The Roles of Theory of Mind and Empathy in the Relationship
between Dysphoria and Poor Social Functioning

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Abstract

The current research, across three studies, examined two social practices that involve processing and responding to others’ emotions, theory of mind (ToM) and empathy, and how they relate to dysphoria and the social impairments associated with dysphoria over time.

Mildly depressed, or dysphoric, individuals, have been found to have heightened ToM when identifying others’ emotions, despite reporting widespread social impairments (Harkness et al., 2005). The first study (Chapter 2) examined if and how ToM is a mediator in the relationship between dysphoria and social functioning. Attribution style, specifically the internalizing attribution bias, was hypothesized to play a role. The interaction between ToM and internalizing attribution bias was independently associated with social functioning. For internalizing attributors, higher ToM was related to better social functioning, but no relationship was observed between ToM and social functioning among non-internalizing attributors.

The second study (Chapter 3) examined the relationship between ToM and empathy, addressing the debate surrounding cognitive and affective aspects of ToM and empathy. Affective ToM and cognitive empathy both have been described as processes involving cognitive inferences about others’ emotions. Current results supported this link, showing that a specific component of empathy, perspective-taking, was related to ToM. Although ToM was associated with some aspects of empathy, empathy remained a separate construct that includes both cognitive and emotional responding to others’ emotions.

Chapter 4 shifted focus to empathy to examine how this social practice relates to
dysphoria and social functioning. The last study first examined how empathy relates to dysphoria. Results showed that only personal distress, one component of empathy, was associated with greater dysphoria.

The final study also examined if the empathy x emotion regulation interaction mediates the relationship between dysphoria and social functioning. Different patterns were observed for different emotion regulation types. The interaction between maladaptive, but not adaptive, emotion regulation strategies and empathy was correlated directly with social functioning. For individuals with negative cognitive emotion regulation strategies, greater empathy was associated with better social functioning, a relationship not present for individuals who do not use negative cognitive emotion regulation. Finally maladaptive, but not adaptive, emotion regulation significantly predicted social functioning after controlling for dysphoria.
Co-Authorship

I assumed primary responsibility for the conceptualization, design, and execution of the research reported in this thesis. In recognition of her assistance in the research, data analysis, and manuscript preparation, my supervisor, Dr. Jill Jacobson, will appear as a co-author on all manuscripts submitted for publication in the future.
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CHAPTER ONE

Introduction

Because of the widely reported social impairments in individuals with depression and dysphoria (e.g., Gotlib & Lee, 1989), studying the specific mechanisms behind social functioning in these individuals is important. Within any social situation, an individual encounters multiple social stimuli to which he or she may respond in different ways. One specific stimulus type within social situations involves others’ emotional or affective states and the contexts behind these states. Two processes that help an individual make sense of and respond to others’ emotions are theory of mind (ToM) and empathy. ToM and empathy are processes that have been linked theoretically and empirically in neuropsychological studies. The current research, as a whole, examined these two social processes and how they relate to dysphoria and the social impairments associated with dysphoria.

In Manuscript 1 (Chapter Two), I focused on an individual’s cognitive representation of others’ emotions, or ToM, and how this social cognitive process may mediate the relationship between dysphoria and social functioning. In Manuscript 2 (Chapter Three) and Manuscript 3 (Chapter Four), I extended this area of research into empathy, or an individual’s emotional response to others’ emotions. In Manuscript 2, I specifically examined the relationship between ToM and empathy, as two social processes that involve one’s responses to others’ emotions. I found that, although the cognitive aspects of empathy relate to ToM, empathy is itself a separate construct. In Manuscript 3, I examined how empathy, as another social process that involves responding to others’ emotions, relates to dysphoria and the social impairments
associated with dysphoria.

All three studies were drawn from the same longitudinal data collection but are presented separately because the goals and background literature for the research questions were divergent. A longitudinal study design was chosen to provide more support for the establishment of the direction of influence. Participants completed all questionnaires for the three studies during the same visit during the first time point. The experimental materials for all studies are presented together in Appendix A.
Forward to Chapter Two

The study presented in Chapter Two focused on four of the variables that were collected for my thesis research. Specifically, in this study, I examined the interrelationships among dysphoria, social functioning, theory of mind, and an internalizing attribution bias. In subsequent chapters, I present two other studies with overlapping data that are concerned more with the role of empathy, both in its relation to theory of mind and in its relation to dysphoria and social functioning.

Chapter Two consists of a manuscript that may be submitted for publication. This chapter is similar to the manuscript to be submitted but contains greater detail on the statistical analyses performed.
CHAPTER TWO

Dysphoria and Social Functioning: The Roles of Theory of Mind and Attribution Style
Abstract

Despite enhanced theory of mind (ToM) abilities, dysphoric individuals continue to experience profound social impairments. To better understand this paradoxical relationship, the current study examined if ToM mediated the relationship between dysphoria and social functioning and if ToM’s mediational role was moderated by attribution style. Contrary to previous research, ToM and dysphoria were not related. Still, over time, higher ToM and lower dysphoria levels were independently associated with better social functioning, as was the interaction between ToM and an internalizing attribution bias. More specifically, for individuals who tend to blame themselves for negative events, better ToM was related to better social functioning, but for individuals who do not have a tendency to self-blame, ToM and social functioning were not related.
**Dysphoria and Social Functioning: The Roles of Theory of Mind and Attribution Style**

An individual’s social-cognitive processes, or the mental representations he or she forms of others’ intentions, dispositions, and emotions in the context of social interactions plays an important role in his or her social behaviour (e.g., Adolphs, 1999, 2001; Blakemore, Winston, & Frith, 2004; Brothers, 1990; Pinkham, Penn, Perkins, & Lieberman, 2004). A common social-cognitive dysfunction found in psychiatric disorders with well-documented social impairments implicates theory of mind (ToM) or the ability to infer others’ mental states (e.g., Baron-Cohen, 1995; Brune, 2005). That is, in psychiatric disorders with severe social deficits, such as schizophrenia (Blanchard & Panzarella, 1998) and autism (e.g., Mundy & Sigman, 1989), ToM does, indeed, correlate with levels of social functioning (e.g., Brune, 2005; Tager-Flusberg, 1999).

Major depression, a psychiatric disorder characterized by a pervasive sad mood and loss of pleasure, has been consistently associated with decreased social functioning. For example, depressed individuals are socially isolated and rate their interpersonal relationships to be more inadequate, more unsatisfying, and less intimate than do non-depressed individuals (e.g., Billings & Moos, 1984; Costello, 1982; Fredman, Weissman, Leaf, & Bruce, 1988; Gotlib & Lee, 1989; Nezlek, Hampton, & Shean, 2000; Nezlek, Imbrie, & Shean, 1994; Weissman & Paykel, 1974). In addition, depression is associated with more negative self- and other-perceptions of social attributes, including social competence, attractiveness, confidence, and popularity (Lewinsohn, Mischel, Chaplin, & Barton, 1980); a lack of intimate relationships (Costello, 1982); and negative interactions with family members (Benason, 2000; Gotlib & Beach, 1995).

Recently, ToM deficits have been shown in mood disorders as well. That is, in a
variety of ToM tasks, individuals in depressed and manic phases of bipolar disorder (Kerr, Dunbar, & Bentell, 2003) and euthymic patients (Bora et al., 2005; Olley et al., 2005) were found to perform worse than controls. For example, depressed patients are impaired on the Reading the Mind in the Eyes task, a ToM task looking at others’ emotions (Lee, Harkness, Sabbagh, & Jacobson, 2005). Patients in remission from major depression or from bipolar disorder with the most recent episode being depression also have been shown to be impaired in another ToM task, a cartoon second-order false belief task (Inoue, Yamada, Tanooka, & Kanba, 2004). Moreover, patients who initially failed in this task had significantly greater relapse rates and poorer social adjustment over the next year (Inoue, Yamada, & Kanba, 2006). Unfortunately, ToM and social functioning have not been studied together in patients in a current episode of clinical depression.

Dysphoria and Theory of Mind

An interesting dichotomy has emerged in ToM functioning between depressed patients and individuals who are mildly depressed or dysphoric. Using the Eyes task, dysphoric individuals actually were more accurate than were non-dysphoric controls in identifying complex emotions (Harkness, Sabbagh, Jacobson, Chowdry, & Chen, 2005). This finding is supported by a study that found dysphorics to be more accurate in lie detection (Lane & DePaulo, 1999). Additionally, Harkness et al.’s finding fits with research showing that dysphorics are particularly sensitive to and more interested in social information that helps them decode others’ mental states (Weary & Edwards, 1994; Yost & Weary, 1996) and understand others’ personalities and behaviours (Gleicher & Weary, 1991). Dysphorics also have been found to seek more diagnostic information about others (Hildebrand-Saints & Weary, 1989), make more complex
attributions about people (Marsh & Weary, 1989), and to use more trait attributes versus
categorical strategies when evaluating others (Edwards & Weary, 1993).

Taken together, these findings suggest that dysphoric individuals may function at
a higher and more accurate level of social cognition than do non-dysphoric individuals.
The question then becomes how heightened abilities in social cognition relates to real-life
social functioning for dysphoric individuals.

Dysphoria and Social Functioning

Interestingly, despite this heightened social cognitive functioning, dysphoria, like
depression, has been associated with serious interpersonal problems (Segrin & Dillard,
1993). For example, compared to nondysphoric people, dysphoric individuals report
more interpersonal rejection (Coyne, 1976; Segrin & Dillard, 1992), disruption in
relationships (Coyne, 1976; Hokanson, Loewenstein, Hedeen, & Howes, 1986), and
family-related distress (Barnett & Gotlib, 1988; Gotlib & Whiffen, 1989; Hops et al.,
1987).

Whether or not these social impairments are a result of observable social skills
deficits, self-perceptions, or more subtle social cognitive processing is unclear. Gotlib
and Robinson (1982) found that, in interactions with strangers, dysphoric individuals
were not rated more negatively by others although objective observers did rate dysphoric
people as engaging in more negative behaviours. However, Segrin and Dillard (1992), in
a study looking at the assessment of social skills, found that dysphoric individuals’ social
skills were rated lower than were non-dysphoric individuals’ abilities only in self-reports,
not in interaction-partners’ and objective observers’ ratings. These findings match those
of many other studies that have found differences in dysphoric individuals’ social skills
only at the self-report level (Dobson, 1989; Dow & Craighead, 1987; Gotlib & Meltzer, 1987; Haley, 1985; Hokanson, Hummer, & Butler, 1991; Loewenstein & Hokanson, 1986). However, impaired day-to-day social functioning in dysphoric individuals may be due not only to self-perception but also to more subtle differences in social cognitive processing, such as ToM, that are difficult to observe in overt social behaviours.

Thus far, the relationships between dysphoria and ToM and between dysphoria and social functioning have been studied only separately in a non-clinical population. Consequently, in the current study, I extended this area of research to examine the role of ToM in the relationship between dysphoria and impaired social functioning. My primary research questions were if and how ToM mediates the relationship between dysphoria and social functioning. Although little research has been done on ToM in non-clinical samples, ToM research in other populations, such as autistic and schizophrenic people, suggests that better ToM skills should be related to better social functioning (e.g., Brune, 2005, Tager-Flusberg, 1999). I hypothesized that, independent of dysphoria, ToM would be related to better social functioning.

ToM and Attribution Style

If better ToM skills are directly related to both greater dysphoria and better social functioning, how, then, would better ToM mediate a relationship between dysphoria and the worse social functioning associated with dysphoria? Although better ToM could, by itself, mediate the relationship between dysphoria and poor social functioning, this finding would still not address the mechanism that makes better ToM a liability for dysphorics’ social functioning when, for other populations, ToM is a positive social trait.

Therefore, to understand how ToM mediates the relationship between dysphoria
and worse social functioning, I hypothesized that another cognitive process may be involved. This process would be responsible for translating a better ToM ability in dysphoric individuals into the greater social impairments they exhibit. I hypothesized that attribution style, which is a cognitive bias that has been independently linked to both depression and social functioning, may moderate ToM’s mediating effects in the dysphoria-social functioning relationship (see Figure 2.1). Specifically, I examined the internalizing attribution bias, which is the tendency to attribute negative events to oneself as opposed to attributing positive events to oneself or attributing negative events to external causes (Kinderman & Bentell, 1996; Seligman, Abramson, Semmel, & de Baeyer, 1979). Internalizing attribution styles have been linked to depression theoretically (Abramson, Seligman, & Teasdale, 1978) and empirically (Seligman, Abramson, Semmel, & de Baeyer, 1979). Although internalizing attribution biases have not been studied widely in the context of global social functioning, they have been linked

![Figure 2.1. Hypothesized model for the mediation of the dysphoria-social functioning relationship by the interaction between ToM and attribution style.](image-url)
to greater failure in specific arenas such as schooling and solving problems (Kudo & Numazaki, 2003; Miller & Ivan, 1981; Ollfors & Andersson, 2007). Additionally, other types of attribution biases have been linked to social functioning (e.g., Sukhodolsky, Golub, Stone, & Orban, 2005, found that training targeted at hostile attribution biases improves social functioning).

If an individual has an internalizing bias, greater accuracy in reading others’ emotions may translate into worse social functioning due to his or her tendency to overattribute others’ negative emotions to him- or herself and to underattribute the positive emotions to him- or herself. For these individuals, greater ToM accuracy may be a mediator between depressive symptoms and social impairments because although they are accurately reading others’ emotions, the attribution of these emotions is biased. For individuals who do not exhibit such an internalizing attribution bias, increased ToM accuracy may not play a mediating role in the relationship between dysphoria and the poor social functioning associated with dysphoria. Externalizing attributors, who would not tend to self-blame for negative social events, would not experience a liability from enhanced ToM.

In sum, I explored the mediating roles of ToM and attribution style in the relationship between dysphoria and social functioning. My hypotheses were:

**H1:** Better ToM will be correlated with increased dysphoria, as previously found.

**H2:** Better ToM will be independently correlated with increased social functioning.

**H3:** After accounting for dysphoria, which is related to better ToM, ToM will be
related to social functioning through attribution style. That is, the interaction between ToM and attribution style should mediate the relationship between dysphoria and social functioning (see Figure 2.1). I further predicted that, for individuals who have an internalizing attribution bias, increased ToM will mediate the relationship between dysphoria and social functioning. For individuals who do not have such an attribution bias, ToM will not mediate the dysphoria-social functioning relationship.

Method

Participants

Participants were male and female students from introductory psychology courses at Queen’s University. During an in-class prescreening session at the beginning of the school year, students completed measures providing information about current use of antidepressant medication and/or previous diagnoses of bipolar mood disorder, both of which were exclusion criteria for the current study, and thus these students were not contacted for participation in this study.

A total of 292 individuals completed Time 1 of the study during the Fall term. Of these, one woman was dropped because she had previously completed another study using the same Eyes task, leaving 291 individuals who continued to Time 2.

A total of 242 students completed Time 2 during the Winter term. Of these, one woman was dropped due to a duplication in the prescreening identification number that made her prescreening information unidentifiable. A second woman was excluded because she was taking antidepressant medications when completing the Time 2 assessment. Two additional participants were dropped due to incomplete Eyes task data from Time 1 (which did not preclude them from completing Time 2). Thus, the final
sample consisted of 238 individuals, including 62 men (26.05%) and 176 women (73.95%). At Time 1, the mean age for this sample was 18.27 ($SD=1.45$) years.

**Measures**

All reliability and factor analyses of the measures were performed with the 238 participants who completed all aspects of the study. To verify the scale structures, factor analyses were conducted on all scales using principal axis factoring with an oblique rotation. The subscale structure of each scale as described by its developers was replicated, and thus these analyses will not be discussed further.

*Beck Depression Inventory-II* (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item self-report questionnaire that assesses the presence and severity of depressive symptoms over the past two weeks with each item rated on a 0 to 3 scale. The items are summed for a total score, with higher scores indicating greater depressive symptomatology. The BDI-II is widely used in clinical research and has good concurrent and discriminant validity, high internal consistency with a Cronbach’s $\alpha$ of .81 (Beck, Steer, & Garbin, 1988a) and good test-retest reliability ranging from $r = .67$ to .90 (Lightfoot & Oliver, 1985; Oliver & Burkham, 1979; Oliver & Simmons, 1984). In the current study, the BDI-II had a Cronbach’s $\alpha$ of 0.90. Additionally, men and women did not differ in levels of depression, $t(236) = .63$, $p = .53$, with men having a mean BDI-II score of 7.65 ($SD = 6.59$) and women having a mean of 8.26 ($SD = 6.59$).

*Beck Anxiety Inventory* (BAI; Beck & Steer, 1990). The BAI is a 21-item self-report questionnaire that assesses the presence and severity of anxiety symptoms with each item rated on a 0 to 3 scale. Items are summed for a total score, with higher scores indicating greater anxiety symptomatology. The BAI is widely used and has a high
internal consistency at .92 and good test-retest reliability of $r = .75$ (Beck, Epstein, Brown, & Steer, 1988b; Beck & Steer, 1990). This scale, which is a good measure of the physiological symptoms of anxiety, will be included to isolate results specific to depression, which is often comorbid with anxiety (Clark & Watson, 1991). In the current study, its Cronbach’s $\alpha$ was .90. Men and women did not differ in levels of anxiety, as measured by the BAI, $t(236) = .20$, $p = .84$. The mean BAI score for men was 11.97 ($SD = 10.61$) and for women was 8.91 ($SD = 8.91$).

*Social Adjustment Scale (SAS; Weissman & Bothwell, 1976).* The SAS is a 54-item self-report scale that assesses current social functioning in domains of Primary Relationship (living with a partner); Work (employment, school, or housework); Social and Leisure (dating, recreation); Extended Family (relatives); Parental (own children); and Family unit (partner or children). An Overall Adjustment Score is based on these six domains with higher scores indicating poorer functioning. The scale is reliable, valid, and widely used in clinical research (Edwards, Yarvis, Mueller, Zingale, & Wagman, 1978; Weissman, Prosoff, Thompson, Harding, & Myers, 1978).

The SAS is scored by summing responses in each subscale and then summing the subscales for a total social functioning score. These scores are next converted to standardized T-scores that were normed separately for men and women and across age groups. Higher scores indicate *poorer* social functioning (i.e., more problems in social functioning). In my sample, men and women did not differ in their total social functioning T-scores at Time 1, $t(236) = 1.79$, $p = .08$, with men’s mean total social functioning T-score at 61.53 ($SD = 11.00$) and women’s mean total social functioning T-score at 59.10 ($SD = 8.52$). At Time 2, men ($M = 61.39$, $SD = 10.25$) and women ($M =$
58.80, $SD = 9.12$) again did not differ significantly in their social functioning levels, $t(236) = 1.86, p = .06$.

Reliability and factor analyses were conducted with subscales A (Work for Pay), B (Housework), G (Parental), and H (Family Unit) taken out because most students’ life styles did not include these components, and thus they did not complete these subscales. Cronbach’s $\alpha$ was 0.74 at Time 1 and 0.68 at Time 2. Test-retest reliability was .64, $p = .000$.

*Reading the Mind in the Eyes Test, Revised* (Eyes task, Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001; Harkness et al., 2005). The Eyes test was designed as an advanced ToM task that requires the participant to attribute the relevant mental state to the eye region of the face, from the eyebrows to halfway down the bridge of the nose. It consists of 36 black-and-white photographs standardized to 15 cm x 6 cm and adapted for the computer by Harkness et al. (2005). Stimuli are presented with four adjectives (one target and three foils), situated at the corners of the pictures, describing the emotional content of the eyes.

The adapted Eyes test by Harkness et al. (2005) included two control tasks to ensure that differences in performance on the original Eyes stimuli can be attributed to differences in ToM ability. The Animals task required the participant to make judgments about the traits of different animals. Twelve black-and-white pictures of animals were presented in a manner similar to the eyes stimuli with one target and three foils for each animal stimulus. The Gender task consisted of 12 black-and-white pictures of randomly selected pictures from the eyes stimuli, presented with *male* and *female* at the bottom corners of the pictures.
The Eyes, Animals, and Gender stimuli were presented in a block of 60 randomly ordered trials with one practice item at the start that was not included in the analysis. Percent accuracy scores were calculated for the Eyes, Animals, and Gender stimuli, and the Eyes score was used as a ToM measure, with higher scores indicating greater ToM ability.

As the reading of others’ emotions is a subjective task (Baron-Cohen et al., 2001), responses to the Eyes task items were analyzed to ensure that the targets specified by the task developers 1) were chosen by more participants than the foils were and 2) were chosen by participants at rates significantly greater than chance.

Examination of the number of participants who chose the target and foils for each item revealed that for all Gender, Animal, and Eyes items, more participants chose the target than any of the foils.

Binomial tests also were conducted on all Gender, Animal, and Eyes items. On Gender items, which each contained one target and one foil, chance rates were 50%. On Animal and Eyes items, which each contained one target and three foils, chance rates were 25%. Participants chose all Gender and Animal targets at rates significantly greater than chance (binomial test \( p < .0041 \), Bonferroni corrected for 12 items per task). Participants chose all Eyes targets at rates significantly greater than chance (binomial test \( p < .0013 \), Bonferroni corrected for 36 Eyes items).

A reliability analysis was then conducted on the Eyes items. The 36 Eyes items yielded an initial Cronbach’s \( \alpha \) of .530. To increase the internal reliability of the Eyes task, items that, when excluded, would increase \( \alpha \) to \( \geq .535 \) were removed. With this criterion, three items of neutrally-valenced emotions were excluded. These items
included one male item with the target emotion “uneasy” and two female items with the
target emotions “reflective” and “flirtatious.” The revised Eyes task had a Cronbach’s $\alpha$
of .55. Although the internal reliability was not high, it was judged to be adequate given
that the Eyes task was not designed as a scale and that the reliability analysis was
conducted on a correct/incorrect binary basis. When comparing men and women across
Eyes accuracy, no significant differences were observed, $t(236) = .86, p = .30$, with men
having a mean accuracy score of .73 ($SD = .10$) and women having a mean score of .72
($SD = .11$).

Differential Emotions Scale (DES; adapted from Cacioppo, Martzke, Petty, &
Tassinary, 1988). The DES is a measure of positive and negative state affect. Eight sets
of affect items are rated on a scale from 1 (Not at all) to 7 (Very strongly). These eight
sets include: merry/gleeful/amused, warmhearted/joyful/elated, sad/downhearted/blue,
irritated/angry/mad, fearful/scared/afraid, tense/anxious/nervous, disgusted/turned-
off/repulsed, and contemptuous/scornful/disdainful. The two positive items are reverse
scored, and the items are summed to produce a total score. Higher scores indicate greater
negative affect. The DES was administered immediately following the Eyes task to
account for current mood effects on Eyes task performance. Men ($M = 20.19, SD = 6.69$)
and women ($M = 18.84, SD = 5.84$) did not differ in ratings of their current mood, $t(236)$
$= 1.51, p = .13$.

Current Non-sadness Negative Affect is a term created from the two DES items
that preliminary analyses (discussed below) found to unexpectedly influence Eyes
performance, “fearful/scared/afraid” and “disgusted/turned off/repulsed.” These two
items were summed to create a variable representing non-sadness negative affect.
Internal, Personal, and Situational Attributions Questionnaire (IPSAQ; Kinderman & Bentall, 1996). The IPSAQ is a 32-item questionnaire assessing attributional style. Participants are given a brief scenario that is either positive or negative. They then provide a reason for which the scenario would occur and to rate whether their provided reason is due to something about themselves (internal attribution), other people (external personalizing attribution), or a situation (external situational attribution).

The scale yields two measures of attributional bias. The Externalizing Bias (EB) a measure of the extent to which one attributes positive versus negative events to oneself. The EB is calculated by subtracting the number of internal attributions for negative events from the number of internal attributions for positive events. This scale has been found to be correlated with depressed mood and with internality from the Attribution Style Questionnaire (ASQ; Peterson et al., 1982). Higher EB scores represent greater tendency to attribute positive events, as opposed to negative events, to oneself. Lower EB scores, then, represent the internalizing attribution style of depression (Kinderman & Bentell, 1996), the tendency to attribute more negative than positive events to oneself.

The Personalizing Bias (PB) is a measure of the extent to which one attributes negative events to other people versus situations and is calculated as the number of personalizing attributions made to negative events divided by the number of personalizing and situational attributions made to negative events. The PB has been found to be related to measures of paranoia (Kinderman & Bentell, 1996).

On both the EB and PB scales, men and women did not score significantly differently, \( t(236) = .27, p = .79 \), and \( t(236) = 1.65, p = .10 \), respectively. On the EB
scale, men had an average score of 1.72 ($SD = 3.86$) and women of 1.87 ($SD = 3.49$). On
the PB scale, men had an average score of .66 ($SD = .26$) and women of .59 ($SD = .26$).

Reliability for the different subscales and composites have been found to be
between .61 and .76, which are higher than reliabilities for the ASQ (Kinderman &
Bentell, 1996). In the current study, reliability was assessed across the scale as a whole
and was found to be .75.

Procedure

This longitudinal study followed a group of university students over seven
months. Assessments were made at two time points during the school year: during the
Fall term (October – December 2008) and during the Winter term (January – April 2008).
Between Time 1 and Time 2, 12-22 weeks elapsed ($M = 14.34$, $SD = 2.05$ weeks). All
measures were administered at Time 1. At Time 2, the social functioning questionnaire,
SAS, was administered again.

Time 1 and Time 2 assessments were completed in a laboratory. At Time 1, all
participants received course credit; at Time 2, participants received either course credit or
monetary compensation if they had completed their course credits by that time.
All participants completed consent forms at the beginning of their Time 1 visit. At Time
2, participants were reminded that they had completed consent forms during their first
visit, and all consent forms were on hand in the event that a student wished to review his
or her form. All measures were completed on the computer. The Eyes task was always
presented first, followed by the DES. All other questionnaires were then presented in
random order, with the exception of the BDI-II, which was always presented last to avoid
mood effects (Mark, Sinclair, & Wellens, 1991). Upon completion of Time 1,
participants were debriefed without a full explanation of the study, but still offered the chance to ask questions. The experimenter also reminded them that they would be contacted during the following term for their second visit. Upon completion of Time 2, participants were fully debriefed and thanked for their time.

Results

Descriptive Statistics

Zero-order correlations, means, standard deviations, and ranges are presented in Table 2.1. As expected, BDI-II was significantly and positively correlated with BAI, DES, and SAS at Times 1 and 2. BAI also was correlated with DES and SAS at both times. Although I expected a significant correlation to exist between Eyes accuracy and BDI-II scores, as previously found (Harkness et al., 2005), this relationship was not significant in my study, \( r = .02, \ p = .80 \). Hence, I conducted a series of tests to examine possible explanations.

First, I found that reaction time also was not correlated with Eyes accuracy, \( r = .04, \ p = .59 \). Second, I tested if BDI-II had a differential relationship with Eyes accuracy based on the valence of the Eyes stimuli (positive, negative, or neutral emotion). That is, each Eyes stimulus has been assigned to one of the three valence categories based on consensus criteria (Harkness et al., 2005), and therefore, each valence thus has its own accuracy score comprised of the items in its category. Consistent with my null findings for overall Eyes accuracy, BDI-II also was not correlated with the separate valence accuracy scores (positive: \( r = -.02, \ p = .78 \); negative: \( r = .09, \ p = .16 \); neutral: \( r = -.04, \ p = .57 \)). Third, I examined whether or not current mood had an impact on Eyes accuracy. The total DES score was not significantly correlated with Eyes performance, \( r = -.09, \ p = \).
Table 2.1

Descriptive Statistics and Correlations

<table>
<thead>
<tr>
<th></th>
<th>BDI-II</th>
<th>BAI</th>
<th>Eyes</th>
<th>IPSAQ EB</th>
<th>IPSAQ PB</th>
<th>SAS (T1)</th>
<th>SAS (T2)</th>
<th>DES</th>
<th>CNNA</th>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Eyes</td>
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<td></td>
<td></td>
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<td>.04</td>
<td>-.09</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAS (Time 1)</td>
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<td>-.06</td>
<td>-.07</td>
<td>-.02</td>
<td>.64***</td>
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<td></td>
</tr>
<tr>
<td>SAS (Time 2)</td>
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<td>.64***</td>
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<td>.02</td>
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<td>.39***</td>
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<tr>
<td>CNNA</td>
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<td>.28***</td>
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<td>.35***</td>
<td>.36***</td>
<td>.71***</td>
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Note: BDI-II: Beck Depression Inventory – II; BAI: Beck Anxiety Inventory; Eyes: Eyes task accuracy; IPSAQ EB: IPSAQ Externalizing Bias; IPSAQ PB: IPSAQ Personalizing Bias; SAS (T1): Social Adjustment Scale (Time 1); SAS (T2): Social Adjustment Scale (Time 2); DES: Differential Emotions Scale; CNNA: Current Non-sadness Negative Affect. SD = standard deviation.  
* p < .05  ** p < .01  *** p < .001
However, I further examined current mood by looking at whether individual emotion categories were related to Eyes performance. I found that the “fearful/scared/afraid” and “disgusted/turned off/repulsed” scales were significantly correlated with Eyes accuracy, $r = -.15, p = .02$ and $r = -.22, p = .001$, respectively. Consequently, I created a variable that was the sum of these two scales. This new variable, which I named “Current Non-sadness Negative Affect” (CNNA), was significantly correlated with Eyes performance, $r = -.22, p = .001$.

Based on these results, I then conducted a hierarchical regression analysis with Eyes as the dependent variable, CNNA as a predictor in the first step, and BDI-II as a predictor in the second step. Both steps in this regression were significant, $R = .22, F(1, 236) = 11.97, p = .001$ in step 1 and $R = .25, F(2, 235) = 7.49, p = .001$ in step 2. However, the $R^2$ change was not significant at the second step when BDI was added, indicating that BDI-II did not significantly predict Eyes accuracy over and above CNNA, $R^2_{\text{change}} = .01, F_{\text{change}}(1, 235) = 2.91, p = .09$.

To further examine the BDI-II and Eyes relationship, I decided to include BAI in the regression equation. Although BAI in this sample was not significantly related to Eyes accuracy, previous reports have shown a significant relationship between Eyes and anxiety (Harkness et al., 2005). Given that CNNA had an effect on the Eyes and BDI-II relationship, anxiety also could have had some effect on this relationship. Therefore, I conducted another hierarchical regression with Eyes as the dependent measure, CNNA and BAI as predictors in the first step, and BDI-II as a predictor in the second step. At the first step, CNNA had a significant relationship with Eyes, $\beta = -.22, p = .001$, but BAI did not, $\beta = -.01, p = .87$. The overall regression at this first step was significant, $R = .22,$
At the second step, CNNA again had a significant relationship with Eyes, $\beta = -.26, p = .000$, but BAI did not, $\beta = -.08, p = .27$. Importantly, BDI-II did have a significant relationship with Eyes, $\beta = .16, p = .04$. The overall regression at this second step was significant, $R = .26, F(2, 235) = 5.40, p = .001$, and the regression model significantly improved after adding BDI-II, $R^2_{\text{change}} = .02, F_{\text{change}}(1, 234) = 4.10, p = .04$. Therefore, by taking into account participants’ current non-sadness negative affect and general anxiety, I was able to replicate the relationship between Eyes accuracy and BDI-II scores.

Finally, I conducted the same regression analyses replacing Eyes accuracy with Animals accuracy. Animals is a control task for the Eyes task. It was designed to ensure that effects seen with Eyes performance are specific to emotionally-laden stimuli and not due solely to general cognitive ability in these types of tasks. In this regression, the overall model at both steps was not significant, nor was the relationship between BDI-II and Animals accuracy in the second step. Therefore, current non-sadness negative affect and anxiety were significant influences on the relationship between dysphoria and ToM ability, but not on the relationship between dysphoria and a more general cognitive ability.

In sum, then, I found that the zero-order correlation between Eyes accuracy and BDI-II did not exist because several other variables were correlated with Eyes performance, namely current non-sadness negative affect and anxiety. When these influences were covaried out, the expected relationship between BDI-II and Eyes was replicated. Additionally, these influences were specific to ToM abilities and not more general cognitive abilities.
Path Analyses

Path analyses were conducted in RAMONA and LISREL 8.30 using maximum likelihood estimation. Decisions surrounding model fit were based on Hoyle and Panter’s (1995) recommendations to use: 1) an absolute fit index, the Root Mean-Square Error of Approximation (RMSEA; Browne & Budek, 1993); 2) an incremental fit index, the Tucker-Lewis (TLI; Tucker & Lewis, 1972) or Non-Normed Fit Index (NNFI; Bentler & Bonett, 1980); and 3) a second incremental fit index, the Comparative Fit Index (CFI, 1990). The following decision rules were applied in the interpretation of each fit index: the RMSEA should be less than .05 for good fit or less than .10 for acceptable fit (Browne & Cudek, 1993) and the TLI/NNFI and CFI should be greater than .90 (Bentler & Bonett, 1980; Hu & Bentler, 1995), with preference for estimates greater than .95 (Hu & Bentler, 1999).

Primary Path Analyses. In my primary path analyses, I examined ToM, Externalizing Bias (EB), and their interaction as potential mediators of the relationship between dysphoria and social functioning in three models: partial mediation, full mediation, and separate direct effects of the variables (i.e., no mediation). To create the interaction term between ToM and attribution style, I first standardized Eyes accuracy scores and the Externalizing Bias. Then, I multiplied the standardized Eyes and Externalizing Bias terms together. By first standardizing the original variables, I reduced the multicollinearity between the interaction term and its composite variable main effects when I conducted path analyses.

Because I measured social functioning at both Times 1 and 2, I was able to examine changes in social functioning between the two time points. A path analysis that
includes a directional path from a Time 1 variable to the same variable measured at Time 2 allows one to take into account participants’ scores at Time 1. By doing so, one is actually looking at changes in the variable from Time 1 to Time 2. Conceptually, this approach is similar to creating a change score in other statistical analyses. In other words, then, I examined how Time 1 dysphoria, ToM, Externalizing Bias, and the ToM and externalizing bias interaction influenced changes in participants’ social functioning from Time 1 to Time 2.

To represent their significant relationship, all of the models also contained a path between Time 1 dysphoria to Time 1 social functioning. No paths between the mediator variables and Time 1 social functioning were included in the models because they were not significant in preliminary analyses nor were they key to my hypotheses.

Finally, as I reported earlier, I was unable to replicate the previously found relationship between dysphoria and Eyes accuracy on which my hypotheses were based unless I covaried out both Current Non-sadness Negative Affect and BAI from participants’ ToM accuracy scores. Consequently, the following paths were added to all models: 1) a path from Current Non-sadness Negative Affect to Eyes accuracy, 2) a path from BAI to Eyes accuracy, and 3) a correlational path between BAI and BDI, as depression and anxiety were, as expected, significantly related.

The partial mediation model tested the hypothesis that the relationship between dysphoria and social functioning is partially mediated by ToM, attribution style, and their interaction. That is, the partial mediation model contained a direct path from dysphoria to social functioning as well as paths from dysphoria to the mediator variables and from the mediator variables to social functioning. A conceptual representation of the partial
mediation model is shown in Figure 2.2. My hypotheses, specifically my third hypothesis regarding mediation, are best represented by this partial mediation model.

*Figure 2.2. Hypothesized full and partial mediation models: Mediating effects of ToM and attribution style on the relationship between dysphoria and social functioning. Note. ToM = Theory of mind or Eyes task accuracy. CNNA = Current Non-sadness Negative Affect. The path between Time 1 Dysphoria and Time 2 Social Functioning (dashed line) was not included in the full mediation model but was included in the partial mediation model.*

The full mediation model tested the hypothesis that the relationship between dysphoria and social functioning is fully mediated by ToM, attribution style, and their interaction. As such, the full mediation model contained no direct path from dysphoria to social functioning. It contained only paths from dysphoria to the mediators and paths from the mediators to social functioning. The full mediation model also is conceptually represented in Figure 2.2 if one removes the path, shown as a dotted line, between
dysphoria and social functioning at Time 2. If this model fits the data the best, it also
would be supportive of my hypotheses albeit a stronger version of them because the
mediator variables would completely account for the relationship between dysphoria and
social functioning.

In the direct effects model, I tested the direct effects of all variables on social
functioning (see Figure 2.3 for a conceptual representation of this model). More
specifically, this model included direct paths from dysphoria and the mediator variables
to social functioning, but dysphoria and the mediator variables were not linked to each
other. Support for this model would be the most contrary to my hypotheses.

Figure 2.3. Hypothesized direct effects model: Effects of dysphoria, ToM, and attribution
style on social functioning.
None of the models achieved an acceptable fit to the data (see Table 2.2) and thus will not be interpreted. To further explore my data, I examined the accuracy for positive, negative, and neutral Eyes, separately. That is, I replaced the total Eyes accuracy score with the accuracy score for each valence category. Of particular interest was the negative Eyes valence, as the attribution bias I measured was specific to negative events. Again, however, none of the models fit the data well enough to be interpreted (all RMSEAs > .10). In sum, then, I did not find support for my hypotheses that ToM, externalizing bias, or their interaction could account for the relationship between dysphoria and social functioning.

Table 2.2
Fit Statistics for ToM and Attribution Style Path Analyses

<table>
<thead>
<tr>
<th>Model</th>
<th>df</th>
<th>Parameters</th>
<th>Fs</th>
<th>Chi-Square</th>
<th>TLI/NNFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>RMSEA CI</th>
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<td></td>
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<td></td>
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<tr>
<td>Full</td>
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<td>19</td>
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<td>.78</td>
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</tr>
<tr>
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<td>.89</td>
<td>.11</td>
<td>.08-.14</td>
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<td>.89</td>
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<td>.08-.13</td>
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<tr>
<td>Direct Effects</td>
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<td>.00-.07</td>
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<td>4.01</td>
<td>1.00</td>
<td>1.00</td>
<td>.00</td>
<td>.00-.04</td>
</tr>
</tbody>
</table>

*Note. df = Degrees of freedom; Parameters = Number of parameters estimated in model; Fs = Sample Discrepancy Function; Chi-Square = Chi-square statistic for model; TLI/NNFI = Tucker-Lewis Index/Non-Normed Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean-Square Error of Approximation; RMSEA CI = RMSEA 90% Confidence Interval.*

Secondary Path Analyses. Unfortunately I cannot advance my third hypothesis regarding ToM and/or externalizing bias as potential mediators of the relationship between dysphoria and social functioning. However, I conducted additional analyses to further explore the relationship between my primary variables. In these analyses, I no
longer included Current Non-sadness Negative Affect and BAI as covariates for Eyes accuracy in an attempt to improve model fit and make the model more parsimonious (i.e., it had fewer parameters). Without these variables, BDI and Eyes were no longer correlated. My new direct effects model (see Figure 2.4) had good fit to the data based on all three indexes (see Table 2.2).

As predicted and consistent with previous research, I found a significant relationship between BDI and problems in social functioning, both concurrently and longitudinally. I also found that ToM directly influenced changes in social functioning. More specifically, greater ToM abilities at Time 1 were related to improved social functioning between Time 1 and Time 2. Finally, as I expected, the interaction between

![Figure 2.4. Direct effects model: Effects of dysphoria, ToM, and attribution style on social functioning.](image)

* $p < .05$  
** $p < .01$  
*** $p < .001$
ToM and attribution style was significantly related to changes in social functioning.

To break down the interaction between ToM and Externalizing Bias attribution style, I conducted a multiple group analysis to examine how the ToM-social functioning relationship differed from High versus Low Externalizing Bias individuals. I split my sample using a median split, which resulted in 112 individuals in the high Externalizing Bias group (greater than or equal to the median Externalizing Bias score of 2) and 126 individuals in the low Externalizing Bias group.

In my multiple group analysis, I allowed all of the specified paths, including the one between ToM and social functioning, to be unconstrained or free to vary across the two groups (Figure 2.5). The model fit the data well according to all three indexes (see Table 2.2). I found a significant inverse relationship between ToM and problems with social functioning in low Externalizing individuals. That is, for individuals who tend to attribute more negative than positive events to themselves (i.e., an internalizing attribution bias), greater ToM abilities were associated with better social functioning and fewer social problems, $\beta = -0.19$, $t = 2.78$, $p = .005$. For high Externalizing Bias individuals, the relationship between ToM and social functioning was not significant, $\beta = -0.03$, $t = .38$, $p = .70$. These two path coefficients, however, were not significantly different from each other, $z = 1.69$, $p > .09$, thus weakening any conclusions that I can

---

1 After testing an unconstrained model in multiple group analysis, one usually tests additional models that constrain certain paths to be equal across the two groups. By looking at the chi-square values of these constrained versus unconstrained models, one is able to compare whether or not a model that allows path coefficients to differ between the groups is better than one that assumes the paths are equal across groups. However, when constraining certain paths in my model, the structural equation models had identification problems. As a result, instead of comparing constrained versus unconstrained models, I statistically compared the individual path coefficients from the fully unconstrained model.
Finally I also tested several alternative models to ensure that my findings were not due to other, related variables including anxiety, general cognitive ability (i.e., performance on the Animals Task), and a different attribution bias (i.e., the Personalizing Attribution Bias). I also performed multiple group analysis by splitting on the Eyes variable, although this was less relevant to my research question, as an alternative approach to examining the Externalizing Bias-social functioning relationship for the ToM x Externalizing Attribution Bias interaction. This model, however, did not yield an acceptable fit (RMSEA > .10, both TLI/NNFI and CFI < .90).

Figure 2.5. Multiple group analysis comparing low and high externalizing bias individuals

* $p < .05$  ** $p < .01$  *** $p < .001$
Bias, or the tendency to attribute negative events to others as opposed to the situation). These models either did not show acceptable fit to the data or the variables were not related to changes in social functioning.

Discussion

The primary goal of this study was to examine if and how ToM mediates the relationship between dysphoria and social functioning. My first hypothesis (H1) centered on only ToM and dysphoria. My prediction that greater ToM would be correlated with greater dysphoria was not supported. In fact, unlike the previous study by Harkness et al. (2005), neither depressive nor anxious symptomatologies were directly correlated with participants’ ToM scores. I found, instead, that the effects of anxiety and current non-sadness negative mood (i.e., fear and disgust) had to be covaried out of participants’ Eyes accuracy scores for the relationship between ToM and dysphoria to be significant.

Several factors may have contributed to the failure to replicate the ToM-dysphoria relationship found by Harkness et al. (2005). First, my sample had lower BDI-II scores ($M = 8.10, SD = 6.58$) than the sample in Harkness et al. ($M = 10.88, SD = 8.70$ in Study 2). The lower levels of depression in the current sample may have resulted in a restricted range of BDI-II scores that made it more difficult to replicate the ToM-dysphoria relationship. For my participants, who were not experiencing as severe or as long-term a dysphoric state, current negative mood, not sadness, may have had the greatest effect on Eyes task performance. However, an important caveat to this possibility is that the DES mood scale was administered after the Eyes task, and it may have been the Eyes task that influenced current mood. Nevertheless, current mood did significantly correlate with Eyes performance, and whether it was current mood influencing Eyes performance or
vice versa, this relationship did impact the Eyes-BDI relationship and was covaried out. Second, the BDI-II could have been affected by fatigue of participants, all of whom completed this scale at the end of an hour-long study. The BDI-II was always given last to prevent mood effects on other study scales (Mark et al., 1991), but this ordering may have altered participants’ responses. Finally, for my sample, perhaps, ToM simply did not correlate with depression. All other well-established and expected relationships were found (e.g., between depression and anxiety, social functioning, and current mood), and it was only Eyes performance that did not have the expected relationship to dysphoria.

The failure to replicate the relationship between greater dysphoria and enhanced ToM is, however, consistent with previous research by Pietromonaco, Rook, and Lewis (1992) showing that dysphoric individuals may not be absolutely more accurate in social cognition. Instead, these researchers found that similarity in dysphoria level between interaction partners improved accuracy. Furthermore, although some studies have shown that dysphoric individuals are more interested in seeking information about others, this increased interest and motivation does not automatically imply increased accuracy (e.g., Hildebrand-Saints & Weary, 1989). Perhaps the increased accuracy and/or complexity in social cognition reported in previous studies (e.g., Harkness et al., 2005; Marsh & Weary, 1989; Yost & Weary, 1991) depends on the increased motivation of dysphoric individuals to understand their social environment. Motivation may indeed have been lacking in this study, as dysphoric individuals’ reaction times to Eyes items did not differ significantly from reaction times of non-dysphorics. In previous studies, dysphoric individuals spent more time responding to an item (Harkness et al., 2005), suggesting that they were more interested in processing the Eyes times thoroughly and accurately. Thus,
motivation may be an important factor to consider in future studies of accuracy in dysphoric individuals’ social cognition abilities.

Notably, Pietromonaco et al.’s study involved *in vivo* interactions between participants, so similarities that can be drawn between the Eyes task and *in vivo* interactions are limited. Additionally, dysphoric individuals in the current study were not more accurate in identifying negative versus positive eyes stimuli. Nevertheless, the failure to replicate the ToM-BDI relationship makes studying the accuracy of social inferences made by dysphoric individuals during in vivo interactions and on measures like the Eyes test important. Given the effects of current negative mood on Eyes task performance in this study, studying the effects of different mood states, including sadness, anxiety, fear, and disgust, on ToM performance should help elucidate our understanding of mood effects on social-cognitive performance.

The lack of a relationship between dysphoria and ToM is a major limitation to this study. It will be important to conduct this study again to replicate the dyshporia-ToM relationship, after which my original hypotheses can be re-examined.

*Dysphoria, ToM, and Attribution Bias: The Direct Effects on Social Functioning*

Because I covaried out the effects of anxiety and current non-sadness negative mood to establish a significant relationship between dysphoria and ToM, I tested my third hypothesis (H3) regarding the mediating effects of ToM in the dysphoria-social functioning relationship by including these two covariates in the model. However, none of the models testing the mediation effects of ToM fit the data well, and therefore, I did not find support for my third hypothesis that the interaction between ToM and attribution style mediates the relationship between dysphoria and social functioning.
I did explore alternative path analyses to test the direct effects of dysphoria, ToM, attribution style, and the interaction between ToM and attribution style on longitudinal changes in social functioning. This new direct effects model fit the data well, and as expected, dysphoria was significantly correlated with social functioning, both concurrently and longitudinally, providing additional support for the well-established relationship between depressive symptomatology and social impairments (e.g., Gotlib & Lee, 1989).

In the alternative model, my second hypothesis (H2) that ToM would be independently correlated with social functioning was supported. Better ToM functioning was associated with greater improvement in social functioning over time. This finding fits well with previous clinical research showing that better ToM is associated with better social functioning in autistic and schizophrenic populations (Brune, 2005; Tager-Flusberg, 1999). The current study establishes that, even in healthy, adult populations, ToM is an important predictor of social functioning.

In addition to ToM itself, I found that the interaction between ToM and attribution style significantly influenced social functioning over time. In my third hypothesis, I had predicted that, for individuals with an internalizing bias, better ToM would mediate a relationship between dysphoria and poor social functioning. That is, an internalizing bias would explain how dysphoric individuals, who display the prosocial trait of enhanced ToM, still experience poor social functioning. Drawing comparisons between my hypothesis and my results is difficult because my hypothesis concerned the mediating role of the ToM x attribution style interaction on the dysphoria-social functioning relationship. Nevertheless, I did find that this interaction directly influenced social
functioning. Still, contrary to my hypothesis, I found a trend indicating that, for individuals with an internalizing bias (the tendency to attribute more negative as opposed to positive events to oneself), better ToM is associated with better social functioning.

Similar to my hypothesis, ToM was not related to social functioning in individuals with an externalizing bias (the tendency to attribute more positive as opposed to negative events to oneself).

The interpretation of these results requires caution because statistically, individuals with internalizing versus externalizing attribution biases did not differ in their relationship between ToM and social functioning. Perhaps individuals with the two different attribution styles actually do not differ in how ToM influences their social functioning, but other factors may have affected the analysis. For example, I applied an arbitrary criterion, a median split, to separate the sample into two groups. Problems exist with dichotomizing a continuous variable like the Externalizing Bias score, including a reduction in statistical power (MacCallum, Zhang, Preacher, & Rucker, 2002). However, no other means of following up an interaction in path analyses have been offered at this time.

Additionally, the internalizing/externalizing attribution bias studied here was calculated in a specific way, by subtracting the number of negative events attributed to oneself from the number of positive events attributed to oneself. The specific scale (IPSAQ; Kinderman & Bentell, 1994) was chosen because all questions concerned attributions in social situations that were most relevant to the study. The median split created an internalizing attribution group that contained individuals who were more prone toward externalizing attributions, albeit to a lesser extent than those in the externalizing
attribution group. In future studies, the definition of internalizing attribution bias can be modified to continue studying the nuances of this interaction. For example, an internalizing attribution bias also could mean a greater number of negative events attributed to oneself versus negative events attributed to others or to the situation. The globality and stability of such an attribution bias also were not assessed. With the trend established by the current study, these other factors will all be important to take into account in future studies that can increase the sample size for each of the two groups to maximize power or can look at alternate ways to separate attribution groups.

The pattern of results nevertheless suggests that being more accurate in social inferences benefits individuals who tend to make negative self-attributions, a benefit that does not extend to individuals who make more positive self-attributions. Further exploration is needed to determine the mechanisms behind how ToM and attribution style interact to influence social functioning. For example, why is greater ToM accuracy beneficial to the social functioning of those with internalizing but not externalizing attribution biases? Perhaps if one tends to attribute negative events to oneself, reading others’ emotions more accurately prevents one from making biased attributions based on a misreading of others’ emotions. Accurate social inferences may then help to prevent misunderstandings that arise when an individual first misreads another’s negative emotion and then feels that he or she is to blame for it. For these high internalizers, future studies will need to look at whether increased accuracy in social inferences is associated with fewer attribution biases, if accuracy in inferring others’ emotional states is correlated with accuracy in inferring the context behind emotions, if these different forms of social inference (i.e., reading contexts) also are associated with better social
functioning, and how internalizing attribution biases may be manifested in overt social behaviour.

For individuals who do not exhibit such self-blame, increased accuracy in social inferences may not be especially beneficial because these individuals do not exhibit negative cognitive biases. That is, because they do not feel overly to blame for negative situations, which in turn can lead to negative emotions and behaviours that impact the social interaction, these individuals are less reliant on reading others’ emotions correctly. The externalizing bias measured in this study is the bias to attribute more positive versus negative events to oneself, and future studies can address how overattributing positive events to oneself may affect social interactions. To understand how different levels of attribution bias influence the ToM-social functioning relationship, future research should distinguish between groups with internalizing bias, externalizing bias, and no attribution bias. It will also be interesting to determine whether or not other social cognitive processes, such as empathic accuracy and reading contexts behind others’ emotions, may benefit externalizing attributors in social functioning.

This study is the first one to link ToM and internalizing attribution bias, two cognitive processes, in their relationship to social functioning. Intuitively, being more accurate in reading others’ emotions (i.e., ToM) should benefit one’s social functioning. The role of attribution biases in social functioning, however, needs to be further elucidated. In addition to examining the mechanisms proposed above for the moderating effect of internalizing versus externalizing biases on the relationship between ToM and social functioning, future studies could look at the effect of misattributing others’ positive versus negative emotions in a social interaction, the effect of misattributing others’
emotions to oneself versus others, and whether or not individuals with internalizing attribution biases are more motivated to be accurate in reading others’ emotions. Finally, research into ToM and social functioning should be extended to clinically depressed individuals, who, like autistic and schizophrenic individuals, have been found to have lower levels of ToM (Lee et al., 2005).

Conclusion

The current study examined the relationships between dysphoria, ToM, attribution style, and changes social functioning over time. Both dysphoria and ToM directly predicted better social functioning over time. The interaction between ToM and attribution also predicted social functioning. I found that for individuals with an internalizing attribution bias, better ToM predicted better social functioning. For individuals with a more externalizing attribution bias, ToM was not related to better social functioning. This study was the first to examine ToM and attribution style as influences on the social functioning of a healthy population. Future studies are needed to continue looking at the mechanisms behind attribution style’s contribution to the ToM and social functioning relationship and, given that a relationship between ToM and dysphoria was not replicated in this study, to re-examine my original hypotheses. Finally, this study focused on one specific cognitive process that may influence how ToM mediates the relationship between dysphoria and social impairment. Other cognitive processes, such as emotion regulation, processing speed, memory, and attention, have been found to be affected by depressive symptoms (e.g., Bornstein, Baker, & Douglass, 1991; Farrin, Hull, Unwin, Wykes, & David, 2003; Garnefski, Kraaij, & Spinhoven, 2001; Tsourtos, Thompson, & Stough, 2002), and based on the findings in this study, it
would be interesting for future research to explore if and how these other cognitive processes influence the interrelationships between ToM, dysphoria, and social functioning.
Forward to Chapter Three

The study presented in Chapter Three provides a bridge between Study 1 (Chapter Two), which focuses on theory of mind, and Study 3 (Chapter Four), which focuses on empathy. Both theory of mind and empathy have been separated into different cognitive and affective components, and debate exists about the connection between the two social processes. The goal of this second study then was to examine the link between affective theory of mind and both cognitive and affective empathy.

The manuscript in Chapter Three, which highlights a theoretical discussion existing in the research literature, will be submitted to the *Journal of Personality.*
CHAPTER THREE

Theory of Mind and Empathy
Abstract

Theory of mind (ToM) and empathy are both processes that involve responding to others’ emotional states and have each been separated into cognitive and affective components. Using the social faux pas ToM task, some studies have shown a connection between affective ToM (i.e., cognitive inferences of others’ emotions) and cognitive empathy (i.e., cognitions surrounding others’ emotions), but others have not found a similarity. The current study examined the link between affective ToM and empathy using a ToM task that focuses specifically on others’ emotions, Reading the Mind in Eyes. As expected, affective ToM was correlated with cognitive empathy, but only one aspect of it, perspective-taking. Affective ToM was not correlated with affective empathy or empathy in general.
Theory of Mind and Empathy

In any social interaction, an individual receives and processes a wide variety of social cues, and the social-cognitive processes, or the mental representations he or she forms of others’ intentions, dispositions, and emotions play important roles in his or her social functioning (Adolphs, 1999, 2001; Blakemore, Winston, & Frith, 2004; Brothers, 1990; Pinkham, Penn, Perkins, & Lieberman, 2004). One such social-cognitive process is theory of mind (ToM) or the ability to infer others’ mental states including other people’s cognitions and emotions. Some researchers have drawn a distinction between two aspects of ToM: cognitive ToM and affective ToM (Blair & Cippolotti, 2000; Shamay-Tsoory, Tomer, Berger, Goldsher, & Aharon-Peretz, 2005). Cognitive ToM involves inferences one makes about others’ thoughts, intentions, and beliefs, whereas affective ToM involves inferences about others’ emotional states and feelings.

Neuropsychological studies have provided empirical support for separating the systems of cognitive and affective ToM. For example, Hynes, Baird, and Grafton (2005) found different areas of the brain responsible for emotional versus cognitive perspective-taking. Participants who focused on the emotions of a target person showed activation in the medial orbitofrontal lobe (or Brodmann areas 11 and 25), but focusing on the cognitions or thoughts of targets did not activate these areas. Shamay-Tsoory et al. (2005) found that patients with damage to the right ventromedial prefrontal cortex (PFC), compared to patients damaged in the left or right posterior cortex and to healthy controls, were impaired in ToM tasks that required greater emotional representation of others. Furthermore, Shamay-Tsoory and Aharon-Peretz (2007a) showed dissociation between cognitive and affective ToM, with cognitive ToM being associated with extensive frontal
damage and affective ToM being associated with ventromedial damage. Patients with ventromedial damage also show worse performance with ToM stories that involve greater emotional content (Shamay-Tsoory, Tibi-Elhanany, & Aharon-Peretz, 2006). Using a ToM task that requires one to judge verbal and eye gaze cues, schizophrenic patients had greater impairment in affective versus cognitive ToM tasks (Shamay-Tsoory, Aharon-Peretz, & Levkovitz, 2007b). These studies show that the affective and cognitive components of ToM not only involve a different focus at the individual’s cognitive level, but also involve distinct neural systems.

*Cognitive and Affective Empathy*

Whereas affective ToM refers specifically to one’s cognitive inference of another’s emotions, the construct of empathy encompasses both cognitive and affective responses to another’s emotions. A formal definition of empathy has remained the subject of much debate in the literature (e.g., Preston & DeWaal, 2002a, 2002b), but most researchers agree that empathy is “the ability to understand and share in another’s emotional state or context” (Cohen & Strayer, 1996, in Jolliffe & Farrington, 2004, p. 988). This definition by Cohen and Strayer seems to include all the important aspects of one’s empathic responding and was the definition I used in this study.

As in ToM models, two components are incorporated into models of empathy: cognitive empathy and affective empathy (e.g., Blair, 2005; Davis, 1983; Davis, Luce, & Kraus, 1994; Davis, Hull, Young, & Warne, 1987; Decety & Jackson, 2006; Jolliffe & Farrington, 2004; Rankin, Kramer, & Miller, 2005; Shamay-Tsoory, Tomer, Goldsher, Berger, & Aharon-Peretz, 2004; Smith, 2006). Cognitive empathy utilizes cognitive capacities (Davis, 1994; Eslinger, 1998; Grattan, Bloomer, Archambault, & Eslinger,
Affective empathy is the capacity to experience emotional reactions to the observed experiences of other people (Davis, 1994). Cognitive empathy, then, involves the cognitive understanding of another person’s emotional state and point of view behind that emotion, and affective empathy involves sharing these feelings and responding emotionally to them, at the very least at the gross pleasant-unpleasant affect level (Mehrabian & Epstein, 1972).

As in the affective and cognitive distinctions in ToM, research supports the separation of cognitive and affective empathies, which, although significantly correlated (Shamay-Tsoory et al., 2004), are distinct processes. For example, Shamay-Tsoory et al. (2004) demonstrated that cognitive empathy was significantly correlated with cognitive flexibility. Affective empathy, on the other hand, was found to correlate with accuracy in identifying facial expressions of sadness and surprise. Shamay-Tsoory, Shur, Harari, and Levkovitz (2007c) also found that impairments in cognitive versus affective empathy were differentially associated with orbitofrontal deficits (e.g., set shifting) and social functioning, respectively.

Additionally, cognitive and affective empathy are differentially affected in some psychiatric disorders. Sociopathy, or antisocial personality disorder, has been consistently linked with intact cognitive empathy but a lack of affective empathy (Blair, 2005). Also, researchers have hypothesized, but not shown conclusively, that autism is associated with a low cognitive empathy but intact affective empathy (Blair, 2005; Smith, 2006).
Affective Theory of Mind and Cognitive Empathy: Are They Related?

As discussed above, separate cognitive and affective components exist for both ToM and empathy. However, only affective ToM and both cognitive and affective empathy are involved in processing and responding to others’ emotional stimuli during social interactions. Figure 3.1 shows the hypothesized link between affective ToM and cognitive empathy, both of which involve cognitions about others’ emotions. The ability to empathize depends on an appreciation of the emotional states of others, and the connection between affective ToM and cognitive empathy has been discussed in the research literature (Baron-Cohen & Wheelwright, 2004; Blair & Cipolotti, 2000; Eslinger, 1998; Joseph & Tager-Flusberg, 2004; Lough et al., 2006; Rankin et al., 2005; Shamay-Tsoory et al., 2004; Smith, 2006).

Figure 3.1. The connection between theory of mind and empathy in the procession of emotional stimuli in social situations.
*Stimuli in social situations are all necessarily intertwined in any social interaction; this model merely highlights the stimuli that are the foci of ToM and empathy processes.
One must consider that the “cognitive” and “affective” divisions of ToM and empathy have been made differently. That is, both cognitive ToM and affective ToM are cognitive processes; the “cognitive” and “affective” terms refer to what our cognitive processes target. In contrast, the target of all empathic processes is emotion; the “cognitive” and “affective” terms for empathy simply refer to the two types of processes that target others’ emotions.

Furthermore, although affective ToM and cognitive empathy have been linked in some empirical studies, taken together, these studies are not conclusive. For example, in patients with ventromedial prefrontal cortex damage, cognitive empathy was related to ToM, as measured by a social faux pas test (Shamay-Tsoory, Tomer, Berger, & Aharon-Peretz, 2003). However, in another study, Shamay-Tsoory et al. (2005) tested affective ToM performance with several ToM tasks, including the social faux pas test that the authors rated as having the most “affective” component. They found affective ToM to be significantly correlated with total empathy in patients with damage to the ventromedial PFC, but when affective and cognitive empathy were separated, only cognitive empathy was correlated with ToM performance. In contrast, one study found that, in patients with frontotemporal lobe dementia (FTD; which can include damage to the ventromedial PFC), emotion recognition, ToM (measured with cartoons and stories), and cognitive and affective empathy were all abnormal, but social faux pas test performance was not (Lough et al., 2006). Although Lough et al.’s study demonstrates a general link between ToM and empathy, this study does not show the specific link between affective ToM and cognitive empathy. In fact, their patients’ intact performance on the social faux pas task is in direct contrast to the findings from Shamay-Tsoory et al. (2005).
I propose that what is needed to determine the link between affective ToM and cognitive empathy is perhaps a better test of affective ToM, one that more directly measures an individual’s processing of emotionally relevant stimuli. Although a wide variety of ToM tasks exists, the cognitive versus affective component involved in each has not been elucidated clearly.

The prototypical ToM task used widely in the developmental literature is the false-belief task, a purely cognitive task (e.g., Perner & Wimmer, 1985; Wimmer & Perner, 1983). Other ToM tasks that have been developed include irony identification (e.g., Ackerman, 1981; Happe, 1993; Lapidot, Most, Pik, & Shneider, 1998 in Shamay-Tsoory et al., 2005), social faux pas tests (e.g., Dewey, 1991), humour recognition based on mental belief identification in cartoons (Happe, Brownell, & Winner, 1999), inferring mental states from story passages (Happe, 1994), hinting tasks (Corcoran, Mercer, & Frith, 1995), and eye gaze tracking (Baron-Cohen, 1995 in Shamay-Tsoory et al., 2007b). Shamay-Tsoory et al. (2005) have graded three ToM tasks on the degree of emotional representation required, which, in increasing order of emotional content, are: false-belief, irony, and social faux-pas. However, use of the social faux-pas test in drawing conclusions about ToM and empathy has led to some discrepant findings in the ToM and empathy literature, as outlined above.

One promising task that emphasizes the affective component of ToM is the Reading the Mind in the Eyes test discussed above (Baron-Cohen, Joliffe, Mortimer, and Robertson, 1997; Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). This Eyes task was designed as an advanced ToM task and avoids the problem of ceiling performance that occurs with other ToM tests when used with non-psychiatric, non-brain-
injured populations.

A criticism of the Eyes task is that it is more an emotion recognition task than a ToM task. Although the test does involve emotion recognition, the complexity of the emotions involved and the difficulty of identifying an emotion from only the eye region makes this task more challenging than typical emotion recognition tests involving only Ekman’s six emotions (e.g., Ekman & Friesen, 1976). Moreover, the Eyes test has been used widely as a ToM task and not an emotion recognition test (e.g., Dziobek et al., 2005; Kelemen, Erdelyi, Pataki, Benedek, Janka, & Kéri, 2005; Ulhaas, Phillips, Schenkel, & Silverstein, 2006), and in at least one study, the Eyes task was used specifically as a measure of affective ToM (Henry, Phillips, Crawford, Ietswaart, & Summers, 2006). In their studies, Shamay-Tsoory and her colleagues also included simple emotion recognition by face and prosody as separate tasks. In one study, performance on these emotion recognition tasks was not correlated to ToM or empathy levels (Shamay-Tsoory et al., 2005), but in a different study, emotion recognition was found to be related to ToM but not to empathy (Shamay-Tsoory et al., 2003).

The Current Research

The current study directly examined the link between affective ToM, as measured by the Eyes task, and empathy, as measured by self-report questionnaires. If the Eyes task does, in fact, tap into the affective component of ToM, past theoretical arguments and research would predict that the Eyes task is related to more cognitive aspects of empathy, such as perspective-taking and fantasizing, both of are measures of cognitive empathy (Shamay-Tsoory et al., 2003, 2004). Affective empathy, however, is a different component of empathy that involves more of an emotional response to others and
depends less on one’s cognitive understanding of others’ emotions. Extending Shamay-
Tsoory’s (e.g., 2005) findings among patient groups, I predicted that, in my sample of
healthy individuals, the same pattern of relationships between affective ToM and
empathy would emerge. That is, I hypothesized that the Eyes task, as a measure of
affective ToM, would be correlated with measures of cognitive empathy but not with
measures of affective empathy. I also hypothesized that affective ToM would be
correlated with empathy as in general (i.e., collapsing across affective and cognitive
components).

Method

Participants

Participants were male and female students from introductory psychology courses
at Queen’s University. These data were gathered as part of a larger longitudinal study,
and individuals who were taking antidepressant medications or who had been diagnosed
with bipolar mood disorder were excluded from participation.

A total of 242 students completed the study. Of these, one woman was dropped
due to a duplication error that made her data undistinguishable from another participant.
A second woman was dropped because she began taking antidepressants during the study
period. Two additional participants were dropped due to incomplete Eyes task data. The
final sample consisted of 238 individuals, including 62 men and 176 women. At Time 1,
the mean age for this sample was 18.27 (SD =1.45) years.

Measures

All reliability and factor analyses of the measures were performed with the 240
participants who completed the study. Factor analyses were conducted on all scales using
principal axis factoring with an oblique rotation, and the subscale structure of each scale as described by its developers was replicated.

*Reading the Mind in the Eyes Test, Revised* (Eyes task, Baron-Cohen et al., 2001). The Eyes test was designed as an advanced ToM task that requires the participant to attribute the relevant mental state to the eye region of the face, from the eyebrows to halfway down the bridge of the nose. It consists of 36 black-and-white photographs standardized to 15 cm x 6 cm and adapted for the computer by Harkness et al. (2005). Stimuli are presented with four adjectives (one target and three foils), situated at the corners of the pictures, describing the emotional content of the eyes.

The adapted Eyes test by Harkness et al. (2005) included two control tasks to ensure that differences in performance on the original Eyes stimuli can be attributed to differences in ToM ability. The Animals task required the participant to make judgments about the traits of different animals. Twelve black-and-white pictures of animals were presented in a manner similar to the eyes stimuli with one target and three foils for each animal stimulus. The Gender task consisted of 12 black-and-white pictures of randomly selected pictures from the eyes stimuli, presented with *male* and *female* at the bottom corners of the pictures.

The Eyes, Animals, and Gender stimuli were presented in a block of 60 randomly ordered trials with one practice item at the start that was not included in the analysis. Percent accuracy scores were calculated for the Eyes, Animals, and Gender stimuli, and the Eyes score was used as a ToM measure, with higher scores indicating greater ToM ability.

As the reading of others’ emotions is a subjective task (Baron-Cohen et al., 2001),
responses to the Eyes task items were analyzed to ensure that the targets specified by the task developers 1) were chosen by more participants than the foils were and 2) were chosen by participants at rates significantly greater than chance.

Examination of the number of participants who chose the target and foils for each item revealed that for all Gender, Animal, and Eyes items, more participants chose the target than any of the foils.

Binomial tests also were conducted on all Gender, Animal, and Eyes items. On Gender items, which each contained one target and one foil, chance rates were 50%. On Animal and Eyes items, which each contained one target and three foils, chance rates were 25%. Participants chose all Gender and Animal targets at rates significantly greater than chance (binomial test $p < .0041$, Bonferroni corrected for 12 items per task). Participants chose all Eyes targets at rates significantly greater than chance (binomial test $p < .0013$, Bonferroni corrected for 36 Eyes items).

A reliability analysis was then conducted on the Eyes items. The 36 Eyes items yielded an initial Cronbach’s $\alpha$ of .530. To increase the internal reliability of the Eyes task, items that, when excluded, would increase $\alpha$ to $\geq .535$ were removed. With this criterion, three items of neutrally-valenced emotions were excluded. These items included one male item with the target emotion “uneasy” and two female items with the target emotions “reflective” and “flirtatious.” The revised Eyes task had a Cronbach’s $\alpha$ of .55. Although the internal reliability was not high, it was judged to be adequate given that the Eyes task was not designed as a scale and that the reliability analysis was conducted on a correct/incorrect binary basis.

*Interpersonal Reactivity Index* (IRI; Davis, 1980). The IRI is a 28-item
questionnaire that measures four aspects of empathy: Perspective Taking, Fantasy, Empathic Concern, and Personal Distress. Each item is rated on a 0 (*does not describe me well*) to 4 (*describes me well*) scale. Perspective taking measures the tendency to spontaneously adopt another’s psychological point of view, whereas fantasy measures the tendency to imaginatively transport oneself into fictional situations. Perspective taking and fantasy both are measures of cognitive empathy and have shown strong correlations with other measures of cognitive empathy, such as Hogan’s cognitive empathy scale (Shamay-Tsoory et al., 2003, 2004). Empathic concern measures other-oriented feelings of sympathy and concern for unfortunate others, whereas the personal distress scale measure self-oriented feelings of personal anxiety and unease in tense interpersonal situations. Empathic concern and personal distress, then, are both measures of emotional empathy. The IRI is scored by taking a sum of the responses to questions within each subscale, as well as a total score for the scale (after reverse-scoring the relevant items). Higher scores indicate higher levels of empathy. The multidimensional structure of the IRI has been supported (Davis, 1983; Pulos, Elison, & Lennon, 2004), and the scale has been found to have satisfactory internal reliability at $r = .71$ to .77 and test-retest reliability at $r = .62$ to .71 (Davis, 1980). Internal reliability was high in the current study, Cronbach’s $\alpha = .80$.

*Questionnaire Measure of Emotional Empathy* (QMEE; Mehrabian & Epstein, 1972). The QMEE is a 33-item questionnaire measure with seven subscales: Susceptibility to emotional contagion, Appreciation of the feelings of unfamiliar and distant others, Extreme emotional responsiveness, Tendency to be moved by others’ positive experiences, Tendency to be moved by others’ negative emotional experiences,
Sympathetic tendency, and Willingness to be in contact with others who have problems. Each item is rated on a -4 (very strong disagreement) to +4 (very strong agreement) scale. The QMEE is scored by summing across the 33 items, after reverse-coding the relevant questions. Higher scores indicate higher levels of emotional empathy. The scale has good construct and discriminant validity (Chlopan, McCain, Carbonell, & Hagen, 1985; Mehrabian & Epstein, 1972) and a good split-half reliability at .84 (Mehrabian & Epstein, 1972). In the current study, internal reliability was high, Cronbach’s α = .83.

Procedure

This longitudinal study followed a group of university students over seven months. Assessments were made at two time points during the school year, but the measures included in this study were taken at the first time point only (i.e., during the fall term).

Assessments were completed in a laboratory. All participants received course credit in exchange for participation at the first time point. Participants completed consent forms at the beginning of their visit, and all measures were presented on computers. The Eyes task was always presented first, and the other questionnaires were then presented in random order. Upon completion of the first part of the study, from which these data are drawn, participants were debriefed without a full explanation of the study, but still offered the chance to ask questions. Participants were then fully debriefed later when they returned to complete the study at the following time point.

Results

Zero-order correlations, means, standard deviations, and ranges are reported in Table 3.1. As predicted, the ToM measure, Eyes, was correlated with one empathy
subscale measuring cognitive empathy, the IRI Perspective Taking Scale, but not the other cognitive empathy subscale, the IRI Fantasy Scale. The affective empathy scales, IRI Empathic Concern, IRI Personal Distress, and QMEE, also were, as predicted, not correlated with Eyes.

Furthermore, contrary to predictions, Eyes was not correlated with empathy overall as measured by the IRI total score. Additionally, I created a second general empathy variable by first standardizing the QMEE and IRI total scores and then averaging them together. This Empathy index also was not correlated with Eyes.

Table 3.1

<table>
<thead>
<tr>
<th></th>
<th>Eyes</th>
<th>QMEE</th>
<th>IRI PT</th>
<th>IRI PD</th>
<th>IRI FS</th>
<th>IRI EC</th>
<th>IRI Total</th>
<th>Empathy</th>
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<tr>
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<td></td>
<td></td>
<td>.23***</td>
<td>1.00</td>
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<tr>
<td>IRI PD</td>
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<td>.23***</td>
<td>-.14*</td>
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<td></td>
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</tr>
<tr>
<td>IRI EC</td>
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<td>.59***</td>
<td>.37***</td>
<td>.05</td>
<td>.33***</td>
<td>1.00</td>
<td></td>
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</tr>
<tr>
<td>IRI Total</td>
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<td>.64***</td>
<td>.58***</td>
<td>.41***</td>
<td>.72***</td>
<td>.68***</td>
<td>1.00</td>
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<tr>
<td>Empathy</td>
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<td>.45**</td>
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<td>.67**</td>
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<td>5.76</td>
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<td>11.70</td>
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</table>

Note. Eyes: Eyes theory of mind task; QMEE: Questionnaire Measure of Emotional Empathy; IRI PT: Interpersonal Reactivity Index – Perspective Taking; IRI PD: Personal Distress; IRI FS: Fantasy Scale; IRI EC: Empathic Concern; IRI Total: Interpersonal Reactivity Index total; Empathy: created variable averaging standardized QMEE and IRI totals.

In sum, the finding that Eyes is uniquely correlated with Perspective Taking, a specific component of empathy, but not other components of empathy, shows that 1) affective ToM (i.e., the component of ToM that deals with cognitions about others’
emotions) is related to cognitive empathy (i.e., the component of empathy that requires one to understand the cognitions behind others’ emotions); and 2) affective ToM and empathy, when considered as a general construct, represent two different entities. Finally, the relationship between the Eyes test, a task on which performance accuracy can be measured, and the IRI, a self-report questionnaire, shows that self-reported cognitive empathy and performance accuracy in affective ToM are linked.

Discussion

The emotional states of other people are important cues in every social interaction. One aspect of ToM, affective ToM, and empathy as a whole are processes that enable us to respond to others’ emotions. ToM involves our cognitive inferences about others’ states of minds, and the ToM cognitive processes that specifically target others’ emotions have been termed affective ToM (Blair & Cippolotti, 2000; Shamay-Tsoory, Tomer, Berger, Goldsher, & Aharon-Peretz, 2005). Empathy processes, which also target others’ emotions, involve both our cognitive and emotional responses to others’ emotions. These constructs are deemed cognitive empathy and affective empathy, respectively (Blair, 2005; Davis, 1983; Davis, Luce, & Kraus, 1994; Davis et al., 1987; Decety & Jackson, 2006; Jolliffe & Farrington, 2004; Rankin, Kramer, & Miller, 2005; Shamay-Tsoory, et al., 2004; Smith, 2006).

The relationship between affective ToM and cognitive empathy, which both involve our cognitions about others’ emotions, has been widely discussed in the literature (Baron-Cohen & Wheelwright, 2004; Blair & Cippolotti, 2000; Eslinger, 1998; Joseph & Tager-Flusberg, 2004; Lough et al., 2006; Rankin et al., 2005; Shamay-Tsoory et al., 2004; Smith, 2006). Using the same ToM task, the social faux pax test, studies have
shown a connection between affective ToM and cognitive empathy (e.g., Shamay-Tsoory et al., 2005), but other research has shown evidence against such a similarity (Lough et al., 2006).

Tasks that target affective versus cognitive ToM have not been adequately defined in this literature. The social faux pas test has been identified in other studies as a ToM test with the greatest affective component (Shamay-Tsoory et al., 2003), but it does not necessarily test inferences about a wide variety of emotions. My study used a ToM task, the Eyes task (Baron-Cohen et al., 2001), developed especially to target emotions. The Eyes task is an advanced ToM task that requires respondents to identify complex emotions. Although it was not defined specifically as an affective ToM task when developed, the focus of this task on emotions makes it a good affective ToM task. The difficulty of the test also allows it to be used with non-patient population without ceiling effects in performance.

Applying the Eyes task as an affective ToM task, I found that affective ToM and cognitive empathy, specifically perspective-taking, were significantly related. Eyes task performance and a second, more cognitively-oriented empathy subscale, fantasizing, however, were not related. This finding was not predicted, as Shamay-Tsoory et al. (2003, 2004) have previously used both the Fantasy and Perspective Taking subscales as measures of cognitive empathy and found them to be related to ToM. The Fantasy subscale, however, does include more emotional content than the Perspective Taking subscale. For example, one item of the Fantasy subscale is “I really get involved in the feelings of characters in a novel.” The Fantasy subscale seems to tap into both cognitive processes of empathy and emotional responses of empathy, as well as involving verbal
intellectual processes. The lack of relationship between Eyes and the Fantasy subscale, then, cannot be taken as evidence that Eyes is not correlated with cognitive empathy, and indeed, other studies have used only Perspective Taking as an indicator of cognitive empathy (e.g., Shamay-Tsoory et al., 2004).

As expected, affective ToM and affective empathy, including empathic concern, personal distress, and a global measure of emotional empathy, were not related. This finding adds support to the distinction made between our cognitive responses to others’ emotions, such as affective ToM and cognitive empathy, and our emotional responses, such as affective empathy. Thus, even in healthy, non-brain injured individuals, one’s cognitive and affective responses to others’ emotions can be differentiated.

Contrary to my hypothesis, however, when empathy was looked at as a whole construct, including both its cognitive and affective components, affective ToM was not correlated with it. That empathy remains an unrelated, distinct construct from affective ToM is a surprising finding, given that the ToM-empathy relationship has been reported in previous studies (e.g., Shamay-Tsoory et al., 2005). One distinction between this study and previous studies is the sample population. My study involved healthy young adults, whereas Shamay-Tsoory et al. have concentrated on patient populations. Perhaps in individuals with no brain injury or psychiatric disorder, subtle differences exist that cannot be observed in those with brain damage when considering ToM and empathy processes as whole constructs involving a variety of processes. Patients with damage in the ventromedial PFC are impaired in affective ToM tasks and found to have lower empathy levels. In healthy adults, the intact prefrontal cortex, responsible for much of our higher-order cognitive processes, may add subtleties to empathy processes, ToM
processes, or both, thus creating a different pattern of similarities between ToM and empathy that breaks down in the face of brain damage. To better understand the nuances of both ToM and empathy, researchers should continue to study the neural bases of these processes in both healthy and patient populations.

My results nevertheless demonstrate that individual components of ToM and empathy, affective ToM and cognitive empathy, are, as their theoretical definitions imply, measuring related constructs. The correlation between affective ToM and cognitive empathy found in different patient populations (Shamay-Tsoory et al., 2003, 2005) and now, in a healthy, non-clinical population shows that a robust relationship exists between these two constructs when a purely affective ToM task, one with a primary focus on emotional content, is used. Given the theoretical connection that exists between the definitions of affective ToM and cognitive empathy (Baron-Cohen & Wheelwright, 2004; Lough et al., 2006; Rankin et al., 2005; Shamay-Tsoory et al., 2004; Smith, 2006), this study provides empirical support for the use of the Eyes task as an acceptable measure of affective ToM for future studies.

Additionally, as the Eyes task is performance-based and the empathy scales were self-report scales, I demonstrated that performance on affective ToM tasks and self-reported levels of a related construct, perspective-taking, are related. Future research can extend this result into comparisons between performance-based measures of both ToM and empathy (e.g., empathic accuracy tasks).

The connection found between the Eyes task and perspective-taking is a first step toward understanding whether the Eyes test is a pure emotion recognition task or one that taps more deeply into ToM processes. Distinct neural networks have been posited for
emotion recognition and ToM, and these networks have been found to be differentially impaired in traumatic brain injury (e.g., Frith & Frith, 2001; Henry, Phillips, Crawford, Ietswaart, & Summers, 2006) and in schizophrenia (Brune, 2005). Shamay-Tsoory and her colleagues (2004) found no correlation between empathy and performance on emotion recognition tasks. Although increased accuracy in reading others’ emotions would undoubtedly be beneficial to empathy levels, the relationship between Eyes task performance and cognitive empathy is one that would not be predicted were the Eyes test a purely emotion recognition task.

The Eyes test also has been criticized in the *opposite* direction, as involving more emotional processing and thus being more of an empathy test than a test of ToM (Jarrold, Butler, Cottington, & Jimenez, 2000). The correlation between the Eyes test and perspective-taking would seem to support this criticism, but in fact, when Eyes task performance is compared to empathy as a general construct (i.e., one that includes both cognitive and affective components), no correlation was found. I would argue that although this study shows a clear connection between Eyes task performance and a specific component of empathy, this connection is due more to the theoretical, and possibly functional, link between affective ToM and cognitive empathy, not to a failure of the Eyes task to measure ToM.

Demonstrating the link between affective ToM and cognitive empathy in a healthy, non-clinical young adult population represents the first step in disentangling ToM and empathy processes. To further distinguish between cognitive ToM, affective ToM, and empathy, future studies can now include more ToM tasks, such as the false belief task or social faux pas test, along with the Eyes task and empathy measures. In
addition, advancing this area of research into brain imaging studies will be important to our understanding of the neural similarities and differences between ToM and empathy processing, both during performance of the Eyes task and in other ToM and empathy tasks. Finally, ToM and empathy can continue to be studied with more performance-based tasks, including empathic accuracy and in vivo interactions.

The distinctions that have been erected between cognitive and affective ToM and between cognitive and affective empathy may perhaps be arbitrary. Undoubtedly, when faced with a social situation, most individuals will use all four of these processes to assess and respond to their social partners. The discussion above surrounding the Fantasy subscale of the IRI also highlights the interconnection between these different processes. However, the theoretical distinctions between ToM and empathy, which my and other studies have attempted to functionalize with performance tasks and self-report measures, will have important implications for how we understand the neural response patterns associated with social practices. As brain imaging technology advances, we can begin to apply and refine these theories and definitions toward understanding how humans and other animals make sense of and respond to the social world.
Forward to Chapter Four

The study presented in Chapter Four builds on my first study (Chapter Two) by extending the ToM in dysphoria research into the area of empathy. My second study (Chapter Three) showed that, although aspects of ToM and empathy are related, empathy is itself a distinct construct that is potentially important in social processing, both in general and in the social impairments associated with dysphoria. Consequently, in the next chapter, I examined 1) the relationship between empathy and dysphoria and 2) the mediating effects of empathy and emotion regulation in the relationship between dysphoria and social functioning.

Chapter Four is similar to a manuscript that will be submitted to the *Journal of Social and Clinical Psychology*, but it provides more detail about the testing of specific hypotheses.
CHAPTER FOUR

Dysphoria and Social Functioning: The Roles of Empathy and Emotion Regulation
Abstract

Dysphoric individuals experience profound social impairments. One important social practice that involves cognitive and emotional responding to another’s emotions is empathy. The current study examined the relationship between empathy and dysphoria and whether or not empathy mediated the relationship between dysphoria and social functioning. Emotion regulation also was investigated as a potential moderator of empathy’s mediational role. Only one aspect of empathy, personal distress, was related to dysphoria. Furthermore, empathy interacted with two types of maladaptive emotion regulation to significantly and independently predict social functioning. Finally, maladaptive emotion regulation, not empathy, mediated the relationship between dysphoria and social functioning.
Dysphoria and Social Functioning: The Roles of Empathy and Emotion Regulation

Dysphoria, or mild-to-moderate depressive symptomatology, is associated with serious interpersonal problems (Segrin & Dillard, 1993). For example, compared to nondysphoric people, dysphoric individuals report more interpersonal rejection (Coyne, 1976; Segrin & Dillard, 1992), disruption in relationships (Coyne, 1976; Hokanson, Loewenstein, Hedeen, & Howes, 1986), and family-related distress (Barnett & Gotlib, 1988; Gotlib & Whiffen, 1989; Hops et al., 1987).

Other psychiatric disorders with well-documented social impairments have been associated with social processing difficulties. For example, both autistic and schizophrenic people have difficulties with theory of mind (ToM), or cognitive inferences about others’ mental states (e.g., Baron-Cohen, 1995; Brune, 2005). ToM also has been studied in clinically depressed and dysphoric individuals, and these two groups differ from healthy controls in their abilities to infer others’ complex emotions albeit in opposite ways (Harkness, Sabbagh, Jacobson, Chowdrey, & Chen, 2005; Lee, Harkness, Sabbagh, & Jacobson, 2005).

A second social process that involves responding to others’ emotions is empathy or “the ability to understand and share in another’s emotional state or context” (Cohen & Strayer, 1996, in Jolliffe & Farrington, 2004, p. 988). Empathy has been divided into two main components: cognitive and affective. Cognitive empathy is one’s cognitions surrounding others’ emotions, and affective empathy is one’s emotional responses to others’ emotions (e.g., Blair, 2005; Davis, 1983; Davis, Luce, & Kraus, 1994; Davis, Hull, Young, & Warrne, 1987; Decety & Jackson, 2006; Jolliffe & Farrington, 2004; Rankin, Kramer, & Miller, 2005; Shamay-Tsoory, Tomer, Goldsher, Berger, & Aharon-
Peretz, 2004; Smith, 2006). In the current study, I sought to extend the research on social processes in dysphoria into the area of empathy.

**Depression, Dysphoria, and Empathy**

Keenan and Hipwell (2005) have noted that excessive empathy is part of etiological theories of depression and further argued that higher-order emotions, such as empathy, although necessary to one’s emotional health, can result in psychopathology if present at abnormal levels. These authors posit that anxiety and depression can result from excesses in empathy.

Empirical studies of empathy and depression, however, have led to mixed conclusions. Greater empathy is correlated with concurrent depressive symptoms in children (Robins & Hinkley, 1989) and in individuals in the helping professions (Gawronski & Privette, 1997). Additionally, empathic distress, a component of affective empathy, is correlated with greater depression (O’Connor, Berry, Weiss, & Gilbert, 2002). After controlling for other sociodemographic and psychosocial resources, one study found greater empathy in general was correlated with depression (Schieman & Turner, 2001). In another study with caregivers, however, empathy was not related to depression after controlling for caregiving variables such as situational appraisals (Lengua & Stormshak, 2000). Still other studies have found an inverse relationship between depression and both empathy (Berthoz et al., 2000; Donges et al., 2005) and fantasizing, a component of cognitive empathy (O’Connor et al., 2002).

Clearly, the role of empathy in depression and dysphoria needs to be further clarified. In the current study, I examined how empathy relates to depressive symptoms within a non-clinical population, and I hypothesized that greater empathy, including both
cognitive and affective empathy, would be related to dysphoria. Cognitive empathy has been linked to affective ToM or cognitive inferences about others’ emotions (e.g., Shamay-Tsoory, Tomer, Berger, & Aharon-Peretz, 2003), and higher levels of affective ToM have been linked to dysphoria (Harkness et al., 2005). Therefore, I predicted that cognitive empathy also would be heightened in dysphoria. I further hypothesized that dysphoric individuals, in addition to heightened cognitive sensitivity to emotional stimuli in social situations, would have heightened emotional sensitivity to these emotional stimuli, or affective empathy. That is, I predicted that dysphoria would be associated with heightened cognitive and affective empathy, or in other words, empathy in general.

**Empathy, Dysphoria, and Social Functioning**

Empathy typically is considered a beneficial quality that enhances moral and social functioning. Empathy and social functioning are related in an adult non-clinical population (Cliffordson, 2002). Empathy also has been correlated with better social functioning among schizophrenic individuals (Shamay-Tsoory, Shur, Harari, & Levkovitz, 2007). Finally empathy and social functioning are both higher in nonaggressive youth versus aggressive youth (Mayberry & Espelage, 2007).

If empathy, like ToM, is heightened in dysphoric individuals, and it is a pro-social quality, then the question arises as to how such a process would mediate the relationship between dysphoria and poor social functioning. Another process must be involved through which empathy could mediate the dysphoria-social functioning relationship. I hypothesized this process to be emotion regulation.

**Emotion Regulation**

Emotional reactions, such as empathic reactions, involve subjective experience,
expressive behaviour, and physiological response. The regulation of these emotions include a wide range of conscious or unconscious behavioural, social, biological, and cognitive processes that influence, initiate, amplify, attenuate, or maintain the strength of these emotions (Davidson, 2000; Gross, 1998; Hayes & Feldman, 2004; Keenan, 2000). Thompson (1994) defines emotion regulation as “all the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one’s goals” (p. 27). Within this definition, Garnefski, Kraaij, and Spinhoven (2001) situate cognitive emotion regulation as the self-regulatory, conscious, and cognitive components of emotion regulation. These components include self-blame, blaming others, acceptance, refocus on planning, positive refocusing, rumination or focus on thought, positive reappraisal, putting into perspective, and catastrophizing.

Emotion regulation is associated with social functioning, depression, and empathy. That is, adaptive cognitive emotion regulation has been linked to well-being and successful functioning (Cicchetti, Ackerman, & Izard, 1995; Thompson, 1991), whereas maladaptive emotion regulation strategies have been implicated in depressive disorders (Bromberger & Matthews, 1996; Garnefski et al., 2001; Rude & McCarthy, 2003). In addition, Decety and Jackson (2006) have incorporated emotion regulation into their model of empathy. Indeed, they define the three components of empathy as affective empathy, cognitive empathy, and emotion regulation. Other researchers have found that individuals who can regulate their emotions are more likely to experience empathy, have self-agency, and act in morally desirable ways (Eisenberg, Smith, Sadovsky, & Spinard, 2004). Finally Keenan and Hipwell (2005) argue that both
excessive empathy and impaired emotion regulation, along with other factors such as compliance, may be specific risk factors for depression in preadolescent girls.

In addition to cognitive strategies one uses to regulate emotion, another component of emotion regulation is one’s subjective feelings about one’s ability to regulate emotion. This meta-cognition about emotion regulation includes what has been termed negative mood regulation expectancy. Negative mood regulation expectancy refers to one’s belief about one’s ability to cope with negative mood states, and it has been connected to the construct of emotion regulation (Mearns, 1991). Negative mood regulation expectancy also has been linked to coping strategies (Catanzaro & Greenwood, 1994; Mearns, 1991; Surmann, 1999) and depressive symptoms (Catanzaro & Greenwood, 1994; Surmann, 1999).

The second goal of the current study was to examine how empathy relates to dysphoria and its social impairments. Specifically, I tested the hypothesis that emotion regulation moderates empathy’s mediating effect in the relationship between dysphoria and social functioning (i.e., the interaction between empathy and emotion regulation mediates the dysphoria-social functioning relationship) as shown in Figure 4.1. I further hypothesized that, for individuals who use negative, maladaptive emotion regulation strategies, greater empathy would mediate the relationship between dysphoria and social functioning. For these individuals, greater empathy with others (which I predicted to be associated with dysphoria) should be detrimental to social functioning due to an inability to deal effectively with the empathic feelings they encounter during social interactions. For individuals who effectively regulate their emotions, I hypothesized no mediating effect of greater empathy in the dysphoria-social functioning relationship. That is, for
these individuals, heightened empathy should not account for the poor social functioning
associated with dysphoria.

Figure 4.1. Hypothesized model for the mediation of the dysphoria-social functioning
relationship by the interaction between empathy and emotion regulation.

To summarize, my hypotheses for the current study were as follows:

H1: Dysphoria will be related to increased empathy.

H2: Empathy will be independently correlated with better social functioning.

H3: After accounting for dysphoria, which I predicted to be related to increased
empathy, empathy will be related to social functioning through emotion regulation. That
is, the interaction between empathy and emotion regulation should mediate the
relationship between dysphoria and social functioning. As part of this hypothesis, I
predicted that, for individuals who have maladaptive emotion regulation strategies,
empathy would mediate the relationship between dysphoria and poor social functioning.
Such mediation, however, would not occur in individuals who have more adaptive
emotion regulation skills.

Method

Participants

Participants were male and female students from introductory psychology courses at Queen’s University. During an in-class prescreening session at the beginning of the school year, students completed measures providing information about current use of antidepressant medication and/or previous diagnoses of bipolar mood disorder, both of which were exclusion criteria for being contacted about or continuing in the current study.

A total of 292 individuals completed Time 1 of the study during the fall term of the school year. A total of 242 students completed Time 2 during the Winter term. Of these, one woman was dropped due to a duplication in the prescreening identification number that made her prescreening information indistinguishable from another student. A second woman was dropped because she was taking antidepressant medications when completing the Time 2 assessment. The final sample consisted of 240 individuals, including 62 men and 178 women. At Time 1, the mean age for this sample was 18.29 (SD = 1.48) years.

Measures

All reliability and factor analyses of the measures were performed with the 240 participants who completed the study. Factor analyses were conducted on all scales using principal axis factoring with an oblique rotation. The subscale structure of each scale as described by its developers was replicated.

Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II
is a 21-item self-report questionnaire that assesses the presence and severity of depressive symptoms over the past two weeks with each item rated on a 0 to 3 scale. The items are summed for a total score, with higher scores indicating greater depressive symptomatology. The BDI-II is widely used in clinical research and has good concurrent and discriminant validity, high internal consistency with a Cronbach’s $\alpha$ of .81 (Beck, Steer, & Garbin, 1988a), and good test-retest reliability ranging from $r = .67$ to .90 (Lightfoot & Oliver, 1985; Oliver & Burkham, 1979; Oliver & Simmons, 1984). In the current study, the BDI-II had a Cronbach’s $\alpha$ of 0.90. Men had an average BDI-II score of 7.65 ($SD = 6.59$), and women had an average score of 8.33 ($SD = 6.70$); this difference was not significant, $t(238) = .69, p = .49$.

**Beck Anxiety Inventory** (BAI; Beck & Steer, 1990). The BAI is a 21-item self-report questionnaire that assesses the presence and severity of anxiety symptoms with each item rated on a 0 to 3 scale. Items are summed for a total score, with higher scores indicating greater anxiety symptomatology. The BAI is widely used and has a high internal consistency at .92 and good test-retest reliability of $r = .75$ (Beck et al., 1988b; Beck & Steer, 1990). This scale, which is a good measure of the physiological symptoms of anxiety, was included to isolate results specific to depression, which is often comorbid with anxiety (Clark & Watson, 1991). In the current study, its Cronbach’s $\alpha$ was .90. Men ($M = 11.97, SD = 10.61$) and women ($M = 12.39, SD = 9.02$) did not differ in their levels of anxiety, $t(238) = .30, p = .76$.

**Social Adjustment Scale** (SAS; Weissman & Bothwell, 1976). The SAS is a 54-item self-report scale that assesses current social functioning in domains of Primary Relationship (living with a partner); Work (employment, school, or housework); Social
and Leisure (dating, recreation); Extended Family (relatives); Parental (own children); and Family unit (partner or children). An overall adjustment score is based on these six domains with higher scores indicating poorer functioning. The SAS is scored by summing responses in each subscale and then summing the subscales for a total social functioning score. These scores are next converted to standardized T-scores that were normed separately for men and women and across age groups. Higher scores indicate poorer social functioning (i.e., more problems in social functioning). The scale is reliable, valid, and widely used in clinical research (Edwards, Yarvis, Mueller, Zingale, & Wagman, 1978; Weissman, Prosoff, Thompson, Harding, & Myers, 1978).

In the current study, reliability and factor analyses were conducted with subscales A (Work for Pay), B (Housework), G (Parental), and H (Family Unit) taken out because most participants were students, and therefore these subscales were not relevant to them. Cronbach’s α was 0.74 at Time 1 and 0.68 at Time 2. Test-retest reliability was .64, \( p = .000 \). Men \( (M = 61.53, SD = 11.00) \) and women \( (M = 59.15, SD = 8.49) \) did not differ in their total social functioning T-scores at Time 1, \( t(238) = 1.75, p = .08 \), or at Time 2 (men \( M = 61.39, SD = 10.25 \) and women \( M = 58.79, SD = 9.08 \)), \( t(238) = 1.87, p = .06 \).

Interpersonal Reactivity Index (IRI; Davis, 1980). The IRI is a 28-item questionnaire that measures four aspects of empathy: Perspective Taking, Fantasy, Empathic Concern, and Personal Distress. Each item is rated on a 0 (does not describe me well) to 4 (describes me well) point scale. For the two measures of cognitive empathy, perspective taking measures the tendency to spontaneously adopt another’s psychological point of view, whereas fantasy measures the tendency to imaginatively transport oneself into fictional situations (Shamay-Tsoory et al., 2003). For the two
measures of affective empathy, empathic concern measures other-oriented feelings of sympathy and concern for unfortunate others, whereas the personal distress scale measures self-oriented feelings of personal anxiety and unease in tense interpersonal situations. The IRI is scored by taking a sum of the responses to questions within each subscale, as well as a total score for the scale (after reverse-scoring the relevant items). Higher scores indicate higher levels of empathy. The multidimensional structure of the IRI has been supported (Davis, 1983; Pulos, Elison, & Lennon, 2004), and the scale has been found to have satisfactory internal reliability at \( r = .71 \) to .77 and test-retest reliability at \( r = .62 \) to .71 (Davis, 1980). Internal reliability was high in this study, Cronbach’s \( \alpha = .80 \).

Men (\( M = 17.81, SD = 4.62 \)) and women (\( M = 18.42, SD = 4.92 \)) did not differ in Perspective Taking, \( t(238) = .85, p = .40 \). However, men scored significantly lower than women on Personal Distress (men: \( M = 10.76, SD = 4.79 \); women: \( M = 12.22, SD = 4.66 \)); Fantasy (men: \( M = 16.92, SD = 6.06 \); women: \( M = 19.81, SD = 5.47 \)); and Empathic Concern (men: \( M = 18.97, SD = 4.02 \); women: \( M = 21.12, SD = 3.99 \)), \( ts(238) \geq 2.12, ps < .05 \).

**Questionnaire Measure of Emotional Empathy (QMEE; Mehrabian & Epstein, 1972).** The QMEE is a 33-item questionnaire measure with seven subscales: Susceptibility to emotional contagion, Appreciation of the feelings of unfamiliar and distant others, Extreme emotional responsiveness, Tendency to be moved by others’ positive experiences, Tendency to be moved by others’ negative emotional experiences, Sympathetic tendency, and Willingness to be in contact with others who have problems. Each item is rated on a -4 (very strong disagreement) to +4 (very strong agreement) scale. The QMEE is scored by summing across the 33 items, after reverse-coding the
relevant questions. Higher scores indicate higher levels of emotional empathy. The scale has good construct and discriminant validity (Chlopan, McCain, Carbonell, & Hagen, 1985; Mehrabian & Epstein, 1972) and a good split-half reliability at .84 (Mehrabian & Epstein, 1972). In the current study, internal reliability also was high (Cronbach’s α = .83), and women (M = 44.24, SD = 24.87) scored significantly higher than did men (M = 28.10, SD = 23.34), t(238) = 4.42, p = .000.

Negative Mood Regulation Scale (NMR Scale; Cataranzaro & Mearns, 1990). The NMR Scale is a 30-item self-report questionnaire that assesses generalized expectancies for negative mood regulation or the degree to which an individual expects some behaviour or cognition to alleviate a negative mood state. The NMR has been related to depression scores both concurrently and longitudinally (Cataranzaro & Mearns, 1990). Additionally, compared to the BDI-II, it has a different pattern with related variables (e.g., current emotional state); therefore, it is not a proxy measure of negative affect (Cataranzaro & Mearns, 1990).

For the NMR, individuals are instructed to rate items based on “what you believe you can do, not…what you actually or usually do” when confronted with negative emotions. Participants are provided with the prompt, “When I’m upset, I believe that…,” and items include “Planning how I’ll deal with things will help” and “I won’t be able to put it out of my mind.” Items are rated on a 5-point scale from 1 (strongly disagree) to 5 (strong agree). The NMR yields a total score (after reverse-coding the relevant items), with higher scores indicating greater expectancy that one can regulate one’s negative moods. The NMR Scale, rather than measuring the actual strategies one uses to regulate emotions, measures how effective one believes these strategies will be for oneself. Thus,
it is a measure of expectancy for negative mood regulation, and although correlated with the strategies one employs, it is a distinct entity. Higher NMR expectancy scores indicate a greater belief in the effectiveness of one’s ability to regulate negative emotions.

The NMR Scale has acceptable internal consistency, temporal stability, and discriminant validity from social desirability and locus of control (Cataranzaro & Mearns, 1990). In the current study, the internal reliability was high with a Cronbach’s $\alpha$ of .87, and men ($M = 103.50$, $SD = 15.36$) and women ($M = 107.32$, $SD = 14.55$) did not have significantly different NMR scores, $t(238) = 1.76$, $p = .08$.

*Cognitive Emotion Regulation Questionnaire* (CERQ; Garnefski, Kraaij, & Spinhoven, 2001). CERQ is a 36-item questionnaire that assesses emotion regulation strategies in cognitive domains. The nine subscales include Self-blame, Blaming others, Acceptance, Refocusing on planning, Positive refocusing, Rumination, Positive reappraisal, Putting into perspective, and Catastrophizing. Items are rated on a 1 (*almost never*) to 5 (*almost always*) scale. The CERQ is scored by summing each subscale. Scores are then converted to T-scores that have separate norms for men and women across different age groups. In my factor analyses, these nine subscales separated neatly into a positive CERQ factor and a negative CERQ factor. The Positive CERQ factor consisted of adaptive cognitive emotion regulation strategies, including Acceptance, Refocus on Planning, Positive Reappraisal, Positive Refocusing, and Putting into Perspective, all but one item having factor loadings $> .40$. The Negative CERQ factor consisted of maladaptive strategies such as Self-Blame, Blaming Others, Rumination, and

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3 One item of the Acceptance subscale, “I think that I cannot change anything about it,” had a factor loading of .02. All other items loaded onto Positive CERQ at greater than .40.
Catastrophizing, all with item factor loadings > .30. To form the Negative CERQ and Positive CERQ indexes, I averaged the T-scores across the relevant subscales. Higher scores on each index represent a greater tendency to use the associated coping strategies. The scale has good internal consistency from $r = .68$ to $.93$, and convergent and discriminant validity through relationships with depression and anxiety have been demonstrated (Garnefski et al., 2001, 2002, 2004; Kraaij et al., 2003). In the current study, internal reliability also was high (Cronbach’s $\alpha$ of .86), with Negative CERQ having a Cronbach’s $\alpha$ of .81 and Positive CERQ having a Cronbach’s $\alpha$ of .91. On the composite Negative CERQ scale, men ($M = 57.32$, $SD = 6.14$) scored significantly higher than women did ($M = 54.66$, $SD = 5.20$), $t(240) = 3.31$, $p = .001$, but on Positive CERQ, men ($M = 53.04$, $SD = 6.15$) and women ($M = 53.44$, $SD = 7.08$) did not differ significantly, $t(240) = .34$, $p = .69$.

**Procedure**

This longitudinal study followed a group of university students over seven months. Assessments were made at two time points during the school year: during the fall term (October – December 2008) and during the winter term (January – April 2008). Between Time 1 and Time 2, 12-22 weeks elapsed ($M = 14.34$, $SD = 2.05$ weeks). At Time 1, all measures were administered. At Time 2, the social functioning scale, SAS, was administered again.

Time 1 and Time 2 assessments were completed in a laboratory. At Time 1, all participants received course credit; at Time 2, participants received either course credit or monetary compensation if they had finished their course credits by that time. All participants completed consent forms at the beginning of their Time 1 visit. At Time
2, participants were reminded that they had completed consent forms during their first visit, and all consent forms were on hand in the event that a student wished to review his or her form. All measures were presented on computers in random order, with the exception of the BDI-II, which was always presented last to avoid mood effects (Mark, Sinclair, & Wellens, 1991). Upon completion of Time 1, participants were debriefed without a full explanation of the study but still offered the chance to ask questions. The experimenter also reminded them that they would be contacted during the following term for their second visit. Upon completion of Time 2, participants were fully debriefed and thanked for their time.

Results

Descriptive Statistics

Zero-order correlations, means, standard deviations, and ranges are reported in Table 4.1. My first research question was if and how dysphoria and empathy were related. I found that only the Personal Distress subscale of the IRI was significantly correlated with dysphoria. The QMEE, a measure of emotional empathy, the other three IRI subscales (Perspective Taking, Empathic Concern, and Fantasy Scale), and the IRI total were not significantly correlated with BDI-II scores. Because the QMEE and IRI were significantly correlated, their total scores were standardized and then averaged to create an Empathy index. This composite empathy variable also was not correlated with
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Note: BDI-II: Beck Depression Inventory — II; BAI: Beck Anxiety Inventory; QMEE: Questionnaire Measure of Emotional Empathy; IRI PT: Interpersonal Reactivity Index — Perspective Taking; IRI PD: Personal Distress; IRI FS: Fantasy Scale; IRI EC: Empathic Concern; IRI Total: Interpersonal Reactivity Index total; NMR: Negative Mood Regulation Scale; SAS (T1): Social Adjustment Scale (Time 1); SAS (T2): Social Adjustment Scale (Time 2); Empathy: created variable from IRI and QMEE averages; Positive CERQ: created variable from CERQ Acceptance, Positive Refocusing, Refocus on Planning, Positive Reappraisal, and Perspective Taking subscale averages; Negative CERQ: created variable from CERQ Self-blame, Rumination, Catastrophizing, and Blaming Others subscale averages. All variables are from Time 1 except SAS (T2).

* p ≤ .05  ** p ≤ .01  *** p ≤ .001
BDI-II scores. Thus contrary to my hypothesis, empathy in general was not related with dysphoria, but rather a specific component of empathy, Personal Distress, was related with greater dysphoria.

Path Analyses

Path analyses were conducted in RAMONA and LISREL 8.30 using maximum likelihood estimation. Decisions surrounding model fit were based on Hoyle and Panter’s (1995) recommendations to use: 1) an absolute fit index, the Root Mean-Square Error of Approximation (RMSEA; Browne & Budek, 1993); 2) an incremental fit index, the Tucker-Lewis (TLI; Tucker & Lewis, 1972) or Non-Normed Fit Index (NNFI; Bentler & Bonett, 1980); and 3) a second incremental fit index, the Comparative Fit Index (CFI, 1990). The following decision rules were applied in the evaluation of each model: the RMSEA should be less than .05 for good fit or less than .10 for acceptable fit (Browne & Cudek, 1993), and the TLI/NNFI and CFI should be greater than .90 (Bentler & Bonett, 1980; Hu & Bentler, 1995), with preference for estimates greater than .95 (Hu & Bentler, 1999). Table 4.2 provides the fit statistics for all of the models tested.

In the path analyses, I examined empathy in two separate ways. First, I looked at the Personal Distress subscale of the IRI scale, which was the only empathy construct significantly correlated with dysphoria. Second, I examined empathy as a whole construct by using the Empathy index variable composed of the IRI and QMEE as described above. I also examined three different aspects of emotion regulation: adaptive cognitive emotion regulation strategies (Positive CERQ), maladaptive cognitive emotion regulation strategies (Negative CERQ), and negative mood regulation expectancy (NMR expectancy).
To examine empathy, emotion regulation, and their interaction as potential mediators of the relationship between dysphoria and social functioning, I tested three models: full mediation, partial mediation, and separate, direct effects of the variables (i.e., no mediation). To create the interaction term between empathy and emotion regulation, I first standardized each variable and then multiplied the standardized terms together. By first standardizing the original variables, I reduced the multicollinearity between the interaction term and its composite variable main effects when I conducted the path analyses.
In the partial mediation model, I tested the hypothesis that the relationship between dysphoria and social functioning is partially driven by empathy, emotion regulation, and their interaction (Figure 4.2). That is, the partial mediation model contained a direct path from dysphoria to social functioning as well as paths from dysphoria to the mediator variables and from the mediator variables to social functioning. My hypotheses are best represented by the partial mediation model.

Figure 4.2. Hypothesized full and partial mediation models: Mediating effects of empathy and emotion regulation on the relationship between dysphoria and social functioning.

Note. Path between Time 1 Dysphoria and Time 2 Social Functioning (dashed line) was not included in the full mediation model but was included in the partial mediation model. Emotion regulation included Negative CERQ (negative cognitive emotion regulation strategies), Positive CERQ (positive cognitive emotion regulation strategies), and NMR Expectancy (negative mood regulation expectancy), all tested separately.
The full mediation model tested the hypothesis that the relationship between dysphoria and social functioning is fully mediated by empathy, emotion regulation, and their interaction. As such, the full mediation model contained no direct path from dysphoria to social functioning, but rather only paths from dysphoria to the mediators and paths from the mediators to social functioning. Thus this model also is represented in Figure 4.2 when the dotted line between dysphoria and social functioning is removed. If this model fits the data the best, it too would be supportive of my hypotheses, albeit a stronger version of them because the mediator variables would completely account for the relationship between dysphoria and social functioning.

In the direct effects model, I tested the direct effects of all variables on social functioning (see Figure 4.3 or 4.4). More specifically, this model included direct paths from dysphoria and the mediator variables to social functioning, but dysphoria and the mediator variables were not linked to each other. Support for this model would be the most contrary to my hypotheses.

Because I measured social functioning at both Times 1 and 2, I was able to examine changes in social functioning between the two time points. A path analysis that includes a directional path from a Time 1 variable to the same variable measured at Time 2 allows one to take into account participants’ scores at Time 1. By doing so, one is actually looking at changes in the variable from Time 1 to Time 2. Conceptually, this approach is similar to creating a change score in other statistical analyses. In other words, then, I examined the relationship of Time 1 dysphoria, empathy, emotion regulation, and the empathy by emotion regulation interaction to changes in social functioning from Time 1 to Time 2. All of the models also contained a path from Time 1 social
functioning to dysphoria and to the mediator variables measured at Time 1 to account for the concurrent relationships among these variables. Additionally, because dysphoria was significantly correlated with all three types of emotion regulation, a path between dysphoria and emotion regulation was included in each of the models.

Figure 4.3. Direct Effects model of empathy and positive cognitive emotion regulation strategies.

* $p < .05$  ** $p < .01$  *** $p < .001$

**Empathy as Personal Distress.** I tested Personal Distress, emotion regulation, and the interaction between Personal Distress and emotion regulation using my three emotion regulation variables (Positive CERQ, Negative CERQ, and NMR expectancy), separately. For each emotion regulation variable, I tested all three models (i.e., full
mediation, partial mediation, and direct mediation as shown in Figures 4.2 and 4.3 replacing “Empathy” with “Personal Distress”).

Two models yielded good or fair fit to the data: the partial mediation models with NMR expectancy and Negative CERQ (see Figure 4.3 for the parameter estimates and Table 4.2 for the fit indexes). However, Personal Distress and the Personal Distress by emotion regulation interactions were not significantly related to social functioning in either model. As my hypotheses concerned empathy, these models will not be discussed further. The relationships between dysphoria, emotion regulation, and social functioning that were found in these models were replicated in the models below and will be discussed in those contexts.

*Empathy as Index of IRI and QMEE.* Using the Empathy variable I created from the QMEE and IRI scores, I examined Empathy, the three different types of emotion regulation, and the interaction between Empathy and each type of emotion regulation as mediators in the relationship between dysphoria and social functioning. Again I examined full mediation, partial mediation, and direct effects models separately with each of the three emotion regulation variables (NMR expectancy, Positive CERQ, and Negative CERQ).

For Positive CERQ, Negative CERQ, and NMR, only the partial mediation model and the direct effects model provided good fit to the data. The chi-square difference test between the partial mediation model and direct effects model was not significant, \( \chi^2_{\text{difference}} = 2.10, df_{\text{difference}} = 2, p = .35; \chi^2_{\text{difference}} = .30, df_{\text{difference}} = 2, p = .86; \chi^2_{\text{difference}} = .63, df_{\text{difference}} = 1, p = .73 \), for Positive CERQ, Negative CERQ, and NMR, respectively. Therefore, the direct effects model, which was the most parsimonious (i.e., it had the
fewest parameters), would be preferred in all three cases.

In all three direct effects models, dysphoria was correlated with both concurrent and longitudinal changes in social functioning. Empathy, on the other hand, was correlated with concurrent but not longitudinal changes in social functioning. Positive CERQ strategies, as well as the interaction between Positive CERQ and empathy, were not correlated with social functioning either concurrently or longitudinally.

As shown in Figure 4.4, Negative CERQ, after accounting for the effects of dysphoria, was correlated with both concurrent and longitudinal changes in social functioning. Additionally, as I predicted, the interaction between Empathy and Negative CERQ was correlated with longitudinal changes in social functioning.

* Figure 4.4. Direct effects model of empathy and negative cognitive emotion regulation strategies.

* $p < .05$  ** $p < .01$  *** $p < .001$
To break down the Empathy x Negative CERQ interaction, I conducted a multiple group analysis in LISREL using a median split to create a high Negative CERQ group (N = 121 participants with scores greater than or equal to the median of 55) and a low Negative CERQ group (N = 119). As shown in Figure 4.5, I found that for high Negative CERQ individuals, Empathy and changes in social functioning were significantly related, $\beta = -.22, t = 2.80, p = .005$, but for low Negative CERQ individuals, Empathy and social functioning were not related, $\beta = .10, t = 1.43, p = .15$. These path coefficients were significantly different from each other, $z = 3.05, p = .002$.

* Figure 4.5. Multiple group analysis of low and high negative cognitive emotion regulation strategies.

* $p < .05$ ** $p < .01$ *** $p < .001$

* In the multiple group analyses for both the Empathy x Negative CERQ and the Empathy x NMR Expectancy interactions, the path between Empathy and social functioning at Time 1 was not included due to a model identification problem. Therefore, I analyzed only empathy’s relation to changes in social functioning.
Consequently, for individuals who employ negative or maladaptive cognitive emotion regulation strategies, greater problems in social functioning were associated with lower levels of empathy. For individuals who do not employ these maladaptive cognitive emotion regulation strategies, empathy and social functioning were not related.

Similar to Negative CERQ, NMR expectancy, even after controlling for the effects of dysphoria, was correlated with both concurrent and longitudinal changes in social functioning as was the interaction between Empathy and NMR expectancy. To break down the Empathy x NMR expectancy interaction, I again used multiple groups analysis of a high NMR group ($N = 126$ participants with a total NMR score greater than

![Diagram](image)

*Figure 4.6. Direct effects model of empathy and negative mood regulation expectancy.*

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

89
or equal to the median of 107) versus a low NMR expectancy group ($N = 114$).

However, this multiple-groups model did not have adequate fit to the data (see Table 4.2 above), so the model was not interpreted.

**Secondary Analyses**

I also explored the possibility that other variables, including anxiety and participant gender, may have influenced the results I found in my previous models. However, adding either anxiety or sex to the original direct effects models did not improve the models’ fit or change any relationships between variables found in the original models.

**Discussion**

The primary goal of my study was to examine the mediating roles of empathy and emotion regulation in the relationship between dysphoria and social functioning. The first step toward understanding these variables was to examine the relationship between empathy and dysphoria. Although past studies have looked at empathy and dysphoria, findings have been mixed. Previous research on empathy and depressive symptoms has found a positive relationship (Gawronski & Privette, 1997; Robins & Hinkley, 1989; Schieman & Turner, 2001), an inverse relationship (Berthoz et al., 2000; Donges et al., 2005), and no relationship (Lengua & Stormshak, 2000). Not only do these studies contradict each other, but drawing any conclusions from them is difficult because the studies use different measures of empathy and tested different populations.

In the current study, I sought to examine how various aspects of empathy, including emotional empathy, personal distress, empathic concern, fantasizing, and perspective-taking, relate to depressive symptoms in a healthy, young adult population.
Fantasizing and perspective-taking have been applied as measures of cognitive empathy or one’s cognitive response to another’s emotions (e.g., Shamay-Tsoory et al., 2004). Empathic concern, on the other hand, has been used as a measure of affective empathy or the emotional responding to another’s emotions (e.g., Shamay-Tsoory et al., 2004). Personal distress, a measure of personal anxiety and unease in tense interpersonal situations, is also a component of affective empathy.

Previous research has established a connection between dysphoria and heightened ToM, another social practice that involves the ability to infer others’ emotions accurately (Harkness et al., 2005). Therefore, I hypothesized that dysphoria would have a similar connection to heightened empathy, a social process that involves cognitive and emotional responding to others’ emotions (H1). However, I found that only one specific component of affective empathy, personal distress, was correlated with dysphoria. (Empathic concern and a global measure of emotional empathy were not related to dysphoria.) This relationship between dysphoria and personal distress also was reported by O’Connor et al. (2002), but they additionally found fantasizing to be inversely related to depression, which was not replicated in my study.

In my study, fantasizing, along with the other component of cognitive empathy, perspective-taking, were not related to dysphoria. Given that affective ToM has been found to be heightened in dysphoria (Harkness et al., 2005) and that affective ToM and cognitive empathy have been linked theoretically and empirically (e.g., Baron-Cohen & Wheelwright, 2004; Blair & Cipolotti, 2000; Eslinger, 1998; Joseph & Tager-Flusberg, 2004; Rankin, Kramer, & Miller, 2005; Shamay-Tsoory et al., 2003; and Smith, 2006), not finding a relationship between any aspect of cognitive empathy and dysphoria is
Results from the current study, although in agreement with some previous findings, do not definitively disentangle the varied findings in the empathy and dysphoria literature. A strength of this study was its use of multiple empathy measures to examine different components of empathy. However, this study is limited by its failure to find correlations between empathy and dysphoria, relationships which are supported by theoretical arguments. Future studies need to replicate the current findings, both with the same scales and with different empathy measures. For example, an empathic accuracy task could be studied in relation to dysphoria as a more performance-based, as opposed to self-report, measure. Longitudinal data will also be helpful in understanding how empathy levels change as depressive symptoms change.

**Empathy and Social Functioning**

My second and third hypotheses concerned the effects of empathy and emotion regulation on social functioning. Specifically, I hypothesized that empathy would be directly related to social functioning (H2) and that the interaction between empathy and emotion regulation would mediate the relationship between dysphoria and social functioning (H3).

After testing a series of models, I found that dysphoria, empathy, and the empathy x emotion regulation interaction all had independent, direct effects on social functioning. Consistent with the well-established relationship between depressive symptomatology and social impairments (e.g., Gotlib & Lee, 1989), dysphoria was found to be significantly related to both concurrent and longitudinal changes in social functioning.

Empathy also was significantly correlated with better concurrent social
functioning, but not with longitudinal changes. These results are consistent with my hypothesis (H2) and fit with findings by Cliffordson (2002) who used one of the same empathy scales I used (IRI) but a different social functioning measure. Cliffordson measured social functioning using the Social Skills Inventory (Riggio, 1986, 1989), a measure that assesses specific social skills such as “I am able to liven up a dull party” rather than global social functioning. Although social skills are an important aspect in successful social functioning, they are not a direct measure of real life social functioning. The Social Adjustment Scale (SAS) used in this study is often used in clinical studies and assesses global social functioning in different, specific areas of life, including work/housework/school, family life, social life and friendships, and romantic life. My results, then, extend Cliffordon’s (2002) research on empathy and social skills by relating empathy directly to social functioning in important life areas.

Although my study adds to the evidence supporting the relationship between empathy and social functioning, directionality cannot be determined. Empathy was related only with concurrent social functioning but not with social functioning over time. Nevertheless, these findings indicate that empathy is an important correlate of effective social functioning across different arenas in life.

Empathy, Emotion Regulation, and Social Functioning

My third hypothesis pertained to the interaction between empathy and emotion regulation mediating the relationship between dysphoria and social functioning. Testing this hypothesis was limited because only one aspect of empathy, as opposed to empathy in general, was related to dysphoria. Therefore, contrary to my hypothesis, I found that the empathy x emotion regulation interaction did not have a mediating effect on the
relationship between dysphoria and social functioning. Instead, it had a direct influence on social functioning, independent of dysphoria. Furthermore, I found a different pattern of results for each of the three emotion regulation variables I examined.

For positive, adaptive cognitive emotion regulation strategies, I found that the interaction with empathy did not predict concurrent or longitudinal changes in social functioning. Hence, the use (or non-use) of adaptive emotion regulation strategies does not interact with empathy to influence social functioning.

However, for both negative, maladaptive cognitive emotion regulation strategies and negative mood regulation expectancy, I found that their interactions with empathy did predict longitudinal changes in, but not concurrent, social functioning. These results provide support for theories that have linked empathy and emotion regulation. For instance, Decety and Jackson (2006) have included emotion regulation as an important component of empathy, and Keenan and Hipwell (2005) have argued that both empathy and emotion regulation are important risk factors for depression in adolescent girls. My finding that the interaction between empathy and emotion regulation is an important predictor for social functioning extends these theories into the realm of social functioning. That is, I have shown empirically that empathy and emotion regulation act together to influence social functioning.

Upon breaking down the interaction with negative mood regulation expectancy, I found that the model was not interpretable because of poor fit. Several factors may have contributed to the bad model fit and will need to be explored in future studies. These factors include the arbitrary criterion applied to separate the sample into two groups, the median split. Many problems exist with dichotomizing a continuous variable like the
Externalizing Bias score, including a reduction in statistical power (MacCallum, Zhang, Preacher, & Rucker, 2002). However, no other means of following up an interaction in path analyses have been offered at this time. A larger sample size can be used in future studies to increase statistical power. Additionally, the multiple group analysis omitted the path between empathy and concurrent social functioning due to a model identification problem. Re-running these analyses in a different sample whose data allow this structural equation to be specified would be helpful.

In my third hypothesis, I predicted that, for individuals with poorer emotion regulation, better empathy would mediate a relationship between dysphoria and poor social functioning. That is, poor emotion regulation would explain how dysphoric individuals, who I hypothesized to display the pro-social trait of enhanced empathy, also would have poorer social functioning. Drawing comparisons between my hypothesis and my results is difficult because my hypothesis concerned the mediating role of the empathy x emotion regulation interaction on the dysphoria-social functioning relationship.

On the other hand, I did find that the interaction directly influenced social functioning. However, upon breaking down the interaction with negative, maladaptive cognitive emotion regulation strategies, I found that, for individuals who use more maladaptive cognitive emotion regulation strategies, greater empathy was correlated with better social functioning over time. Similar to my hypothesis, empathy was not correlated with social functioning in individuals who do not use maladaptive cognitive emotion regulation strategies.

As the empathy x maladaptive cognitive emotion regulation interaction had direct
effects on social functioning, I was no longer examining the paradoxical relationship between dysphoria, poor social functioning, and the enhanced empathy I hypothesized dysphoric individuals to display. Instead, maladaptive cognitive emotion regulation had moderating effects on the direct relationship between empathy and social functioning. Considering the variables without dysphoria, then, greater empathy seems to lead to better social functioning for individuals who use maladaptive cognitive emotion regulation strategies, a relationship also found in the general population.

This finding indicates that for individuals who have difficulty regulating their own emotions, greater empathy is beneficial to their social functioning. Based on these findings, future studies will need to investigate possible mechanisms for this interaction. For example, the use of maladaptive techniques to regulate emotions suggests that one will be immersed in emotions for longer periods of time. This immersion in emotion, in combination with a tendency to be more empathic, may be beneficial for social interactions because people may be more attracted to those who share their emotions for longer periods of time, especially if they are experiencing negative emotions. For individuals who use maladaptive cognitive emotion regulation strategies, future studies can address 1) how the combination of high empathy and maladaptive emotion regulation manifest in overt social behaviours; 2) whether or not those individuals who are more empathic are perceived as more likeable by others; 3) whether or not it is the length of time, quality, or both of the empathic connection that is beneficial in social interactions; and 4) whether or not differences exist between how these individuals behave in social interactions involving others’ positive versus negative emotions. Finally, the maladaptive cognitive strategies studied here include catastrophizing and rumination, processes that
are usually self-directed. Future studies need to address whether or not these strategies are processes that are shared and vocalized during empathic responses, whether or not they are directed toward one’s social partner, and how such processes, which are usually considered negative, are perceived by a social partner.

Individuals who do not use maladaptive cognitive strategies to regulate their emotions may not experience benefits from greater empathic tendencies because they are able to immediately and effectively regulate their emotional responses to others. This approach may make their emotion connection to others less dependent on the quality of empathy. For these individuals, research is needed into whether or not their greater ability to regulate emotions influences their social behaviour and whether or not other social practices, such as theory of mind or empathic accuracy, may influence their social functioning.

*Emotion Regulation and Social Functioning*

Although emotion regulation by itself was not a focus of this study and specific predictions about emotion regulation were not made, I found that emotion regulation was the only variable to significantly mediate the relationship between dysphoria and social functioning. Again, different patterns were observed for the different types of emotion regulation.

After dysphoria was taken into account, positive, adaptive cognitive emotion regulation strategies were not correlated with either concurrent or longitudinal changes in social functioning. Negative cognitive emotion regulation strategies and negative mood regulation expectancy, in contrast, were both correlated significantly with worse concurrent and longitudinal social functioning, even after controlling for dysphoria.
Emotion regulation is an important correlate of social functioning and depression (e.g., Bromberger & Matthews, 1996; Cicchetti, Ackerman, & Izard, 1995; Garnefski, Kraaij, & Sphinhoven, 2001; Rude & McCarthy, 2003; Thompson, 1991). For example, perceived self-efficacy for affect regulation, a construct similar to the negative mood regulation expectancy measured in this study, is related to both pro-social behaviour and depression (Bandura, Carpara, Barbranelli, Gerbino, & Pastorelli, 2003). Furthermore, these relationships are mediated by action-oriented self-efficacy, such as beliefs about academic efficacy, empathic efficacy, and self-regulatory efficacy for resisting peer pressure.

Emotion regulation also can be an important mediator for well-being and social functioning. In one study, emotion regulation mediated the relationship between attachment and social behaviour (Laible, 2007), and yet another study found that emotion regulation mediated the relationship between a stressful life event and subsequent depression and anxiety (Garnefski, Kraaij, & Spinhoven, 2001). My study extends the importance of emotion regulation as a mediating process by examining its mediating effects on the relationship between dysphoria and longitudinal changes in social functioning.

From both the empathy x emotion regulation interactions and the emotion regulation as mediator analyses, a pattern has emerged. Maladaptive emotion regulation, including negative cognitive regulation strategies and negative mood regulation expectancy, play an important role in social functioning, but adaptive emotion regulation does not. If maladaptive emotion regulation is associated with worse social functioning, then more adaptive emotion regulation strategies should be associated with better social
functioning, a trend that I did not find. What, then, is different about the use of adaptive versus maladaptive emotion regulation in social interactions? This question is important for future studies to address, including, for example, whether or not individuals can distinguish when someone is using adaptive versus maladaptive emotion regulation and, if so, how the use of adaptive versus maladaptive emotion regulation strategies is perceived. In addition, the emotion regulation process itself may not affect social functioning, but emotion regulation may influence the emotion that one wishes to regulate. Future studies, then, also could address how emotion regulation affects one’s emotions, including their intensity and length of duration, and how these variables that are related to emotion in turn affect social interactions.

Conclusion

The current research examined the interrelationships between dysphoria, empathy, emotion regulation, and social functioning. Only one aspect of empathy, personal distress, was correlated with dysphoria, and higher empathy and lower dysphoria levels were independently related to better social functioning.

This study is the first to examine the interaction between empathy and emotion regulation in relation to social functioning. The interaction between adaptive cognitive emotion regulation strategies and empathy was not correlated with social functioning. However, maladaptive cognitive emotion regulation strategies and negative mood regulation expectancy, in their interactions with empathy, were significantly correlated with social functioning. For individuals using more maladaptive cognitive emotion regulation strategies, heightened empathy was correlated with better social functioning. For individuals who do not use maladaptive cognitive emotion regulation strategies,
empathy was not correlated with social functioning. The interaction between empathy and negative mood regulation expectancy could not be interpreted because the statistical model had poor fit to the data. Therefore, future studies need to examine the interpretation of this interaction in greater depth.

This study also is the first to establish emotion regulation as a mediator between depressive symptoms and the social impairments often associated with depression. Both maladaptive cognitive emotion regulation strategies and negative mood regulation expectancy mediated the relationship between dysphoria and social functioning, but adaptive cognitive emotion regulation strategies did not. These results represent a new direction in studying empathy and emotion regulation in their relations to dysphoria and social functioning. My study’s participants were healthy, young adult population, and future studies need to extend this line of research into clinical groups, including those with major depression, autism, and schizophrenia, all of who report social impairments. Understanding how social practices, such as empathy, and cognitive processes, such as emotion regulation, influence social functioning may have important implications for the development of treatment for these groups and their quality of life.
CHAPTER FIVE

General Discussion

The series of studies presented in Chapters Two, Three, and Four focused on two social practices relevant to individuals’ responses to others’ emotions, ToM and empathy. In examining the similarities and differences between these two processes, I found a connection between affective ToM, our cognitive inferences about others’ emotions, and cognitive empathy, our cognitive responses to others’ emotions. A ToM task assessing accuracy in reading others’ complex emotions, the Reading the Mind in the Eyes task (Baron-Cohen et al., 2001), was correlated with self-report measures of perspective-taking, a component of cognitive empathy, thus confirming a link between the two constructs and providing the first empirical support of the Eyes task as a measure of affective ToM in a healthy, adult population.

Affective ToM and empathy have both been reported to be beneficial to social functioning in psychiatric populations (e.g., Bandura et al., 2003; Brune, 2005). The studies presented in this thesis sought to examine their influence on social functioning in a healthy, non-clinical population and found that ToM was a significant predictor of improvement in social functioning over time, whereas empathy was correlated with concurrent social functioning. These findings echo the research literature in psychiatric populations and show that, even for healthy adults, ToM and empathy are pro-social traits that enhance one’s social functioning.

In the studies in Chapters Two and Four, I tested the mediational roles of ToM and empathy when they interact with other cognitive factors in the relationship between dysphoria and social functioning. Instead of mediating the relationship between
dysphoria and social functioning, these interactions directly affected social functioning, independent of dysphoria. The interaction between ToM and internalizing attribution style independently predicted only longitudinal changes in social functioning; whereas the interaction between empathy and maladaptive emotion regulation, including maladaptive cognitive emotion regulation strategies and negative mood regulation expectancy, had a direct effect on both concurrent and longitudinal changes in social functioning. Although these interactions did not mediate the relationship between dysphoria and social functioning, I did find that two different types of maladaptive emotion regulation mediated this relationship. Specifically, maladaptive cognitive emotion regulation strategies and negative mood regulation expectancy mediate the dysphoria-social functioning relationship.

These studies are the first to investigate how ToM and empathy interact with various cognitive mechanisms (i.e., attribution bias and emotion regulation, respectively) to influence social functioning. The finding that these interactions do indeed predict changes in social functioning opens up a wide range of future research possibilities into how different cognitive processes may interact and influence our social interactions.

Conclusion

As the first studies to connect ToM and empathy to cognitive mechanisms and social functioning, my studies open new, exciting areas of research that can be extended into different clinical populations. Although only a few of the variables and their interactions mediated the relationship between depressive symptoms and social functioning, they still may be important independent influences on social functioning in different populations. Major depression, autism, schizophrenia, and social phobia are all
disorders associated with social impairments. The variables I have examined here also may influence social functioning in these clinical populations and may have important implications for treatments that could significantly improve quality of life. For example, I found that individuals who display processing biases normally targeted in cognitive therapy – and internalizing bias and poor emotion regulation – nevertheless are able to benefit from enhanced theory of mind or empathy in their social lives. That is, for these individuals, despite their maladaptive cognitive biases, the pro-social traits of ToM and empathy are able to help enhance their social functioning if they have higher levels of ToM and/or empathy. Based on these findings, it seems reasonable to predict that targeting ToM and empathy in populations with social impairments, such as depressed and dysphoric individuals, may help improve their social functioning. Therapists would be able to train clients to improve inferences about others’ emotional states and train empathic responding. With practice in these techniques, clients may experience better social functioning and, as a result, a better quality of life.
References


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Behavioral and Brain Sciences, 25(1), 1-20.


Appendix A

Experimental Materials
Beck Anxiety Inventory (BAI)

Please rate how much you have experienced each of the following have occurred to you over the past week. Please be as honest as possible. Your responses are anonymous and confidential.

Put either a 0, 1, 2, or 3 by each item to indicate the extent to which you have been bothered by the event or feeling described, with a 0 indicating "Not at all" and a 3 indicating "Severely - I could barely stand it".

____ Numbness or tingling
____ Feeling hot
____ Wobbliness in legs
____ Unable to relax
____ Fear of the worst happening
____ Dizzy or lightheaded
____ Heart pounding or racing
____ Unsteady
____ Terrified
____ Nervous
____ Feelings of Choking
____ Hands trembling
____ Shaky
____ Fear of losing control
____ Difficulty breathing
____ Fear of dying
____ Scared
____ Indigestion or discomfort in abdomen
____ Faint
____ Face flushed
____ Sweating (not due to heat)
Beck Depression Inventory – II (BDI-II)

This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks, including today. Fill in the circle beside the statement you have picked. If several statements in the group seem to apply equally well, fill in the circle next to the highest numbered statement for that group. Be sure that you do not choose more than one statement for any group, including Item P or Item R.

A.  
0 I do not feel sad.  
1 I feel sad much of the time.  
2 I am sad all of the time.  
3 I am so sad or unhappy that I can't stand it.

B.  
0 I am not discouraged about my future.  
1 I feel more discouraged about my future than I used to be.  
2 I do not expect things to work out for me.  
3 I feel my future is hopeless and will only get worse.

C.  
0 I do not feel like a failure.  
1 I have failed more than I should have.  
2 As I look back, I see a lot of failures.  
3 I feel I am a total failure as a person.

D.  
0 I get as much pleasure as I ever did from the things I enjoy.  
1 I don't enjoy things as much as I used to.  
2 I get very little pleasure from the things I used to enjoy.  
3 I can't get any pleasure from the things I used to enjoy.

E.  
0 I don't feel particularly guilty.  
1 I feel guilty over many things I have done or should have done.  
2 I feel quite guilty most of the time.  
3 I feel guilty all of the time.

F.  
0 I don't feel I am being punished.  
1 I feel I may be punished.  
2 I expect to be punished.  
3 I feel I am being punished.

G.  
0 I feel the same about myself as ever.  
1 I have lost confidence in myself.  
2 I am disappointed in myself.  
3 I dislike myself.

H.  
0 I don't criticize or blame myself more than usual.  
1 I am more critical of myself than I used to be.  
2 I criticize myself for all of my faults.  
3 I blame myself for everything bad that happens.

I.  
0 I don't have any thoughts of killing myself.  
1 I have thoughts of killing myself, but I would not carry them out.  
2 I would like to kill myself.  
3 I would kill myself if I had the chance.

J.  
0 I don't cry anymore than I used to.  
1 I cry more than I used to.  
2 I cry over every little thing.  
3 I feel like crying, but I can't.

K.  
0 I am no more restless or wound up than usual.  
1 I feel more restless or wound up than usual.  
2 I am so restless or agitated that it's hard to stay still.  
3 I am so restless or agitated that I have to keep moving or doing something.
L. 0 I have not lost interest in other people or activities.
   1 I am less interested in other people or things than before.
   2 I have lost most of my interest in other people or things.
   3 It’s hard to get interested in anything.

M. 0 I make decisions about as well as ever.
   1 I find it more difficult to make decisions than usual.
   2 I have much greater difficulty in making decisions than I used to.
   3 I have trouble making any decisions.

N. 0 I do not feel I am worthless.
   1 I don’t consider myself as worthwhile and useful as I used to.
   2 I feel more worthless as compared to other people.
   3 I feel utterly worthless.

O. 0 I have as much energy as ever.
   1 I have less energy than I used to have.
   2 I don’t have enough energy to do very much.
   3 I don’t have enough energy to do anything.

P. 0 I have not experienced any change in my sleeping pattern.
   1a I sleep somewhat more than usual.
   1b I sleep somewhat less than usual.
   2a I sleep a lot more than usual.
   2b I sleep a lot less than usual.
   3a I sleep most of the day.
   3b I wake up 1-2 hours early and can’t get back to sleep.

Q. 0 I am no more irritable than usual.
   1 I am more irritable than usual.
   2 I am much more irritable than usual.
   3 I am irritable all the time.

R. 0 I have not experienced any change in my appetite.
   1a My appetite is somewhat less than usual.
   1b My appetite is somewhat greater than usual.
   2a My appetite is much less than before.
   2b My appetite is much greater than usual.
   3a I have no appetite at all.
   3b I crave food all the time.

S. 0 I can concentrate as well as ever.
   1 I can’t concentrate as well as usual.
   2 It’s hard to keep my mind on anything for very long.
   3 I find I can’t concentrate on anything.

T. 0 I am no more tired or fatigued than usual.
   1 I get more tired or fatigued more easily than usual.
   2 I am too tired or fatigued to do a lot of things I used to do.
   3 I am too tired or fatigued to do most of the things I used to do.

U. 0 I have not noticed any recent change in my interest in sex.
   1 I am less interested in sex than I used to be.
   2 I am much less interested in sex now.
   3 I have lost interest in sex completely.
Social Adjustment Scale (SAS)

The SAS is a copyrighted scale that requires researchers to purchase the scale before use. As such, the scale items will not be reported here. The SAS is a 54-item self-report scale that assesses current social functioning in domains of Primary Relationship (living with a partner), Work (employment, school, or housework), Social and Leisure (dating, recreation), Extended Family (relatives), Parental (own children), and Family unit (partner or children). An Overall Adjustment Score is based on these six domains with higher scores indicating poorer social functioning.
Example of the Eyes Test

a) jealous       panicked

arrogant      hateful

b) aloof        ferocious

timid        obedient

c) male   female

a) Eyes item
b) Animal control item
c) Gender control item
Differential Emotions Scale (DES)

For the following items, please choose the number on the scale that best describes the way you feel at this moment.

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<tr>
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<th>Not At All</th>
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<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>1. Merry/gleeful/amused</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<td>2. Warmhearted/joyful/elated</td>
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<td>2</td>
<td>2</td>
<td>4</td>
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<td>3. Sad/downhearted/blue</td>
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<td>2</td>
<td>2</td>
<td>4</td>
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<td>6</td>
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<td>4. Irritate/angry/mad</td>
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<td>2</td>
<td>2</td>
<td>4</td>
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<td>6</td>
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<tr>
<td>5. Fearful/scared/afraid</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
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<td>6</td>
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<tr>
<td>6. Tense/anxious/nervous</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>7. Disgusted/turned-off/repulsed</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
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<td>6</td>
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<tr>
<td>8. Contemptuous/scornful/disdainful</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
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<td>6</td>
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<td>9. Ashamed/embarrassed/regretful</td>
<td>1</td>
<td>2</td>
<td>2</td>
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<td>6</td>
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<tr>
<td>10. Sympathetic/compassionate/thoughtful</td>
<td>1</td>
<td>2</td>
<td>2</td>
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Internal, Personal, Situational Attributions Questionnaire (I.P.S.A.Q.)

INSTRUCTIONS
Please read the statements on the following pages. For each statement please try to vividly imagine that event happening to you. Then try to decide what was the main cause of the event described in each statement. Please write the cause you have thought of in the space provided. Then tick the appropriate letter (a, b or c) according to whether the cause is:

a) Something about you
b) Something about another person (or a group of people)
c) Something about the situation (circumstances or chance)

It might be quite difficult to decide which of these options is exactly right. In this case, please pick one option, the option which best represents your opinion. Please pick only one letter in each case.

1. **A friend gave you a lift home.**
What caused your friend to give you a lift home? (Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

2. **A friend talked about you behind your back.**
What caused your friend to talk about you behind your back? (Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

3. **A friend said that he/she has no respect for you.**
What caused your friend to say that he/she has no respect for you? (Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

4. **A friend helped you with the gardening.**
What caused your friend to help you with the gardening? (Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?
5. **A friend thinks you are trustworthy.**
What caused your friend to think you are trustworthy? (Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

6. **A friend refused to talk to you.**
What caused your friend to refuse to talk to you? (Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

7. **A friend thinks you are interesting.**
What caused your friend to think you are interesting? (Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

8. **A friend sent you a postcard.**
What caused your friend to send you a postcard? (Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?

9. **A friend thinks you are unfriendly.**
What caused your friend to think that you are unfriendly? (Please write down the one major cause)

Is this:

a. Something about you?
b. Something about the other person or other people?
c. Something about the situation (circumstances or chance)?
10. **A friend made an insulting remark to you.**
    What caused your friend to insult you? (Please write down the one major cause)

    Is this:
    a. Something about you?
    b. Something about the other person or other people?
    c. Something about the situation (circumstances or chance)?

11. **A friend bought you a present.**
    What caused your friend to buy you a present? (Please write down the one major cause)

    Is this:
    a. Something about you?
    b. Something about the other person or other people?
    c. Something about the situation (circumstances or chance)?

12. **A friend picked a fight with you.**
    What caused your friend to fight with you? (Please write down the one major cause)

    Is this:
    a. Something about you?
    b. Something about the other person or other people?
    c. Something about the situation (circumstances or chance)?

13. **A friend thinks you are dishonest.**
    What caused your friend to think you are dishonest? (Please write down the one major cause)

    Is this:
    a. Something about you?
    b. Something about the other person or other people?
    c. Something about the situation (circumstances or chance)?

14. **A friend spent some time talking to you.**
    What caused your friend to spend time talking with you? (Please write down the one major cause)

    Is this:
    a. Something about you?
    b. Something about the other person or other people?
    c. Something about the situation (circumstances or chance)?
15. **A friend thinks you are clever.**
   What caused your friend to think you are clever? (Please write down the one major cause)

   Is this:
   a. Something about you?
   b. Something about the other person or other people?
   c. Something about the situation (circumstances or chance)?

16. **A friend refused to help you with a job.**
   What caused your friend to refuse to help you with the job? (Please write down the one major cause)

   Is this:
   a. Something about you?
   b. Something about the other person or other people?
   c. Something about the situation (circumstances or chance)?

17. **A friend thinks you are sensible.**
   What caused your friend to think that you were sensible? (Please write down the one major cause)

   Is this:
   a. Something about you?
   b. Something about the other person or other people?
   c. Something about the situation (circumstances or chance)?

18. **A friend thinks you are unfair.**
   What caused your friend to think that you are unfair? (Please write down the one major cause)

   Is this:
   a. Something about you?
   b. Something about the other person or other people?
   c. Something about the situation (circumstances or chance)?

19. **A friend said that he(she) dislikes you.**
   What caused your friend to say that he(she) dislikes you? (Please write down the one major cause)

   Is this:
   a. Something about you?
   b. Something about the other person or other people?
   c. Something about the situation (circumstances or chance)?
20. **A friend rang to enquire about you.**
What caused your friend to ring to enquire about you? (Please write down the one major cause)

Is this:
- a. Something about you?
- b. Something about the other person or other people?
- c. Something about the situation (circumstances or chance)?

21. **A friend ignored you**
What caused your friend to ignore you? (Please write down the one major cause)

Is this:
- a. Something about you?
- b. Something about the other person or other people?
- c. Something about the situation (circumstances or chance)?

22. **A friend said that she/he admires you.**
What caused your friend to say that she/he admired you? (Please write down the one major cause)

Is this:
- a. Something about you?
- b. Something about the other person or other people?
- c. Something about the situation (circumstances or chance)?

23. **A friend said that he/she finds you boring.**
What caused your friend to say that he/she finds you boring? (Please write down the one major cause)

Is this:
- a. Something about you?
- b. Something about the other person or other people?
- c. Something about the situation (circumstances or chance)?

24. **A friend said that she/he resents you.**
What caused your friend to say that she/he resents you? (Please write down the one major cause)

Is this:
- a. Something about you?
- b. Something about the other person or other people?
- c. Something about the situation (circumstances or chance)?
25. **A friend visited you for a friendly chat.**
What caused your friend to visit you for a chat? (Please write down the one major cause)

Is this:
- a. Something about you?
- b. Something about the other person or other people?
- c. Something about the situation (circumstances or chance)?

26. **A friend believes that you are honest**
What caused your friend to believe that you are honest? (Please write down the one major cause)

Is this:
- a. Something about you?
- b. Something about the other person or other people?
- c. Something about the situation (circumstances or chance)?

27. **A friend betrayed the trust you had in her.**
What caused your friend to betray your trust? (Please write down the one major cause)

Is this:
- a. Something about you?
- b. Something about the other person or other people?
- c. Something about the situation (circumstances or chance)?

28. **A friend ordered you to leave.**
What caused your friend to order you to leave? (Please write down the one major cause)

Is this:
- a. Something about you?
- b. Something about the other person or other people?
- c. Something about the situation (circumstances or chance)?

29. **A friend said that she(he) respects you.**
What caused your friend to say that she(he) respects you? (Please write down the one major cause)

Is this:
- a. Something about you?
- b. Something about the other person or other people?
- c. Something about the situation (circumstances or chance)?
30. **A friend thinks you are stupid.**
What caused your friend to think that you are stupid? (Please write down the one major cause)

\[
\text{Is this:} \\
a. \text{Something about you?} \\
b. \text{Something about the other person or other people?} \\
c. \text{Something about the situation (circumstances or chance)?}
\]

31. **A friend said that he/she liked you.**
What caused your friend to say that he/she liked you? (Please write down the one major cause)

\[
\text{Is this:} \\
a. \text{Something about you?} \\
b. \text{Something about the other person or other people?} \\
c. \text{Something about the situation (circumstances or chance)?}
\]

32. **A neighbour invited you in for a drink.**
What caused your friend to invite you in for a drink? (Please write down the one major cause)

\[
\text{Is this:} \\
a. \text{Something about you?} \\
b. \text{Something about the other person or other people?} \\
c. \text{Something about the situation (circumstances or chance)?}
\]
Interpersonal Reactivity Index (IRI)

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: A, B, C, D, or E. When you have decided on your answer, fill in the letter next to the item number. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can. Thank you.

ANSWER SCALE:

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<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
<tr>
<td>DOES NOT</td>
<td>DESCRIBES</td>
<td>ME VERY WELL</td>
<td></td>
<td></td>
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<tr>
<td>DESCRIBES ME VERY</td>
<td>WELL</td>
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</tbody>
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1. I daydream and fantasize, with some regularity, about things that might happen to me. (FS)
2. I often have tender, concerned feelings for people less fortunate than me. (EC)
3. I sometimes find it difficult to see things from the "other guy's" point of view. (PT) (-)
4. Sometimes I don't feel very sorry for other people when they are having problems. (EC) (-)
5. I really get involved with the feelings of the characters in a novel. (FS)
6. In emergency situations, I feel apprehensive and ill-at-ease. (PD)
7. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. (FS) (-)
8. I try to look at everybody's side of a disagreement before I make a decision. (PT)
9. When I see someone being taken advantage of, I feel kind of protective towards them. (EC)
10. I sometimes feel helpless when I am in the middle of a very emotional situation. (PD)
11. I sometimes try to understand my friends better by imagining how things look from their perspective. (PT)
12. Becoming extremely involved in a good book or movie is somewhat rare for me. (FS) (-)
13. When I see someone get hurt, I tend to remain calm. (PD) (-)
14. Other people's misfortunes do not usually disturb me a great deal. (EC) (-)
15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (PT) (-)
16. After seeing a play or movie, I have felt as though I were one of the characters. (FS)
17. Being in a tense emotional situation scares me. (PD)
18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (EC) (-)
19. I am usually pretty effective in dealing with emergencies. (PD) (-)
20. I am often quite touched by things that I see happen. (EC)
21. I believe that there are two sides to every question and try to look at them both. (PT)
22. I would describe myself as a pretty soft-hearted person. (EC)
23. When I watch a good movie, I can very easily put myself in the place of a leading character. (FS)
24. I tend to lose control during emergencies. (PD)
25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT)
26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. (FS)
27. When I see someone who badly needs help in an emergency, I go to pieces. (PD)
28. Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT)
Questionnaire Measure of Emotional Empathy (QMEE)

Please rate how much you agree with the following statements from -4 (very strong disagreement) to +4 (very strong agreement).

1. It makes me sad to see a lonely stranger in a group.
2. People make too much of the feelings and sensitivity of animals.
3. I often find public displays of affection annoying.
4. I am annoyed by unhappy people who are just sorry for themselves.
5. I become nervous if others around me seem to be nervous.
6. I find it silly for people to cry out of happiness.
7. I tend to get emotionally involved with a friend’s problems.
8. Sometimes the words of a love song can move me deeply.
9. I tend to lose control when I am bringing bad news to people.
10. The people around me have a great influence on my moods.
11. Most foreigners I have met seemed cool and unemotional.
12. I would rather be a social worker than work in a job training center.
13. I don’t get upset just because a friend is acting upset.
14. I like to watch people open presents.
15. Lonely people are probably unfriendly.
16. Seeing people cry upsets me.
17. Some songs make me happy.
18. I really get involved with the feelings of the characters in a novel.
19. I get very angry when I see someone being ill-treated.
20. I am able to remain calm even though those around me worry.
21. When a friend starts to talk about his problems, I try to steer the conversation to something else.
22. Another’s laughter is not catching for me.
23. Sometimes at the movies I am amused by the amount of crying and sniffling around me.
24. I am able to make decisions without being influenced by people’s feelings.
25. I cannot continue to feel OK if people around me are depressed.
26. It is hard for me to see how some things upset people so much.
27. I am very upset when I see an animal in pain.
28. Becoming involved in books or movies is a little silly.
29. It upsets me to see helpless old people.
30. I become more irritated than sympathetic when I see someone’s tears.
31. I become very involved when I watch a movie.
32. I often find that I can remain cool in spite of the excitement around me.
33. Little children sometimes cry for no apparent reason.
Cognitive Emotion Regulation Questionnaire (CERQ)
© Garnefski, Kraaij & Spinhoven, 2001

How do you cope with events?
Everyone gets confronted with negative or unpleasant events now and then and everyone responds to them in his or her own way. By the following questions you are asked to indicate what you generally think, when you experience negative or unpleasant events.

Please rate the following statements based on the following scale:

1. (almost) never
2. sometimes
3. regularly
4. often
5. (almost) always

1. I feel that I am the one to blame for it
2. I think that I have to accept that this has happened
3. I often think about how I feel about what I have experienced
4. I think of nicer things than what I have experienced
5. I think of what I can do best
6. I think I can learn something from the situation
7. I think that it all could have been much worse
8. I often think that what I have experienced is much worse than what others have experienced
9. I feel that others are to blame for it
10. I feel that I am the one who is responsible for what has happened
11. I think that I have to accept the situation
12. I am preoccupied with what I think and feel about what I have experienced
13. I think of pleasant things that have nothing to do with it
14. I think about how I can best cope with the situation
15. I think that I can become a stronger person as a result of what has happened
16. I think that other people go through much worse experiences
17. I keep thinking about how terrible it is what I have experienced
18. I feel that others are responsible for what has happened
19. I think about the mistakes I have made in this matter
20. I think that I cannot change anything about it
21. I want to understand why I feel the way I do about what I have experienced
22. I think of something nice instead of what has happened
23. I think about how to change the situation
24. I think that the situation also has its positive sides
25. I think that it hasn’t been too bad compared to other things
26. I often think that what I have experienced is the worst that can happen to a person
27. I think about the mistakes others have made in this matter
28. I think that basically the cause must lie within myself
29. I think that I must learn to live with it
30. I dwell upon the feelings the situation has evoked in me
31. I think about pleasant experiences
32. I think about a plan of what I can do best
33. I look for the positive sides to the matter
34. I tell myself that there are worse things in life
35. I continually think how horrible the situation has been
36. I feel that basically the cause lies with others
Negative Mood Regulation Scale

This is a questionnaire to find out what people believe they can do about upsetting emotions or feelings. Please answer the statements by giving as true a picture of your own beliefs as possible. Of course, there are no right or wrong answers. Remember, the questionnaire is about what you believe you can do, not about what you actually or usually do. Be sure to read each item carefully and show your beliefs by filling in the blank in front of each item with the appropriate number from the following rating scale:

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<td>mildly disagree</td>
<td>agree and disagree equally</td>
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When I’m upset, I believe that:

1. ____ I can usually find a way to cheer myself up.
2. ____ I can do something to feel better.
3. ____ Wallowing in it is all I can do.
4. ____ I’ll feel okay if I think about more pleasant times.
5. ____ Being with other people will be a drag.
6. ____ I can feel better by treating myself to something I like.
7. ____ I’ll feel better when I understand why I feel bad.
8. ____ I won’t be able to get myself to do anything about it.
9. ____ I won’t feel much better by trying to find some good in the situation.
10. ____ It won’t be long before I can calm myself down.
11. ____ It will be hard to find someone who really understands.
12. ____ Telling myself it will pass will help calm me down.
13. ____ Doing something nice for someone else will cheer me up.
14. ____ I’ll end up feeling really depressed.
15. ____ Planning on how I’ll deal with things will help.
16. ____ I can forget about what’s upsetting me pretty easily.
17. ____ Catching up with my work will help me calm down.
18. ____ The advice friends give me won’t help me feel better.
19. ____ I won’t be able to enjoy the things I usually enjoy.
20. ____ I can find a way to relax.
21. ____ Trying to work the problem out in my head will only make it seem worse.
22. ____ Seeing a movie won’t help me feel better.
23. ____ Going out to dinner with friends will help.
24. ____ I’ll be upset for a long time.
25. ____ I won’t be able to put it out of my mind.
26. ____ I can feel better by doing something creative.
27. ____ I’ll start to feel really down about myself.
28. ____ Thinking that things will eventually be better won’t help me feel any better.
29. ____ I can find some humor in the situation and feel better.
30. ____ If I’m with a group of people I’ll feel “alone in a crowd.”
CONSENT TO ACT AS A HUMAN RESEARCH SUBJECT

Triangle Study
Jill A. Jacobson, Ph.D.
Department of Psychology
Queen’s University

NAME OF PARTICIPANT (please print): __________________________________________

PURPOSE OF STUDY: I have been asked to participate in a research project designed to investigate a person’s understanding of other people’s feelings.

PARTICIPANTS: I understand that I cannot participate if I have previously been diagnosed with major depression and/or received psychotherapy or medication for depression.

PROCEDURES: This study has two separate parts. If I agree to participate, the following will occur: I will complete some questionnaires and tasks on the computer today. These procedures will take approximately 60 minutes. During Winter term, I will be contacted again to complete the second part of the study, which will take approximately 30 minutes to complete.

RISKS: No risks are anticipated. If there is something that makes me uncomfortable, I understand that I have the right to refuse to answer any questions or withdraw from this study at any time without penalty.

BENEFITS: I will receive 1 credit for my Psychology 100 course through the Queen’s University Psychology subject pool for my participation in today’s part of the study. For the second part, I have the option of receiving .5 subject pool credits or $5 if I have completed my subject pool credits. Also, I will have the opportunity to learn more about social psychology, clinical psychology, and research in general.

CONFIDENTIALITY: I understand that my research records will be stored in a locked cabinet in a secured building. I hereby authorize the use of all records, tests, and personal data derived from this experiment for research purposes. I understand that any information derived from this research project that personally identifies me will not be voluntarily released or disclosed by the researchers without my separate consent, except as specifically required by law.

IF I HAVE QUESTIONS: If I have any comments or questions regarding the conduct of this research or my rights as a research participant, I may contact Dr. Jill Jacobson at 533-2847, the Head of the Psychology Department at 533-2492, and/or Dr. Steven Leighton of the General Research Ethics Board for Queen’s University, c/o Research Services at 533-6081.

VOLUNTARY PARTICIPATION: By signing below, I indicate that I understand the nature of this study and that the experimenter has answered my questions to my satisfaction. I know that I may refuse to answer any question or discontinue my involvement at any time without penalty. My signature below indicates that I have read the information in this form and consent to participate in this study voluntarily.

_________________________________________
SIGNATURE OF PARTICIPANT

DATE

This study has received clearance from Queen’s University.

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Debriefing

Triangle Study (1)
Jill A. Jacobson, Ph.D.
Department of Psychology
Queen’s University

The purpose of the experiment is not only for us to collect data, but also for you to learn what psychology research is like. It gives you a chance to see how experiments really work and an opportunity to learn how we test hypotheses.

The questionnaires you completed and tasks you did will help us understand how people process and respond to other people’s emotions. We will be looking at overall trends across participants and not findings for particular individuals. All results will be reported at the aggregate level and you will not be identified in any way.

You will be contacted in 2-3 months (during Winter term) to complete your participation in this study. The next phase will involve answering some questionnaires. It will take approximately 30 minutes and you will receive either .5 subject pool credits or $5 if I have completed my 5 credits.

If you have any comments or questions regarding the conduct of this research or your rights as a research participant, you may contact Dr. Jill Jacobson at 533-6000, ext. 32847; the Head of the Psychology Department, Dr. Vernon Quinsey, at 533-2492; and/or Dr. Steven Leighton of the General Research Ethics Board for Queen’s University, c/o Research Services at 533-6081. If you should experience any emotional discomfort after completing this experiment, you are encouraged to contact the Student Counseling and Disability Centre at 533-2506 to discuss your experience.

If you are interested in this area of research, you may wish to read the following references:


Thank you for participating!

This study has received clearance by Queen’s University.
Debriefing

Triangle Study (2)
Jill A. Jacobson, Ph.D.
Department of Psychology
Queen’s University

The purpose of the experiment is not only for us to collect data, but also for you to learn what psychology research is like. It gives you a chance to see how experiments really work and an opportunity to learn how we test hypotheses.

Individuals who are depressed often report having difficulties in their social lives. One part of social functioning involves how you read and process other people’s emotions. This study is looking at whether there are differences in how depressed individuals think about and react to others’ emotions and whether these differences relate to their everyday social lives. The questionnaires you completed and tasks you did will help us understand this question.

We will be looking at overall trends across participants and not findings for particular individuals. All results will be reported at the aggregate level and you will not be identified in any way.

If you have any comments or questions regarding the conduct of this research or your rights as a research participant, you may contact Dr. Jill Jacobson at 533-6000, ext. 32847; the Head of the Psychology Department, Dr. Vernon Quinsey, at 533-2492; and/or Dr. Steven Leighton of the General Research Ethics Board for Queen’s University, c/o Research Services at 533-6081. If you should experience any emotional discomfort after completing this experiment, you are encouraged to contact the Student Counseling and Disability Centre at 533-2506 to discuss your experience.

If you are interested in this area of research, you may wish to read the following references:


Thank you for participating!

This study has received clearance by Queen’s University
Appendix B

Full Descriptive Statistics and Correlations for Chapter Four
Table B.1.  
Complete Descriptive Statistics and Correlations for Chapter Four.

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Note. BDI-II: Beck Depression Inventory – II; BAI: Beck Anxiety Inventory; QMEE: Questionnaire Measure of Emotional Empathy; IRI PT: Interpersonal Reactivity Index – Perspective Taking; IRI PD: Personal Distress; IRI FS: Fantasy Scale; IRI EC: Empathic Concern; IRI Total: Interpersonal Reactivity Index total; NMR: Negative Mood Regulation Scale; SAS (T1): Social Adjustment Scale (Time 1); CERQ 1: Cognitive Emotion Regulation Questionnaire – Self-blame; CERQ 2: Acceptance; CERQ 3: Rumination; CERQ 4: Positive Refocusing; CERQ 5: Refocus on Planning; CERQ 6: Positive Reappraisal; CERQ 7: Perspective Taking; CERQ 8: Catastrophizing; CERQ 9: Blaming Others; SAS (T2): Social Adjustment Scale (Time 2); Empathy: created variable from IRI and QMEE averages; Positive CERQ: created variable from CERQ 2, 4, 5, 6, and 7 averages; Negative CERQ: created variable from CERQ 1, 3, 8, and 9 averages. All variables from Time 1 except SAS (T2).