. (1980). Effects of induced elation depression on the accessibility of memories of happy and unhappy experiences. *Behaviour Research and Therapy, 18*, 339–346.
Tellegen, A. (1985). Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A. H. Tuma & J. Mason (Eds.), *Anxiety and the anxiety disorders* (pp. 681-706). Hillsdale, NJ: Erlbaum.
Thoits, P. A. (1986). Social support as coping assistance. *Journal of Consulting and Clinical Psychology, 54*, 416-423.
Thompson, D. F., & Meltzer, L. (1964). Communication of emotional intent by facial expression. *Journal of Abnormal and Social Psychology, 68*, 129-135.
Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the society for research in child development, 59*, 25-52.
Trierweiler, L. I., Eid, M., & Lischetzke, T. (2002). The structure of emotional expressivity: Each emotion counts. *Journal of Personality and Social Psychology, 82*, 1023–1040.
Tronick, E., Als, H., & Brazelton, T. B. (1980). Monadic phases: A structural descriptive analysis of infant-mother face-to-face interaction. *Merrill-Palmer Quarterly, 26*, 3-24.
Trower, P., Bryant, B., & Argyle, M. (1978). *Social skills and mental health*. London: Methuen.

Trull, T. J., & Sher, K. J. (1994). Relationship between the five factor model of personality and axis I disorders in a nonclinical sample. *Journal of Abnormal Psychology, 103*, 350–360.

Tsai, J. L., Pole, N., Levenson, R. W., & Munoz, R. F. (2003). The effects of depression on the emotional responses of Spanish speaking Latinas. *Cultural Diversity and Ethnic Minority Psychology, 9*, 49–63.

Tylee, A. (1999). Bringing treatment by halves to an end. *The Practitioner, 243*(591).

Uekermann, J., Channon, S., Lehmkämper, C., Abdel-Hamid, M., Vollmoeller, W., & Daum, I. (2008). Executive function, mentalising and humor in major depression. *Journal of International Neuropsychological Society, 14*(1), 55-62.

Vanger, P. (1987). An assessment of social skill deficiencies in depression. *Comprehensive Psychiatry, 28*, 508–512.

Vaz Serra, A., & Pollitt, J. (1975). The relationship between personality and the symptoms of depressive illness. *British Journal of Psychiatry, 127*, 211-218.

Vollrath, M., & Torgersen, S. (2000). Personality types and coping. *Personality and Individual Differences, 29*, 367–378.

Watson, D. (2000). *Mood and temperament*. New York: Guilford Press.

Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychological Bulletin, 96*, 465-490.

Watson, D., & Clark, L. A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-1070.

Watson, D., & Clark, L. A. (1992). On traits and temperament: General and specific factors of emotional experience and their relation to the five factor model. *Journal of Personality, 60*, 441–476.

Watson, D., Clark, L. A., & Carey, G. (1988). Positive and negative affect and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology, 97*, 346-353.

Watson, D., & Pennebaker, J. W. (1989). Health complaints, stress, and distress: Exploring the central role of negative affectivity. *Psyhological Review, 96*, 234-225 I.

Waxer, P. H. (1974). Nonverbal cues for depression. *Journal of Abnormal Psychology, 83*, 319-322.

Weissman, M. M., Bruce, M. L., Leaf, P. J., Florio, L. P., & Holzer, C. (1991). *Affective disorders*. New York: Free Press.

Weissman, M. M., & Paykel, E. S. (1974). *The depressed woman: A study of social relationships*. Chicago: University of Chicago Press.

Wellman, H. M. (1990). *The child's Theory of Mind*. Cambridge, MA: Bradford Books/MIT Press.

Werden, D., Elikann, L., Linster, H., Dykierek, P., & Berger, M. (2008). Theory of Mind (ToM) and depression - an explorative study including narrative ToM performances. *Annals of General Psychiatry, 7*.

Wexler, B. E., Levenson, L., & Warrenburg, S. (1994). Decreased perceptual sensitivity to emotion-evoking stimuli in depression. *Psychiatry Research, 51*, 127 - 138.

WHO. (1992). *The ICD-10 Classification of Mental and Behavioural Disorders*. Geneva: World Health Organisation.

Wierzbicki, M. (1984). Social skills deficits and subsequent depressed mood in students. *Personality and Social Psychology Bulletin, 10*, 605-610.

Wierzbicki, M., & McCabe, M. (1988). Social skills and subsequent depressive mood symptomatology in children. *Journal of Clinical Child Psychology, 17*, 203-208.

Wiggers, M. (1982). Judgments of facial expressions of emotion predicted from facial behavior. *Journal of Nonverbal Behavior, 7*, 101–116.

Wilhelm, K., Parker, G., Dewhurst-Savellis, J., & Asghari, A. (1999). Psychological predictors of single and recurrent major depressive episodes. *Journal of Affective Disorders, 54*, 139-147.

Williams, J., Barlow, D., & Agras, W. (1972). Behavioral measurement of severe depression. *Archives of General Psychiatry, 27*, 330-333.

Williams, J., Watts, F., Macleod, C., & Mathews, A. (1997). *Cognitive psychology and emotional disorders* (2nd ed.). New York: Wiley.

Williams, J. M. G. (1996). Depression and the specificity of autobiographical memory. In D. C. Rubin (Ed.), *Remembering our past* (pp. 244–267). New York, NY: Cambridge University Press.

Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition, 13*, 103-128.

World Health Organisation. (2001). *Mental health: New understanding, new hope*. Geneva: World Health Organisation.

Youngren, M. A., & Lewinsohn, P. M. (1980a). The functional relation between depression and problematic interpersonal behavior. *Journal of Abnormal Psychology, 89*(3), 333-341.

Youngren, M. A., & Lewinsohn, P. M. (1980b). The Functional Relation Between Depression and Problematic Interpersonal Behaviour. *Journal of Abnormal Psychology, 89*, 333-341.

Yurgelun-Todd, D. A., Gruber, S. A., Kanayama, G., Killgore, W. D., Baird, A. A., & Young, A. D. (2000). FMRI during affect discrimination in bipolar affective disorder. *Bipolar Discord, 2*, 237-248.

Zlotnick, C., Kohn, R., Keitner, G., & Della Grotta, A. (2000). The relationship between quality of interpersonal relationships and major depressive

disorder: Findings from the National Comorbidity Survey. *Journal Affective Disorder, 59*, 205–215. .

Zuroff, D. C., & Colussy, S. A. (1986). Emotion recognition in schizophrenic and depressed patients. *Journal of Clinical Psychology, 42*, 411-416.

Appendix I – Study 1 Stimuli Pilot Study

14 never before depressed participants took part in the pilot study for study 1 stimuli. During this pilot study 47 gestures were assessed alongside 30 facial expressions.

Gesture Stimuli

Each participant was shown 47 clips of different gestures and asked to provide the following information following each clip:

i) What is the name of the movement/gesture you have just seen?
ii) At which point during the clip did you become aware of the meaning behind the movement? (start, middle or end)
iii) Was the movement in the clip: slow, average or fast
iv) How easy was the movement to understand? (easy, average, hard)
v) How negative, neutral or positive do you think the movement was:

A)	Very negative	-2
B)	Slightly negative	-1
C)	Neutral	0
D)	Slightly positive	1
E)	Very positive	2

From the gestures receiving the highest levels of recognition accuracy, those with comparable levels of apparent meaning, speed and complexity were allocated to one of three categories; positive expressive, negative expressive and instrumental. The gestures that received neutral valence ratings and were assigned instructive meanings by participants were selected to be instrumental gestures. 24 gestures were selected in total (8 positive, 9 negative and 7 instrumental). Only the expressive gestures were used for study 1, all gestures were then used for study 2.

Table 8.1 Gestures Used in Pilot Study

Afraid	Full**	Salute*
Aggressive	Give me	Shock
Angry*	Giving up*	Sleepy
Back away*	Got it*	Stop (one hand)
Blowing a kiss*	Hot	Stop (two hand)
Bold*	Hug*	Straight ahead
Cold*	Kiss on cheek*	Thoughtful
Come forwards	Look up	Time out**
Come here*	Lowering down	Told off
Come quickly**	No more*	Touched*
Crazy	No*	Turn around**
Don't know	Over there**	Upset
Down there**	Pleading*	Waiting
Excited***	Raise up**	Wave hello
Fearful*	Realisation	Well done*
Fed up	Sad***	Yay***

Note: Items accompanied by an * were expressive gestures used in study 1; Items accompanied by a ** were instrumental gestures and used in study 2; The three items accompanied by *** were used as task practice trials.

Facial Expression Stimuli

Each participant was also asked to watch 30 video clips of facial expressions taken from the Cambridge mind reading emotions library. Expressions were selected from levels five and six of the library ensuring their suitability for adult or normal intelligence. Expressions were portrayed by male and female actors and participants were again asked to provide the following information after each clip:

i) How is the person feeling? (choose one of the accompanying adjectives)
ii) At which point during the clip did you become aware of the meaning behind the facial expression? (start, middle, end)
iii) Was the movement in the clip: slow, average or fast
iv) How easy was the expression to understand? (easy, average, hard)
v) How negative or positive do you think the movement was

A)	Very negative	-2
B)	Slightly negative	-1
C)	Neutral	0
D)	Slightly positive	1
E)	Very positive	2

vi) Did you understand all of the four possible adjectives provided with the facial expression?

Of the expressions that participants interpreted correctly those with comparable; apparent meaning, speed, complexity and valence were selected. The final number of expressions used for the task in study 1 included eleven positive facial expressions and eleven negative facial expressions.

Any adjectives accompanying the facial expression which were not unanimously understood were changed for more easily understandable adjectives and taken from a lower category level in the Cambridge mind reading emotions library (e.g. empathetic – pitying; affinity – adoring; entrancing – attractive).

Table 8.2 Facial Expressions used in Pilot Study

Aggrieved**	Exhilarated*	Needled*
Ambivalent*	Exonerated*	Needy*
Appealing*	Flattered**	Nostalgic*
Awed*	Grave	Oppressive
Belittling*	Incredulous*	Ruffled*
Cherishing*	Insincere*	Scandalised*
Complacent**	Invigorated*	Seductive*
Composed*	Jubilant*	Spellbound*
Deflated*	Lured*	Turmoil*
Discomforted*	Maudlin	Vacant*

Note: Items accompanied by an * were selected and used in study 1; The three items accompanied by a ** were used as trials in study 1.

Appendix II – Study 3 Stimuli Pilot Study

20 participants took part, recruited from within Strathclyde University and the surrounding community. Each participant was asked to watch 38 film clips, answering four questions after each clip. The clips were taken from the following films:

Table 8.3 Pilot Study Positive Clip Titles

Clip	Film Title	Clip Title	Clip Category
1	Curb Your Enthusiasm**	It's Okay	Positive
2	About a Boy	Picnic	Positive
3	A Good Year*	Dinner	Positive
4	Ground Hog Day*	Excuse me	Positive
5	In Good Company	Gig	Positive
6	Mrs Doubtfire*	Conference	Positive
7	In Good Company*	Meeting	Positive
8	Ground Hog Day*	Early Spring	Positive
9	Mrs Doubtfire*	Dinosaurs	Positive
10	Something's Gotta Give*	Beach	Positive
11	In Good Company*	Café Meeting	Positive
12	Prime*	Evening Walk	Positive
13	Tailor of Panama	Breakfast Rush	Positive
14	Love Actually	In Car	Positive
15	Tailor of Panama	Suit Needs	Positive
16	Prime	Photo Shoot	Positive
17	The Company	Boardroom	Positive
18	About a Boy*	Vegetarian	Positive

Note: Items accompanied by an * were selected and used in study 3; the item accompanied by a ** was selected and used as an example in study 3.

Table 8.3 Pilot Study Negative Clip Titles

Clip	Film Title	Clip Title	Clip Category
1	Beaches*	Playing cards	Negative
2	Mrs Doubtfire*	Divorce	Negative
3	Donny and Joon	Separation	Negative
4	Beaches*	Breakfast	Negative
5	Children of Men*	Transit Papers	Negative
6	Good will Hunting*	Not your Fault	Negative
7	Melinda and Melinda*	Not a Name	Negative
8	Beaches**	Taxi	Negative
9	Good Will Hunting*	Professors	Negative
10	Donny and Joon	Medication	Negative
11	The Company	My career	Negative
12	Beaches*	Playing Pool	Negative
13	Prime	Dinner Date	Negative
14	Ground Hog Day	Espresso	Negative
15	Ground Hog Day*	Ned	Negative
16	Melinda and Melinda	Girls in Kitchen	Negative
17	Man loves a Woman*	shrink	Negative
18	A Good Year	Meeting the Boss	Negative
19	Love Actually	Opening Presents	Negative
20	Heartbreakers	Injured Girl	Negative

Note: Items accompanied by an * were selected and used in study 3; the item accompanied by a ** was selected and used as an example in study 3.

The question and answer sheet is included below:

Please use the scales below to indicate how positive and negative you found the interaction in this clip to be:

Positive	1	2	3	4	5	6	7	8	9	10
Negative	1	2	3	4	5	6	7	8	9	10

(Circle appropriate number)

(1 = not positive/negative at all 10 = extremely positive/negative)

Please circle the category that you feel best suits the clip:

Family harmony / Family disharmony / Family interaction

Marital harmony / Marital disharmony / Marital interaction

Work related problem / Work related success / Interaction between colleagues

Positive interaction between friends / Negative interaction between friends

Other (please specify) _____

Please indicate using the scales below, whether this clip affected how you were feeling:

Made me feel sad	1	2	3	4	5	6	7	8	9	10
Made me feel happy	1	2	3	4	5	6	7	8	9	10

(Circle appropriate number)

(1 = Did not make me feel sad/happy at all 10 = Made me feel very sad/happy)

The clips that were rated as depicting the most positive and negative interactions and which elicited the highest levels of sadness and happiness were chosen to use in the task for study 3. Initially it was hoped that clips would be categorised as; work related (positive/negative), family interactions (positive/negative), and interactions between friends (positive/negative), in order to examine whether the interactional members, as well as the valence of the interaction, altered levels of facial expressivity. The film clips

were not rated in such a way as to enable this, with clear delineations between individual's roles, failing to be successfully conveyed in such short clips (the average clip length was 31 seconds).

Appendix III – Interview schedule

The following questions were asked throughout the course of interviews with the women in study 4. The questions were not asked in any specific order. Further if the woman covered the issues to which the questions pertained without being prompted the question was not re-asked.

How has depression affected your relationships with people?

How do you feel about being around people when you're depressed?

Do you tend to stay away from people when you're depressed?

What do you think/worry/expect will happen?

Does your interest in conversations/people diminish?

Can you describe to me how you feel in a social setting when you're depressed?

Who do you find it easiest to interact with?

What do you find most difficult about interacting?

How do you feel when you come away from an interaction?

How do you think people perceive you?

How confident are you in your social skills?

Are you interested in what other people have to say?

Do you find it difficult to engage with your CPN?

Do you feel you have to behave in a certain way with people when you're depressed?

Do you think the way depression is viewed affects how you feel about being around people?

Do you prepare a lot before meeting or speaking to someone?

What signals do you rely on most to determine how someone is feeling?

How do you find interacting at work?

If you could explain why you're feeling depressed would it be easier to engage with people?

Does depression alter how you view other people?

Do you feel like you need to put on an act?

What is that like how does it alter you?

Why do you feel the need to do that?

Do you feel like you're burdening people if you were to engage with them?

Were you sociable before you became depressed?

What do you think is going through people minds when you're talking to them / what's going through your mind when you're interacting with someone?

What's the most difficult aspect of an interaction?

When you start to feel depressed how quickly does that affect your relationships and ability to engage?

Appendix IV – Study 4 Thematic Analysis

Phase 1

Interviews were listened to several times and detailed memo notes taken:

Memo notes for Ann

Doesn't want to see anyone because it will make her feel worse when they ask her questions - self preservation - too sad and too much to talk about in front of people, would end up getting upset and spoiling the other people's night

Stays inside her bubble - Safe place
Not aware of others

When with others she feels very isolated - doesn't fit

Intolerant of uninteresting conversations - need to be self-relevant for her to have any interest

Finds conversation hard - Can't concentrate; Continually worrying

Embarrassed and ashamed of people's perceptions - just labeled as depressed when she's so much more

Thinks people will just feel sorry for her

She's not acceptable to herself so it's not acceptable to show other people who she is or what she expects people to think 'Oh God not her she's too depressed' so tries to hide her depression

Self recriminates

Thinks too much before an interaction - panic, dread, crying, no choice

Fear of crying in public

If nothing happy to say don't say anything

Takes too much to organise herself to leave the flat if she's made arrangements to meet people

Fear of collapsing outside when with people

Let's people who have been through similar close as she feels they will understand - have the ability to understand

Was seen as the support to family and friends

CPN – Great; Not textbook; Totally open and understanding about everything

Friends - not qualified so can't understand, can't feel what it's like

After each interview had been repeatedly listened to, each interview was transcribed.

Phase 2

Codes were generated from the data and memo notes.

Table 8.5 Codes Developed During the Memo Taking and Detailed Reading in Phase 2

Codes	Characteristics
Appearances	Public face, public persona, mask
Interest	Lack of interest in conversation topics
Judgments	Criticisms from others including stigma fears
Recriminations	Self focused thinking
Overload	Emotional overload
Burden	Don't want people to think of them as a burden
Vulnerable	Sense that people can see right through them
CPN	Safe person
Ignorant	Opinion of others capabilities and insights
Special	Positivist view of depression
Fit	Sense that the person does not fit with others
Jealous/Resentful	Wanting of other people's happiness
Explanation	Other people desire an explanation for depressed feelings
Flip	One minute sad next happy
Trust	Trusting people to stay even when they know how depressed they are
Organization	Takes a lot of organization to prepare to go out
Understanding	Lack of understanding from people
Lonely	Being with others makes them feel more lonely

Each interview was broken down into line-by-line sections and each sentence was compared against the codes in the table above.

Table 8.6 The attribution of Codes to Extracts of Dialogue in Phase 2

Dialogue	Code
Karen Mm yea sometimes you feel more isolated when you're with people	Lonely
Researcher Was there something that stopped you from reaching out to someone?	
Karen Mm em I don' t know why I didn't I think it was my thing you know I didn't think other people would understand like I suppose I don't give other people enough credit I like to think that I'm that I've got a bit more going on in my head than other people can like understand I don't want people to like belittle ma feelings	Ignorant/Special
Researcher Patronise you?	
Karen Yea I don't like I don't think other people could understand what it feels like unless they've really had these feelings	Understanding

Phase 3

The individual codes were grouped into potential themes. The entire data set was then re-read to ensure that no codes had been missed and that the themes developed amounted to a good representation of the data set.

Table 8.7 Individual Codes Grouped into Potential Themes for Phase 3

Theme	Code
Display rules	Appearances
	Embarrassment
	Understanding
Fear of social interactions	Burden
	Overload
	Organisation
Diminished desire to socially interact	Interest
	Ignorant special
	Jealous resentful
	Recriminations
Perceptions of others	Stigma
	Judgments/vulnerability
	Explanations
Isolation	Fit
	Lonely
	Ruminative

Phase 4

In this phase each of the themes mentioned above were reviewed with their sub-theme components. All of the selected extracts were re-read to ensure that they focused on their designated theme and represented the meaning behind the theme. The previously identified themes were found to adequately represent the data. Once the themes had been assessed, focus was returned to the original transcripts. Each interview was re-read to assess whether the themes accurately represented the data set as a whole and again to ensure that no themes had been missed during phase 2 or 3. The sub-themes, recrimination, explanations and ruminative were removed as individual sub-themes and instead amalgamated into the sub-themes of judgements, stigma and fit respectively. This change was made, as the three sub-themes did not, on reflection, constitute new sub-themes but rather aspects of other sub-themes.

Phase 5

The identified themes and sub-themes were assessed to ensure that each was clearly defined in the concepts they represented. During this phase the sub-themes were also re-labelled to aid the reader in understanding the content of each.

Table 8.8 Code Labels Renamed for Phase 5

Code	New sub-theme label
Appearances	The Social mask
Embarrassment	Fear of public displays
Understanding	Sub-culture norms
Burden	Fear of being a burden
Overload	Emotionally overloaded
Organisation	Satisfactory self-presentation
Interest	Lack of interest
Ignorant special	Ignorant others/ special self
Jealous resentful	Jealousy and resentment
Stigma	Stigma
Judgments/vulnerability	Being judged
	Fear of being vulnerable
Fit	Detachment
Lonely	Alone and lonely