Affiliation stress : effects on the relationship between implicit motives and emotion recognition ability

Gan, Priscilla Ning Hui

2019

Gan, P. N. H. (2019). Affiliation stress : effects on the relationship between implicit motives and emotion recognition ability. Master's thesis, Nanyang Technological University, Singapore.

<https://hdl.handle.net/10356/105863>

<https://doi.org/10.32657/10220/47883>

**AFFILIATION STRESS: EFFECTS ON THE RELATIONSHIP
BETWEEN IMPLICIT MOTIVES AND EMOTION RECOGNITION
ABILITY**

GAN NING HUI PRISCILLA

School of Social Sciences

A thesis submitted to Nanyang Technological University in partial fulfilment of
the requirements for the degree of Masters of Arts

2019

Statement of Originality

I certify that all work submitted for this thesis is my original work.

I declare that no other person's work has been used without due acknowledgement. Except where it is clearly stated that I have used some of this material elsewhere, this work has not been presented by me for assessment in any other institution or University. I certify that the data collected for this project are authentic and the investigations were conducted in accordance with the ethics policies and integrity standards of Nanyang Technological University and that the research data are presented honestly and without prejudice.

A handwritten signature in blue ink, appearing to read 'priscilla', written over a horizontal line.

5 Mar 2019

.....

Date

.....

Gan Ning Hui Priscilla

Supervisor Declaration Statement

I have reviewed the content of this thesis and to the best of my knowledge, it does not contain plagiarised materials. The presentation style is also consistent with what is expected of the degree awarded. To the best of my knowledge, the research and writing are those of the candidate except as acknowledged in the Author Attribution Statement. I confirm that the investigations were conducted in accordance with the ethics policies and integrity standards of Nanyang Technological University and that the research data are presented honestly and without prejudice.

5 Mar 2019

.....

.....

Date

Associate Professor Ring Joyce Pang Shu Min

Authorship Attribution Statement

This thesis does not contain any material from paper(s) published in any peer-reviewed journal(s) where I was the first and/or corresponding author.

5 Mar 2019

A handwritten signature in black ink, appearing to read 'Gan Ning Hui', written over a horizontal line.

.....

.....

Date

Gan Ning Hui Priscilla

ACKNOWLEDGEMENTS

I would like to express my gratitude to those who have made this personal pursuit possible for me.

First, I am thankful to my supervisor, Joyce, for communicating her stringent academic demands in the most reasonable manner and for emphasising the need for me to correct my mistakes in the most composed manner.

I would also like to extend my appreciation to the Graduate Studies administrative staff, especially Sufei who has constantly provided prompt advice pertaining to submission of necessary documents.

Finally, my fiancé deserves a special mention for his understanding, patience and unconditional acceptance of my pursuit of higher education. While it may have cost us time and financial resources that could have helped expedite starting the next phase of our lives together, he fully recognised and accepted this pursuit as a motive-congruent goal that would eventually make me happy. With his unquestioning companionship, emotional support and data analytics expertise, he has been instrumental in motivating me to finally arrive at the end of this journey.

TABLE OF CONTENTS

	Page
TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF FIGURES	xi
ABSTRACT.....	xii
CHAPTER ONE: INTRODUCTION.....	1
1.1 Emotion Recognition Ability.....	1
1.1.1 The Utility of Emotion Recognition.....	5
1.1.2 Facial Emotional Expressions.....	6
1.1.3 Vocal Emotional Expressions.....	9
1.2 Personality Correlates.....	11
1.2.1 Implicit Motives.....	13
1.3 Affiliation stress, rejection sensitivity and social rejection.....	16
1.4 Tend and Befriend theory.....	19
1.5 The Present Research.....	21
1.5.1 Research Questions.....	22

1.5.2	Study 1.....	26
1.5.3	Study 2 and Study 3.....	27
CHAPTER TWO: LITERATURE REVIEW		29
2.1	Determinants of Emotion recognition ability.....	29
2.1.1	Assessment and measurement of emotion recognition ability.....	32
2.2	Implicit motives.....	38
2.2.1	Implicit power motivation and attention to FEEs.....	42
2.2.2	Implicit affiliation motivation and attention to FEEs.....	43
2.3	Affiliation stress.....	46
2.4	Tend and Befriend Model.....	51
2.5	Summary.....	53
2.6	Research Questions.....	54
CHAPTER THREE: STUDY 1.....		56
3.1	Study 1.....	56
3.1.1	Methodology.....	57

3.1.2	Statistical Analysis and Results.....	61
3.1.3	Brief Discussion of Study 1.....	63
CHAPTER FOUR: STUDY 2 AND STUDY 3.....		75
4.1	Study 2.....	75
4.1.1	Methodology.....	82
4.1.2	Statistical Analysis and Results.....	87
4.1.3	Brief Discussion of Study 2.....	91
4.2	Study 3	92
4.2.1	Methodology.....	93
4.2.2	Statistical Analysis and Results.....	97
4.2.3	Brief Discussion of Study 3.....	105
CHAPTER FIVE: GENERAL DISCUSSION.....		108
5.1	Dominant motives and emotion recognition ability.....	109
5.2	Dominant motives, rejection sensitivity, affiliation stress and emotion recognition ability.....	110
5.3	Contribution to the study of affiliation stress and emotion recognition.....	115
5.4	Limitations and recommendations.....	117

5.5	Practical implications.....	120
REFERENCES.....		124
APPENDIX.....		142

LIST OF TABLES

	Page
Table 1. Summary of research questions and hypotheses tested across Study 1, 2 and 3.....	24
Table 2. Study 1: Means, SDs and Inter-Correlations of key study variables.....	63
Table 3. Study 2: Means and SDs on the measure of Emotion Recognition Ability (GERT-S).....	89
Table 4. Study 2 Results: ANOVA table for three way interaction (GERT-S).....	89
Table 5. Study 3: Means and SDs on the measure of Emotion Recognition Index (ERI Facial)	99
Table 6. Study 3: Means and SDs on the measure of Emotion Recognition Index (ERI Vocal).....	100
Table 7. Study 3 Results: ANOVA table for three way interaction - Emotion Recognition Ability (ERI Facial).....	102
Table 8. Study 3 Results: ANOVA table for three way interaction - Emotion Recognition Ability (ERI Vocal)	103
Table 9. Study 3 Results: Main effects of Affiliation Stress in Emotion Recognition Ability (ERI Facial)	104

LIST OF FIGURES**Page**

Figure 1. Estimated marginal means of accuracy on the ERI test for dominant motives	107
---	-----

ABSTRACT

The ability to read emotional expressions, and interpret them accurately, is vital both to our personal as well as our social success. While there is evidence for implicit motives orienting attention to emotion cues in the face, no research is known to have investigated the relative contribution of implicit motives to performance measures of emotion recognition ability. Given that emotion recognition and implicit motives share similar tenets pertaining to functioning outside of one's consciousness, it is plausible that implicit motives, as drivers of needs, would inform one's selective attention to specific emotion cues in others thereby enhancing one's overall emotion recognition accuracy. Being socially excluded has immediate consequences for individuals which further warrants the need for people to pay attention to cues that indicate potential rejection. Through a correlational study and two experimental paradigms, the current research set out to investigate and provide preliminary experimental evidence that affiliation stress engendered from social rejection would potentiate the link between implicit motives and emotion recognition. Accordingly, I hypothesised that a three-way interaction between dominant implicit motives, affiliation stress and emotion recognition ability, with an expectation that social rejection would accentuate the emotion recognition ability of an affiliation motivated individual. However, no statistically significant interaction effects were found. The significant key finding was a main effect between affiliation stress and emotion recognition ability in faces. Specifically, accuracy in identifying emotions in faces is attenuated by social rejection. The implications of these findings were considered in view of the "deconstructed state" theory of social rejection. Recommendations were made

to further investigation into the link between implicit motives, social rejection and emotion recognition for its potential to delineate and defuse destructive behaviours of socially rejected individuals.

CHAPTER ONE

INTRODUCTION

1.1 Emotion Recognition Ability

Emotion recognition ability (ERA) typically refers to the ability to make accurate judgments of emotion in others (Matsumoto, LeRoux, Wilson-Cohn, Raroque, Kookan, Ekman, Yrizarry, Loeinger, Uchida, Yee, Amo & Goh, 2000) and is broadly defined as the capacity to accurately recognise emotions in the faces or voices of others (Brackett, Mayer & Warner, 2004). Emotional expressions are displayed quickly. A ‘brow-flash’ (i.e. raising one’s eyebrow), occurs in a split second. Emotional expressions are also capable of being picked up over great distances. Regardless of the distance, we can tell if a stranger’s face is registering shock or joy. As psychologists and social scientists have discovered, the face is a critical component to consider in social interactions. As transient and fleeting as micro-expressions are, they are the most reliable visual hints at the dynamic mood shifts and emotional changes experienced by individuals. Our ability to notice these expressions and our subjective interpretations of these expressions guide our interpersonal exchanges, offering a systematic algorithm of sorts to how we may relate to other individuals. There has been strong evidence that the ability to read emotional expressions, and interpret them accurately, is related both to our personal, social and professional success (Beaupre & Hess, 2005; Byron, Terranova & Nowicki, 2007; Hall, Roter, Blanch & Frankel, 2009). Perception of others’ nonverbal expressions of

emotion such as anger elicits avoidance tendencies while fear elicits approach tendencies (Marsh, Ambady & Kleck, 2005) suggesting that one's perception of emotions in others could determine whom one would initiate contact with and whom one would avoid contact with. At the core of our survival, we all seek belongingness ("the need to belong"; Leary & Baumeister, 2017), by forming meaningful, beneficial relationships with social others (be it romantic, familial, friendly or professional) despite the risk of rejection. The "need to belong", conceptualised as a human urge to develop affiliative attachments, to sustain and to prevent dissolution of existing attachments, has effects on our socio-cognitive processes and is a powerful, pervasive motivation (Leary & Baumeister, 2017) and has also been shown to relate to enhanced sensitivity to facial cues and vocal tones associated with specific emotions (Pickett, Gardner & Knowles, 2004).

The ability to recognise how someone else is feeling is an essential skill for success in many life domains, for example, for professionals in the workforce. Elfenbein, Der Foo, White, Tan and Aik (2007), who examined recognition accuracy of facial expressions within the specific context of buyer-seller negotiations, found that higher recognition accuracy of static facial expressions predicted higher performance for participants playing the role of seller in buyer-seller negotiation. This suggests that professionals whose work is largely contingent on successful negotiations and promoting a product or service with conviction, like that of a buyer-seller relationship, would benefit from emotion recognition accuracy. For instance, a sales executive whose key performance indicator hinges on his ability to pitch a cogent narrative and sell a product to a stranger, would definitely fare better by being able to discern

whether or not his potential buyer is growing disinterested in his pitch or is keen to engage his services. Emotion recognition has also been found to positively predict transformational leadership (Rubin, Munz & Bommer, 2005) which has been positively linked to performance, organisational commitment and talent management (Wang & Walumbwa, 2007; Dvir, Eden, Avolio & Shamir, 2002). As transformational leadership has been extensively examined and encouraged as the preferred style of leadership (over the conventional transactional or instructional style) to promote employee commitment and performance today, a leader's ability to accurately identify his subordinates' or associates' expressed emotions would likely add value to his decision-making. For instance, if he were to recognise that his followers are displeased with certain organisational initiatives, he could intervene immediately to dispel tension and inspire commitment to organisational goals, effectively avoiding long-term dissatisfaction that would ultimately affect the team and the organisation. The ability to recognise how someone else is feeling is also vital for maintaining positive, meaningful and successful adult relationships. Carton, Kessler and Pape (1999) provided empirical evidence in support of this by administering tests of participants' abilities to determine emotions in both facial and vocal expressions. Self-report measures of relationship well-being and depression were collected for analysis as well. Inaccuracy in identifying target emotions in facial and vocal expressions were found to be associated with reduced relationship well-being, and associated with increased tendency to be depressed. Conversely, accuracy in identifying target emotions was significantly related to relationship well-being. Findings suggesting the positive effects of emotion recognition accuracy on relationship satisfaction were

replicated in other studies as well: in dating couples (Tucker & Anders, 1999) and in married couples (Cordova, Gee & Warren, 2005; Blonder, Pettigrew & Kryscio (2012). Relationships break down due to lack of emotional skillfulness (Cordova, Gee & Warren, 2005) which includes the accurate reading of a partner's nonverbal emotional cues. This inability to accurately recognise distress or hostility could greatly influence relationship satisfaction and cause misunderstandings. Over and above these specific instances, our ability to notice how fellow human beings are feeling is an essential skill in our personal, professional and social lives.

Most people attend to emotional expressions without much conscious thought and this almost intuitive assessment of what another person is feeling towards oneself is typically taken for granted. Furthermore, what people do not realise is how complicated the interpretation of emotional expressions is and therefore overestimate, the accuracy of which they interpret emotional expressions in others. For example, gauging the first impression one has made on a social other is actually a challenging process of reading and interpreting brief, subtle and ever-changing cues in the face, the voice and body language. In everyday life such situations are the norm rather than the exception. In order to interpret facial emotional expressions of a person, the brain executes all of the following processes: (a) encoding of all relevant facial cues, (b) taking into account the emotionally salient features of the context, (c) interpreting the reader's own emotions and (d) utilising memories and judgments to formulate a suitable response. The range of multisensory stimuli received during a social interaction can barely be processed in a slow, sequential, analytical way. Rather, an evaluation of a person's emotions is typically based on holistic,

parallel-processed assessments of their nonverbal expressions of emotion, which is almost akin to intuitive parallel processing (Bargh & Ferguson, 2000). Given the complex processing that occurs behind each second of our social interaction with others, the question we ask and seek to answer is one about individual differences in emotion processing: Does each and every individual have whatever it takes to accurately perceive and recognise emotions in others, or do only some of them rely on predispositions that others do not have or utilise?

1.1.1 The Utility of Emotion Recognition

Many studies have sought to delineate the evolutionary basis of our ability to read emotions in others. By facilitating the nurturance and maintenance of meaningful connections, emotion recognition ability ensures our survival (Hess & Thibault, 2009; Fessler, 1999; Scherer & Wallbott, 1994; Izard, 1994; Nesse, 1990). For instance, according to Nesse (1990), anger is a basic emotion that is universally recognisable precisely because relationships are valuable—anger presents an undesirable state of disconnect and a perceived lack of reciprocity in a relationship. Particularly, Nesse’s evolutionary explanations of emotions provide two conceptual understandings pertinent to how the recognition of emotions provide humans adaptive advantage. The first one is that emotions alter cognition and behaviour, as well as physiology. For instance, when one experiences panic, the mind becomes focused on finding escape routes. Facial and vocal expressions of panic are also useful for soliciting aid and warning kin of danger. Correspondingly, it is thus assumed that a person who lacks the tendency to recognise others’ facial expression of

panic (as a warning of an imminent attack), will, in a natural environment, also be at a selective disadvantage. This is because the inability to recognise and respond to others' panic will then result in a lack of defence against a particular kind of danger. The second one is that consideration of states of high and low mood (i.e. happy and sad, respectively) will hint at the contextual impetus that will be beneficial to the perceiver. Being able to accurately recognise individuals would help them make more informed decisions about their emotional and social investments i.e. to regulate their energy and to invest emotionally only when those efforts will reap targeted rewards, instead of at times when those efforts will be expended in vain. For instance, in a flirting situation, a man who recognises that a lady is smiling or giggling in response to his jokes can be assured to a great extent that the lady is happy to receive his attention, and he would thus continue to invest his time and energy into building the propitious connection. Emotion recognition ability allows individuals to make astute social investments of limited resources (i.e. energy, time, effort, money) by helping to discern between propitious connections and unpromising interactions, and inform subsequent decisions to nurture or to sever them respectively. As such, the capacity to accurately recognise facial and vocal emotional expressions of others in an accurate and timely manner is of importance. This begs the question: are there defining characteristics or features of emotions in the face and voice?

1.1.2 Facial Emotional Expressions

By and large, facial expressions are biological and evolutionary imperatives (Nesse, 1990). Responding to external stimuli and internal

emotional experiences with our facial muscles is a biological instinct. A baby is not taught to cringe—the baby cringes and scrunches up his face instinctively when in pain or in discomfort. Making faces is in our blood, and so is reading faces that others make. From a Darwinian perspective, the ability to recognise facial emotional expressions (FEEs) is innate. The recognition of facial emotional expressions appear universal (Ekman, Frieson & Ancoli, 1980) and studies examining the “action units” (otherwise known as the characteristic facial features) of basic emotions have provided support to the universality theory of emotion. Kohler, Turner, Stolar, Bilkerm Bresinger, Gur and Gur (2004)’s study provided fresh evidence that Ekman and Friesen’s (1978, 1982) earlier predictions regarding the presence of action units in each emotional expression were accurate and valid. Among the four fundamental emotions (fear, anger, sadness and happiness) there was clear consensus for presence of the following characteristic action units (CAUs) in the respective expressions: the lift of the cheek and the corners of lips in FEEs of happiness; a lowered brow and a droop in the corners of lips in FEEs of sadness; widened eyes, a lowered brow and mouth agape in both FEEs of fear and anger. Their findings also suggest that the presence of just one or two CAUs of the target emotional expression was sufficient for the recognition of target emotions. When the researchers systematically removed one, two or three CAUs associated with the target emotions and pared down to the bare minimum number of CAUs, they reported that FEEs of happiness, sadness, anger and fear remained recognisable. Their findings also inform our current study examining personality predictors of emotion recognition ability as their findings establish that differences in emotion recognition do not occur simply because of *insufficient* recognisable

elements in others' faces. Since even when not all the characteristic action units are present, basic emotions are still recognisable, the reason for differences has to stem from the perceiver. This renders void the notion that inaccurate recognition of emotions in others' facial expressions necessarily occur due to the lack of or insufficient affective cues in the face available. It is thus assumed that, unless impaired neurologically or psychologically, healthy adults should be able to recognise emotions to a similar level of accuracy. And yet, differences in this capacity to accurately recognise and identify emotions have also been reported to exist (McCown, Johnson & Austin, 1986). Humans may be more likely to recognise the "signatures" of basic expressions, but there are still sources of contextual influences to be considered: childhood experiences, personality differences, psychiatric conditions and perceptual similarity of certain emotions, just to name a few, that may result in subjective interpretations of the same affective visual stimuli (Aviezer, Eisenberg & Hassin, 2017; Wieser & Brosch, 2012; Barrett, Mesquita & Gendron, 2011; Schultheiss & Hale, 2007; Pollak & Singha, 2002). Details of contextual influence relevant to the core focus of this paper will be detailed in subsequent chapters. Similar to characteristic action units of facial emotions, there are characteristic acoustic features associated with vocal emotions (Frick, 1985). Characteristic acoustic features in our vocal expressions of emotions relate closely to prosody which concerns linguistic functions such as intonation, stress, rhythm, frequency and volume.

1.1.3 Vocal Emotional Expressions

The voice can convey emotion information, and recognising emotions expressed in the voice also contributes to our overall assessment of what another person is feeling (Kraus 2017; Simon-Thomas, Keltner, Sauter, Sinicropi-Yao & Abramson, 2009; Sauter & Scott, 2007). Simon-Thomas, Keltner, Sauter, Sinicropi-Yao and Abramson (2009)'s study examining how emotions convey similar emotions across cultures found that non-lexical outbursts, termed "vocal bursts", such as the "Ah!" of fright and the "Ahhhh..." of pleasure, are recognisable across cultures as they contain certain characteristic intonations. Relatedly, other studies examining vocal bursts have included sounds (e.g. shrieks, groans, grunts, breathy exhalations) that we tend to produce involuntarily during moments of surprise, shock and awe, just to name a few. While these sounds are by and large linguistically meaningless, they are heavily laced with affective meaning and tend to be culturally or universally recognisable. One easily relatable example of such emotion-laden vocal bursts is 'wahhhhh' which potentially translates to an expression of awe or "Awesome!" or "Amazing!" (Scherer, 1994).

Particularly, a high percentage of accuracy has been reported by researchers investigating participants' ability to identify target emotions from paralinguistic vocal outbursts. According to Schroder's (2003) research, participants have been observed to be 81.1% accurate in recognising displays across 10 different emotions (worry, startle, threat, relief, elation, disgust, contempt, boredom, anger and admiration). According to Sauter and Scott's (2007) research, participants have been observed to be 70.1% accurate in

recognising vocal outbursts across five different positive emotions (relief, pleasure, contentment, amusement and achievement). These reported findings pointing towards individuals' ability to correctly infer affective meaning from paralinguistic outbursts suggest that, similar to characteristic action units of facial emotions, there are characteristic acoustic features associated with vocal emotions. Characteristic acoustic features in our vocal expressions of emotions (e.g. prosodic expressions of anger versus surprise) relate to linguistic functions such as intonation, stress, rhythm, frequency and volume (Frick, 1985). Other than basic intonations in the voice characterising positive (e.g. excitement) versus neutral feelings (e.g. calmness) versus negative feelings (e.g. anger), it appears that even through spontaneous sounds made with our breath, fine nuances can be communicated and detected (e.g. distinguishing anger from fear and sadness; distinguishing awe from compassion, interest and embarrassment). While it has been established that humans have an innate tendency to infer meaning from (even) paralinguistic vocal outbursts, empirical studies examining individual differences in the accuracy of doing so have yet to be conducted. Although a couple of studies (Pickett, Gardner & Knowles, 2004; Ishii, Reyes & Kitayam, 2003) used a vocal Stroop interference task to examine how culture and a need to belong would affect one's attention to lexical connotations and vocal tone, I argue that these studies should not be reviewed as existing literature pertaining to emotion recognition accuracy. This is because the researchers are interested in establishing simply preferential attention of individuals to content or tone, rather than their ability to identify affective meaning of sounds. Additionally, their experiment presented merely three tones of voice labelled "pleasant", "neutral" and "unpleasant" which are

simply generic references to the perception of tone and definitely not indicative of any basic (or complex) emotion prosody. An experiment examining individual differences in emotion recognition accuracy should involve participants attempt at making a distinction among prosodic expressions of “anger”, “disappointment” and “disgust” (all of which fall into the “unpleasant” tone category). Having said that, the value of these research involving the vocal Stroop interference task is in highlighting the potential confounding nature of lexical content and thereby providing a strong support for my decision to employ the GERT-S and the ERI to measure emotion recognition ability. Both the GERT-S and the ERI were selected because their vocal subsets involve pseudo-linguistic sentences (i.e. sentences that resemble natural speech but have no lexical or linguistic meaning).

We are well aware that some people are especially musically inclined and especially sensitive to dynamics, tempo and articulation in music. Perhaps then in a similar, but less noticeable fashion, some people are, what I call, emotionally inclined in the way they attune to frequency, intensity and inflexions in vocal emotional expressions. Do individual differences influence ability to recognise acoustic features in voices? How do individual differences feature in the ability to distinguish involuntary outburst of pleasure from an outburst of fright? Do individuals direct attention to certain affective outbursts depending on their motives?

1.2 Personality correlates

Previous research investigating the characteristic action units of basic emotions have demonstrated that target emotions in the face are still

recognisable even with merely one or two characteristic features. These findings are important in providing empirical evidence that individual differences in emotion recognition ability exist not simply because of insufficient recognisable elements of the target emotion in others' faces. The assumption then is that, unless impaired neurologically or psychologically, healthy adults should be able to recognise emotions to a similar level of accuracy. Despite that, differences in this capacity to accurately recognise and identify emotions have been reported to exist (McCown, Johnson & Austin, 1986). It appears that while we are biologically prepared to understand the meaning behind certain expressions (Hess & Thibault, 2009), our individual experiences and abilities also act as filters of the meaning, so that subtleties of interpretation can occur. Culture (Yuki, Maddux & Masuda, 2007), gender differences (Hall, Matsumoto, 2004; Hoffmann Kessler, Eppel, Rukavina & Traue, 2010) and personality differences (Schultheiss & Hale, 2007; Matsumoto, LeRoux, Wilson-Cohn, Raroque, Kookan, Ekman, Yrizarry, Loewinger, Uchida, Yee, Amo & Goh, 2000; Mann, Wise, Trinidad, & Kohanski, 1994) have been shown to influence one's capacity to interpret emotions. In this current research, I focus my attention on personality correlates and how they relate to emotion recognition ability.

Previous research examining personality correlates of emotion has explored the influence of the Big Five traits and of implicit motives. Pertaining to the Big Five, emotion recognition is positively related to conscientiousness (Matsumoto, LeRoux, Wilson-Cohn, Raroque, Kookan, Ekman, Yrizarry, Loewinger, Uchida, Yee, Amo & Goh, 2000) and agreeableness (Mann, Wise, Trinidad, & Kohanski, 1994), and negatively related to anxiety (Mann et al.,

1994) and neuroticism (Matsumoto et al., 2000). These studies are limited in their contribution to our understanding of emotion recognition ability as their main study participants were individuals with psychological disorders with neurophysiological dispositions that impair their ability to process social cues. Additionally, the measure of Big Five traits rely on self-report questionnaires, which do not inform about motives that direct the near-instantaneous automatic processing of emotion cues. The aim of my research is thus to extend the current literature by using an implicit measure of motives. In the following section, I discuss implicit motives as a possible personality correlate of emotion recognition ability (ERA).

1.2.1 Implicit Motives

Implicit motives are motivations that function outside one's consciousness and are also known as dispositions (needs). By making certain actions or activities emotionally rewarding, these needs urge an individual to seek out stimuli to feel emotionally satisfied, or to actively avoid stimuli that could cause emotional discontent (Schultheiss & Brunstein, 2010). They are dispositions that act as constant internal guides driving recurrent, consistent preferences and patterns of behaviour. Most research focus on the three major implicit motives (also known as the "Big Three"), namely affiliation, power and achievement (Schultheiss & Brunstein, 2010). Research has shown that implicit motives (or needs) orient the perceiver towards motivational cues in certain facial expressions of emotion. Specifically, implicit motives directly influence people's attentional orienting to certain perceptual cues for certain categories of emotions (Schultheiss & Hale, 2007). As each implicit motive

represents the individual's tendency to positively experience the attainment of any incentive associated with it, each implicit motive would consequently orient the individual towards social, visual and emotional cues related to the incentive. (Schultheiss & Hale, 2007; McClelland, 1987; Atkinson, 1957).

The complex process of noticing, inferring and identifying emotion cues in others' facial, vocal and nonverbal communication happens at the fringe of one's consciousness. For instance, when a student is consulting with a professor, the student is simultaneously reading the emotion cues of the professor while responding to questions posed to him by the professor. It is hardly feasible nor ideal to halt one's interaction with social others to leisurely deliberate over whether the other person is angry, disgusted or amused. Complex inferences drawing from the specific social context, one's mental schema, memories, personality and culture occur promptly, at the subconscious level, to inform our subsequent behavioural response. In my research, we explore how implicit motives that occur promptly at the subconscious level guide selective attention to emotion cues. When needs are aroused automatically in a social situation, they inform our allocation of resources and energy towards motive-congruent efforts. Different motivational dispositions are anticipated to orient attention to different emotion cues, thus giving rise to individual differences in emotion recognition ability.

Motives have typically been assessed in two different ways, namely, explicitly by means of self-report questionnaires or implicitly by means of projective tests (Thematic Apperception Test; Murray, 1943). In such projective tests, individuals provide personal, subjective interpretations of ambiguous

pictures meant to inform the researcher about the individual's implicit motives. Although some studies have linked self-report measures of personality (i.e. the Big Five) to emotion processing ability, research exploring the relationship between personality and emotion using implicit measures of personality via projective tests is scarce (Donhauser, Rosch & Schultheiss, 2015; Schultheiss, Wirth, Waugh, Stanton, Meier & Reuter-Lorenz, 2008; Schultheiss & Hale, 2007; Wirth & Schultheiss, 2006). McClelland, Koestner and Weinberger (1989) posited that implicit motive measures in general are typically superior to explicit motive measures in predicting spontaneous behavioural responses as they tap into automatic behavioural tendencies. In contrast, explicit measures are typically preferred for predicting planned and controlled behavioural responses that are typically biased by personal and social standards. Emotion recognition is largely based on an intuitive, holistic and parallel-processed assessments of others' expressions of emotion (Kuhl & Kazen, 2008; Kuhl, 2000), and that perception of others' emotions cannot be deduced via purposeful and effortful sequential analysis (Gigerenzer & Todd, 1999). With due consideration of the aforementioned, this study measured implicit motives using the Picture Story Exercise (PSE; McClelland, Koestner & Weinberger, 1989) to explore the link between motives, as implicit constructs of personality, and emotion recognition ability.

Emotion recognition is considered critical to the attainment of positive, meaningful relationships and the larger context in which it operates is of an interpersonal and social nature. An interpersonal exchange is an opportunity for mutual acceptance and propitious connections, but also sets the stage for

potential rejection. How does acceptance and rejection influence the way we read emotions in others?

1.3 Affiliation stress, rejection sensitivity and social rejection

Humans have a fundamental need to belong (Maslow, 1968) and we are motivated by this need to maintain close, positive bonds with others (Bowlby, 1973). When the need to belong is threatened or compromised, the accompanying psychological distress prompts us to employ coping strategies against stress from the dissolution of affiliative relations. Despite the challenging process of reading and interpreting brief, subtle and ever-changing emotion cues in others, we continuously seek to fulfil the evolutionary goal of forming meaningful, beneficial relationships with social others (be it romantic, familial, friendly or professional), even if it means risking rejection. According to Baumeister, Twenge and Nuss (2002), affiliation stress from anticipated social rejection is even associated with cognitive impairments, suggesting that affiliation stress may be akin to “emotional pain” that has effects on socio-cognitive processes. The experience of affiliation stress—a distressing concern about one’s affiliative relationship with others—a relatively common one in real life. Any form of interpersonal exchange could potentially create a stressful expectation or experience of being rejected, isolated, excluded or ignored. While most people could habituate to the occurrence of rejection and come to terms with the fact that not every social situation would have positive outcomes, this awareness does not negate the fact that people are psycho-physiologically affected by rejection (i.e. experience affiliation stress). Functional MRI research investigating how neurological activation of psychological distress (of social

rejection) and physical pain (of physical injury or impairment) are startlingly similar provided evidence that rejection causes a psychological distress that shared a common somatosensory representation of being physically hurt or debilitated (Kross, Berman, Mischel, Smith & Wager, 2011; Eisenberger, Jarcho, Lieberman, 2006). While prior studies have considered the possibility of rejection causing a distress that was conceptually similar to that of physical pain, neurological examinations of rejection have further cemented the notion that psychological distress (as a result of rejection) should not be taken lightly. People experience social anxiety and personal inadequacy when exposed to situations that threaten status or group membership, or involving rejection by allies or groups (Nesse, 1990). These situations characterised by social rejection, also referred to in research as ostracism and exclusion (Lieberman & Eisenberg, 2006), create temporary affiliation stress that have immediate effects on a person's well-being, interpersonal relationships and interpersonal perception (Sacco, Wirth, Hugenberg, Chen, Williams, 2011; Berstein, Young, Brown, Sacco & Claypool, 2010; 2008; DeWall, Maner & Rouby, 2009).

For certain individuals however, their threshold for affiliation stress is lower and their expectation of affiliation stress is higher. The “alarm system” to rejection is hypersensitive. These individuals might be predisposed to interpret neutral cues as negative or threatening and overreact to them. This tendency, called rejection sensitivity suggests an individual's inclination to anticipate and respond to (perceived) rejection in an excessive manner, and often develops from childhood experiences or encounters of being rejected (Downey & Feldman, 1996). For instance, people sensitive to rejection are inclined to

conclude that their partner's behaviour is indicative of purposeful rejection, even if there may be other viable explanations.

While rejection sensitivity and social rejection both trigger affiliation stress, the distinction between rejection sensitivity and social rejection is important in my current study. This is because they differ in the nature of their potential effects on emotion recognition ability. Social rejection should be understood as a state variable, as a social rejection situation presents a temporary threat which triggers temporary affiliation stress. On the other hand, rejection sensitivity should be understood as a trait variable, a manifestation of pervasive affiliation stress which predisposes an individual to anticipate rejection. Given that the underlying preoccupation of rejection-sensitive individuals is the preservation of positive social connections, I expect that emotion researchers would see value in examining how this trait influences emotional capacities. Surprisingly, none of the studies examining emotion recognition ability has included rejection sensitivity. This may be a particularly important gap to note because rejection sensitivity is related to the recognition of FEEs. In the study by Burklund, Eisenberger and Lieberman (2007), rejection sensitivity has been found specifically to moderate brain activation to disapproving facial expressions. This suggests that rejection sensitive individuals may be more vigilant of facial cues signalling potential rejection, such as those characteristic of disapproval. It is thus plausible that rejection sensitivity could account for some of the individual variance in emotion recognition accuracy. Interaction effects between rejection sensitivity and implicit motives could potentially predict emotion recognition ability as well. I expect that affiliation stress could factor in the link between implicit motives

and emotion recognition ability. I argue in favour of these specific constructs based on the reasoning that affiliation stress has a close relationship with the ‘fear of rejection’ aspect of the implicit affiliation motive. Thus it seems possible that an individual who is both high in rejection sensitivity and affiliation-motivated, when exposed to a social rejection situation, could be especially attuned to emotion cues in others, thus enhancing emotion recognition ability.

In the following section, I will argue in favour of the Tend and Befriend theory as a particularly useful paradigm for understanding affiliation stress and its effects. Burgeoning evidence from Tend and Befriend theory provides an explanatory perspective for understanding the influence of affiliation stress on an individual’s subsequent interpersonal awareness and thus, emotion recognition ability.

1.4 Tend and Befriend theory

Tend and Befriend theory is an approach to human motivation and personality that investigates people’s behavioural preference for affiliation following a stressful experience. The theory is developed based on Taylor’s (2006) observation that humans seek opportunities to affiliate with social others as an adaptive response to stress. When social others exhibit hostility, it is expected that people would experience psychological and biological stress. When social others exhibit support and willingness to mingle, it is expected that people would experience a decline in stress levels. Accordingly, positive social contact would lead to a decline in the need for affiliation (Taylor, 2006). In circumstances in which an organism’s survival is threatened, organisms

instinctively (a) tend to their offspring as a means to increase probability of surviving the threat and (b) seek opportunities to affiliate with or befriend others in the community to establish a support system for protection and comfort.

While we might be more familiar with the fight-flight response (Cannon, 1932) to threats, I suggest that rather than fight or flight, the Tend and Befriend response is the more likely and more realistic course of action in the face of contemporary social threats. This is because the fight or flight theory is largely founded on the assumption that one's physical survival or bodily preservation is at stake. However, in contemporary social situations where the goal is to form or maintain positive interpersonal bonds, and correspondingly to prevent the dissolution of these bonds, to fight or to flee in the face of non-physical threats by social others seem quite excessive and counterproductive. For instance should one be left out of an invitation to have lunch with co-workers, it is hardly productive to "fight" immediately, or to "flee" in an instant due to a perceived snub. Instead, one may consider first the "befriending" response that could provide a more contextually relevant avenue to improve relations with one's co-workers to gain social in-group status. As such, the Tend and Befriend model was identified as a more viable framework to integrate my variables of interest. Following the Tend and Befriend model, I conceptualised a three way interaction (affiliation $\times$ rejection sensitivity $\times$ social rejection) such that when individuals with an implicit affiliation motivation and are high in rejection sensitivity are exposed to social rejection that engenders affiliation stress, their desire to dispel affiliation stress, to seek comfort by employing strategies to make positive connections and "befriend"

others, further sharpens their attentiveness to subtle micro-expressions in the face or nuanced inflexions in the voice conveying both positive and negative valence. This attentiveness thus contributes to their overall recognition accuracy of emotions. The Tend and Befriend model triggered the ideation of the present research, which will be outlined in detail in the final section of this chapter.

1.5 The Present Research

Previous studies have established links between implicit motives (affiliation and power) and recognition of facial expressions of emotions; between rejection sensitivity and recognition of facial expressions of emotions; and between social rejection and recognition of facial expressions. However, to my knowledge, no research has linked particularly, implicit motives to emotion recognition ability. The present research extends knowledge in the field by examining the relationship between dominant implicit motives with emotion recognition ability. Furthermore, I propose that the affiliation and power motive is related to emotion recognition ability, although I expect a stronger correlation between the affiliation motive and emotion recognition ability as compared to the power motive. I developed specific hypotheses to test the role of dominant implicit motives (affiliation, power, achievement) and two antecedents of affiliation stress (rejection sensitivity and social rejection) as predictors of emotion recognition ability. I anticipated also that affiliation stress would moderate the effects of dominant affiliation motive on emotion recognition ability. I expected affiliation stress to enhance the emotion recognition ability of an affiliation motivated individual. As there has been no research linking

achievement motive to emotion recognition or affiliation stress, I was unable to make any reasonable deductions regarding the achievement motive.

The present research aims to examine the link between personality correlates and emotion recognition ability by focusing on three ideas: (a) link between implicit motives and emotion recognition ability, (b) link between affiliation stress and emotion recognition ability when affiliation stress is measured as a rejection sensitivity trait and (c) link between affiliation stress and emotion recognition ability when affiliation stress is a state induced with a social rejection situation.

1.5.1 Research Question

The research questions listed below seek to expand and refine the existing literature stream surrounding emotion recognition ability. Despite the universality hypothesis of basic emotions, individual differences still exist in emotion recognition ability. While researchers have examined and established psychological impairments accounting for these differences in children and the clinical population, few studies have examined predictors of emotion recognition ability in non-clinical populations or accounted for differences in emotion recognition ability in healthy adults. Even among the few studies linking implicit motives to emotion recognition, the experimental focus was on either facial expressions or vocal expressions of emotions, rather than a performance measure of both. It appears that there is no known study examining the effects of implicit motives on emotion recognition ability as an overall ability to make judgments of emotions based on facial, vocal and non-verbal expressions. This research aimed to fill this gap by examining whether a

dominant affiliation motive (rather than a dominant power or achievement motive) would be particularly associated with emotion recognition accuracy. Finally, this research also aimed to examine the contribution of affiliation stress in this association by suggesting interaction effects. Table 1 enumerates the research questions and the study-wise examination of specific hypotheses related to each question. Four broad research questions are proposed:

1. How do implicit motives (affiliation, power and achievement) relate to emotion recognition ability?
2. How does affiliation stress, measured as rejection sensitivity trait, relate to the link between implicit motives and emotion recognition ability?
3. How does affiliation stress, experimentally induced with a social rejection situation, relate the link between implicit motives and emotion recognition ability?
4. How does affiliation stress (rejection sensitivity and social rejection) relate to the link between implicit motives and emotion recognition ability?

Table 1

Summary of research questions and hypotheses tested across Study 1, 2 and 3

Research Question	Corresponding Hypotheses	Study
How do implicit motives (affiliation, power and achievement) relate to emotion recognition ability?	H1: Implicit motives are correlated to emotion recognition ability.	Study 1
How does affiliation stress, measured as rejection sensitivity trait, relate to the link between implicit affiliation motive and emotion recognition ability?	<p>H2b: Rejection sensitivity (trait) and dominant affiliation motive interacts to affect a person's overall emotion recognition ability.</p> <p>H3b: Rejection sensitivity (trait) and dominant affiliation motive interact to affect a person's dominant implicit motive and a person's recognition accuracy of emotion cues in faces.</p> <p>H3d: Rejection sensitivity (trait) and dominant affiliation motive interact to affect to affect a person's recognition accuracy of emotion cues in voices.</p>	Study 2 & 3

How does affiliation stress, experimentally induced with a social rejection situation,	H2a: Affiliation stress (state) and dominant affiliation motive interacts to affect a person's overall emotion recognition ability.	Study 2 & 3
relate to the link between implicit affiliation motive and emotion recognition ability?	H3a: Affiliation stress (state) and dominant affiliation motive interact to affect a person's recognition accuracy of emotion cues in faces?	
	H3c: Affiliation stress (state) and dominant affiliation motive interact to affect a person's recognition accuracy of emotion cues in voices.	
How does affiliation stress (rejection sensitivity and social rejection) relate to the link between implicit affiliation motive and emotion recognition ability?	H2c: Affiliation stress (state), rejection sensitivity (trait) and dominant affiliation motive interact to affect a person's overall emotion recognition ability.	Study 2 & 3
	H3e: Affiliation stress (state), rejection sensitivity (trait) and dominant affiliation motive interact to affect a person's recognition accuracy of emotion cues in faces.	
	H3f: Affiliation stress (state), rejection sensitivity (trait) and dominant affiliation motive interact to affect a person's recognition accuracy of emotion cues in voices.	

1.5.2 Study 1

The first study in this research explored whether implicit motives are related to emotion recognition ability, specifically if a dominant implicit motive would be related to higher accuracy in emotion recognition. While our first study was exploratory in nature, we expected that a dominant affiliation motive (“affiliation-motivated individuals”) would be associated with higher scores on an emotion recognition test relative to dominant power motive (“power-motivated individuals”) or dominant achievement motive (“achievement-motivated individuals”). This would imply that different motives correspond to different emotion recognition abilities, and specifically that a dominant affiliation motive might potentiate accuracy in the interpretation of emotion cues, thus increasing one’s score on an emotion recognition test. The implicit affiliation motive is operationally defined as a concern for developing, sustaining or preserving positive, meaningful relationships with others. As the implicit affiliation motive is understood to be an interplay of two components – “fear-of-rejection” (operationally defined as the desire to avoid situations of rejection by social others) (Schultheiss & Brunstein, 2010) and “hope-for-closeness” (operationally defined as the desire to seek out affiliative encounters with social others) (Schultheiss, & Brunstein, 2010), this study considered rejection sensitivity as a related construct that could interact with the affiliation motive to affect the link between motive and emotion recognition ability. Specifically, a dominant affiliation motive and high rejection sensitivity could improve emotion recognition ability. For instance, an affiliation-motivated man on his first date would be already be keen to develop friendly, positive relationships with a romantic interest. A high rejection sensitivity predisposing

him to expect and anticipate rejection, would further prompt him to be attentive to the inflexions and micro-expressions of his romantic interest to determine his next course of action. If his date speaks with a lilt and has a genuine smile—a Duchenne smile (Duchenne, 1990)—it is likely that she enjoys his company and he could propose a second date with some assurance. If his date speaks with monotonous regularity and smiles in a way that does not quite reach her eyes, he might be compelled to consider strategies to pique her interest better.

1.5.3 Study 2 and Study 3

For Study 2 and Study 3, the present research is interested in exploring how affiliation stress would influence the link between motive and emotion recognition ability. Specifically, we sought to examine whether pervasive and chronic experience of affiliation stress (as a result of the rejection sensitivity trait), and whether the temporary induced state of affiliation stress (as a result of being in a social rejection situation) would influence the link between motive and emotion recognition ability. The second and third studies of my research investigate whether affiliation stress could, as a trait and a state, moderate the relationship between implicit motives and emotion recognition through an experimental paradigm. For all hypotheses, we expected that interaction effects would occur only for the dominant affiliation motive.

In Chapter 2, I will further discuss the existing literature on personality and individual differences related to emotion recognition ability, highlighting the scarcity of literature exploring implicit constructs of personality and I elaborate on the theoretical basis of the relationship and related pathways

between implicit motive and emotion recognition ability proposed in my research.

CHAPTER TWO

LITERATURE REVIEW

The first section of this literature review focuses on delineating research pertaining to emotion recognition ability. The second section will focus on lines of research that have examined the personality correlates of emotion recognition. Additionally, I will discuss how my study builds on the previous literature on implicit motives, and explain my rationale for focusing the hypotheses on the affiliation motive. The third section will focus on literature related to affiliation stress and its implications on emotion recognition – this study attempts to point out why affiliation stress is a particularly relevant construct in the relationship between implicit motives and emotion recognition. Relevant research from the Tend and Befriend theory will be discussed to illustrate how it provides an explanatory theoretical perspective for understanding the impact of affiliation stress. Specifically, I am interested in the influence of affiliation stress on an individual's subsequent interpersonal awareness and thus, emotion recognition ability. The literature review will conclude with an assessment of how the current research aims would address limitations of prior research.

2.1 Determinants of Emotion Recognition Ability

According to Rotter and Rotter (1988), the abilities to express and recognise emotion are inborn, genetic, evolutionary. The largely established position of basic emotions (Izard, 2007; 1992; Ekman, 1992) assumes that

facial expressions of emotions are largely universal; they are the by-products of biological imperatives. One might even argue that making and reading faces are evolutionary imperatives. Humans may instinctively recognise and express certain expressions, but our prior experiences, mental schema, individual abilities and personality differences may result in subjective interpretations of the same affective stimuli. While the basic ability to read emotions is universal, what factors determine how adept one is at doing so?

The ability to accurately interpret emotions is potentially affected by childhood experience. Pollak and Singha (2002) report that children who have experienced abuse are likely to get into or cause trouble due to their inability to accurately make sense of others' facial expressions. Gender differences in emotion recognition have been debated. While there was no difference between genders in the recognition of highly expressive stimuli, females have been found to recognise subtle facial emotions better than males (Hoffmann Kessler, Eppel, Rukavina & Traue, 2010). Hall and Matsumoto (2004) have also reported a higher recognition accuracy by females than males even when the stimulus information presented was minimal. The researchers investigated whether gender affected emotion judgments by presenting stimuli in a way that did not allow participants time to be fully conscious or aware of the target emotion (i.e. presenting stimuli extremely quickly). Females were observed to perform better in the experiment, rendering a higher accuracy rate than the males.

In the experimental testing of emotion recognition, it is often assumed that contextual conditions have been controlled for. However, it appears

possible that in an experimental test, the participant's emotion perception may be influenced significantly by contextual factors unintended by the experimenter. Aviezer, Eisenberg and Hassin (2017) made a strong statement about how the traditional methodology of testing emotion perception is problematic as the role of context is sidelined. The role of context has been a blind spot. The researchers asserted that the ambiguity of real-life facial expressions can only be decoded with an understanding of the context. Under the wider umbrella of context, they highlighted how (a) the tone of voice and the body language of a person could affect our perception of their facial and (b) how one's psychological traits or state could affect one's interpretation of others' facial expressions. Their views echo those of Barrett, Mesquita and Gendron (2011) who suggested that even laboratory conditions such as the presentation of stimuli could be a main source of contextual influence on participants' perceptions of facial expressions of emotions. Specifically, it was emphasised that real-life facial expressions and experimental-based presentations of static faces are critically distinct from each other. Traditional methodology preferred posed faces of basic emotions, often presenting to participants a "head shot" of an isolated, static facial expression. Advocates of the effect of context on perception argue that in reality, people would not expect to encounter merely a silent or detached "head shot". Even in the situation of purchasing tickets over a counter, one would be able to draw insights from whatever minimal body language is within view or derive meaning from verbal exchanges (Aviezer, Eisenberg & Hassin, 2017; Weiser & Brosch, 2012; Barrett, Mesquita & Gendron, 2011). To drive home this point, I refer to Aviezer, Trope and Todorov (2012)'s study demonstrating that it is not always

clear whether the player is the winner or the loser of the match merely based on their facial expressions—it galvanises experimenters into considering how isolated presentation of facial expressions could result in unfair evaluations of a participants’ recognition ability due to the perceptual similarity of certain emotions in the face. While emotions happiness and disgust are unlikely to cause confusion or second-guessing, expressions of anger and disgust can potentially be mistaken for each other when other contextual cues (e.g. body language) are removed or added. When participants in experiments are presented isolated, static facial expression, the perceptually similarity of some expressions cast a veil of ambiguity and thus affects recognition accuracy. In the subsequent sections, I go deeper into how my research took into consideration (a) verbal expression and body language and (b) one’s psychological traits or state, namely implicit motives, rejection sensitivity and affiliation stress, in the measurement of emotion recognition ability.

2.1.1 Assessment and measurement of emotion recognition ability

The phrase “the eyes are windows to the soul” is often a hallmark for emotion recognition and for the role that eyes play in the communication and decoding of emotions. Psychologists use the “Reading the Mind in the Eyes” test (Baron-Cohen, 2001) to evaluate participants’ emotion recognition ability and the idea is that if one can detect subtle changes in glances and fleeting “looks” of social others, one can then make fairly accurate inferences of their feelings and respond appropriately. The preponderance of tests that rely on the eyes and the face to evaluate emotion recognition is juxtaposed with the lack of measures that evaluate *both* the role of the voice and the face in communicating

emotion. Despite the commonsensical expectation that integrating emotion cues from both the face and the voice in unison would contribute to adaptive social responses, individuals' ability to identify affective states is more commonly examined using only one experimental modality at a time i.e. participants' emotion recognition ability is determined based on their accuracy in perceiving one sensory channel: either facial cues or vocal cues.

Presentation of multimodal or multisensory information

To assert the value of using more than one modality to measure participants' emotion recognition ability in research experiments, I will discuss a few studies suggesting the human tendency to rely on multisensory information in order to decode the affective expressions of others (Collignon, Girard, Gosselin, Roy, Saint-Amour, Lassonde & Lepore, 2008; Vuilleumier, 2005; Vroomen, Driver & De Gelder, 2001). Through an experiment requiring participants to identify target emotions based on three types of cue-presentation: (a) visual cues only, (b) vocal cues only and (c) visual and vocal cues together, Massaro and Egan (1996)'s study examined single-modality versus dual-modality presentation of cues. Their findings suggested that participants fared better when they integrated information from both modalities to perceive the target emotion. It appears that congruence in information received from facial expression and affective prosody (i.e. linguistic rhythm, intonation, emphasis) of the voice empowers one to react appropriately to emotions expressed by others. Relatedly, it is important to consider that information obtained via one sensory channel potentially alters the processing of information obtained from another sensory channel (Aviezer et al., 2008; Anderson, Christoff, Panitz, De

Rosa & Gabrieli, 2003; de Gelder and Vroomen, 2000; Massaro and Egan, 1996). In de Gelder and Vroomen (2000)'s experimental investigation, findings suggested that despite participants being explicitly told to rely only on one single (out of the two) sensory channels presented to make their judgment, (a) the identification of facial cues still influenced participants' judgment of vocal cues and (b) the identification of vocal cues still influenced participants' judgment of facial cues. The fact that the participants had been given clear, direct instructions to ignore stimuli from the other sensory channel and yet were unable to disregard them completely, strengthened the belief that detection of affect in visual and vocal cues are inherently linked. The integration of facial and vocal affective information occurring automatically likely serves an adaptive function—the concurrent processing of information perceived in others' faces and voices optimises identification of the target emotion being expressed by social others.

Dynamic changes in emotional expressions

Given that emotion recognition ability applied in real life is the aptitude to make instantaneous, accurate and context-specific inferences of what others are feeling based on emotion cues in the face, voice and body, I argue that the measure used should mirror realistic conditions as closely as possible by depicting dynamic changes in emotional expressions instead of static poses. With only a few exceptions (Kreifelts, Ethofer, Grodd, Erb & Wildgruber, 2007; de Gelder, Bocker, Tuomainen, Hensen & Vroomen, 1999), the majority of emotion recognition studies were conducted using static stimuli i.e. still faces. However, neuroimaging studies (Kilts, Egan, Gideon, Ely & Hoffman,

2003; LaBar, Crupain, Voyvodic & McCarthy, 2003) comparing brain activation to static facial displays against dynamic facial changes illustrated how relevant brain regions showed greater activation when participants viewed dynamic expression changes (e.g. from neutral to fear or anger, creating the effect of someone getting angry or getting scared). Collignon, Girard, Gosselin, Roy, Saint-Amour, Lassond and Lepore (2008) have also asserted that research examining emotion recognition should use measures involving dynamic stimuli—evolving depictions of faces from neutral to the target emotion. This is based on the understanding that (a) the facial expressions we encounter in a realistic setting are almost never static and that (b) we process fluid and posed facial expressions in different ways. They further highlighted that this requirement is particularly important in investigations of emotion processing as the combination of audio stimuli with a posed picture is simply not realistic (i.e. participant is shown a picture of someone’s static expression of anger with a voiceover, as if the picture could speak). This view is supported by other researchers (Aviezer et al., 2017; Aviezer et al., 2008; Campanella & Belin, 2007; Sugihara, Diltz, Averbek & Romanski, 2006; De Gelder & Vroomen, 2000). Additionally, Collignon et al. (2008)’s study is of particular interest as it allows us to understand why multisensory integration of emotions is necessary for the assessment of emotion recognition ability. Realistically speaking, it is unlikely for us to be completely certain when processing others’ facial or vocal expressions. While we have a mental schema of what “angry” or “sad” or “scared” looks like, we may still be required to rely on other clues to make a final deduction of others’ feelings. The researchers discuss a “perceptual framework” that takes into account the “degree of relative uncertainty” in the

sender's (i.e. the person exhibiting the emotion) emotional expressions. This degree dictates whether the perceiver (i.e. the person trying to read the emotion) bases his judgment using the visual or auditory channel (Ernst and Bulthoff, 2004). This means that when the perceiver finds visual cues in the face to be so ambiguous that he is unable to interpret with confidence, the perceiver would compensate by paying attention to another less ambiguous sensory channel such as the voice or nonverbal gestures, in order to make a judgment of the sender's emotions. This process of decidedly relying on the comparatively less ambiguous sensory channel is an adaptive feature in everyday situations as decoding another person's emotion requires us to simultaneously evaluate multiple sources of sensory information. This flexibility in making evaluations is useful especially since the availability of cues in interpersonal interactions varies depending on the person and the situation. In another study, Aviezer et al. (2008) examined how perceptual similarity of certain emotions and contextual effects in body language could affect participants' identification of the target emotion. Using portraits from the Ekman and Friesen (1976) set of basic facial expressions of disgust, they imposed these faces on different "bodies" as a manipulation of context. These "bodies" differed largely in hand gestures and angle of body tilt, with a couple of object aids (e.g. a soiled diaper for the "body" conveying disgust). Across three related experiments, Aviezer et al. (2008) found that participants perceived distinctly different emotions depending on the "body" on which they were imposed on. They discussed how contextual effects vary depending on how closely associated the presented facial expression and the "body" is. For instance, a "body" with a raised fist could induce the participants to misperceive a facial expression of disgust as

anger because disgust and anger expressions share many prototypical “signatures” in the face. Participants then integrate their basic recognition of these prototypical “signatures” within the context of the “body” presented to draw conclusions. The findings and explanations by Collignon et al. (2008) and Aviezer et al. (2008) lend weight to my position that an ecologically valid and fair assessment of emotion recognition ability requires a measure that includes at least more than one sensory channel. While I do not discount the enhanced salience of facial expressions and its importance in the assessment of emotion recognition ability, I am of the opinion that facial expressions should not be the sole component in a measure of emotion recognition ability. This is simply because in real life the complexity of social situations may influence the veracity of facial expressions (Aviezer et al., 2017; Collignon et al., 2008). Although facial expressions are largely relied on for the most accessible information, nuances in social interactions necessitate an interpersonal awareness of cues beyond the face. For instance, in a professional networking session, a newly-acquainted business associate may not be particularly agreeable to your proposition but may still maintain a fairly composed expression of neutrality. An astute perceiver should then recognise the ambiguity of his associate’s facial expression and attune his attention to other less ambiguous sensory channels, such as a sceptical tone (vocal) or stiff posture (body language) to draw a better conclusion about how his associate feels towards him.

All things considered, I selected the GERT-S (Schlegel, Grandjean & Scherer, 2014) and the Emotion Recognition Index (Scherer & Scherer, 2011) as the preferred measures of emotion recognition ability. The GERT-S presents

stimuli consisting of dynamic, multisensory motion expressions in the face, voice and bodily movements (i.e. audio clips and video clips of actors expressing target emotions). The ERI, while also a multisensory measure, presents the facial stimuli and vocal stimuli, separately. The ERI allows the option of further examining participants' emotion recognition ability by modality, for example if affiliation motivated individuals and power motivated individuals achieve equally high overall scores on the ERI, it would be of interest to determine if affiliation motivated individuals are better at reading faces than power motivated individuals. By employing these tests that measure recognition accuracy beyond just emotion cues in the face, I hope to analyse the link between implicit motives, affiliation stress and emotion recognition ability in a more ecologically valid manner to inform practical implications of related findings. Emotion recognition is regarded to be an intuitive assessment of others' affective signals (Kuhl & Kazen, 2008; Kuhl, 2000), essentially a judgment call that takes place automatically and almost immediately. Given that implicit motive measures are superior in predicting such spontaneous responses (McClelland, Koestner & Weinberger, 1989), investigating the role of implicit motives in emotion recognition ability appeared to be a worthy venture.

2.2 Implicit motives

Curiously, there is a paucity of existing literature investigating the direct link between implicit motives and emotion recognition. To date, only two studies have explored this link experimentally, one examining whether implicit motives have the capacity to direct one's attention to or away from emotional expressions (Schultheiss & Hale, 2007) and one reporting for implicit power

motivation predicting how fast an individual recognises continuously changing or developing facial expressions of emotion (Donhauser, Rosch & Schultheiss, 2015). In this section, I will consider the findings from the two studies and explain how they inform my hypotheses testing whether implicit motives predict emotion recognition ability, and how that relationship is influenced by affiliation stress. Thereafter, I would also highlight how my current research would contribute to expanding the field of knowledge concerning the link between implicit motives and emotion recognition.

Implicit motives are dispositions that act as constant internal guides driving recurrent, consistent preferences and patterns of behaviour. The three main implicit motives that have been studied are need for affiliation, need for power and need for achievement. They are needs that function on the edge of consciousness, urges that influence physiological, cognitive, affective, and behavioural responses to actions or activities that are emotionally rewarding (Schultheiss & Brunstein, 2010). Although the validity of the implicit motive construct has been investigated and documented extensively, the role of implicit motives in emotion recognition ability is comparatively lesser known. There is a scarcity of existing literature examining the direct link between implicit motives and emotion recognition. To date, only two studies have explored this link experimentally, one examining whether implicit motives have a direct impact on attention to facial expressions of emotion (Schultheiss & Hale, 2007) and the second one reporting that implicit power motivation predicts how fast individuals recognise subtle changes between facial expressions of emotion (Donhauser, Rosch & Schultheiss, 2015). However, to my knowledge, there has not been any published study that directly investigates how implicit motives

influence a person's emotion recognition ability across multisensory channels (i.e. the face, the voice and nonverbal gestures). This gap in the literature is unexpected given that motivation is commonly examined for its capacity to direct behaviour. Most examinations of socio-cognitive processes factor motivation as a driving force for behaviour: in leadership and organisational behaviour (House, 2004); competence and job satisfaction (Hofer & Busch, 2011); sexual attitudes (Yost & Zubriggen, 2006) and interpersonal relationships (Leary & Baumeister, 2017) just to name a few. This means that motivation is responsible for driving or orienting a person's recurrent, consistent patterns of behaviour towards a certain motive-congruent outcome. For instance, an affiliation motivation (motivation) could be responsible for orienting a person towards recognising certain emotion cues in others' faces, voices and body language (behaviour) in order to develop affiliative relationships (outcome). Additionally, the dearth of empirical studies investigating implicit motives and emotion recognition ability is also surprising as emotion recognition ability has been demonstrated to predict many other socially adaptive behaviours such relationship satisfaction (Carton, Kessler & Pape, 1999; Tucker & Anders, 1999; Cordova, Gee & Warren, 2005), transformational leadership qualities (Rubin, Munz & Bommer, 2005) and negotiation skills (Elfeinbein, Der Foo, White, Tan & Aik, 2007). Moreover, sophisticated tools used to measure implicit motives such as the Picture Story Exercise (PSE; McClelland, Koestner & Weinberger, 1989), the Operant Motive Test (Scheffer, Kuhl & Eichstaedt, 2003) and the Thematic Apperception Test (Murray, 1943) have been available to researchers. Similarly, sophisticated tools for the measure of emotion recognition ability

such as the Geneva Emotion Recognition Test (GERTS; Schlegel, Grandjean & Scherer, 2014), the Emotion Recognition Test (ERI; Scherer & Scherer, 2011) and the Multimodal Emotion Recognition Test (MERT; Bänziger, Grandjean & Scherer, 2009) have also been available to researchers.

Research examining implicit motives as predictors in emotion recognition demonstrate that implicit motives have the capacity to orient individuals towards motivational cues in others' FEEs. Specifically, implicit motives directly influence people's attentional orienting to certain perceptual cues for certain categories of emotions. For example, power motivated individuals were observed to pay attention to FEEs of surprise (low dominance) but avoided FEEs of anger (high dominance). Affiliation motivated individuals on the other hand paid attention to FEEs that both signalled rejection (low affiliation) and signalled acceptance (high affiliation). This helps us understand the variance in people's emotion processing, specific to the recognition and interpretation of affective phenomena.

According to the theoretical framework of emotion processing, FEEs are considered the most accessible and tangible indicators of interpersonal needs (Stanton, Hall & Schultheiss, 2010). FEEs signal to the perceiver, certain incentives or disincentives that elicit approach or avoidance in the perceiver and thus are the cornerstones of nonverbal communication in social interactions. In the context of the implicit power motivation, FEEs indicate to the perceiver, information about the sender's dominance (high or low). In the context of the implicit affiliation motivation, FEEs indicate to the perceiver, information about the sender's affiliation (high or low) (Donhauser, Rosch, Schultheiss, 2015;

Rosch, Stanton & Schultheiss, 2013; Schultheiss & Hale, 2007). These researchers studying motivation and emotion have worked to validate the notion that emotional expressions could project certain incentives or disincentives and could also *be perceived to* project certain incentives or disincentives. This notion forms the basis for my study examining how one's implicit motives could subjectively affect one's attention to and interpretation of emotions in others, thereby impacting one's overall emotion recognition ability.

2.2.1 Implicit power motivation and attention to FEEs

Facial emotional expressions (FEEs) can indicate the dominance levels of the person conveying the emotion ("sender") (Schultheiss & Hale, 2007; Hess, Blairy & Kleck, 2000; Knutson, 1996). FEEs of anger, disgust and joy have been identified to indicate senders' high dominance. Since power-motivated individuals ("perceiver") seek to ensure a certain degree of (emotional) influence in social relationships, emotions that indicate senders' high dominance are considered disincentives that potentially elicit avoidance in perceivers.

On the other hand, FEEs of fear, sadness, or surprise (Schultheiss & Hale, 2007; Hess, Blairy & Kleck, 2000; Knutson, 1996) have been identified to indicate senders' low dominance and are expected to incentivise attention for power-motivated individuals. These FEEs of fear, sadness and surprise serve as visual confirmation, for the perceivers, of their relative dominance over their social contacts. As a result, I expect that an implicit power motivation would influence perceivers' reactions to both high dominance FEEs (anger, joy, disgust) as well as low dominance ones (fear, sadness, surprise). Schultheiss

and Hale (2006)'s study in particular, clearly demonstrated how power motivation is associated with attention *towards* surprise, and associated with attention *away* from joy and anger. As previously argued by Schultheiss, Pang, Torges, Wirth and Treynor (2005), a facial expression of surprise is a positive incentive for power-motivated perceivers who are driven by a need to influence or impact others. This is because a surprised expression is an emotional reaction to an unplanned outcome, thus indicating to the perceiver, the sender's lack of control in the situation. Schultheiss and Hale (2006)'s current findings provide further empirical support that to a power-motivated individual, another person's surprise is a salient signal due to its low-dominance, rewarding nature. When presented with anger and joy expressions, power-motivated individuals avoided aversive FEEs that signalled the sender's high-dominance, likely because power-motivated individuals' recognised the low probability of making an emotional impact on the sender. Disincentivised by the absence of opportunities to assert one's influence, power-motivated individuals tended to avoid such FEEs.

2.2.2 Implicit affiliation motivation to FEEs

The implicit affiliation motivation is little more complex. Generally speaking, as affiliation-motivated individuals seek affiliative connections in social exchanges, they are sensitive to FEEs that signal high-rejection and low-affiliation such as anger (Schultheiss & Hale, 2007). On the other hand, it is also plausible that affiliation-motivated individuals would avoid social interactions with individuals who exhibit high-rejection and low-affiliation FEEs, to circumvent potential rejection by a social contact. In this section, I

consider the two possible response trajectories of affiliation-motivated individuals in the face of a high-rejection and low-affiliation emotion. Specifically, I will discuss how affiliation motivated individuals would react to perceived anger FEEs in two possible ways: the duration of the anger expression and the intensity of it.

The need for affiliation expected to sensitise individuals to rejection (Boyatzis, 1973) and we also know that an affiliation motive alerts individuals to social signals that challenge their need for affiliative connections. To further our understanding of the affiliation motive, findings from Schultheiss and Hale (2007)'s study delineated how affiliation-motivated individuals attend to FEEs. Their study provided two pieces of evidence for high affiliation motive orienting attention towards anger FEEs: (a) affiliation motivated individuals are vigilant of anger FEEs regardless of senders' gender and (b) affiliation-motivated individuals transit from avoidance to vigilance when they deem the anger "intense" enough (i.e. low-intensity anger to medium-intensity anger) to revise their attentional strategy. These findings demonstrate that affiliation-motivated individuals pay close attention to social signals that challenge their need for affiliative connections, and employ strategies to cope with or to deal with the threatening stimulus. In the event of low-intensity anger, affiliation-motivated individuals appear to cope by ignoring the unrewarding stimulus. In the event of high-intensity anger, affiliation-motivated individuals spring into action and respond proactively to defuse the situation. Specifically, anger is considered low-affiliation and therefore considered a threat to affiliation-motivated individuals' need for affiliative, peaceful relations. They may therefore have a heightened awareness of these threatening, anger expressions,

and they are wired to respond proactively when the anger expressions in others become prolonged and impossible to ignore.

Employing morphing technology, Donhauser, Rosch and Schultheiss (2015) artificially developed video stimuli displaying the subtle micro-changes around the eye. By recording participants' speed and accuracy in recognising the first signs of the target emotion from a neutral expression, they tested whether power motivation predicted how quickly participants discerned dominance-related dynamic changes. Their findings supported their hypothesis that high power motivation predicted for an enhanced ability to recognise FEEs at lower intensities - high power individuals were significantly faster in accurately recognising the target FEEs. Although Donhauser, Rosch and Schultheiss (2015) focused their investigation only on one region of the face, their findings offer preliminary insight into how implicit motives can affect one's sensitivity to even the most subtle micro-expressions indicative of a specific, recognisable emotion in the entire face. The researchers' work provides some real-world justification for studying motives and emotions. While existing studies have demonstrated how implicit motives direct a person's attention to certain emotions in the face, none has provided a differentiated explanation of (a) the relation between implicit motivation and *static* visual stimuli and (b) the relation between implicit motivation and *dynamic* visual stimuli. The researchers' findings suggest that high power motivated individuals process their social environment in a way that promotes the efficient identification of dominance- or submission-signals in others. Their findings are also helpful in informing my hypothesis—given that a high power motivation predisposes a person to better recognise changes in dynamic

presentations of FEEs, I am inclined to expect that power-motivated individuals would achieve a high accuracy score on the emotion recognition ability test. I suggest that heightened vigilance (and, conversely, lowered vigilance or “blind spots”) to certain emotion cues may predispose people to make biased interpretations of facial expressions, thereby affecting their overall emotion recognition accuracy. Evidence suggests that implicit motives may predispose people to be biased towards certain emotional cues in faces (“hot spots”) and to neglect certain emotional cues in faces (“blind spots”) while reading others’ emotions. The aforementioned existing research findings give me reason to believe that personality differences in implicit motives could potentially determine the variance in emotion recognition accuracy.

It has been argued that personality accounts for only some variance in socio-cognitive processing and social behaviour. Situational factors contribute to the variance as well (Mischel, 1977). Examining how personality interacts with contextual factors to influence human interaction and human behaviour is an ongoing effort (Mischel, Shoda, & Mendoza-Denton, 2002; Mischel, 1977). On this note, this study aims to examine the *person × situation* effect by investigating how situations triggering affiliation stress moderates the effect on implicit motives on emotion recognition.

2.3 Affiliation stress

At the core of my research on emotion recognition ability (ERA), I am interested in the attainment of positive and fulfilling relationships as an outcome of ERA. The capacity to deduce others’ emotions in an accurate manner is particularly relevant in the wider context of interpersonal interactions

(familial, romantic, professional or social). Unfortunately, the human desire to form positive ties (Bowlby, 1973) inherently opens us up to the possible experience of affiliation stress. Affiliation stress can be understood as “emotional pain” stemming from social anxiety and personal inadequacy after being ousted from a social group (Baumeister, Twenge & Nuss, 2002; Nesse, 1990).

Social rejection (state variable)

In the last decade, several publications have documented the effects of ostracism, social exclusion, and social rejection on one’s ability to distinguish emotions. Sacco, Wirth, Hugenberg and Williams (2011) found that ostracism enhanced participants’ abilities to distinguish facial emotional expressions (FEEs) from different categories (e.g. between happy and angry faces). Ostracism was also found to enhance one’s ability to discern nuances in others’ emotional reactions (e.g. to accurately identify emotions even if cues are subtle or transient). For instance, a slight uplift of the corners of the mouth could be a very subtle and fleeting cue that would still be picked up by an ostracised individual. Additionally, social rejection has been found to improve detection of genuine versus fake smiles (Berstein, Young, Brown, Sacco & Claypool, 2008). A related study by the same group of researchers (Berstein, Young, Brown, Sacco & Claypool, 2010) went on to assert that social exclusion, in fact, triggers a preference for genuine smiles. Affiliation stress triggers adaptive responses in people to boost success in future social interaction. This is likely achieved by enhancing one’s perceptual sensitivity and acuity of emotions in others. While affiliation stress is not explicitly mentioned in the existing

literature, it is clear that affiliation stress occurs as a natural by-product of unpleasant social situations. Findings from the abovementioned studies suggest that when people are often exposed to situations triggering high affiliation stress, they become better at reading emotions over time.

Rejection sensitivity (trait variable)

Rejection sensitivity refers to a tendency to assume the worst in ambiguous social situations. Instead of considering other potential explanations for others' non-affiliative behaviours, rejection sensitive individuals are inclined to assume that they have been negatively evaluated or have been rejected (Downey & Feldman, 1996). Rejection sensitive individuals are also inclined to imagine others perceiving them and their actions negatively. While it is human nature to be concerned about social acceptance and to be upset by a rejection, an individual who is hypersensitive to rejection would jump to the conclusion that others' unresponsiveness or ambiguity indicates something more personally hurtful (i.e. waning affection or negative evaluations). This thus impacts their willingness to solicit help in times of trouble and potentiates conflict and escalation of conflict with friends, family and romantic partners (Ayduk & Downey, 2001). In their study, Downey and Feldman (1996) reported that rejection sensitive youths were inclined to interpret hypothetical scenarios involving their partners as intentionally hurtful despite the plausibility of other external factors unrelated to their partner's intention to hurt. The researchers had youths fill out rejection sensitivity questionnaires at two different times. The first instance was when they were not romantically involved with anyone. A few months later, those who had romantic partners

attempted another set of questionnaires regarding hypothetical partner behaviours. The questions required them to reflect on their partners (a) being aloof, (b) being intolerant of an act and (c) spending less time with them. Participants were also required to indicate how intentionally hurtful they perceived these behaviours to be. In a realistic social or romantic relationship, it is reasonable that friends, partners or spouses may appear more aloof during a particularly hectic week. However the researchers reported that individuals high in rejection sensitivity had the tendency to misattribute their partners' behaviour to implicit rejection, instead of considering other practical reasons.

Beyond just the perception of hurtful intent, other research has also found that a high rejection sensitivity has the potential to negatively impacts one's behaviour and interaction with loved ones. In one such research, Downey, Freitas, Michaelis and Khouri (1998) examined conflict management between romantic partners. They recorded conflict interactions of couples and it was evident that rejection sensitive people communicated in patterns that were characterised by hostility, denial of responsibility, mockery, and other unconstructive outbursts. In terms of relationship satisfaction, Ayduk, Downey, Testa, Yen and Shoda (1999) reported that rejection sensitivity in males was associated with jealousy and hostility, and rejection sensitivity in females was associated with being less supportive. Accordingly, jealousy, hostility and the lack of support in relationships were related to their decrease in relationship satisfaction.

Other research suggests that rejection sensitivity increases the risk of aggression towards oneself and others (Purdie & Downey, 2000; Levy, Ayduk,

Downey, 2001): rejection sensitive males who are invested their relationships are more likely to be physically violent. Rejection sensitivity appears to also be related to a willingness to self-harm as a coping mechanism when one experiences rejection. In a study by Romero-Canvas, Downey, Reddy, Rodriguez, Cavanaugh and Pelayo (2010), rejection sensitive males who have experienced an episode of rejection were found to engage in acts that aim to please others and ingratiate themselves: (a) they demonstrated increased willingness to contribute more money in order to win favour and to accepted by a group that had harshly rejected them and (b) they demonstrated increased willingness to spend more money on a date with a female who had earlier evaluated them negatively on a fictitious online dating forum. These reported findings from rejection sensitivity research point towards the possibility that social exclusion or rejection triggers a desire to reconnect with social others, especially so in rejection sensitive individuals. It appears to be particularly prevalent when close relationships with significant others or membership in valued social communities is at stake. It appears that rejection sensitivity predisposes individuals to anticipate and pay attention to negative emotion cues, and perhaps even misinterpret ambiguous cues as negative cues in social others. This tendency means that rejection sensitivity individuals are generally emotionally hypersensitive and have a lower threshold for distress related to rejection (experienced or perceived). In light of how rejection sensitivity impacts interpersonal behaviour, I consider it worthwhile to factor rejection sensitivity in the link between implicit motives and emotion recognition ability.

A theoretical framework that might provide a viable conceptual basis for the relationships between implicit affiliation motive, affiliation stress (trait

variable: rejection sensitivity; state variable: social rejection situation) and emotion recognition ability is the Tend and Befriend (Taylor, 2011; 2006) theory.

2.4 Tend and Befriend Model

The Tend and Befriend model is built on the observation that people affiliate in response to stress (Taylor, 2006). When people experience threat, they tend to their offspring to ensure survival and they affiliate with others to seek protection and solace. This model provides the theoretical basis for my hypothesis that affiliation-motivated individuals orient towards emotional cues of both acceptance and rejection in others after experiences of social rejection. My research proposes that when individuals – who are rejection sensitive and with a dominant affiliation motive – experiences social rejection that engenders affiliation stress, they would seek to dispel that affiliation stress. This desire to dispel affiliation stress motivates them to employ strategies that would foster positive connections and “befriend” others. The strategies include paying close attention to subtle micro-expressions in the face or nuanced inflexions in the voice conveying both positive and negative valence. As a way of illustrating how the “Tend-and-Befriend” theory provides an explanatory framework integrating affiliation motive, affiliation stress and recognition of target emotion, I present in the following paragraphs, an explanation of how these constructs come together to inform an affiliation-motivated, rejection-sensitive perceiver’s recognition of fear as the target emotion.

First, let’s understand the facial expression of fear. The facial expression of fear is considered a distress cue indicating to others that one is undergoing

some degree of anxiety or suffering (Marsh & Ambady, 2007). The fear expression helps one look disarming and infantile which encourages caregiving actions from others towards oneself (Marsh, Adams & Kleck, 2005) and enables one to acquire help from others by eliciting sympathy or prosocial responding (Marsh & Ambady, 2007). All of these point towards the tendency of fear expressions to elicit some form of prosocial reaction in others. Specifically, it appears that the facial expression of fear is evolutionarily adaptive for social success and preservation of self as it compels others to tend to and appeals to other's protective tendencies. As the fear expression facilitates approach behaviour in people perceiving it, it suggests that fear expression may represent an affiliative stimulus (Marsh, Ambady & Kleck, 2005).

Next, let's revisit the Tend and Befriend framework in the context of an affiliation-motivated individual who has experienced an affiliatively stressful situation. An affiliation-motivated individual's wish to "tend" - to extend help, to nurture, to look out for, to care for, to soothe the fearful feelings of individuals and to rebuild relationships would shape his response to others. We hypothesise then that an affiliation-motivated individual may be more attune to facial expressions of fear (an affiliative stimulus), than another individual motivated by achievement or power. Additionally, as an affiliation-motivated individual is predisposed to explore means of nurturing affiliative connections, the individual may be especially aware of fearful others who require protection or who would benefit from their affiliative reassurance. As a way of triangulating emotional expression of fear, the affiliation motive and the Tend and Befriend explanatory framework, I posit that the affiliation-motivated individual would instinctively be drawn to and perhaps even proactively be alert

for emotional expressions of fear. I expect this in light of their inclination to either (a) tend to those who have experienced some sort of traumatic experience by offering protection or (b) to dispel others' concerns of them as a threat by offering affiliative reassurance in a bid to (re)build positive relations.

The above example of fear illustrates how following stressful situations, an affiliation-motivated individual's accuracy of perceiving emotions could be enhanced. Instead of impairing emotion recognition accuracy as believed, I argue that an experience of affiliation stress enhances the emotion recognition accuracy of an affiliation-motivated individual as a result of their need for affiliative connections. Enhanced emotion recognition accuracy is achieved by redirecting energy and resource to orient towards affiliative cues, and employing appropriate affiliation-building strategies that could lead to a rewarding experience of goal attainment.

2.5 Summary

Emotional intelligence (EQ) comprise emotion recognition, emotion expression and emotion management (Schutte, Malouff, Hall, Haggerty, Cooper, Golden & Dornheim, 1998; Salovey & Mayer, 1990). Recognition of one's emotions is the first step to effective management and regulation of one's emotions. Likewise, recognition of others' emotions is the first step to artfully manage others' emotions (Mayer, DiPaolo, Salovey, 1990)—when someone is noticed to be sad, one reaches out to offer comfort or cheer and when someone is noticed to be angry or tensed, one seeks to soothe or calm. In these ways, the ability to appraise and recognise emotions in others paves the way for downstream emotion-related functions such as expression and management,

that eventually foster positive, affiliative and empathetic relationships with others (Schutte, Malouff, Bobik, Coston, Greeson, Jedlicka, Rhods & Wendorf, 2001). Previously considered an intuitive reflex, the mystery behind emotion recognition is gradually unfolding. With the insights provided by scientists examining characteristic facial features of emotions (Kohler, Turner, Stolar, Bilkerm, Bresinger, Gur & Gur, 2004; Ekman & Friesen, 1982; 1978), we now know that the “mastery” behind appraising others’ emotions lies in a person’s selective attention to action units archetypal of specific facial emotions and acoustic elements archetypal of specific vocal emotions. What factors then determine how attentive one is to these affective cues?

2.6 Research Question

The present research investigates the link between personality correlates and emotion recognition ability by focusing on three ideas: (a) the link between implicit motives and emotion recognition ability, (b) the link between affiliation stress and emotion recognition ability when affiliation stress is measured as a rejection sensitivity trait, (c) the link between affiliation stress and emotion recognition ability when affiliation stress is a state induced with a social rejection situation. Additionally, this study investigates the person $\times$ situation interaction effects of rejection sensitivity and social rejection and postulates a moderating effect on the relationship between implicit motive and emotion recognition ability. To reiterate, the four broad research questions are:

1. How do implicit motives (affiliation, power and achievement) relate to emotion recognition ability?

2. How does affiliation stress, measured as rejection sensitivity trait, relate to the link between implicit affiliation motive and emotion recognition ability?
3. How does affiliation stress, experimentally induced with a social rejection situation, relate the link between implicit affiliation motive and emotion recognition ability?
4. How does affiliation stress (rejection sensitivity and social rejection) relate to the link between implicit affiliation motive and emotion recognition ability?

To answer all these questions, Study 1 aimed to provide preliminary correlational evidence for a relationship between implicit motives and emotion recognition ability. Thereafter, Study 2 and 3 focused on examining affiliation stress as a moderator variable and further examining interaction effects of rejection sensitivity, social rejection and implicit affiliation motive on emotion recognition ability.

CHAPTER THREE

STUDY 1

3.1 Study 1

This chapter will provide empirical support to the theoretical postulation that emotion recognition ability (ERA) is influenced by implicit motives. The fundamental purpose of Study 1 was to measure ERA and its relationship with implicit motives so as to derive preliminary evidence to support my hypothesis that ERA may be affected by implicit motives. Although previous studies have found correlations between implicit motives and the recognition of FEEs, the present study set out to demonstrate that implicit motives are correlated with a general ERA involving the recognition of emotions in both the voice and the face.

The overarching research aim is to derive evidence that affiliation stress moderates the negative relationship between implicit motives and ERA. However, as there has not been any experimental study examining the specific contribution of the three implicit motives to individuals' overall ability to recognise emotions accurately, I had to first explore the correlational relationship between implicit motives and ERA (Study 1). For Study 1, it was hypothesised that an individual's ERA is influenced by the individual's dominant implicit motive. Specifically, it was expected that a dominant implicit motive of affiliation would correlate with a high score on the Geneva Emotion Recognition Test (GERT-S; Schlegel, Grandjean & Scherer, 2014). This

expectation is formed on the basis that an affiliation motive represents the non-conscious desire for friendly relations with others (Wirth & Schultheiss, 2006), and increases vigilance of facial expressions of emotion (Donhauser, Rosch & Schultheiss, 2015; Schultheiss, Wirth, Waugh, Stanton, Meier & Reuter-Lorenz, 2008; Schultheiss & Hale, 2007). Additionally, people who are predominantly affiliation-motivated prioritise positive, meaningful social bonds with others. This prioritisation of affiliative relationships driven by the desire for positive social bonds of an implicit affiliation motivation enhances emotion recognition accuracy. As there is no directly relevant literature for us to draw any reasonable postulations linking implicit power or achievement motives to facial or vocal expressions of emotion, no correlation was expected between a dominant implicit motive of power or achievement and the GERT-S test scores.

3.1.1 Methodology

Participants

Seventy seven participants were tested . Data from 16 participants were excluded as the data did not pass quality reviews (to be elaborated on later). About 65% of the participants were females. The sample comprised 79% Chinese, 15% Indians, 4% Malays and 2% belonged to other races. Among them 91% were Singaporeans, 5% were Malaysians and 4% were other nationalities (Italian, Australian and Chinese). The mean age of the participants was 24.48 years with a standard deviation of 4.32. Participants were recruited from NTU's research participation pool and also by means of the snowball technique. Participation was completely voluntary and responses were kept anonymous (by assignment of an alphanumeric code) unless participants

volunteered means of identification. Participants completed a battery of tests on two online experimental and survey platforms, namely Inquisit (Millisecond Software, Seattle, WA) and Qualtrics (Qualtrics Labs Inc., Provo, UT). The institutional review board approved the study prior to commencement.

Across all phases of data collection, it was communicated to participants that a dedicated time period is required for the focused completion of the entire study. Participants were also given multiple reminders (by means of email and text messages) to ensure the working condition of an audio-visual enabled laptop prior to attempting the study. It was also clearly communicated that data will be reviewed for quality and completeness before the promised compensation would be accorded.

Measures

Implicit Motives. The Picture Story Exercise (PSE; Schultheiss & Pang, 2007), a research version of the Thematic Apperception Test (TAT; Morgan & Murray, 1935), is widely-used for measuring implicit motives. For the PSE, participants are required to write stories in response to pictures that have been included for their high cue strength for the motive of interest. For the purpose of this study, the PSE will be used to assess 3 specific motives – the need for Affiliation (*nAffiliation*), the need for Achievement (*nAchievement*) and need for Power (*nPower*). The PSE takes about 30 minutes to administer and the coding protocol is not dependent on grammatical accuracy. An experienced coder would code all the stories based on the Winter's (1994) content coding manual and with reference to Pang's (2010) best practices for implicit motive assessment. According to the manual, affiliation imagery is scored when

characters demonstrate concern about developing, sustaining or rebuilding positive connections with others. This is more clearly exemplified as (a) the character's expression of positive feelings toward others, (b) the character's expression of sadness about separation from loved ones and (c) the mention of friendly, affectionate and nurturing acts. Power imagery is scored when characters show concern about impacting others through (a) forceful actions, (b) control of others, (c) exerting influence on others e.g. in coming to a decision or to perform an act, (d) offering unsolicited help, (e) attempting to impress others or (d) attempting to elicit emotional reactions in others. Achievement imagery is scored when characters are concerned about achieving or maintaining excellence. This is exemplified as (a) the character's expression of negative feelings about failure or (b) the character's expression of specific actions performed as an attempt to attain excellence.

Emotion Recognition Ability. The Geneva Emotion Recognition Test – short version (GERT-S; Schlegel, Grandjean & Scherer, 2014) requires forced-choice responses to audio, video and picture stimuli. The GERT has been found to be the most ecologically valid test of ERA. Video clips, audio clips and still photos simultaneously present cues from various combinations of the face, voice and body to closely mirror the real-life scenario of social interactions. It takes about fifteen minutes to administer and reduces the likelihood of fatigue factor contaminating results.

Procedure

Voluntary informed consent was obtained prior to commencement. Participants were provided with substantial information relevant to the study,

including the ostensible purpose of furthering research in the psychology behind emotion recognition ability. They were also informed about the various components in the study (i.e. picture story writing task, questionnaires and emotion recognition test) as well as the estimated time taken to complete the entire study. Information about investigators was presented before participants expressed their choice to participate. Should the participants choose not to participate after reading the electronic consent form or should they wish to discontinue at any point, no penalty was imposed. In the case of NTU Research Pool (NTU RP) students, they would be able to withdraw their participation and they would be allowed to re-select another study to participate in for their course credits. In the case of the general participant recruited through convenience sampling or through the MTurk platform, withdrawal at any point also did not incur any penalty or financial loss to them.

The Picture Story Exercise (PSE) was used to assess implicit affiliation, power and achievement motives, To assess the ERA of participants, the Geneva Emotion Recognition Test (GERT-S) was used. Participants were first asked to complete the PSE, followed by the the GERT-S.

Data Quality Review

Picture Story Exercise (PSE). Data from participants were reviewed for quality and completeness—participants' data were excluded if their data met at least one of the following exclusion criteria: (a) incomplete attempt of the entire set of six stories (Given that each story is expected to arouse different motives, a strict 100% completeness decision was made a-priori.) or (b) incomprehensible or nonsensical content characterised by disjointed fragments of unrelated content

indicating a “cut and paste” strategy from unknown sources.

Geneva Emotion Recognition Test (GERT-S). Data from participants were reviewed for quality and completeness—participants’ data were excluded if their data fulfilled at least one of the following exclusion criteria: (a) no attempt (b) any incomplete attempt (Given that the 42-item test covers 14 different emotions and the recognition of each target emotion is tested only thrice, a strict 100% completeness decision was made a-priori.) or (c) suspected perfunctory attempt characterised by patterns of identical answers for consecutive questions (e.g. blindly selecting “anger” as the answer to five consecutive presented stimuli followed by selecting “joy” to the next five consecutive presented stimuli).

3.1.2 Statistical Analysis and Results

Deriving motive scores for analysis

Each participant submitted six stories for coding, and each story was coded for the three motives of affiliation, power and achievement. The scores of affiliation, power and achievement from the stories were then accumulated to derive, for each participant, a total affiliation score, power score and achievement score. The total scores from all participants were then calculated for sample mean before being used to derive the z-scores. Each participant would then have a z-score for affiliation, power and achievement respectively. These z-scores indicate both within and between subject differences in motive scores. As our study’s hypotheses required a comparison of participant’s dominant motive rather than simply whether participants were high or low on the motive, the within-subject z-scores were further compared to derive their

dominant motive. For instance, if a participant's *nAffiliation* z-score is highest as compared to his *nPower* or *nAchievement* z-score, the participant would be coded as having a dominant affiliation motive or affiliation-motivated (denoted as "1" in SPSS data set). This means to say that even if a participant's z-score for *nAffiliation* is high as compared to the rest of the participants in the sample (between-subject), we cannot assume that the participant's dominant motive is affiliation unless his *nAffiliation* z-score is also highest as compared to his *nPower* or *nAchievement* z-score (within-subject). This distinction is important for our study as we expect that dominance in one of the implicit motives is particularly associated with emotion recognition ability. Participants were thereafter categorized based on their dominant implicit motive: Affiliation (denoted as "1"), power ("2") and achievement ("3").

Implicit Motives on Performance

Table 2 shows the inter-correlations between all the key variables used in the study. A correlational analysis was computed to assess the relationship between standardized implicit motive scores (*nAffiliation*, *nPower* and *nAchievement*) and raw scores on the GERT-S. There was no correlation between the *nAffiliation* and GERT-S ($r = 0.043$, $n = 61$, $p = 0.740$), no correlation between the *nPower* and GERT-S ($r = 0.039$, $n = 61$, $p = 0.764$) and no correlation between *nAchievement* and GERT-S ($r = -0.135$, $n = 61$, $p = 0.94$). While a positive correlation could still exist between any of the implicit motives and GERT-S scores since $p > 0$, overall there was no significant correlation observed between implicit motives and ERA on the GERT-S. Implicit motives did not appear to influence performance on the emotion

recognition test in either direction.

Table 2

Correlations Among and Descriptive Statistics For Key Study Variables

Variables	Mean	SD	A	B	C	D
A. <i>nAff</i>	.00	1.00				
B. <i>nPow</i>	.00	1.00	.276*			
C. <i>nAch</i>	.00	1.00	.191	.500**		
D. ERA	23.92	3.707	.043	.039	.055	

Notes. N=61, **Correlations are significant at .01 level, *correlations are significant at .05 level. *nAff*=*nAffiliation*, *nPow*=*nPower*, *nAch*=*nAchievement*, ERA=emotion recognition ability

A one-way ANOVA was conducted for a comparison of means to determine if implicit motives correlated with emotion recognition ability as hypothesised. There was no statistically significant difference, as determined by one-way ANOVA $F(1,59) = 0.247, p = 0.621$, in the mean performance scores on the GERT-S between dominant affiliation motive, dominant power motive or dominant achievement motive.

3.1.3 Brief Discussion of Study 1

Absence of catalytic social situation. Contrary to expectations, correlations between implicit motives and ERA were not significant and no positive relationship was evident between a dominant affiliation motive and

ERA. While Study 1 failed to reject the null hypothesis, it remains reasonable to explore how one's dominant implicit motive could influence one's accuracy in interpreting emotions. In light of the fact that interpreting emotions in others is necessary in social interactions it was considered that perhaps a catalytic social situation (an event that triggers an important change in a person's thoughts, attitudes, motives or behaviour) was required for effects of implicit motives on individuals' ERA to be apparent. For instance, when an individual first encounters a new group of people at an event, such as a freshman orientation camp, this event potentiates two outcomes: acceptance or rejection. The individual would be concerned about gaining acceptance and in-group status, hence the anticipation of potential rejection at this event motivates him to pay attention to emotional cues in others. Another example of a catalytic social situation would be an individual being excluded from certain in-group activities, such as not being invited to a dinner gathering. The event triggers a change—it arouses his desire to reconnect and motivates alertness to emotional cues in others in order to successfully mitigate for whatever negative impression he has made and re-establish himself in the group. After all, we are studying accuracy in reading and interpreting emotional cues in social others, which necessitates the context of interpersonal interaction to some degree. Social interaction presents the possibility of being rejected or considered undesirable by social others. Rejection, ostracism and exclusion are considered social stressors which may trigger acute social stress—affiliation stress. The experience of social rejection appears to have a physical outlook as well—affiliation stress manifests itself as bodily inflammation that promotes susceptibility to diseases. Neural responses to social rejection have been found

to be associated with inflammatory activity in the body (Slavich, Way, Eisenberger & Taylor, 2010). This suggests that as the brain processes the experience of being socially rejected, the body attempts to cope with the “threat” of social stress as if it were combatting a bacterial or viral invasion. For most social creatures in the animal kingdom, rejection by their pack leads to death (Gruter & Masters, 1986)—it appears that humans are no exception. According to researchers (Williams & Nida, 2011; Kurzban & Leary, 2001), social rejection has provided evolutionary benefits as it serves as a way to trigger the elimination process of inept, problematic or burdensome members of the society. With ostracism and eventual elimination of these members, the well-being of the society as a whole is preserved and the rates of survival enhanced. Emotion recognition ability then is an inherent mechanism for an individual to readily detect social rejection by others in order to be alerted to the possibility of his elimination from the group. From the perspective of the individual, emotion recognition ability allows him to maximize his chances of survival, especially after an episode of being socially rejected. Timely detection of rejection maximizes the rejected individual’s opportunities to respond to rejection promptly, to successfully mitigate for whatever negative impression he has made on others before he continues to offend others to the point where elimination is inevitable. Williams (2011) posited that humans are built to detect social rejection readily through the experience of pain—social pain. Accordingly, it seemed clear then that by merely examining implicit motives and emotion recognition without a situational impetus, Study 1 was not providing participants reason enough to avoid social pain. As such, participants were approaching the emotion recognition test as if it were merely a task. This

then did not allow us to ecologically examine the social phenomenon of emotion recognition as we had set out to. While Williams has taken to describing the pain of being rejected as social pain, our present research prefers the term affiliation stress, as it better encapsulates the idea that a rejection episode is a psychologically distressing one, and that it results in feelings of stress, rather than physical pain per se. Affiliation stress could be considered a likely agent of change in a person's socio-cognitive responses to affective stimuli. I postulate then that affiliation stress caused by social rejection is the catalyst in the link between implicit motives and emotion recognition.

To decide on a suitable experimental paradigm to elicit affiliation stress, we looked towards Eisenberger, Lieberman, and Williams (2003)'s research on Cyberball and rejection. While there were other paradigms that involved confederates (Yale Interpersonal Stressor, Stroud, Tanofsky-Kraff, Wilfley & Salovey, 2000), our study required a virtual platform that could allow us to reach multi-ethnic and multi-national participants beyond just the local pool. As I was interested to reach a diverse group of participants not limited to university students as well, it was imperative that working adults are not deterred by the need to physically attend a laboratory session. Using a magnetic resonance image scanner, Eisenberger, Lieberman and Williams (2003) found that the participants who experienced rejection through the Cyberball manipulation – a virtual ball tossing game which involves the participant being intentionally excluded – had brain activity in a similar area as people experiencing physical pain. Their study provided strong support that rejection whether experienced in person or through a virtual platform has a similar ability to trigger a psychological warning such that individuals would be compelled to attend to

the stressor.

In the next section, I will discuss further how affiliation stress is related to interpersonal perception of affect which ultimately influences one's emotion recognition ability. Thereafter, I will outline how we have decided to examine the possibility that affiliation stress is the missing link in the relationship between implicit motives and emotion recognition ability. We hope that by inducing affiliation stress, we may provide motivational (dis)incentives for implicit needs to be activated.

Affiliation Stress and the need-threat model

While the phenomenon of ostracism, social rejection and exclusion has received considerable empirical attention (Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007; Zadro, Boland & Richardson, 2006; Zadro, Williams & Richardson, 2004; Twenge, Baumeister, Tice & Stucke, 2001), only Williams (2009)'s temporal need-threat model of ostracism provides a nuanced perspective on distinguishing between the immediate and long-term effects of a rejection episode. The temporal need-threat model posits, describes and predicts three stages of reactions: *Reflexive* (immediate), *Reflective* (coping) and *Resignation* (long-term).

Reflexive stage. During this immediate stage, rejection is experienced as pain and this pain response reflexively triggers the individual's desire to combat the perceived threat to four fundamental needs. Specifically, the needs in mention are belonging, control, meaningful existence and self-esteem. They are related to, but not completely dependent on the development and the

maintenance of social connections.

Reflective stage. Being alerted to the perceived threat quickly compels the individual to reflect on how significant or personally relevant the rejection episode is. This contemplation then leads to coping responses that would serve to mitigate for the damaging effects of the stressor and to “fortify the threatened need” (Williams, 2009).

Resignation stage. While immediate coping responses would address the psychological distress following a rejection episode, an individual who is consistently exposed to rejection and who has to persistently employ mental and psychological strategies to bolster one’s needs (i.e. sense of belonging, control, sense of meaningful existence and self-esteem) would have trouble sustaining himself in the long run. Over time, he would deplete the resources necessary to mitigate for damaging effects and to restore threatened needs. Eventually, resignation, alienation, helplessness, and depression would supersede his motivation to restore his sense of self.

William’s temporal need-threat model is particularly useful in the conceptualisation of our investigation in Study 2 and 3. As we are examining how affiliation stress affects an individual’s interpersonal functioning, his model that distinguishes between the nature of immediate and long-term responses to a rejection episode provides a viable explanatory framework. This study will be referencing the two stages, reflexive and reflective, of William’s model as the basis for our conceptualisation of how affiliation stress affects emotion recognition ability. As I am unable to pinpoint exactly whether the process of emotion recognition constitutes as an immediate or delayed response,

I consider both the reflexive and reflective stage in our explanatory framework. The reflexive stage is deemed appropriate as our investigation of state affiliation stress (with situationally induced rejection) requires an understanding of the immediate effects of a rejection episode. Given that our study would be tapping into a dispositional tendency to anticipate rejection (rejection sensitivity trait that is consistent over time may continue to effect delayed responses), the reflective stage would be relevant to consider in our explanatory framework. However, as we do not intend to expose participants to rejection episodes over a long period of time, our study will not be including the resignation stage into our conceptualisation.

Notably, William's model highlights also that the influence of *contextual factors* (i.e. the person initiating the rejection and the reason for doing so) and *individual differences* differ between the reflexive and the reflective stages. According to Williams, contextual and individual factors are inconsequential during the reflexive stage. However, during the reflective stage, contextual and individual factors will be expected to augment or attenuate any reactions and desire to cope when the rejected individual starts to reflect on the implications of the rejection.

As per the model, our study does not expect contextual factors to particularly play a role in eliciting the feeling of affiliation stress. The identity (who) and the motivation (why) of the perpetrator(s) of rejection will not be established and are not anticipated to exacerbate or diminish the feeling of affiliation stress. However, Williams's position that individual differences are inconsequential during an individual's immediate psychological distress is

debatable. With the exception of one study on personality disorders (Wirth, Lynam & Williams, 2010), individual differences by other researchers support Williams's postulation that individual factors are unlikely to moderate the reflexive impact of rejection experiences. State self-esteem did not moderate the immediate impact of ostracism (Williams, Cheung, & Choi, 2000), nor did collectivism–individualism (Smith & Williams, 2004) or social anxiety (Zadro, Boland & Richardson, 2006; Oaten, Williams, Jones & Zadro, 2008). As mentioned earlier, I do agree with Williams that contextual factors (i.e. the person initiating the rejection and the reason for doing so) are inconsequential to the experience of affiliation stress. However, I persist in arguing that individual differences, specifically implicit motives in healthy, non-clinical adults, would have a bearing on an individual's immediate response to a rejection episode. To further elucidate, I expect that individuals who are affiliation-motivated would have stronger immediate responses to the rejection episode than one who is not affiliation-motivated. This is particularly so as the rejection episode itself presents a direct threat to the need to belong, one of the four threats included in Williams's need-threat model, which has been found to positively correlate with affiliation motivation (Leary, Kelly, Cottrell & Schreindorfer, 2013). Moreover, the need to belong is defined as an immanent drive to develop positive and meaningful connections with others by seeking frequent, affiliatively pleasant interactions. The need to belong also drives an individual to ensure these interactions occur with the mutual understanding that one is invested in the other's welfare (Baumeister & Leary, 1995). Given the closeness of constructs in the need to belong and implicit affiliation motive, it is thus viable that the implicit affiliation motive could buffer or accentuate the

effects of social rejection even at the reflexive stage of the need-threat model. It appears possible then, that individual differences in the reflexive stage of the need-threat model has not been yet found. I propose that the personality dimension of implicit motives could explain such individual differences. To specify, I expect that individuals who are affiliation-motivated would have stronger immediate responses to the rejection episode than one who is not affiliation-motivated. Considered together with the Tend and Befriend theory discussed earlier in this paper, the temporal need-threat model provides an explanation for affiliation stress maximising reinforcing consequences (i.e. befriending) that motivates individuals (particularly affiliation-motivated individuals) to pay attention to interpersonal cues of emotion.

Affiliation stress and interpersonal perception of emotions

Prior research examining social rejection and interpersonal perception offer specific examples of behaviours that maximise reinforcing consequences. Pickett, Gardner and Knowles (2004) believed that people especially concerned about a need to belong would be especially vigilant of and would be especially accurate in decoding social cues. Across three studies, they examined recognition accuracy of vocal inflexions and facial emotion. The perspective that social exclusion threatens the need for belonging, is echoed by DeWall, Maner and Rouby (2009) who specifically studied how social rejection threatens this need to belong, with effects on perceptual processing of emotions in others. They found that the threat of rejection appeared to motivate people to connect with sources of acceptance. Specifically, people who experienced social rejection appeared to be perceptually biased to facial cues of acceptance.

Across four experiments examining speed and accuracy, they concluded that the threat of exclusion increased selective attention to smiling faces. The researchers argue that social exclusion thwarts people's powerful need for belonging and therefore motivates people to seek acceptance reflexively, manifested as an immediate bias in perceptual processing. The preference for cues of acceptance was also experimentally examined by Bernstein, Young, Brown, Sacco and Claypool (2008). They reported that an individual's ability to detect real and fake smiles improved following social rejection. In another study by the same researchers (Bernstein, Sacco, Brown, Young and Claypool, 2010), rejected individuals were found to be better at distinguishing genuine (Duchene) from deceptive (non-Duchenne) smiles, and were also more willing to work with individuals who displayed genuine smiles. The results suggest that rejection yields adaptive responses of distinguishing between genuine and non-genuine indicators of affiliative opportunity which could enable a rejected individual to invest resources wisely in his attempt to re-establish connections with social others. Taken together, these findings suggest that because individuals experience a rejection episode, they are then triggered to be more attentive to certain cues in facial expressions of others in order to build or to prevent the dissolution of positive relationships. Drawing from these findings, it is probable that the introduction of social rejection would catalyse the link between implicit affiliation motive and emotion recognition, as I have hypothesised. I suggest then that the relationship between implicit motives and emotion recognition ability requires a moderator variable, affiliation stress.

Study 2 and Study 3

Based on the empirical support that social rejection promotes selective attention to facial cues (Sacco, Wirth, Hugenberg, Chen & Williams 2011; Bernstein et al., 2010; DeWall, Maner & Rouby, 2009; Bernstein et al., 2008; Pickett, Gardner & Knowles, 2004) and the theoretical underpinning that social rejection situations engenders affiliation stress (MacDonald & Leary, 2005; Eisenberg, Lieberman, Williams, 2003; Leary, 1990), I have adopted a two-pronged approach to understanding the links between implicit motives, affiliation stress and emotion recognition ability in Study 2 and 3. While this research attempts to clarify how affiliation stress is related to emotion recognition ability (from a Tend and Befriend perspective), it now incorporates in the equation, the antecedent conditions (i.e. social rejection state and rejection sensitivity trait) that give rise to affiliation stress. This conceptualisation is different from previous ones that examined, affiliation stress or social rejection or rejection sensitivity, as a single factor in emotion recognition ability.

Thus, in order to establish whether implicit affiliation motive, affiliation stress interact to impact emotion recognition ability, I conducted two experiments in Study 2 and 3 whereby the following were examined:

- (a) Extent to which rejection sensitivity trait affects the link between implicit affiliation motive and emotion recognition
- (b) Extent to which social rejection state affects the link between implicit affiliation motive and emotion recognition
- (c) Extent to which rejection sensitivity trait, social rejection state and

implicit affiliation motive may affect emotion recognition (rejection
sensitivity $\times$ social rejection $\times$ implicit affiliation motive)

Studies 2 and 3 will be detailed in Chapter 4.

CHAPTER FOUR

STUDY 2 AND STUDY 3

4.1 Study 2

This chapter details the two studies (Study 2 and Study 3) investigating whether emotion recognition ability (ERA) is enhanced when affiliation stress is elicited, especially so in individuals whose dominant implicit motive is affiliation. I explored the role of a trigger or catalyst which would activate one's dominant motive, and in turn affect one's accuracy in identifying emotions. Considerable attention has been devoted to rejection (Kurzban & Leary, 2001; Nezlek, Kowalski, Leary, Blevins & Holgate., 1997), stigma (Major & O'brien, 2005), social exclusion (Leary & Baumeister, 2017; Baumeister & Tice, 1990) and ostracism (Williams, 1997, 2001; Williams & Zadro, 2001). Although they are termed differently to reflect situational variations, they all imply the explicit rejection of an individual by another individual, group or community. Across studies, rejected individuals report negative reactions in areas of control, belongingness, self-esteem and moods (Williams & Govan, 2005). The experience of social rejection is a social "pain" (Williams, 2007), and considered a social stressor that threatens a one's need for affiliative connections with others.

While researchers acknowledge and concur on the psychological consequences of rejection, studies examining the behavioural consequences following rejection appear to report divergent findings. Some studies report

evidence of conciliatory impulses and the urge to be included. For instance, socially rejected individuals were observed to put in more effort during a group assignment (Williams & Sommer, 1997) and also tended to conform to a group decision even if they were aware that the group decision was wrong (Williams, Cheung & Choi, 2000). However other studies demonstrate counterintuitive reactions of anger and retaliatory impulses. For instance, socially rejected individuals tended to be vengeful, and to exhibit anger (Twenge, Baumeister, Tice & Stucke, 2001). Why is it that in some studies, individuals react in ways that will potentially gain them acceptance, whereas in other studies, they react in ways that seem likely to perpetuate their out-group status? This is the focus of Study 2 and 3. Do socially rejected people react in ways that encourage social inclusion or in ways that perpetuate social exclusion? Instead of pitting the findings of previous studies against one another and questioning the validity of these studies' findings, I believe that a more productive line of inquiry might be to consider if implicit motives would explain the individual differences observed. The question to consider is possibly: Do socially rejected people react differently based on their predispositions? Do implicit motives influence attention to emotion cues (that may be linked to retaliatory, conciliatory tendencies or even indifference) when one experiences social rejection? If so, which implicit motive accounts for an enhanced ability to accurately recognise emotions in others after an experience of social rejection?

As my research is interested in emotion recognition ability, I consider the plausibility of implicit motives influencing reading of emotions (that may be theoretically underscored by retaliatory, conciliatory and indifferent responses to social rejection) in the following ways:

(a) Power motivated people who thrive on having impact on others would be so irked and frustrated by the social rejection that their judgment is clouded by rage (retaliatory), thus impairing their ability to interpret and identify emotions accurately. Being socially rejected and isolated by others removes opportunities for them to assert their influence and this may result in them becoming insensitive *or* choosing to be insensitive to others' emotional expressions.

(b) Affiliation motivated people who prioritise affiliative connections over other forms of achievement would be so distraught by the social rejection that they would become proactive in seeking re-inclusion (conciliatory). They would seek to establish positive relationships by means of befriending (as per the Tend and Befriend theory). They would become especially eager to read others' emotions and ensure that they accurately recognise emotion cues in order to gain in-group status.

(c) Achievement motivated people, whose needs to excel or to reach a standard of excellence are not especially threatened, would be comparatively less sensitive to threats to social status. They may be fairly unaffected by social rejection especially if there is no foreseeable consequence on their opportunities to excel. As such they may not be motivated to change their social processing to enhance or to impair their emotion recognition accuracy.

To formulate my hypotheses for Study 2 and 3, I referenced literature regarding individual tendencies to respond in a conciliatory, retaliatory or indifferent way. I anticipated how affiliation motivated, power motivated and achievement motivated individuals would likely respond in a conciliatory,

retaliatory and indifferent manner respectively. As being able to read emotions well facilitates conciliatory behaviours, I expected affiliation motivated individuals to be particularly accurate at recognising emotions after experiencing social rejection.

The rationale for our assumptions will be detailed in the next segment.

Assumptions and rationale

Affiliation-motivated individuals and conciliatory response to affiliation stress

I hypothesised that the experience of social rejection would enhance the emotion recognition ability of affiliation-motivated individuals. This is because there has been evidence that the affiliation motive also involves a fear of solitude and rejection, rather than just about the emotional pleasure of being in the affiliative company of others (Boyatzis, 1973). Relatedly, an affiliation motivation has been associated with social anxiety (Bryne, 1961) and some researchers have argued for the conceptualisation of affiliation motivation as affiliative anxiety or fear of rejection (Schultheiss & Hale, 2007; Koestner & McClelland, 1992). Moreover, the presence of affiliation stress has been found to trigger hormonal release to promote affiliation-seeking tendencies. This hormonal release is a response to the withdrawal of affiliation. According to Taylor and his fellow researchers, the release of oxytocin during stressful situations is more likely to induce an adaptive “tend-and-befriend” response rather than a primitive “fight or flight” response (Taylor, Klein, Lewis, Gruenewald, Gurung & Updegraff, 2000). Schultheiss and Hale’s (2007) study

investigating the release of progesterone as a response to fear of rejection has also found that progesterone release during stressful situations may encourage affiliation in order to reduce stress levels. Believed to be a direct adaptive mechanism by the body to restrain stress response, progesterone release may promote the desire for affiliative contact conducive for longer-term coping. Implicit affiliation motive, rejection sensitivity and affiliation stress were suggested to share similar tenets related to the preservation of positive social connections. Taken together, the literature suggests that a need for affiliation could motivate desperate attempts and relentless efforts for closeness and attention, especially in the aftermath of social rejection. I would argue that this very overwhelming fear of rejection or affiliative anxiety predisposes those with affiliation motivation, as the dominant motive, to pay attention to social cues in the aftermath of social rejection, in a bid to seek opportunities to befriend and establish positive connections.

On the other hand, Schultheiss and Hale (2007)'s study examining progesterone did not find correlations between hormones and a need for power or achievement—changes in progesterone were not found to be related to an implicit power or achievement motive. Affiliation stress was not expected to particularly arouse achievement motivated individuals as affiliative connections were not motive-congruent goals for these individuals. Achievement motivated individuals would only be challenged by a task that required some sort of mastery and demonstration of competence. For instance, Math problems or academic examinations would provide the necessary conditions for achievement stress that would be motive-congruent enough to elicit an adaptive response. Our experimental paradigm of a social acceptance or rejection

condition, however, engenders affiliation stress, which is incongruent to the dispositions of an achievement motivated individual. As such, an achievement motivated individual is unlikely to be provoked to change his social information processing in any specific direction.

In terms of the power motive, while there has been studies demonstrating strong reactions to affiliation stressors, it appears that their response is characterised largely by violence and rage (Chow, Tiedens & Govan, 2008; Leary, Twenge & Quinlivan, 2006; Leary, Kowalski, Smith & Phillips, 2003). According to Baumeister and Sommer (1997), males and females do differ in their preference for the types of social relationships in that females prefer close-knit dyads while males gravitate towards big groups. However, both genders are concerned about the recognition and acknowledgement from peers, and that their sense of social aptitude and self-image hinges on affirmation by peers. Humans inherently desire favourable attention which helps explain why some individuals would respond in antisocial ways following episodes of rejection. Humans could be upset, distressed or even angered should one feel non-existent (Nezlek, Wesselmann, Wheeler & Williams, 2002; Leary, Twenge & Quinlivan, 2006; Warburton, Williams & Cairns, 2006). Relatedly, our Cyberball configuration allows the participant only two tosses at the start of the game before being completely sidelined by the other two “players” (i.e. the computer). As such it is highly probable that participants could perceive themselves as invisible to the other “players”, a personally upsetting situation that may be especially distasteful to individuals predisposed to seek influence and control over social others. Although it is my opinion that power motivated individuals could be provoked by social rejection

to the extent that their perceptual judgment is clouded, literature examining the implicit power motive in association with affiliation stress or social rejection was scarce. As such, I did not predict or hypothesise effects in either direction pertaining to the power motive. Nonetheless, I did expect a dominant power motive to assert a larger effect on emotion recognition ability than a dominant achievement motive.

In Study 2, rejection sensitivity (high or low) and dominant motive (affiliation, power or achievement) were considered as within-subjects factors and affiliation stress (social acceptance or social rejection condition) as a between-subjects factor on emotion recognition ability. In this paradigm, emotion recognition ability is measured as the accuracy in which participants managed to identify the target emotion in presented stimuli of the GERT-S. We expected to find positive effects of implicit affiliation motivation on an individual's emotion recognition accuracy after an experience of social rejection.

Hypotheses

H2a: Affiliation stress (state) and dominant affiliation motive interacts to affect a person's overall emotion recognition ability.

H2b: Rejection sensitivity (trait) and dominant affiliation motive interacts to affect a person's overall emotion recognition ability.

H2c: Affiliation stress (state), rejection sensitivity (trait) and dominant affiliation motive interact to affect a person's overall emotion recognition ability.

4.1.1 Methodology

Participants

Ninety four participants were recruited for this study. Data from 17 participants were excluded due to incomplete responses or poor quality. 62.3% of participants were females. The sample comprised 80.5% Chinese and 4% Indians and 15% of participants did not provide information about ethnicity. The sample comprised 72.7% Singaporeans, 5% Malaysians and 3% Chinese nationals, 3% Indian nationals, 1% Indonesians and 15% of participants did not provide information about nationality. The mean age of the participants was 23.08 years with a standard deviation of 3.47. Participants were recruited from NTU's research participation pool and also by means of the snowball technique. Participation was completely voluntary and responses were kept anonymous (by assignment of an alphanumeric code) unless participants volunteered means of identification. Participants completed a battery of tests on two online experimental and survey platforms – Inquisit (Millisecond Software, Seattle, WA) and Qualtrics (Qualtrics Labs Inc., Provo, UT). Approval for the study was given by the institutional review board prior to the commencement. Across all phases of data collection, it was communicated to participants that a dedicated time period is required for the focused completion of the entire study. Participants were also given multiple reminders (by means of email and text messages) to ensure the working condition of an audio-visual enabled laptop prior to attempting the study. It was also clearly communicated that data will be reviewed for quality and completeness before the promised compensation would be accorded.

Measures and Manipulation

Implicit motives and emotion recognition ability were measured in Study 2 using the same measures as in Study 1. Rejection sensitivity was measured in Study 2 using the Rejection Sensitivity Questionnaire for adults (A-RSQ; Downey & Feldman, 1996).

Rejection-sensitivity. The Rejection Sensitivity RS-Adult questionnaire (ARSQ; Berenson, Gyurak, Downey, Ayduk, Mogg, Bradley & Pine, 2009) is used to measure sensitivity to actual or perceived rejection in social and interpersonal interactions. The questionnaire was conceptualised to help researchers account for the role of rejection sensitivity in maladaptive patterns of interpersonal interaction. The Rejection Sensitivity RS-Adult questionnaire (ARSQ) measures one's tendency to anxiously expect, perceive and react to rejection in an intense manner (Berenson et al., 2009) as if rejection sensitivity were a trait variable that is expected to shape one's social cognitive processing similarly across situations and time.

Affiliation Stress. The moderator variable of affiliation stress was experimentally manipulated using a virtual ball-tossing game, *Cyberball* (Williams & Jarvis, 2006). Cyberball procedure has been established as a viable manipulation for a social rejection context, even when participants were cognizant of the fact that they were playing with a computer (Zadro, Williams & Richardson, 2004). Cyberball is a virtual ball-tossing game that has been used for research on ostracism, social exclusion or rejection. Participants engaged in a virtual ball-tossing activity with two other players who are anonymously named 'Player A' and 'Player X'. To give the impression that the

task was ostensibly aimed at assessing the effect of mental visualization on performance, participants were instructed at the start that the task is one of mental visualisation, challenging participants to mentally visualise the experience of playing the ball-tossing game with two other players in reality. This explicit instruction was employed specifically to mitigate for the possibility of participants deriving the true intention of the game (i.e. to manipulate rejection). Participants were also prompted to consider what the other players would look like and how the weather would be while playing the game. Additionally, participants were informed prior that they were playing with other real individuals logged on to the network although in reality, they were actually playing with a computer based on a predetermined algorithm that manipulated an acceptance or rejection context. All of these preceding instructions were introduced as a subtle suggestion of potential social consequences as per a realistic social situation. During the game, a total of 30 tosses were made, lasting approximately four minutes. Additionally, the time taken for 'Player A' and 'Player X' to toss the ball after receiving it was manipulated (i.e. extended to 10 seconds instead of an immediate response) to better mimic the decision-making process of a real participant.

Participants were randomly assigned to one of two groups. Participants in one group (*Social Acceptance*) experienced social acceptance and the ball was preset to be randomly tossed to them 33% of the time, which would result in an approximately equal number of tosses received per player in the trio. The other group (*Social Rejection*), experienced social rejection and the ball was preset to be specifically tossed back to them only twice, once from each player at the start of the game, after which 'Player A' and 'Player X' only tossed the

ball back and forth between themselves, excluding the participant. This would leave the participant in an attentive limbo, awaiting the ball to be tossed to him while watching the exchange between ‘Player A’ and ‘Player X’ onscreen. In order to further heighten the feeling of purposeful rejection by social others, the three-player set-up was selected to visually emphasise the participant being singled out from the trio.

Procedure

Voluntary informed consent was obtained prior to commencement. Participants were provided with substantial information relevant to the study, including the ostensible purpose of furthering research in the psychology behind emotion recognition ability. They were also informed about the various components in the study (i.e. picture story writing task, questionnaires, virtual game and emotion recognition test) as well as the estimated time taken to complete the entire study. Information about investigators was presented before participants expressed their choice to participate. Should the participants choose not to participate after reading the electronic consent form or should they wish to discontinue at any point, no penalty was imposed. In the case of NTU Research Pool (NTU RP) students, they would be able to withdraw their participation and they would be allowed to re-select another study to participate in for their course credits. In the case of the general participant recruited through convenience sampling or through the MTurk platform, withdrawal at any point also did not incur any penalty or financial loss to them.

Participants were first asked to complete the PSE, followed by the ARSQ, the Cyberball game and finally the GERT-S. In order to experimentally

manipulate affiliation stress, Cyberball (introducing a social rejection context) had to be conducted prior to participants' attempt of the GERT-S.

Data Quality Review

Picture Story Exercise (PSE). Data from participants were reviewed for quality and completeness—participants' data were excluded if their data met at least one of the following exclusion criteria: (a) incomplete attempt of the entire set of six stories (Given that each story is expected to arouse different motives, a strict 100% completeness decision was made a-priori.) or (b) incomprehensible or nonsensical content characterised by disjointed fragments of unrelated content indicating a “cut and paste” strategy from unknown sources.

Geneva Emotion Recognition Test (GERT-S). Data from participants were reviewed for quality and completeness—participants' data were excluded if their data fulfilled at least one of the following exclusion criteria: (a) no attempt (b) any incomplete attempt (Given that the 42-item test covers 14 different emotions and the recognition of each target emotion is tested only thrice, a strict 100% completeness decision was made a-priori.) or (c) suspected perfunctory attempt characterised by patterns of identical answers for consecutive questions (e.g. blindly selecting “anger” as the answer to five consecutive presented stimuli followed by selecting “joy” to the next five consecutive presented stimuli).

Data for the other measure(s) were also reviewed for quality and completeness but as they were straightforward and fairly short surveys, there were few challenges encountered by participants.

4.1.2 Statistical Analysis and Results

Deriving motive scores for analysis

Each participant submitted six stories for coding, and each story was coded for the three motives of affiliation, power and achievement. The scores of affiliation, power and achievement from the stories were then accumulated to derive, for each participant, a total affiliation score, power score and achievement score. The total scores from all participants were then calculated for sample mean before being used to derive the z-scores. Each participant would then have a z-score for affiliation, power and achievement respectively. These z-scores indicate both within and between subject differences in motive scores. As our study's hypotheses required a comparison of participant's dominant motive rather than simply whether participants were high or low on the motive, the within-subject z-scores were further compared to derive their dominant motive. For instance, if a participant's nAffiliation z-score is highest as compared to his nPower or nAchievement z-score, the participant would be coded as having a dominant affiliation motive or affiliation-motivated (denoted as "1" in SPSS data set). This means to say that even if a participant's z-score for nAffiliation is high as compared to the rest of the participants in the sample (between-subject), we cannot assume that the participant's dominant motive is affiliation unless his nAffiliation z-score is also highest as compared to his nPower or nAchievement z-score (within-subject). This distinction is important for our study as we expect that dominance in one of the implicit motives is particularly associated with emotion recognition ability. Participants were thereafter categorized based on their dominant implicit motive: Affiliation

(denoted as “1”), power (“2”) and achievement (“3”).

Deriving Rejection Sensitivity scores

Often examined as a personal factor in socio-cognitive research, rejection sensitivity (RS) refers to a tendency to anxiously expect rejection. A person high in rejection sensitivity is expected to be particularly concerned about rejection and acceptance by others, and this concern is expected to be consistent across time and situations. In order to measure this individual tendency and place individuals on a spectrum, the Rejection Sensitivity questionnaire (RSQ; Downey & Feldman, 1996) was developed to include nine situations in which rejection or acceptance by others is possible. The Adult-RSQ (A-RSQ; Berenson, Gyurak, Downey, Ayduk, Mogg, Bradley & Pine, 2009) is an adaptation of the original RSQ, focused on the assessment of rejection sensitivity in adults and includes situations involving spouses, romantic partners and sexual partners. Based on scoring instructions (Berenson, Gyurak, Downey, Ayduk, Mogg, Bradley & Pine, 2009), a rejection sensitivity score for each of nine situations is calculated by multiplying the level of rejection concern (the response to the first segment of the question) by the level of rejection expectancy (the reverse of the level of acceptance expectancy reported in response to the second segment of the question). For example, if someone responded to the first situation with a 5 (first segment) and a 2 (second segment), their rejection concern score is a 5, and their rejection expectancy score is $(7-2)$ or 5. So their rejection sensitivity score for this situation would be 5×5 or 25. Every score will be between 1 and 36. The total rejection sensitivity score is the mean of the rejection sensitivity scores for the nine situations. The

total score will also be between 1 and 36. Thereafter, the median of the sample was used as a cut point to categorise participants as high or low.

Results

Table 3

Means and Standard Deviations on the Measure of Emotion Recognition Ability (GERT-S)

		Low		High		
		Rejection Sensitivity		Rejection Sensitivity		
	Dominant Motive	M	SD	M	SD	N
Social Acceptance	Affiliation	20.67	5.72	25.63	2.67	17
	Power	23.25	2.87	22.13	5.22	12
	Achievement	24.25	4.95	22.00	3.85	16
Social Rejection	Affiliation	22.86	1.46	20.75	5.97	11
	Power	24.00	3.56	25.38	3.70	12
	Achievement	23.50	3.11	23.00	7.81	9

Notes. N=77

Table 4

ANOVA table for three way interaction (GERT-S)

Predictor	Sum of Squares	df	Mean Square	F	p	Effect size
(Intercept)	37013.6	1	37013.6	1809.64	.000	.965
AS	1.179	1	1.179	.058	.811	.001
RS	.059	1	.059	.003	.957	.000

DM	17.458	2	8.729	.427	.654	.013
AS × RS	3.813	1	3.813	.186	.667	.003
AS × DM	32.416	2	16.208	.792	.457	.024
RS × DM	23.61	2	11.805	.577	.564	.017
AS × RS × DM	85.377	2	42.689	2.087	.132	.06
Error	1329.482	65	20.454			
Total	1529.429	6				

Notes. N=77, AS=Affiliation Stress; RS=Rejection Sensitivity; DM=Dominant Motive.

I hypothesised that the experience of social rejection would enhance the emotion recognition ability of affiliation-motivated individuals. A mixed-design ANOVA with rejection sensitivity and dominant motive as within-subjects factors and affiliation stress as a between-subjects factor on emotion recognition ability was conducted to test the hypothesis: 3 (dominant motive: affiliation or power or achievement, between-subject) × 2 (rejection sensitivity: high or low, within-subject) × 2 (affiliation stress: social acceptance or social rejection, between-subject) ANOVA. In this paradigm, emotion recognition ability is measured as the accuracy in which participants managed to identify the target emotion in presented stimuli of the GERT-S. Results did not support my predictions for Study 2, there were no statistically significant two-way interaction between affiliation stress and dominant motive, $F(2,65) = .792, p = .457$; no statistically significant two-way interaction between rejection sensitivity and dominant motive, $F(2,65) = .577, p = .564$; and no statistically significant three-way interaction between rejection sensitivity, dominant motive and affiliation stress, $F(2,65) = 2.087, p = .132$.

4.1.3 Brief Discussion of Study 2

Study 2 set out to investigate motive differences in the recognition of emotions after an experience of affiliation stress. Specifically, we were interested in motive-specific advantage for the identification of emotions. No significant interactions between affiliation stress, dominant motives and rejection sensitivity was found.

Some participants had commented about the challenging nature of the GERT-S, citing specifically the duration of the task and the inability to re-play the audio-video stimuli presented. Even though the GERT-S had already been chosen over the original GERT (which is twice as long in duration to complete), it was possible that the dynamic portrayal of emotions using multiple sensory channels was too complex. The GERT-S only allows participants one chance to look at the face of the actor, the body language of the actor and listen to the actor's voice at the same time in order to discern the emotion being expressed. Recognising that this could have compromised the results, we decided on replicating the experiment with a different emotion recognition test. The three-way interaction between dominant motives, rejection sensitivity and affiliation stress on emotion recognition ability was examined again using our second test—Emotion Recognition Index (ERI).

The ERI was chosen because the presented stimuli of the vocal subset closely mirror those of the vocal components of the videos in the GERT-S. Similar to the videos presented in the GERT-S, the vocal subset of the ERI involves radio actors intonating one of two pseudo-linguistic sentences

(sentences that resemble natural speech but are literally meaningless) according to the target emotion.

In consideration of participants' feedback, the ERI was identified suitable to be used as an alternative dependent measure of emotion recognition accuracy for its separate assessment of the facial and vocal expressions of emotions. The GERT-S explores emotion recognition accuracy by means of dynamic, simultaneous presentation of emotions in multiple modalities (i.e. face, voice and body). Having to process multiple channels of sensory information could have been too distracting or too challenging for participants. On the other hand, the ERI separately presents facial and vocal expressions of emotion in either (a) static faces or (b) voice recordings, which is significantly more straightforward and less complex for participants. Additionally, in the ERI, participants have the option to repeat the voice recordings should they require it.

4.2 Study 3

Study 3 was designed to test my hypotheses about the link between affiliation stress, implicit motives, and emotion recognition ability (ERA) by using a different measure of emotion recognition accuracy - the Emotion Recognition Index (ERI; Scherer & Scherer, 2011). Like the GERT-S, the ERI is designed to assess individual's accuracy in interpreting emotions in faces as well as emotions in voices. The key difference is that the ERI separately presents (a) facial expressions of emotion in static faces or (b) vocal expressions of emotion in voice recordings. Having considered that the multiple demands of the GERT-S may have unwittingly impaired the participants'

ability to meaningfully process presented stimuli, and obscured any effects of participants' implicit motives on their ERA, Study 3 aimed to delineate the effect of implicit motives on ERA by employing an alternative dependent measure.

4.2.1 Methodology

Participants

The sample for this study consisted of 67 adults. The original participant count was 76 but data from nine participants were excluded due to incomplete responses or poor quality. Participants completed a battery of tests through two online experimental and survey platforms – Inquisit (Millisecond Software, Seattle, WA) and Qualtrics (Qualtrics Labs Inc., Provo, UT). Approval from the institutional review board was obtained prior to the commencement of the study. Participants were recruited from either the university's research participation ("NTU RP") pool or through Amazon Mechanical Turk ("MTurk"). As the university has a fixed number of undergraduate participants each academic semester and that convenience sampling via word of mouth has also been exhausted for Studies 1 and 2, I extended my recruitment strategy to the online labour pool, also known as crowdsourcing. Crowdsourcing on the MTurk platform functions similarly to convenience sampling, but on a virtual platform where participants are incentivised with monetary remuneration. Notably, MTurk and NTU RP operate in a similar fashion, allowing participants to select studies from a list with a number of available alternatives (based on their needs and preferences). Similar to NTU RP, MTurk's interface necessitates a short summary of the study as well as the promised remuneration

to aid the potential participants' decision whether to participate or not. In the case of NTU RP, students are promised credits that would count towards their final academic grade while MTurk participants are promised money.

Participants from MTurk who completed my study were compensated with USD\$2.00 for their effort. This amount was decided on after browsing other listed studies to estimate the "market rate" and determining a remuneration attractive enough to promote recruitment without undue inducement. As recommended, measures were employed to deter the undesirable and conniving MTurk worker (Paolacci & Chandler, 2014; Buhrmester, Kwang, Gosling, 2011). Measures were put in place to ensure the quality of the data and the veracity of analysis: (a) Criteria of English language proficiency and a minimum high school education were specified for MTurk participants; (b) A specific algorithm was programmed into the MTurk-Qualtrics link to ensure that data from all components could be verified and matched to each participant prior to approval; (c) All data were checked for quality prior to inclusion for analysis. Participation was voluntary and anonymity of responses was maintained unless participants volunteered means of identification. 60.6% of participants were females. The sample comprised 65.1% Americans, 15% Singaporeans, 9% Indian nationals and 10.9% others (Italian, Brazilian, Bangladeshi, Kenyan and Filipino). The mean age of the participants was 34.24 years with a standard deviation of 11.34. Across all phases of data collection, it was communicated to participants that a dedicated time period is required for the focused completion of the entire study. Participants were also given multiple reminders (by means of email and text messages) to ensure the working condition of an audio-visual enabled laptop prior to attempting the

study. It was also clearly communicated that data will be reviewed for quality and completeness before the promised compensation would be accorded.

Measures and Manipulation

Implicit motives, rejection-sensitivity trait and emotion recognition ability were measured in Study 3 using the same measures as in the previous two studies. Mirroring the protocol of Study 2, the moderator variable of affiliation stress was experimentally manipulated using a virtual ball-tossing game, *Cyberball* (Williams & Jarvis, 2006). The measure of emotion recognition ability for Study 3 was the Emotion Recognition Index (ERI; Scherer & Scherer, 2011).

Emotion Recognition Index

The ERI is a rapid screening instrument measuring ERA, consisting of a separate facial and vocal subset. They each measure an individual's accuracy in detecting sad, fearful, angry, happy and neutral expressions. The facial subset involves posed expressions from the Pictures of Facial Affect set (Ekman & Friesen, 1976) that are presented for three seconds, while the vocal subset is composed of recordings by actors, lasting about three to five seconds. The facial subtest uses pictures of posed expressions from the Pictures of Facial Affect set (Ekman & Friesen, 1976) that are each presented for 3 seconds. The vocal subtest is performed by radio actors and is composed of recordings that are part of the Geneva Vocal Emotion Expression Stimulus Set corpus (Banse & Scherer, 1996). The verbal content is one of two pseudo-linguistic sentences that resemble natural speech but are devoid of literal meaning. In both the facial

and vocal subtests, after they have been presented the stimuli, participants are asked to choose, without time limitation, the target emotion that had been expressed in the face or voice. A total score from each subset is computed from the number of items in which the participant's response matched the target emotion.

Procedure

Voluntary informed consent was obtained prior to commencement. Participants were provided with substantial information relevant to the study, including the ostensible purpose of furthering research in the psychology behind emotion recognition ability. They were also informed about the various components in the study (i.e. picture story writing task, questionnaires, virtual game and emotion recognition test) as well as the estimated time taken to complete the entire study. Information about investigators was presented before participants expressed their choice to participate. Should the participants choose not to participate after reading the electronic consent form or should they wish to discontinue at any point, no penalty was imposed. In the case of NTU Research Pool (NTU RP) students, they would be able to withdraw their participation and they would be allowed to re-select another study to participate in for their course credits. In the case of the general participant recruited through convenience sampling or through the MTurk platform, withdrawal at any point also did not incur any penalty or financial loss to them.

Study 3 employed a similar experimental procedure to Study 2. Participants were first asked to complete the PSE, followed by the ARSQ, the Cyberball game and finally the ERI. In order to experimentally manipulate

affiliation stress, Cyberball (introducing a social rejection context) had to be conducted prior to participants' attempt of the ERI.

Data Quality Review

Picture Story Exercise (PSE). Data from participants were reviewed for quality and completeness—participants' data were excluded if their data met at least one of the following exclusion criteria: (a) incomplete attempt of the entire set of six stories (Given that each story is expected to arouse different motives, a strict 100% completeness decision was made a-priori.) or (b) incomprehensible or nonsensical content characterised by disjointed fragments of unrelated content indicating a “cut and paste” strategy from unknown sources.

Emotion Recognition Index (ERI). Data from participants were reviewed for quality and completeness—participants' data were excluded if their data fulfilled at least one of the following exclusion criteria: (a) no attempt (b) any incomplete attempt or (c) suspected perfunctory attempt characterised by patterns of identical answers for consecutive questions (e.g. blindly selecting “anger” as the answer to consecutive presented stimuli or selecting “neutral” as the answer to every question).

4.2.2 Statistical Analysis and Results

As in Study 2, the dominant motive (affiliation, power or achievement) and rejection sensitivity (high or low) were derived in similar ways for Study 3.

In Study 3, emotion recognition ability was measured as accuracy in recognising target emotions from both the facial subset of the ERI (ERI Facial)

and the vocal subset of the ERI (ERI Vocal). Scores are computed in percentages for the total accuracy across both subsets (ERI Total), for the facial subset (ERI Facial) and for the vocal subset (ERI Vocal).

Results

I hypothesised that the experience of social rejection would enhance the emotion recognition ability of affiliation-motivated individuals. To test this hypothesis, I conducted a 3 (dominant motive: affiliation or power or achievement, between-subject) $\times$ 2 (rejection sensitivity: high or low, within-subject) $\times$ 2 (affiliation stress: social acceptance or social rejection, between-subject) ANOVA on participants' emotion recognition ability. In this paradigm, emotion recognition ability is defined as the accuracy in which participants managed to identify the target emotion in the facial and vocal subsets of the ERI test.

Table 5

Means and Standard Deviations on the Measure of Emotion Recognition Index (ERI Facial)

		Low		High		
		Rejection Sensitivity		Rejection Sensitivity		
	Dominant Motive	M	SD	M	SD	N
Social Acceptance	Affiliation	75.33	4.04	75.173	5.42	9
	Power	71.75	9.94	70.00	5.39	13
	Achievement	73.17	5.76	73.33	9.48	13
Social Rejection	Affiliation	65.44	13.02	64.82	15.374	20
	Power	70.00	-	73.50	4.95	3
	Achievement	65.00	8.37	59.00	3.464	9

Notes. N=67.

Table 6

Means and Standard Deviations on the Measure of Emotion Recognition Index (ERI Vocal)

		Low		High		
		Rejection Sensitivity		Rejection Sensitivity		
	Dominant Motive	M	SD	M	SD	N
Social Acceptance	Affiliation	62.33	10.786	56.17	12.937	9
	Power	62.50	13.016	66.60	13.145	13
	Achievement	63.00	11.711	56.67	11.928	13
Social Rejection	Affiliation	57.78	16.006	50.18	17.180	20
	Power	50.00	-	60.00	9.899	3
	Achievement	58.83	7.985	43.33	16.503	9

Notes. N=67.

A mixed-design ANOVA with rejection sensitivity (high or low) and dominant motive (affiliation, power or achievement) as within-subjects factors and affiliation stress (social acceptance or social rejection) as a between-subjects factor was conducted. Against my six predictions for Study 3, there was no statistically significant interactions between affiliation stress, rejection

sensitivity and dominant motive on emotion recognition ability. Even though I further analysed the participants' accuracy by facial or vocal modality (Table 7 and Table 8), no significant interactions were found.

Facial modality. There was no statistically significant two-way interaction between affiliation stress and dominant motive, $F(2,55) = 1.212$, $p = .305$; no statistically significant two-way interaction between rejection sensitivity and dominant motive $F(2,55) = 0.163$, $p = .85$; and no statistically significant three-way interaction between rejection sensitivity, dominant motive and affiliation stress, $F(2,55) = .220$, $p = .803$.

Vocal modality. There was no statistically significant two-way interaction between affiliation stress and dominant motive, $F(2,55) = .136$, $p = .874$; no statistically significant two-way interaction between rejection sensitivity and dominant motive $F(2,55) = 1.365$, $p = .264$; and no statistically significant three-way interaction between rejection sensitivity, dominant motive and affiliation stress, $F(2,55) = .215$, $p = .807$.

Table 7

ANOVA table for three way interaction - Emotion Recognition Ability (ERI Facial)

Predictor	Sum of Squares	df	Mean Square	F	p	Effect size
(Intercept)	210070.37	1	210070.37	2008.129	.000	.973
AS	520.611	1	520.611	4.977	.030*	.083
RS	9.288	1	9.288	.089	.767	.002
DM	96.874	2	48.437	.463	.632	.017
AS × RS	.141	1	.141	.001	.971	.000
AS × DM	253.677	2	126.839	1.212	.305	.042
RS × DM	34.035	2	17.018	.163	.850	.006
AS × RS × DM	46.015	2	23.008	.220	.803	.008
Error	5753.549	55	104.610			
Total	329074.00	67				

Notes. N=67, *p < .05, AS=Affiliation Stress; RS=Rejection Sensitivity;

DM=Dominant Motive.

Table 8

ANOVA table for three way interaction - Emotion Recognition Ability (ERI Vocal)

Predictor	Sum of Squares	df	Mean Square	F	p	Effect size
(Intercept)	141969.703	1	141969.703	747.668	.000	.931
AS	690.464	1	690.464	3.636	.062	.062
RS	149.754	1	149.754	.789	.378	.014
DM	103.493	2	51.746	.273	.762	.010
AS × RS	.4417	1	4.417	.023	.879	.000
AS × DM	51.462	2	25.731	.136	.874	.005
RS × DM	518.244	2	259.122	1.365	.264	.047
AS × RS × DM	81.645	2	40.823	.215	.807	.008
Error	10443.582	55	189.883			
Total	236113.00	67				

Notes. N=67, AS=Affiliation Stress; RS=Rejection Sensitivity; DM=Dominant Motive.

Table 9

Main effects of Affiliation Stress in Emotion Recognition Ability (ERI Facial)

Affiliation Stress	Mean	SD	N
Social Acceptance	73.09	7.159	35
Social Rejection	65.19	11.909	32
Affiliation Stress Effect	7.9		

Main effects

As seen from Table 7, main effects of affiliation stress was indicated for participants' performance on the ERI test, albeit only in the facial modality. The main effect of affiliation stress on ERI (Facial) scores was significant—participants in the social acceptance condition were more accurate in recognising emotions in faces, $F(1,55) = 4.977$, $p = .03$, than participants in the social rejection condition. Further analysis (Table 9) revealed that there was an effect of affiliation stress on participants' performance on the ERI facial subset, averaging across dominant motive and rejection sensitivity. This suggests that participants who did not experience affiliation stress accurately identified more target emotions in facial expressions of emotion than participants who experienced affiliation stress. An additional independent-samples t-test was conducted to compare accuracy in identifying facial expression of emotions in

social acceptance and social rejection conditions. There was a significant difference in accuracy between social acceptance and social rejection participants ($t_{59.931} = -3.253, p = .002$). This result is consistent with the idea that affiliation stress affects one's emotion recognition.

4.2.3 Brief Discussion of Study 3

Study 3 set out to investigate motive differences in the recognition of facial and vocal emotions after an experience of affiliation stress. I was interested in the possibility of a motive-specific advantage in emotion recognition accuracy. However, no significant interactions between affiliation stress, dominant motives and rejection sensitivity was found across the facial and vocal modality. Based on the findings from Study 3, we conclude the following from our experiment: (a) Main effects: Affiliation stress affects accuracy in identifying emotions in faces, but not in voices. Specifically, accuracy in identifying emotions in faces is attenuated by social rejection. (b) Interaction effects: Affiliation stress, rejection sensitivity and dominant affiliation motive were not statistically found to interact to affect recognition accuracy of emotion cues in faces or voices. The null hypothesis could not be rejected for H3a, 3b, 3c, 3d, 3e, and 3f.

Observation of dominant motives and affiliation stress on emotion recognition ability

Although further analyses did not yield any significant interaction effects between dominant motives, rejection sensitivity and affiliation stress, an interesting trend was noticed in post-hoc analyses when we plotted dominant

motives, affiliation stress and accuracy scores on the GERT-S, as well as on the ERI.

A dominant power motive in socially rejected individuals was observed to be consistently related to a higher score on both the GERT-S and the ERI. Additionally, this was observed to be so even when we delineated the ERI scores into two separate scores for facial and vocal modalities. As seen in Figure 1, this observation, while not supported by statistical significance, graphically displays a possibility that affiliation stress could have an enhancing effect on participants with a dominant power motive. Participants with a dominant power motive in both the social acceptance and rejection conditions appeared to be more accurate (than dominant affiliation or dominant achievement) in identifying vocal emotions. Notably, those in the social rejection condition were more accurate in identifying facial emotions than their counterparts in the acceptance condition. This trend observation is contrary to my assumption that power motivated individuals would be so irked and frustrated by the social rejection that their perceptual judgment is clouded by rage, thus impairing their ability to interpret and identify emotions accurately.

Figure 1. Estimated marginal means of accuracy on the ERI test for dominant motives.

Further thoughts regarding the results from Study 1, 2 and 3 will be further discussed in Chapter 5.

CHAPTER FIVE

DISCUSSION

The aim of this research was to establish the relationship between implicit motives and emotion recognition ability, and to investigate how the manipulation of affiliation stress can influence emotion recognition ability. To this end, three experiments were carried out, in which participants' accuracy in identifying target emotions were measured using two emotion recognition tests.

How do people with different dominant motives process socially relevant information? While social connection is a universal desire, are affiliation motivated individuals more attuned to reading and accurately identifying emotions in others? What is the role of important social stressors, such as affiliation stress caused by social rejection and rejection sensitivity in these processes? How do affiliation motivated individuals who have experienced affiliation stress process socially relevant information? These questions were conceptualised as hypotheses across three studies outlined earlier in Table 1. The aim of my research is to answer these questions, or at the very least to provide some direction for future research that could eventually answer these questions, about how emotional recognition ability is affected by implicit motives and affiliation stress.

5.1 Dominant motives and emotion recognition ability

The first study in this research explored whether implicit motives are related to emotion recognition ability, specifically if a dominant implicit motive would be related to higher accuracy in emotion recognition. The fundamental purpose of Study 1 was to measure emotion recognition ability and its relationship with implicit motives so as to derive preliminary evidence in support of the hypothesis that this ability may be affected by dominant motives (affiliation, power or achievement). Although previous studies have found support for the correlation between implicit motives and the recognition of facial expressions of emotions (FEEs), to the best of my knowledge no study has investigated the correlation between implicit motives and emotion recognition as a holistic ability to accurately identify facial *and* vocal expressions of emotions in others. The present study set out to demonstrate that implicit motives are correlated with this ability involving the accurate recognition of emotions beyond just FEEs. Study 1 explored the correlational relationship between implicit motives and emotion recognition ability. While the first study was exploratory in nature, I expected a dominant affiliation motive (“affiliation motivated individuals”) to be associated with higher recognition accuracy relative to a dominant power motive (“power motivated individuals”) or a dominant achievement motive (“achievement motivated individuals”). If proven as hypothesised, that would imply that different motives correspond to different emotion recognition abilities. It would also indicate that a dominant affiliation motive potentiates accuracy in the interpretation of emotion cues, pointing towards a motive-specific advantage in emotion recognition ability. The implicit affiliation motive is operationally

defined as a concern for developing, nurturing or restoring close, friendly relationships with social others. Our results in Study 1 however, showed no clear effects of any dominant motive predisposing emotion recognition ability. Then, it was considered that since emotion recognition ability involves accuracy in reading and interpreting emotional cues in social others, which necessitates the context of interpersonal interaction to some degree, a catalytic social situation needed to be included into the equation. Thereafter, in order to examine implicit motives and emotion recognition within a social context, I sought a social rejection paradigm to provide social consequences for participants. This ensured that participants would not approach the emotion recognition test as if it were merely a task. With the assumption that a social trigger must be included in the experimental design to arouse motive-congruent tendencies, Study 2 and 3 were subsequently conceptualised to investigate moderation effects of affiliation stress on the relationship between dominant motives and emotion recognition ability. While Williams (2007) has taken to describing the pain of being rejected as social pain, our present study prefers the term affiliation stress, as it better encapsulates the idea that a rejection episode is a psychologically distressing one, and that it results in feelings of stress, rather than physical pain per se.

5.2 Dominant motives, rejection sensitivity, affiliation stress and emotion recognition ability

Study 2 and 3 both investigated the theoretical postulation that emotion recognition ability (ERA) is enhanced when affiliation stress is elicited, especially in individuals whose dominant implicit motive is affiliation.

Behavioural reactions to rejection by others are however, divergent. Some studies report some evidence of conciliatory impulses and desires for inclusion (Williams & Sommer, 1997; Williams, Cheung & Choi, 2000). Whereas, other studies demonstrate counterintuitive reactions of anger and retaliatory impulses (Twenge, Baumeister, Tice & Stucke, 2001). Do socially rejected people react prosocially or antisocially? The question to consider is possibly, which implicit motive accounts for retaliatory, conciliatory or even indifferent behaviours when one experiences affiliation stress. Specifically, I hypothesised that the experience of social rejection would enhance the emotion recognition ability of affiliation-motivated individuals as the literature (Schultheiss & Hale, 2007; Koestner & McClelland, 1992) suggests that the affiliation motivation could account for desperate attempts and relentless efforts for closeness and attention, especially in the face of social rejection. I would argue that this very overwhelming fear of rejection or affiliative anxiety predisposes those with affiliation motivation, as the dominant motive, to notice social cues in the aftermath of social rejection. Moreover, implicit affiliation motive, rejection sensitivity and affiliation stress were suggested to share similar tenets related to the preservation of positive social connections. In Study 2 and Study 3, rejection sensitivity (high or low) and dominant motive (affiliation, power or achievement) were considered as within-subjects factors and affiliation stress (social acceptance or social rejection condition) as a between-subjects factor on emotion recognition ability. In Study 2, emotion recognition ability was measured as the accuracy in which participants managed to identify the target emotion in presented stimuli of the GERT-S. In Study 3, emotion recognition ability was measured as the accuracy in which participants managed to identify

the target emotion in the ERI. We expected to find positive effects of implicit affiliation motivation on an individual's emotion recognition accuracy after an experience of social rejection.

However, moderation analyses of affiliation stress in subsequent experiments (Study 2 and 3) also did not yield any clear moderation effects. The only significant result was the main effects of affiliation stress on emotion recognition ability. The results demonstrated that emotion recognition ability was affected by affiliation stress, which is consistent with existing literature. Specifically, participants in the social rejection condition and experienced affiliation stress were found to be less accurate at identifying target emotions in faces than participants in the social acceptance condition. No difference was found for the identification of target emotions in voices.

Analysis with rejection sensitivity

To understand the role of rejection sensitivity as a moderator of the effects of implicit motives, I performed analyses in both Study 2 and 3 including participants' rejection sensitivity score as a moderator. I will not discuss this in further detail since there was no interaction with implicit motives or affiliation stress. A new thread of research related to rejection sensitivity investigated rejection sensitivity against rejection detection capability and found that they were not significantly related (Kawamoto, Nitton & Ura, 2015). It appears that while rejection sensitivity is positively related to social rejection, rejection sensitivity is believed to be separate and different from the ability to accurately identify emotion cues. Instead, rejection sensitivity appears to intensify vigilance and a defensive response to what an individual perceives to

be “cues”. This means that rejection sensitivity simply directs participants’ attention to subjectively perceive cues of threat (even if they were not) without enhancing participants ability to recognise specific emotions. Their findings present a probable explanation for why despite sharing similar tenets to implicit affiliation motive, affiliation stress and emotion recognition, rejection sensitivity has not been found to be related to any of the constructs.

Analysis with affiliation stress

My finding about affiliation stress impairing recognition accuracy of emotions in faces seem counterintuitive given the social reconnection effect reported in literature and in the context of the Tend and Befriend theory. The better-known effect of rejection on individuals’ processing of social information has been termed “tuning to positivity” (DeWall, Twenge, Koole, Baumeister, Marquez, Reid, 2011) and understood as a desire for social reconnection (Maner, Baumeister, DeWall & Schaller, 2007). DeWall, Maner & Rouby (2009)’s study helped elucidate that rejected individuals are attentionally biased towards signals of social acceptance. This attentional bias was particularly pronounced for smiling faces in their experiments. Relatedly, an extension of their primary study also found that an episode of rejection enhanced participants’ positive affect towards others, even though participants were not consciously aware of being so. This finding is especially pertinent in emphasising the automatic and unconscious process of emotion regulation and selectively attending to acceptance-related signals, and how this process serves as a protective mechanism designed to preserve individuals’ sense of self and sense of belongingness.

Findings corroborate with the “Deconstructed state”

While my results are incongruent with the Tend and Befriend theory that was assumed to provide the theoretical underpinnings of the predictions of my research, my results are however consistent with the “deconstructed state” of social rejection described by Twenge, Catanese and Baumeister (2003). Their study focused on demonstrating how social rejection influenced the access to emotions by means of an implicit emotion task involving word guessing. According to their results, rejected participants’ responses included fewer emotion-laden words than accepted participants, supporting their postulation that rejection is associated with an impairment in emotional information processing. The negative effects of social rejection, exclusion and ostracism are very well known. In terms of cognitive performance, rejection and the perceived threat to need to belong had been found to cause significant decreases in cognitive skills (Williams, 2007) and simply the anticipation of being alone negatively affects performance on IQ tests (Baumeister, Twenge, Nuss, 2002). Rejection has also been found to impair participants’ cognitive abilities of self-regulation (Baumeister, DeWall, Ciarocco, Twenge, 2005) and cognitive control (Otten, Jonas, 2013). Just as rejection has debilitating effects on cognitive abilities, it also negatively affects emotional processing, often defined as “emotional (or affective) numbness” (DeWall & Baumeister, 2006).

Although the general impression is that social rejection would lead to immediate emotional distress and social withdrawal, this is not as often the case. Research has proven that emotional hypersensitivity or emotional insensitivity are the immediate responses that then result in reconnection or

disconnection. Moreover, the experience of stress involves the release of cortisol: when one's sense of self is threatened, cortisol changes have been found to be associated with a sense of shame and a lack of social self-esteem (Gruenewald, Kemeny, Aziz & Fahey, 2004; Dickerson, Gruenewald & Kemeny, 2004). All of these corroborating evidence for the negative impact of social rejection has led Twenge and his fellow researchers (2003) to label the state that people are in, following immediate effects of social exclusion, as "the Deconstructed State". My results from Study 3 provides an additional corroborative evidence that social rejection negatively affects emotional processing. Specifically, social rejection impairs recognition of emotions in faces.

5.3 Contribution to the study of affiliation stress and emotion recognition

Studies presenting results for effects of affiliation stress on emotion recognition have largely studied (a) selective attention to social signals of acceptance, (b) enhanced categorical perception or (c) improved detection of certain expressions of the face i.e. smiles (Berstein, Young, Brown, Sacco & Claypool, 2010; 2008; DeWall, Maner & Rouby, 2009; Sacco, Wirth, Hugenberg, Chen, Williams, 2011). However, these studies have yet to examine the effects of affiliation stress on individuals' overall ability to accurately identify target emotions, as I have in my research.

Even among the researchers whose findings corroborate with the "Deconstructed state" hypothesis, it appears that none has focused on measuring accuracy in identifying target emotions. Researchers whose findings

demonstrate negative effects of social rejection have also only measured self-report forecasting of hypothetical situations (DeWall & Baumeister, 2006) or measured conformity to a group's incorrect perceptual judgments (Williams, Cheng & Choi, 2000). Other studies that investigate social rejection by means of an experimental paradigm similar to Cyberball, investigated effects of social rejection on attention to emotions rather than the effects on the accurate identification of emotions. For example, Böckler, Homke & Sebanz (2014)'s study modified the Cyberball paradigm to manipulate gaze exchanges. Their results indicated that the number of eye gaze fixations as well as the duration of eye gaze fixations on other players increased in rejected participants. Notably, the increase in number and duration of eye gaze fixations were specifically focused on the other players whom they believe had the ability to facilitate their reintegration into the group. While these existing studies were referenced closely during my literature review on social rejection and its effects, I noted that the focus was on participants' awareness (i.e. detection of; consciousness of) socio-emotional signals without further querying recognition of emotions being expressed. What I have done in my research is to examine the impact of social rejection (induced by the Cyberball game) on participants' ability to not just detect social signals, but to correctly identify the target emotion being expressed by actors.

Existing studies appear to inform only about social rejection directing people's attention to potentially re-inclusive actors but not about the effects on the individual's ability to accurately identify specific emotions in these actors. Although existing research indicate that rejected individuals may be selectively attentive to the presence of positive valence emotions, prior to my research, it

was not known whether rejected individuals are able to exactly identify which emotion is being expressed (e.g. joy, surprise, pleasure or relief) in others.

Based on existing research, we may have known that affiliation stress sensitises individuals to negative emotions enough to avert attention away from them but it was not yet known whether social rejection has an effect on individuals being able to differentiate among emotions of negative valence (e.g. anger, disgust, fear or sadness). It is possible that my study is the first to examine the link between affiliation stress and emotion recognition ability by measuring explicit identification of target emotions in faces and in voices. As these emotion recognition tests (GERT-S and ERI) involve multiple presented stimuli for each target emotion, they provide an additional benefit of testing consistency in participants' ability to identify certain target emotions. This means that when we assess a participants' ability to identify a target emotion across different test items, we can be better assured that their accurate identification of a target emotion was not a fluke or by chance.

5.4 Limitations and recommendations

First, I observed that the implicit motive task (PSE) and the emotion recognition tasks (GERT-S and ERI) inadvertently caused some discontent due to the length and the mental demands of the tasks. Across the three studies, I excluded some data from the analysis because it was just not relevant to do so, given that the PSE was my primary independent variable (IV) and the emotion recognition test, my sole dependent variable (DV). Since my research aims are focused on ERA, analysis of the other IVs in the absence of a performance measure would be of limited relevance to my research aims. Approximately

10% to 18% of participants were excluded from the final analyses and there is a possibility that if they had been included, the results may differ. The main reasons for exclusion of data from participants across three studies were (a) poor quality of PSE stories and (b) incomplete or perfunctory attempts of the emotion recognition tests. As detailed earlier in the methodology, these exclusion criteria were decided on a-priori. The PSE and the GERT-S in particular demanded focus and attention, which could prove taxing for participants who were not keen to invest the time and energy despite the promised incentive. The PSE has been extensively used and comprehensively studied as a tool to assess implicit motives, and its ability to elicit insights of non-conscious motivations extends research into personality correlates of emotion beyond self-report traits. However, the open-ended nature of the PSE proved daunting for some. The PSE was the first measure in the experimental procedure; participants who did not find the open-ended nature of the PSE palatable were quick to drop out of the experiment and did not move on to subsequent segments. Across the range of emotion recognition tests available, those that include a wider range of target emotions are generally regarded as more ecologically valid. However, when these tests are prolonged to reliably include a substantial range of target emotions, they tend to also be mentally and attentionally demanding, leading to potential test fatigue that could impact validity of results. When researchers include a range of more nuanced emotional expressions (e.g. awe, anticipation, relief, grief, guilt, uncertainty) in tests, the intention is to increase ecological validity of emotion recognition research. However, there are inadvertent drawbacks and considerations. A wider range of emotional expressions in tests also increases the likelihood that

target emotions fall within the same valence category which could prove confusing for participants, especially in the absence of a clear social context (i.e. laboratory setting). Perhaps future studies could incorporate a vignette of sorts to “set the scene” for the participant, without revealing the target emotion. To illustrate, prior to a video clip in the GERT-S, a vignette such as “Amanda is on a first date with John, and he has just said something to which she is responding to” could be provided. The social context of individuals meeting towards a romantic endeavour could help narrow the possibilities of the target emotion while still requiring participants to make complex inferences based on vocal inflexions and micro-expressions. In such a given vignette, emotions such as amusement, pleasure and joy (positive valence) or irritation and disgust (negative valence) might be more likely rather than fear, despair, relief or anxiety.

Second, while I paid attention to the quality of stories that were written by the participants, and weeded out stories that did not meet content requirements or demonstrate a certain language competency, the nature of my research unwittingly resulted in a disproportionate ratio of participants across the three dominant motives. As we had no way to determine or pre-select participants based on their dominant motives (for instance, as one would be able to with gender as a predictor variable), it was observed that we had a clear underrepresentation of dominant affiliation participants that were randomly assigned to the social acceptance condition. To circumvent such disproportion in future studies, it is recommended that the recruitment of participants by dominant motives be conducted separately from the experimental paradigm. This would allow future researchers to gather a somewhat equivalent number of

affiliation-motivated, power-motivated and achievement-motivated participants before randomly assigning them into the social rejection and social acceptance experimental groups.

Finally, future research could make attempts to replicate the findings of this study with a live social rejection paradigm, Yale Interpersonal Stressor (YIPS; Stroud, Tanofsky-Kraff, Wilfley & Salovey, 2000), where participants are excluded from two separate conversations by two confederates of similar gender. The YIPS is recommended as an ecologically valid paradigm of social rejection as it simulates a very common daily social occurrence in people's lives - conversations with social others. Conversations with social others is the hallmark of interpersonal interaction and is relevant regardless of age, gender, culture or social status. This manipulation of affiliation stress, or interpersonal stress as the YIPS term it, can be easily achieved in a laboratory setting while maintaining ecological relevance and with minimal risk to participants. It would be highly valuable should the positive correlation between affiliation stress and emotion recognition is replicated with this live social rejection paradigm. Additionally, perhaps the manipulation of affiliation stress in a "live" social setting would better arouse implicit motives of participants to affect their emotion recognition ability.

5.5 Practical implications

Our results showed that accuracy in identifying emotions in faces is attenuated by social rejection. Individuals who were socially accepted were more accurate at identifying emotions in faces than individuals who were socially rejected. Consistent with the "deconstructed self" hypothesis, our

finding corroborated with previous literature that social rejection has debilitating effects on people. As I consolidate my thesis about implicit motives, affiliation stress and emotion recognition ability, I consider again their relevance to occurrences in the real-world and how further research is necessary. Beyond ensuring personal, social and professional success, it appears that research delving into implicit motives, affiliation stress and emotion may have wider applications, especially in education and the provision of safe environments. Affiliation stress can be argued to be the most pronounced, and emotion recognition the most critical, during adolescence when individuals become increasingly socially aware. Adolescents are also largely interested in fitting in and belonging to a social group. The inability to do so could lead to undesirable consequences for the individual and in extreme cases, outbursts of these socially rejected individuals could severely impact the school population. School shootings have generated much discussion in the recent two decades as many have been injured and killed during such incidences. Within the first five months of this year (2018) alone, there had been 17 incidents of school shootings in America. An analysis conducted by Leary, Kowalski, Smith and Phillips (2003) of school shootings between 1996 to 2003 highlighted the role of social rejection in these acts of terror in schools. It is believed that the perpetrators of school shootings had been taunted and teased by peers, likely felt lonely and isolated, and were reported to be outcasts. The researchers believed that at least some, if not all, of the school shootings may have been precipitated by rejection by school mates or social others. In light of this assertion, social rejection and its prevalence in schools are in the spotlight. Schools, by definition are institutions where knowledge is imparted and where a

child learns in the company of peers within the same age group. Such environments also present opportunities for play and collaborative activities intended to hone communicative and social skills. On the flip side, schools inherently present a social environment full of diverse individuals and where tensions and underlying currents inevitably exist amongst the youth who spend the majority of their day there. For people who experience social rejection, exclusion or ostracism on a daily basis, having to spend the majority of their day in this environment could be incredibly suffocating, resulting in repressed feelings of resentment and rage. The insights from Leary, Kowalski, Smith and Phillips's (2003) investigation is a sombre reminder that these youth are suffering in their own ways, even if the way they have chosen to release that anger and suffering threatens the lives of others. If we could understand their implicit motives and their needs vis-à-vis their social environment (school) and the demands of that environment (peer pressure), it would increase the success of interventions. Schools are places where systematic organisation of individuals according to their competence is necessary to some degree, and in the unofficial arena, students quickly organise themselves and affiliate themselves with similar others. Individual differences become cause for contempt amongst youth, as well as a source of uncertainty in a social environment that may unwittingly reward conformity. While I have highlighted school shootings as an example, the psychological theory of need to belong applies to adults in the workplace as well. This is especially so in today's globalised world where workplaces are increasingly a melting pot of diverse individuals of varied races, ethnicity and nationalities.

My study explored how implicit motives and affiliation stress could influence emotion recognition ability. Although the results did not provide any statistical significance for an interaction between implicit motives and affiliation stress, I would still recommend further investigation into this relationship. The psychological underpinnings and theories referenced in my study—need to belong, the “deconstructed state”, implicit motives, affiliation stress—are relevant to understanding how social rejection by schoolmates could lead to school shootings. A school shooting may be the extreme retaliatory response of an individual whose needs have been threatened after prolonged episodes of social rejection. For instance, a power motivated individual whose need to impact others cannot be achieved in prosocial ways, may resort to doing so in antisocial ways. An affiliation motivated individual whose need to gain affiliative connections is not satisfied may be so distraught and overwhelmed by isolation that he has an emotional outburst. Since implicit motives occur at the unconscious level, individuals may not even be cognizant of their own needs (implicit motivations) and often have no outlet and do not know how to fulfil them even if they feel a sense of dissatisfaction. Perhaps by dedicating research to the relationship between implicit motives, affiliation stress and relevant emotional processes, we would eventually mitigate the “social pain” (Kross, Berman, Mischel, Smith & Wager, 2011; Williams, 2007) and prevent emotional explosions of these socially rejected individuals in educational institutions and in the workplace.

REFERENCES

- Ayduk, O., Downey, G., Testa, A., Yen, Y., & Shoda, Y. (1999). Does rejection elicit hostility in rejection sensitive women?. *Social Cognition*, 17(2), 245-271.
- Banse, R., & Scherer, K. R. (1996). Acoustic profiles in vocal emotion expression. *Journal of personality and social psychology*, 70(3), 614.
- 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. *Journal of child psychology and psychiatry*, 42(2), 241-251.
- Bargh, J. A., & Ferguson, M. J. (2000). Beyond behaviorism: on the automaticity of higher mental processes. *Psychological bulletin*, 126(6), 925.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological bulletin*, 117(3), 497.
- Baumeister, R. F., & Tice, D. M. (1990). Point-counterpoints: Anxiety and social exclusion. *Journal of social and clinical Psychology*, 9(2), 165-195.

- Baumeister, R. F., Twenge, J. M., & Nuss, C. K. (2002). Effects of social exclusion on cognitive processes: anticipated aloneness reduces intelligent thought. *Journal of personality and social psychology*, 83(4), 817.
- Beaupré, M. G., & Hess, U. (2005). Cross-cultural emotion recognition among Canadian ethnic groups. *Journal of cross-cultural psychology*, 36(3), 355-370.
- Berenson, K. R., Gyurak, A., Ayduk, Ö., Downey, G., Garner, M. J., Mogg, K., ... & Pine, D. S. (2009). Rejection sensitivity and disruption of attention by social threat cues. *Journal of research in personality*, 43(6), 1064-1072.
- Bowlby, J. (1973). Attachment and loss: Volume II: Separation, anxiety and anger. In *Attachment and Loss: Volume II: Separation, Anxiety and Anger* (pp. 1-429). London: The Hogarth Press and the Institute of Psycho-Analysis.
- Brackett, M. A., Mayer, J. D., & Warner, R. M. (2004). Emotional intelligence and its relation to everyday behaviour. *Personality and Individual differences*, 36(6), 1387-1402.

- Blonder, L. X., Pettigrew, L. C., & Kryscio, R. J. (2012). Emotion recognition and marital satisfaction in stroke. *Journal of Clinical and Experimental Neuropsychology*, 34(6), 634-642
- Böckler, A., Hömke, P., & Sebanz, N. (2014). Invisible man: Exclusion from shared attention affects gaze behavior and self-reports. *Social Psychological and Personality Science*, 5(2), 140-148.
- Brunstein, J. C., Schultheiss, O. C., & Grässman, R. (1998). Personal goals and emotional well-being: The moderating role of motive dispositions. *Journal of personality and social psychology*, 75(2), 494.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data?. *Perspectives on psychological science*, 6(1), 3-5.
- Byron, K., Terranova, S., & Nowicki Jr, S. (2007). Nonverbal emotion recognition and salespersons: Linking ability to perceived and actual success. *Journal of Applied Social Psychology*, 37(11), 2600-2619.
- Cannon, W. B. (1932). Homeostasis. *The wisdom of the body*. Norton, Newyork.
- Carton, J. S., Kessler, E. A., & Pape, C. L. (1999). Nonverbal decoding skills and relationship well-being in adults. *Journal of Nonverbal Behavior*, 23(1), 91-100.

- Chow, R. M., Tiedens, L. Z., & Govan, C. L. (2008). Excluded emotions: The role of anger in antisocial responses to ostracism. *Journal of Experimental Social Psychology, 44*(3), 896-903.
- Cordova, J. V., Gee, C. B., & Warren, L. Z. (2005). Emotional skillfulness in marriage: Intimacy as a mediator of the relationship between emotional skillfulness and marital satisfaction. *Journal of Social and Clinical Psychology, 24*(2), 218-235.
- DeWall, C. N., & Baumeister, R. F. (2006). Alone but feeling no pain: Effects of social exclusion on physical pain tolerance and pain threshold, affective forecasting, and interpersonal empathy. *Journal of personality and social psychology, 91*(1), 1.
- DeWall, C. N., Maner, J. K., & Rouby, D. A. (2009). Social exclusion and early-stage interpersonal perception: Selective attention to signs of acceptance. *Journal of personality and social psychology, 96*(4), 729.
- DeWall, C. N., Twenge, J. M., Koole, S. L., Baumeister, R. F., Marquez, A., & Reid, M. W. (2011). Automatic emotion regulation after social exclusion: Tuning to positivity. *Emotion, 11*(3), 623.

- Dickerson, S. S., Gruenewald, T. L., & Kemeny, M. E. (2004). When the social self is threatened: Shame, physiology, and health. *Journal of personality*, 72(6), 1191-1216.
- Donhauser, P. W., Rösch, A. G., & Schultheiss, O. C. (2015). The implicit need for power predicts recognition speed for dynamic changes in facial expressions of emotion. *Motivation and Emotion*, 39(5), 714-721.
- Dvir, T., Eden, D., Avolio, B. J., & Shamir, B. (2002). Impact of transformational leadership on follower development and performance: A field experiment. *Academy of management journal*, 45(4), 735-744.
- Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science*, 302(5643), 290-292.
- Ekman, P. (1992). An argument for basic emotions. *Cognition & emotion*, 6(3-4), 169-200.
- Ekman, P., & Friesen, W. V. (1978). *Manual for the facial action coding system*. Consulting Psychologists Press.
- Ekman, P., & Friesen, W. V. (1982). Felt, false, and miserable smiles. *Journal of nonverbal behavior*, 6(4), 238-252.

- Elfenbein, H. A., Der Foo, M., White, J., Tan, H. H., & Aik, V. C. (2007). Reading your counterpart: The benefit of emotion recognition accuracy for effectiveness in negotiation. *Journal of Nonverbal Behavior*, 31(4), 205-223.
- Fessler, D. M. (1999). Toward an understanding of the universality of second order emotions. *Biocultural approaches to the emotions*, 75-116.
- Gigerenzer, G., & Todd, P. M. (1999). Fast and frugal heuristics: The adaptive toolbox. In *Simple heuristics that make us smart* (pp. 3-34). Oxford University Press.
- Gruenewald, T. L., Kemeny, M. E., Aziz, N., & Fahey, J. L. (2004). Acute threat to the social self: shame, social self-esteem, and cortisol activity. *Psychosomatic medicine*, 66(6), 915-924.
- Gruter, M., & Masters, R. D. (1986). Ostracism as a social and biological phenomenon: An introduction.
- Hall, J. A., & Matsumoto, D. (2004). Gender differences in judgments of multiple emotions from facial expressions. *Emotion*, 4(2), 201.
- Hall, J. A., Roter, D. L., Blanch, D. C., & Frankel, R. M. (2009). Nonverbal sensitivity in medical students: Implications for clinical interactions. *Journal of general internal medicine*, 24(11), 1217.

Halberstadt, A. G., Denham, S. A., & Dunsmore, J. C. (2001). Affective social competence. *Social development, 10*(1), 79-119.

Hess, U., Blairy, S., & Kleck, R. E. (2000). The influence of facial emotion displays, gender, and ethnicity on judgments of dominance and affiliation. *Journal of Nonverbal behavior, 24*(4), 265-283.

Hess, U., & Thibault, P. (2009). Darwin and emotion expression. *American Psychologist, 64*(2), 120.

Izard, C. E. (1992). Basic emotions, relations among emotions, and emotion-cognition relations.

Izard, C. E. (1994). Innate and universal facial expressions: evidence from developmental and cross-cultural research.

Izard, C. E. (2007). Basic emotions, natural kinds, emotion schemas, and a new paradigm. *Perspectives on psychological science, 2*(3), 260-280.

Koestner, R., & McClelland, D. C. (1992). The affiliation motive.

Kohler, C. G., Turner, T., Stolar, N. M., Bilker, W. B., Brensinger, C. M., Gur, R. E., & Gur, R. C. (2004). Differences in facial expressions of four universal emotions. *Psychiatry research, 128*(3), 235-244.

- Kross, E., Berman, M. G., Mischel, W., Smith, E. E., & Wager, T. D. (2011). Social rejection shares somatosensory representations with physical pain. *Proceedings of the National Academy of Sciences*, 108(15), 6270-6275.
- Kurzban, R., & Leary, M. R. (2001). Evolutionary origins of stigmatization: the functions of social exclusion. *Psychological bulletin*, 127(2), 187.
- Leary, M. R. (1990). Responses to social exclusion: Social anxiety, jealousy, loneliness, depression, and low self-esteem. *Journal of Social and Clinical Psychology*, 9(2), 221-229.
- Leary, M. R., & Baumeister, R. F. (2017). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. In *Interpersonal development* (pp. 57-89). Routledge.
- Leary, M. R., Kelly, K. M., Cottrell, C. A., & Schreindorfer, L. S. (2013). Construct validity of the need to belong scale: Mapping the nomological network. *Journal of personality assessment*, 95(6), 610-624.
- Leary, M. R., Kowalski, R. M., Smith, L., & Phillips, S. (2003). Teasing, rejection, and violence: Case studies of the school shootings. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression*, 29(3), 202-214.

- Leary, M. R., Twenge, J. M., & Quinlivan, E. (2006). Interpersonal rejection as a determinant of anger and aggression. *Personality and social psychology review*, 10(2), 111-132.
- Levy, S. R., Ayduk, O., & Downey, G. E. R. A. L. D. I. N. E. (2001). The role of rejection sensitivity in people's relationships with significant others and valued social groups. *Interpersonal rejection*, 251-289.
- Link, B. G., Cullen, F. T., Frank, J., & Wozniak, J. F. (1987). The social rejection of former mental patients: Understanding why labels matter. *American journal of Sociology*, 92(6), 1461-1500.
- Linnen, A. M., Ellenbogen, M. A., Cardoso, C., & Joover, R. (2012). Intranasal oxytocin and salivary cortisol concentrations during social rejection in university students. *Stress*, 15(4), 393-402.
- MacDonald, G., & Leary, M. R. (2005). Why does social exclusion hurt? The relationship between social and physical pain. *Psychological bulletin*, 131(2), 202.
- Major, B., & O'brien, L. T. (2005). The social psychology of stigma. *Annu. Rev. Psychol.*, 56, 393-421.

- Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does social exclusion motivate interpersonal reconnection? Resolving the "porcupine problem.". *Journal of personality and social psychology*, 92(1), 42.
- Mann, L. S., Wise, T. N., Trinidad, A., & Kohanski, R. (1994). Alexithymia, affect recognition, and the five-factor model of personality in normal subjects. *Psychological reports*, 74(2), 563-567.
- Marsh, A. A., Adams Jr, R. B., & Kleck, R. E. (2005). Why do fear and anger look the way they do? Form and social function in facial expressions. *Personality and Social Psychology Bulletin*, 31(1), 73-86.
- Marsh, A. A., Ambady, N., & Kleck, R. E. (2005). The effects of fear and anger facial expressions on approach-and avoidance-related behaviors. *Emotion*, 5(1), 119.
- Marsh, A. A., Kozak, M. N., & Ambady, N. (2007). Accurate identification of fear facial expressions predicts prosocial behavior. *Emotion*, 7(2), 239.
- Maslow, A. (1968). Some educational implications of the humanistic psychologies. *Harvard Educational Review*, 38(4), 685-696.
- Matsumoto, D., LeRoux, J., Wilson-Cohn, C., Raroque, J., Kookan, K., Ekman, P., ... & Amo, L. (2000). A new test to measure emotion recognition

ability: Matsumoto and Ekman's Japanese and Caucasian Brief Affect Recognition Test (JACBART). *Journal of Nonverbal behavior*, 24(3), 179-209.

Mayer, J. D., DiPaolo, M., & Salovey, P. (1990). Perceiving affective content in ambiguous visual stimuli: A component of emotional intelligence. *Journal of personality assessment*, 54(3-4), 772-781.

Mischel, W. (1977). The interaction of person and situation. *Personality at the crossroads: Current issues in interactional psychology*, 333, 352.

Mischel, W., Shoda, Y., & Mendoza-Denton, R. (2002). Situation-behavior profiles as a locus of consistency in personality. *Current Directions in Psychological Science*, 11(2), 50-54.

Morgan, C. D., & Murray, H. A. (1935). A method for investigating fantasies: The Thematic Apperception Test. *Archives of Neurology & Psychiatry*, 34(2), 289-306.

Nezlek, J. B., Kowalski, R. M., Leary, M. R., Blevins, T., & Holgate, S. (1997). Personality moderators of reactions to interpersonal rejection: Depression and trait self-esteem. *Personality and Social Psychology Bulletin*, 23(12), 1235-1244.

- Nezlek, J. B., Wesselmann, E. D., Wheeler, L., & Williams, K. D. (2012). Ostracism in everyday life. *Group Dynamics: Theory, Research, and Practice*, 16(2), 91.
- Oaten, M., Williams, K. D., Jones, A., & Zadro, L. (2008). The effects of ostracism on self-regulation in the socially anxious. *Journal of Social and Clinical Psychology*, 27(5), 471-504.
- Otten, M., & Jonas, K. J. (2013). Out of the group, out of control. *The brain responds to social exclusion with changes in cognitive control*.
- Paolacci, G., & Chandler, J. (2014). Inside the Turk: Understanding Mechanical Turk as a participant pool. *Current Directions in Psychological Science*, 23(3), 184-188.
- Pickett, C. L., Gardner, W. L., & Knowles, M. (2004). Getting a cue: The need to belong and enhanced sensitivity to social cues. *Personality and Social Psychology Bulletin*, 30(9), 1095-1107.
- Purdie, V., & Downey, G. (2000). Rejection sensitivity and adolescent girls' vulnerability to relationship-centered difficulties. *Child Maltreatment*, 5(4), 338-349.
- Riggio, H. R., & Riggio, R. E. (2001). Self-report measurement of interpersonal sensitivity. In *Interpersonal sensitivity* (pp. 141-158). Psychology Press.

- Romero-Canyas, R., Downey, G., Reddy, K. S., Rodriguez, S., Cavanaugh, T. J., & Pelayo, R. (2010). Paying to belong: When does rejection trigger ingratiation?. *Journal of personality and social psychology*, 99(5), 802.
- Rubin, R. S., Munz, D. C., & Bommer, W. H. (2005). Leading from within: The effects of emotion recognition and personality on transformational leadership behavior. *Academy of Management Journal*, 48(5), 845-858.
- Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, cognition and personality*, 9(3), 185-211.
- Sauter, D. A., & Scott, S. K. (2007). More than one kind of happiness: Can we recognize vocal expressions of different positive states?. *Motivation and Emotion*, 31(3), 192-199.
- Schlegel, K., Grandjean, D., & Scherer, K. R. (2014). Introducing the Geneva emotion recognition test: an example of Rasch-based test development. *Psychological Assessment*, 26(2), 666.
- Scherer, K. R., & Wallbott, H. G. (1994). Evidence for universality and cultural variation of differential emotion response patterning. *Journal of personality and social psychology*, 66(2), 310.

- Schultheiss, O., & Brunstein, J. (2010). *Implicit motives*. Oxford University Press.
- Schultheiss, O. C., & Hale, J. A. (2007). Implicit motives modulate attentional orienting to facial expressions of emotion. *Motivation and Emotion*, 31(1), 13-24.
- Schultheiss, O. C., & Pang, J. S. (2007). Measuring implicit motives. *Handbook of research methods in personality psychology*, 322-344.
- Schultheiss, O. C., Wirth, M. M., Waugh, C. E., Stanton, S. J., Meier, E. A., & Reuter-Lorenz, P. (2008). Exploring the motivational brain: effects of implicit power motivation on brain activation in response to facial expressions of emotion. *Social Cognitive and Affective Neuroscience*, 3(4), 333-343.
- Schutte, N. S., Malouff, J. M., Hall, L. E., Haggerty, D. J., Cooper, J. T., Golden, C. J., & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and individual differences*, 25(2), 167-177.
- Simon-Thomas, E. R., Keltner, D. J., Sauter, D., Sinicropi-Yao, L., & Abramson, A. (2009). The voice conveys specific emotions: evidence from vocal burst displays. *Emotion*, 9(6), 838.

- Slavich, G. M., Way, B. M., Eisenberger, N. I., & Taylor, S. E. (2010). Neural sensitivity to social rejection is associated with inflammatory responses to social stress. *Proceedings of the national academy of sciences*, 107(33), 14817-14822.
- Stroud, L. R., Tanofsky-Kraff, M., Wilfley, D. E., & Salovey, P. (2000). The Yale Interpersonal Stressor (YIPS): Affective, physiological, and behavioral responses to a novel interpersonal rejection paradigm. *Annals of Behavioral Medicine*, 22(3), 204.
- Taylor, S. E. (2006). Tend and befriend: Biobehavioral bases of affiliation under stress. *Current directions in psychological science*, 15(6), 273-277.
- Taylor, S. E. (2011). Tend and befriend theory. *Handbook of Theories of Social Psychology: Collection: Volumes 1 & 2*, 32.
- Taylor, S. E., Klein, L. C., Lewis, B. P., Gruenewald, T. L., Gurung, R. A., & Updegraff, J. A. (2000). Biobehavioral responses to stress in females: tend-and-befriend, not fight-or-flight. *Psychological review*, 107(3), 411.
- Tucker, J. S., & Anders, S. L. (1999). Attachment style, interpersonal perception accuracy, and relationship satisfaction in dating couples. *Personality and Social Psychology Bulletin*, 25(4), 403-412.

- Twenge, J. M., Catanese, K. R., & Baumeister, R. F. (2003). Social exclusion and the deconstructed state: time perception, meaninglessness, lethargy, lack of emotion, and self-awareness. *Journal of personality and social psychology*, 85(3), 409.
- Twenge, J. M., Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Bartels, J. M. (2007). Social exclusion decreases prosocial behavior. *Journal of personality and social psychology*, 92(1), 56.
- Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If you can't join them, beat them: effects of social exclusion on aggressive behavior. *Journal of personality and social psychology*, 81(6), 1058.
- Wang, P., & Walumbwa, F. O. (2007). Family-friendly programs, organizational commitment, and work withdrawal: the moderating role of transformational leadership. *Personnel Psychology*, 60(2), 397-427.
- Warburton, W. A., Williams, K. D., & Cairns, D. R. (2006). When ostracism leads to aggression: The moderating effects of control deprivation. *Journal of Experimental Social Psychology*, 42(2), 213-220.
- Williams, K. D. (2007). Ostracism. *Annual review of psychology*, 58.

- Williams, K. D. (2009). Ostracism: A temporal need-threat model. *Advances in experimental social psychology*, 41, 275-314.
- Williams, K. D. (2011). The pain of exclusion. *scientific american mind*, 21(6), 30-37.
- Williams, K. D., Cheung, C. K., & Choi, W. (2000). Cyberostracism: effects of being ignored over the Internet. *Journal of personality and social psychology*, 79(5), 748.
- Williams, K. D., & Jarvis, B. (2006). Cyberball: A program for use in research on interpersonal ostracism and acceptance. *Behavior research methods*, 38(1), 174-180.
- Williams, K. D., & Nida, S. A. (2011). Ostracism: Consequences and coping. *Current Directions in Psychological Science*, 20(2), 71-75.
- Williams, K. D., & Sommer, K. L. (1997). Social ostracism by coworkers: Does rejection lead to loafing or compensation?. *Personality and Social Psychology Bulletin*, 23(7), 693-706.

- Wirth, M. M., & Schultheiss, O. C. (2006). Effects of affiliation arousal (hope of closeness) and affiliation stress (fear of rejection) on progesterone and cortisol. *Hormones and Behavior*, 50(5), 786-795.
- Zadro, L., Boland, C., & Richardson, R. (2006). How long does it last? The persistence of the effects of ostracism in the socially anxious. *Journal of Experimental Social Psychology*, 42(5), 692-697.
- Zadro, L., Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer is sufficient to lower self-reported levels of belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology*, 40(4), 560-567.
- Zeidner, M., Roberts, R. D., & Matthews, G. (2002). Can emotional intelligence be schooled? A critical review. *Educational psychologist*, 37(4), 215-231.

APPENDIX

A. REJECTION SENSITIVITY QUESTIONNAIRE – ADULT VERSION

(ARSQ)

The items below describe situations in which people sometimes ask things of others.
For each item, **imagine that you are in the situation, and then answer the questions that follow it.**

1. You ask your parents or another family member for a loan to help you through a difficult financial time.

How concerned or anxious would you be over whether or not your family would want to help you?	very unconcerned						very concerned
	1	2	3	4	5	6	
I would expect that they would agree to help as much as they can.	very unlikely						very likely
	1	2	3	4	5	6	

2. You approach a close friend to talk after doing or saying something that seriously upset him/her.

How concerned or anxious would you be over whether or not your friend would want to talk with you?	very unconcerned						very concerned
	1	2	3	4	5	6	
I would expect that he/she would want to talk with me to try to work things out.	very unlikely						very likely
	1	2	3	4	5	6	

3. You bring up the issue of sexual protection with your significant other and tell him/her how important you think it is.

How concerned or anxious would you be over his/her reaction?	very unconcerned						very concerned
	1	2	3	4	5	6	
I would expect that he/she would be willing to discuss our possible options without getting defensive.	very unlikely						very likely
	1	2	3	4	5	6	

4. You ask your supervisor for help with a problem you have been having at work.

How concerned or anxious would you be over whether or not the person would want to help you?	very unconcerned						very concerned
	1	2	3	4	5	6	
I would expect that he/she would want to try to help me out.	very unlikely						very likely
	1	2	3	4	5	6	

5. After a bitter argument, you call or approach your significant other because you want to make up.

How concerned or anxious would you be over whether or not your significant other would want to make up with you?	very unconcerned						very concerned
	1	2	3	4	5	6	
I would expect that he/she would be at least as eager to make up as I would be.	very unlikely						very likely
	1	2	3	4	5	6	

6. You ask your parents or other family members to come to an occasion important to you.

How concerned or anxious would you be over whether or not they would want to come?	very unconcerned						very concerned
	1	2	3	4	5	6	
I would expect that they would want to come.	very unlikely						very likely
	1	2	3	4	5	6	

7. At a party, you notice someone on the other side of the room that you'd like to get to know, and you approach him or her to try to start a conversation.

How concerned or anxious would you be over whether or not the person would want to talk with you?	very unconcerned						very concerned
	1	2	3	4	5	6	
I would expect that he/she would want to talk with me.	very unlikely						very likely
	1	2	3	4	5	6	

8. Lately you've been noticing some distance between yourself and your significant other, and you ask him/her if there is something wrong.

How concerned or anxious would you be over whether or not he/she still loves you and wants to be with you?	very unconcerned						very concerned
	1	2	3	4	5	6	
I would expect that he/she will show sincere love and commitment to our relationship no matter what else may be going on.	very unlikely						very likely
	1	2	3	4	5	6	

9. You call a friend when there is something on your mind that you feel you really need to talk about.

How concerned or anxious would you be over whether or not your friend would want to listen?	very unconcerned						very concerned
	1	2	3	4	5	6	
I would expect that he/she would listen and support me.	very unlikely						very likely
	1	2	3	4	5	6	

B. PICTURE SET USED IN PICTURE STORY EXERCISE FOR STUDY**1, 2 AND 3**

Look at the picture. Your task is to write a complete story about the picture you see above. This should be an imaginative story with a beginning, middle, and an end. Try to portray who the people might be, what they are feeling, thinking, and wishing. Try to tell what led to the situation depicted in the picture and how everything will turn out in the end.

What do you think they are doing?

What do you think will happen next?

PICTURE 1

PICTURE 2

PICTURE 3

PICTURE 4

PICTURE 5

C. GENEVA EMOTION RECOGNITION TEST – SHORT VERSION

(GERT-S)

Please note: As the actors' utterances consist of a sequence of meaningless syllables, you will not be able to understand any words.

You can watch each video only once.

Please play the example video below to make sure you hear the sound. If necessary, adjust the sound volume for comfortable listening.

Click "Continue" to watch three more example videos and to practice the judgment procedure.

Stop

Play

Return

Continue

We will now present a series of short videos in which different actors express various emotions. After each video, 14 emotion words are presented, arranged in a circle that will help you to rapidly select the appropriate emotion - as shown below:

D. EMOTION RECOGNITION INDEX (ERI)

Recognition of facial expressions of emotion

We will first present two examples to familiarize you with the task. Look closely at the photograph and then indicate your choice. Please decide as spontaneously as possible - your first judgment is likely to be the most accurate.

This task is quite difficult, particularly since the photographs are shown only for a brief period of time. Please make a decision even if you are uncertain.

Continue

Recognition of facial expressions of emotion

The face is one of the most important means of human communication - both in private and professional contexts. We often "read" important information about another person's mood or intentions from his or her facial expression.

In the following, you will see photographs of different facial expressions as portrayed by actors. Your task will be to recognize in each case which emotion is shown.

Continue

Recognition of facial expressions of emotion

To respond, click on the button with the emotion label that seems to describe the facial expression best.

Only one choice is allowed for each item.

Once you have clicked on a button, the emotion labels will disappear and there will be a brief pause. The next item will then be presented.

ANGER

FEAR

JOY

SADNESS

DISGUST

Continue

FACIAL MODALITY:

EXAMPLE PICTURE 1

EXAMPLE PICTURE 2

VOCAL MODALITY:

EXAMPLE AUDIO