CROSS-NATIONAL EXAMINATION OF THE COGNITIVE THEORY OF
DEPRESSION AMONG INDIVIDUALS OF CHINESE AND CANADIAN DESCENT

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Kwan Tsz Yu, candidate for the degree of Master of Arts in Clinical Psychology, has presented a thesis titled, *Cross-Cultural Examination of the Cognitive Theory of Depression Among Individuals of Chinese and Canadian Descent*, in an oral examination held on September 4, 2018. The following committee members have found the thesis acceptable in form and content, and that the candidate demonstrated satisfactory knowledge of the subject material.

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Abstract
Major Depressive Disorder (MDD) or major depression is a debilitating condition affecting members of all cultures around the world. The cognitive theory of depression is one of the most researched theories of the disorder worldwide; however, the theory’s cross-cultural applicability has not been extensively studied, especially among Chinese participants. According to the cognitive theory of depression, symptoms of major depression are hypothesized to strongly associate with negatively distorted cognitions about the self, world, and future. The present investigation examined five descriptive hypotheses (e.g., negativity hypothesis, exclusivity hypothesis, severity/persistence hypothesis, schema activation hypothesis, and selective processing hypothesis) derived from the cognitive theory of depression in a Canadian and a Chinese sample of dysphoric and non-dysphoria individuals to evaluate the theory’s cross-national validity. Dysphoria is conceptualized as a complex emotional state characterized by intense unhappiness and irritability. Data from 259 participants (129 dysphoric and 32 non-dysphoric Canadians; 18 dysphoric and 18 non-dysphoric Chinese) were analyzed to examine the five descriptive hypotheses. Participants completed a battery of self-report measures (i.e., Patient Health Questionnaire [PHQ-9], The Center for Epidemiologic Studies–Depression Scale [CES-D], Automatic Thoughts Questionnaire–Negative [ATQ-N], Automatic Thoughts Questionnaire–Positive [ATQ-P], and Dysfunctional Attitudes Scale [DAS-24]) and a facial expression recognition task. Dysphoric participants in both countries exhibited significantly more negative self-referent cognitions and dysfunctional attitudes, but significantly less positive self-referent cognitions than their non-dysphoric counterparts. Further, negative and positive self-referent cognitions, and dysfunctional
attitudes were correlated with depressive symptoms among the Canadian sample. With the exception of the correlation between dysfunctional attitudes and depressive symptoms, negative and positive self-referent cognitions were significantly and meaningfully correlated with depressive symptoms among Chinese participants. Additionally, there was a trend showing that dysphoric participants in both countries demonstrated higher recall for sad faces in comparison to their non-dysphoric counterparts. Taken together, the current results support the cross-national validity of five descriptive hypotheses of the cognitive theory of depression among individuals of Canadian and Chinese descent and the findings may have clinical implications in the treatment of major depression among non-Western populations.
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Introduction

Major Depressive Disorder (MDD) or major depression is a debilitating, highly recurrent psychiatric condition (Bockting, Hollon, Jarrett, Kuyken, & Dobson, 2015; Kessler, Merikangas, & Wang, 2007). Given the prevalence of major depression in societies across the world, it is not surprising that the disorder is estimated to be a leading cause of disability worldwide (Murray et al., 2013). Decades of extensive research have focused on elucidating the mechanisms underlying major depression, with the consensus being that cognition is a central feature of the disorder (Gotlib & Joormann, 2010). The cognitive theory of depression (Beck, 1967; Beck, Rush, Shaw, & Emery, 1979) emerged out of research with Western samples and emphasizes cognitions as predisposing factors of the disorder that also contribute to the maintenance and exacerbation of depressive episodes (Clark, Beck, & Alford, 1999). The cognitive theory of depression is one of the dominant theories of major depression in contemporary psychology (Beck & Dozois, 2011), and is the basis for cognitive behavioural therapy (CBT), the “fastest growing and most heavily researched systems of psychotherapy on the contemporary scene” (Prochaska & Norcross, 2010, p. 322). Unfortunately, empirical support for the cognitive theory of depression is predominantly derived from research with samples of individuals from Western cultures, limiting generalizability to members of other cultures. Since the Chinese are among the world’s largest ethnic group, the impetus to examine the cognitive theory of depression among Chinese persons is well-justified and the focus of the current investigation.

Review of the extant literature shows that cross-cultural researchers found evidence of marked cultural variation in the presentation of depressive symptoms
(reviewed below). Moreover, researchers have also discovered differences in cognition (e.g., memory, reasoning, perception) between members of East Asian and Western cultures (Nisbett & Masuda, 2003; Norenzayan, Choi, & Peng, 2007). For example, East Asians and Westerners appear to differ in the processes formulating causal attributions about events, such that East Asians tend to emphasize situational and contextual factors, whereas Westerners tend focus on dispositional factors like personal traits (Varnum, Grossmann, Kitayama, & Nisbett, 2010). Researchers have proposed that such attributional differences may be related to the contrasting cultural orientations between Western and East Asian cultures. Specifically, the individualistic orientation of Western cultures that emphasizes the separation of the self from the context may encourage attributions based on internal or general dispositional factors, whereas the collectivistic orientation of East Asian cultures which emphasizes interdependence and connectedness of the self with the surrounding context may encourage attributions based on contextual factors (Miller, 1984). Researchers have also suggested that variations in cognition may be explained by the different construals of the self and social orientation between East Asian and Western cultures (Norenzayan et al., 2007; Ryder et al., 2008). Accordingly, a cross-national investigation of the cognitions underlying major depression is of considerable interest to both the scientific community and the clinical field because the results may have substantial implications for treating major depression across different cultures.

Cross-cultural researchers have amassed extensive evidence indicating that culture influences the manifestation and experience of major depression; however, less is known about how culture may affect depression-related cognitive processes and
cognitions that may contribute to the depressive experience. Accordingly, the current study has been designed to investigate whether the associations between depressive cognitions and the experience of major depression differ between people from Canada and China; namely, by comparing several fundamental descriptive hypotheses derived from the cognitive theory of depression between individuals from Canada and China. Below, I review definitions of major depression, issues regarding the implementation of Western diagnostic criteria cross-culturally, as well as the consequences of major depression as seen in epidemiology studies across countries. Given the cross-national nature of the present investigation, the subsequent discussion will highlight differences in various constructs related to major depression and cognition between Western and East Asian cultures. A discussion and a summary of research on the cognitive theory of depression and the cognitive experiences that contribute to major depression will also be provided, followed by the rationale and hypotheses of the current study.

**Cross-Cultural Definitions and Epidemiology of Major Depression**

According to the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013)*, which is primarily a Western diagnostic tool, major depression is defined as the experience of sadness and/or anhedonia (i.e., loss of pleasure or interest in activities normally found enjoyable) for at least two weeks. The hallmark features of sadness and anhedonia are present alongside several other symptoms, including fatigue, appetite disturbance, sleep disturbance, difficulties in thinking and concentration, psychomotor agitation or retardation, feelings of guilt or worthlessness, and recurrent thoughts of death or suicidality. In addition, people who experience some symptoms of major depression, but do not necessarily meet
diagnostic criteria for major depression, may be considered dysphoric (i.e., experiencing symptoms of major depression at a sub-clinical level; Kendall, Hollon, Beck, Hammen, & Ingram, 1987). Dysphoria is conceptualized as a “complex emotional state, consisting of intense unhappiness and irritability” (Starcevoc, 2007, p. 9). According to Kendall and colleagues (1987), major depression levels range on the BDI such that scores between 10 and 17 suggest dysphoria, scores between 20 to 30 suggest moderate major depression, and scores greater than 30 suggest severe major depression. In a research study on cognitive bias with depressed, dysphoric, and non-depressed participants, depressed participants scored higher on a measure of irrational beliefs than their non-depressed counterparts, with dysphoric participants scoring between the two groups (McDermut, Haaga, & Bilek, 1997). Even with such established criteria, the experience of major depression and dysphoria differ drastically between individuals. Individual differences may be intensified by cultural differences acting as moderators because cultural scripts may influence how mood disorders are experienced, expressed, and understood (Huang, Beshai, & Yu, 2016; Kirmayer, 2001; Ryder, Ban, & Chentsova-Dutton, 2011; Ryder, Sun, Zhu, Yao, & Chentsova-Dutton, 2012). For example, dysphoric emotions are traditionally regarded as shameful in the Chinese culture and therefore discouraged from being expressed outside of the family (Kleinman & Kleinman, 1985). In contrast, Western cultures view emotions as fundamental and the expression of emotions (both positive and negative) is encouraged by Western cultural scripts (Kim and Sherman, 2007; Potter, 1988; Tsai & Clobert, in press).

Major depression is a significant health concern and one of the most prevalent mental disorders in the world, affecting various age cohorts across the lifespan (Kessler
& Bromet, 2013; Richards, 2011). The 2010 Global Burden of Disease Study (GBD 2010), an international collaborative project led by the Institute for Health Metrics and Evaluation (IHME), concluded that major depression is a leading cause of burden worldwide and is linked to an increased risk of mortality from major depression related heart diseases and suicides (Ferrari et al., 2013). Available epidemiological data reveal that the age-of-onset (AOO) of major depression are fairly consistent across countries. For example, a recent World Health Organization’s (WHO) World Mental Health (WHM) survey revealed that the median AOO of major depression is 22.7 in the United States, 18.8 in China, 24.2 in New Zealand, and 23.5 in Mexico (Kessler & Bromet, 2013). However, there is evidence that major depression is more prevalent among the younger than older age cohorts (Jorm, 2000; Blazer & Hybels, 2005), but that late-life depression has a poor long-term prognosis, including a higher relapse rate and a chronic course (Mitchell & Subramaniam, 2005).

Major depression as defined in the DSM-5 is reportedly experienced by individuals around the world; however, the prevalence estimates vary considerably from one country to another (Ryder & Chentsova-Dutton, 2012). The lifetime prevalence rates in North America have been estimated to range between 5% to 12% for men and 10% to 25% for women (American Psychiatric Association, 2000); in contrast, major depression rates in Asian countries, particularly China, have historically been lower than most countries in the world (Kleinman, 1982; Lee et al., 2007; Zhang, Shen, & Li, 1998). Between 4% and 9% of adults in Canada and America report experiencing at least one major depressive episode in the past year (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012; Patten et al., 2015; Vasiliadis, Lesage, Adair, Wang, & Kessler, 2007),
whereas between 2% and 4% of adults in China report experiencing at least one major depressive episode in the last 12 months (Bromet et al., 2011; Lee et al., 2007; Shen et al., 2006).

Hypotheses have been proffered regarding the evidently low prevalence of major depression in China, with some experts claiming that cultural stigma and reluctance to endorse mental symptoms may be partially responsible (Kramer, Kwong, Lee, & Chung, 2002; Weissman et al., 1996; Yang & Benson, 2016). Preserving public appearances is extremely important to East Asian groups, as an individual’s social standing impacts familial reputation (Hampton, Yeung, & Nguyen, 2007; Shea & Yeh, 2008); as such, individuals may be disinclined to voice their psychological distress due to fears of social stigma and shame associated with having mental disorders to the self and the family (Chen, Lai, & Yang, 2013). The expression of major depression in Chinese societies, in which distress is largely somatized (Ryder, Yang, & Heine, 2002), may also differ from DSM-5 symptom profile of major depression which appears largely based on Western notions of disordered mood, namely, the emphasis on psychological symptoms (Kriegler & Bester, 2014; Ryder et al., 2008); as such, individuals with an alternate presentation of the disorder in the Chinese culture may be assigned a different diagnosis (Parker, Gladstone, & Chee, 2001). Failing to delineate major depression symptom presentation patterns specific to persons of Chinese descent may reduce diagnostic sensitivity and specificity, underestimating disorder prevalence, reducing resource access, and increasing stigma (Kleinman, 1986; Parker et al., 2001). Accordingly, the observed differences in the cross-cultural presentation of major depression may be attributed to an
incongruence between symptom profiles based on cultural differences in China relative to Western cultures.

The variations in major depression estimates across countries, especially between Canada and China, may also reflect differences in how the disorder is defined and expressed. Research on major depression in non-Western contexts have traditionally used a Western classification of the disorder, typically in accordance with the various iterations of the DSM; however, cross-cultural researchers (e.g., Kirmayer, 2007; Chentsova-Dutton, Ryder, & Tsai, 2014) have raised concerns regarding such a practice. Major depression as defined in the DSM-5, as well as those other disorders containing within, emerged from a Western cultural perspective that emphasize, for example, individualism, autonomy, and the attainment of personal goals (Kirmayer, 2007). Furthermore, the cultural context in which the DSM-5 and past iterations was created influence the indicators of healthy psychological functioning, including the candid expression of emotions, cultivation of positive affect, and actualization of the individual self (Heine, Lehman, Markus, & Kitayama, 1999). Any deviations from such indicators may be regarded as abnormal and thus may meet diagnostic criteria for major depression (Chentsova-Dutton et al., 2014). Researchers have suggested that the biomedical model of mental disorders endorsed by the DSM-5 is essentially a Western cultural construct (Kriegler & Bester, 2014), thereby using a DSM-5 classification for major depression among Chinese and other non-Western cultures may be problematic as such a classification may conflict with non-Western cultural scripts.

The assumption that mental illnesses map on a dominantly biomedical model is aligned with the orientation of universalist cultures. Universalist cultures (e.g., Canada
and United States) are “rules-based” cultures such that the same rules are applied in all circumstances. Universalist cultures are often juxtaposed with particularist cultures (e.g., China and Russia), wherein judgments are not based on rules but are focused on present situations (Trompenaars & Hampden-Turner, 2011). The key difference between universalist and particularist cultures is on the rules of behaviour (Michailova & Hutchings, 2006). According to the universalistic view of psychopathology, mental disorders are universal and have core symptom patterns that are shared across cultures. Although the universalistic view accepts that culture may affect the manifestation of a disorder, the assumption is that the underlying psychopathology remains the same across cultures (Canino & Alegia, 2008). A particularist view of psychopathology may not necessarily discount the biomedical model of psychopathology, but that manifestations of disorders should be understood in large part due to cultural and situational influences.

Another issue with the use of Western or DSM-5 classification of major depression cross-culturally is that such a classification emphasizes psychological symptoms in which low mood and anhedonia are considered the central features (Chentsova-Dutton et al., 2014). The lack of focus on somatic or even interpersonal symptoms, both of which have shown to be present or associated with a depressive experience (e.g., Joiner, Coyne, & Blalock, 1999; Rief, Mewes, Martin, Glaesmer, & Braehler, 2010; Segrin, 2000; Simms, Prisciandaro, Krueger, & Goldberg, 2012; Zhu et al., 2012), may preclude the diagnosis of major depression in non-Western individuals, especially among those of Chinese descent, that do not exhibit a stereotypical Western profile of major depression endorsed by the DSM-5 (Parker, Cheah, & Roy, 2001).
The *DSM-5* and previous versions have been used in major depression research among non-Western countries. Validation efforts of the *DSM* among non-Western countries is scarce but they do exist. For example, Simon and colleagues (2002) examined the latent structure of the nine *Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV)* (*American Psychiatric Association*, 2000) diagnostic criteria of MDD across 14 countries, stratified by MDD prevalence rate (e.g., low = Japan and China; medium = France and United States; high = Brazil and Chile), and found that the first principal component identified by categorical factor analysis had symptom loadings that were comparable in all three groups. Similar results were reported in a more recent study comparing depressed females from China, the United States, and Europe (*Kendler et al.*, 2015). Despite such results suggesting that the symptomatic manifestations of major depression may be similar across Western and non-Western countries, some researchers argued that “there remain tensions within the [DSM-5] in accommodating the cultural concepts of distress” (Thornton, 2017, p. 67). Further, researchers also contended that the *DSM-5* fails to explicate the relation of cultural concepts to the taxonomy of disorders and the degree to which cultural concepts are considered as valid diagnoses (Thornton, 2017).

Chinese individuals have traditionally emphasized somatic rather than psychological or affective symptoms of major depression, as evident in their culture-bound syndrome of neurasthenia or *shenjing-shuairuo* (*Dere et al.*, 2013; *Kleinman*, 1982). Neurasthenia is characterized by central features of physical and mental fatigue, as well as symptoms overlapping that of major depression, such as mild emotional disturbance, but with an increased emphasis on somatic symptoms, including sleep
disturbances, fatigue, body pain (Ryder & Chentsova-Dutton, 2012; Ryder et al., 2002). Interestingly, neurasthenia remains a standing diagnosis in the WHO International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM), even though the diagnosis of “Neurasthenia” was removed from the DSM in the versions subsequent to the DSM-II (APA, 1968). In a seminal study of neurasthenia, Kleinman (1982) found that 87% of Chinese patients with neurasthenia also met DSM-III (American Psychiatric Association, 1980) criteria for a major depression diagnosis, even though the patients’ chief complaints consisted primarily of somatic symptoms, such as headaches (90% of cases), insomnia (78%), dizziness (73%), and pain (48%), in contrast with only 9% of cases, who endorsed depressed mood. Kleinman (1982) concluded that although neurasthenia is a culture specific way of presenting major depression, neurasthenia also represents a unique symptom profile that warrants a separate diagnostic label. Accordingly, Chinese individuals suffering from major depression or serious distress who elect to report somatic over psychological symptoms may be diagnosed with the culturally fitting condition of neurasthenia, which highlights somatic symptoms, as opposed to major depression, which emphasizes psychological symptoms.

**Cross-Cultural Differences in the “Self”**

In addition to cultural variations in the pattern of depressive symptom presentation, there is also evidence documenting differences in the construals of the self between individuals of East Asian and Western descent (Zhu & Han, 2008). The notion of the self has an important role in the cognitive theory of depression, which emphasizes the role of negatively biased self-referent information (Beck, 1967; Beck, 1987). A fundamental assumption of the theory is that self-referent processes and functions
involved in the depressive experience are closely related to the internal representation of the self (Beck, 2008). Furthermore, self-representation structures are thought to influence the processing of personally meaningful stimuli (Clark et al., 1999). For example, in non-dysphoric mood states, adaptive self-referent cognitions are imposed on incoming stimuli to elicit an adaptive emotional response; however, in dysphoric states, dysfunctional self-referent processes become activated and are associated with negatively biased interpretations of the self that is characteristic of a depressive experience (Clark et al., 1999).

The self-representation structure that has been extensively studied is the self-schema. Markus (1977) defined self-schemas as “cognitive generalizations about the self, derived from past experience, that organize and guide the processing of self-related information…” (p. 64). Depressive, as opposed to non-depressive, self-schemas contain dysfunctional content regarding the self (MacDonald & Kuiper, 1985). Self-schemas influence a variety of aspects related to the processing of self-referent information, including the selection, encoding, and retrieval of personally meaningful stimuli (Clark et al., 1999). As such, information that is more important to the self is processed quicker and more efficiently than less self-relevant information. However, there is evidence that Westerners and East Asians differ in the preferential processing of self-referent information.

Researchers have found differences between Western and East Asian cultures in the memory recall of self-relevant material. For example, findings indicate that Westerners tend to have better memory for self-descriptive traits than others-descriptive traits (e.g., Heatherton et al., 2006; Turk, Cunningham, & Macrae, 2008), whereas
Chinese individuals tend to recall self- and others-descriptive traits equally well (Qi & Zhu, 2002; Zhu & Zhang, 2002). Researchers have proposed that the differences in the recall of descriptive traits between Chinese and Westerners could be explained by the cultural variation in the construals of the self. That is, Westerners typically hold separated self-schemas such that they view themselves as independent and distinct from others, whereas Chinese hold interconnected self-schemas that orient perceptions of others as an extension of self (Wang, Bristol, Mowen, & Chakraborty, 2000).

Accordingly, Westerners will be drawn to self-focused information and attend to the self more readily than to others, as evident in a memory bias for self-descriptive traits, while East Asians will be sensitive to information related to others as much as to the self (for a review, see Zhu & Han, 2008).

Culture exerts a strong influence on the construction of the self. A pioneering review by Markus and Kitayama (1991) indicates that individuals from different cultures have different self-systems. Chinese and other East Asian cultures have traditionally been described as collectivist, which promotes an interdependent orientation whereby self is not separate from the social context and is identified in relations to others (Markus & Kitayama, 2010; Kurman, 2001). Conversely, Western cultures are individualistic, an orientation which emphasizes an independent self that is perceived as an autonomous entity, separate from others and the surrounding social context. In cultures with an independent social orientation, such as that of Canada and other Western countries, happiness is closely associated with personal achievement (e.g., pride, success), whereas in interdependently oriented cultures like China, positive emotions are closely related to
social harmony (e.g., a sense of closeness with others; Kitayama, Mesquita, & Karasawa, 2006; Uchida & Kitayama, 2009).

The self in individualistic cultures is not as easily influenced by the presence of others as the self in collectivist cultures. As such, the Western autonomous self is relatively unchanging and remains constant across situations, whereas the East Asian relational self is flexible and adjusts accordingly to the demands of a given social situation (Heine, 2001; Suh, 2002). Flexibility or inconsistency in the self is seen among Chinese samples. For example, Spencer-Rodgers, Peng, Wang, and Hou (2004) found that when Chinese and American participants were presented with feedback inconsistent with the participants’ self-concepts, Chinese participants were more likely than American participants to alter self-beliefs. In another study, Chinese and Japanese individuals reported more contradictory self-statements and recalled more contradictory self-knowledge than European-Americans (Spencer-Rodgers, Boucher, Mori, Wang, & Peng, 2009). Taken together, there are strong indications that Westerners and East Asians differ in the degree of consistency in self-concept. That is, relative to Westerners, East Asians are more likely to have an inconsistent or fluid sense of self that corresponds to the situation that one is in and to describe themselves in reference to their social environment (English & Chen, 2011; Spencer-Rodgers, Williams, & Peng, 2010).

It is not uncommon for people to show a degree of malleability or flexibility in self-concept under different contexts (DeSteno & Salovey, 1997). However, a consistent and stable self is considered a prerequisite for psychological well-being in Western psychology (Boucher, 2011). Self-inconsistency (i.e., variability in the perception of oneself under different situations or roles) has been associated with poorer psychological
outcomes, including major depression, anxiety, lower self-esteem, and decreased life satisfaction among Western samples (for a review, see Spencer-Rodgers et al., 2010). On the other hand, the relationship between self-consistency and psychological health is far weaker among East Asian samples (Suh, 2002). For example, Church and colleagues (2008) found that, while greater self-concept inconsistency was associated with poorer adjustment (i.e., self-esteem, life satisfaction, social anxiety, and positive/negative affect) across six countries (i.e., United States, Australia, Mexico, Philippines, Malaysia, Japan), the association was the strongest for American participants and weakest for Japanese participants (Church et al., 2008). However, Church and colleagues (2008) argued that the underlying factor accounting for differences in self-concept consistency cannot be simply attributed to differences between collectivism and individualism. Rather, the authors suggested that self-concept consistency differences may be explained by the cognitive tendency of East Asian cultures wherein contradiction and the expectations of change are emphasized, otherwise known as dialectical thinking or dialecticism (further discussed below). Researchers have proposed that self-consistency is not as important for individuals in East Asian or collectivist cultures since the ability to adapt to the social environment—which may require a shift in social role or self-concept—is highly valued among East Asian cultures (Heine, 2001; Spencer-Rodgers et al., 2010).

Similar to the distinction between collectivism and individualism is the dichotomy between high- versus low-context cultures. According to Hall’s (1976) seminal work, there is cultural variation in the use of context to create meaning. In high-context (HC) cultures (e.g., China, Korean, and Jordan), “most communication relies
more on the physical context or is internalized in the person” (Kim, Pan, & Park, 1998, p. 512), wherein the meanings conveyed in the messages are interpreted in connection with the context. In low-context (LC) cultures (i.e., United States and Germany), messages are relatively more context-free and are more dependent on the explicit communications, such as words and sentences (Hall, 1976; Keegan, 1989). The distinction between high- and low-context cultures is also evident in the self. Similar to collectivism, members in HC cultures are interconnected with one another, thus facilitating a strong social hierarchy. These individuals also tend to avoid confrontation to maintain social harmony and harmonious relationships between people, often by repressing the self and internal feelings through strong self-control. In contrast, members of LC cultures are highly individualized and there is often little involvement with others, as such, the social hierarchy has less impact on the lives of the members of LC cultures. Unlike members of HC cultures, people in LC cultures may engage in direct confrontation to express and defend oneself (Hall, 1976). Unfortunately, empirical research on the implications of high- and low-context cultures in the experience of major depression is absent in the literature. However, since HC cultures value emotional restraint to maintain amenities and cordialities among its members (Tse, Lee, Vertinsky, & Wehrun, 1988), it is reasonable to expect that emotional disturbance or distress is seldom discussed in public among members of HC cultures; whereas people in LC cultures may be more candid in reporting dysphoric or depressed moods.

Although there is substantial documented evidence suggesting a cultural variation of the self between East Asian and Western cultures (i.e., collectivism versus individualism; high- versus low-context), much less is known about the impact of this
difference on the experience of major depression across cultures. Since the self plays an important role in the cognitive theory of depression, it is imperative to examine whether self-referent cognitions related to major depression differ between Chinese and Canadians—given the distinction in various aspects of the self between East Asian and Western cultures.

**Cross-Cultural Trends in Positive and Negative Self-Construals**

One of the most prevailing assumptions regarding self-concept is the inclination for people to view themselves positively, or in a self-enhancing manner (Sedikides & Alicke, 2012). Positive evaluations of the self may foster mental health and well-being (Taylor & Brown, 1988). Evidence for self-enhancement, defined as “the desire and preference for maximizing the positivity of self-views” (Sedikides & Alicke, 2012, p. 303), has been documented in decades of research among Western populations (e.g., D’Argembeau & Van der Linden, 2008; Dunning, Heath, & Suls, 2004; Glisky & Marquine, 2009; Greenwald & Farnham, 2000), with a compelling indication of an inverse relationship between self-enhancement and psychological distress, including major depression (e.g., Alloy & Abramson, 1979; Hymes & Alkiyama, 1991). However, the degree to which Westerners engage in positive or self-enhancing cognitive processes may be culture specific. Specifically, there is evidence that East Asians may be substantially less self-enhancing than Westerners. A meta-analysis by Heine and Hamamura (2007) found a large effect ($d = 0.84$) for self-enhancement differences between East Asians and Westerners.

Moreover, there are research results suggesting that healthy East Asians may be more self-critical than their Westerner counterparts (Heine, Takata, & Lehman, 2000).
For example, Heine and Renshaw (2002) found that healthy Japanese students evaluated themselves less positively, and healthy American students rated themselves more positively than their peers’ evaluation of them. Researchers have also found that East Asians reported lower self-esteem than Westerners (Spencer-Rodgers et al., 2004). Although earlier findings among the literature suggested that self-enhancement may be specific to Western cultures, results in later studies reveal that East Asians will evaluate themselves positively in domains that are of significant importance to them and that are congruent with their cultural norms and values (Brown, 2010; Cai et al., 2011; Lee, Oyserman, & Bond, 2010; Sedikides, Gaertner, & Vevea, 2007). Overall, the available evidence suggests Westerners and East Asians may both engage in self-enhancement, but focusing on different domains.

The impact of self-enhancement on psychological health has been widely investigated by cultural researchers (e.g., for a review, see Alicke & Sedikides, 2009; Gaertner, Sedikides, & Chang, 2008; Kurman, 2003; Hymes & Akiyama, 1991). The propensity to criticize oneself may be associated with negative outcomes in Western cultures where personal achievement and success are valued (Brown, 1998; Kuppens, Realo, & Diener, 2008). In contrast, engaging in self-criticism may have beneficial social consequences among East Asian cultures since holding critical attitudes about oneself is viewed as affirming to cultural norms (Ross & Murdock, 2014). The tendency to hold self-critical attitudes is consistent with the social orientation of East Asian cultures wherein individuals are encouraged to focus on personal shortcomings and weaknesses (Spencer-Rodgers & Peng, 2004). Some researchers have questioned the validity of self-criticism and self-enhancement measures in East Asian cultures, and whether East
Asians are feigning modesty in their responses. For example, such a concern is realistic among Japanese participants as humility is a virtue in the Japanese culture—amongst other East Asian cultures—such that respect from peers is earned through a modest and self-effacing manner (Bond, Leung, & Wan, 1982). However, there is evidence that Japanese people still demonstrate self-critical tendencies when they responded in private or anonymized (Kitayama, 1998). An explanation may be related to the idea that the behaviours of members of East Asian cultures are the reflections of situational pressures, rather than the by-products of dispositional factors (Miller, 1984; Morris & Peng, 1994; Weisz, Rothbaum, & Blackburn, 1984). As such, humility may be a product of social factors, whereas self-critical thinking may be associated with a dispositional attitude. Following this notion, the distinction between humility and self-critical thinking supports the validity of self-criticism and self-enhancement measures among members of East Asian cultures.

While East Asians’ increased tendency to consider negative as opposed to positive attributes about the self may serve to promote interpersonal harmony and group cohesion (Kitayama, Markus, Matsumoto, & Norasakkunkit, 1997), there is evidence that the reluctance to self-enhance may have a negative impact on mental health (Hymes & Akiyama, 1991). For example, Hymes and Akiyama (1991) found that Japanese participants self-enhanced significantly less and exhibited higher degrees of depressive symptoms than their American counterparts. Furthermore, depressed Japanese self-enhanced significantly less than their non-depressed counterparts—the same results were also found for the American sample. The authors postulated that negative self-schemas could explain the self-effacing nature of individuals with major depression.
The increased tendency for members of East Asian cultures to emphasize negative self-referent information may have positive social consequences (Ross & Murdock, 2014); however, similar to members of Western cultures, negative thoughts about the self could have detrimental psychological consequences such that the information could give way to the experience of emotional distress and/or major depression (Beck, 1976; Beck & Dozois, 2011).

**Cross-Cultural Differences in Cognition**

The contrasting differences between Western individualistic and East Asian collectivist cultures are also evident in cognition, in addition to cultural variations in self-construals (Varnum et al., 2010). There is evidence of differences among several aspects of information processing between Westerners and East Asians, including memory, attention, and reasoning (e.g., Masuda & Nisbett, 2001; Nisbett & Masuda, 2003; Norenzayan et al., 2007; Oyserman & Lee, 2008; Varnum et al., 2010). For example, East Asian cognitions appear more dialectical in nature, whereas Western cognitions appear to rely more on formal logic (Nisbett & Masuda, 2003; Spencer-Rodgers & Peng, 2004). Dialectical thinking or “dialecticism” is characterized by holistic thinking and the acceptance of contradictions and change (for a review, see Spencer-Rodgers et al., 2010). For example, Chinese participants in a previous study estimated a higher probability for change to occur in the future than did their American counterparts when presented with the same hypothetical scenarios (Ji, Nisbett, & Su, 2001). Chinese people may be more likely than American people to anticipate larger changes and for situations to be dynamic rather than fixed, a thinking that is indicative of dialectical cognitions. Dialectical cognitions also tend to be less polarized, with individuals from cultures with
relatively higher dialectical foci, such as China, Japan, and Malaysia, reporting less extreme ratings (i.e., very positive or very negative) when assessing quality of life than individuals from cultures with relatively lower dialectical foci, such as Canada and the United States (Minkov, 2009). Such differences in cognitive tendencies may also influence how individuals of East Asian and Western heritage perceive incoming information about the self and the world.

The effect of dialectical cognitive tendencies on mental health have also been investigated, with some results indicating possible detriment to psychological well-being. Due to the contradictory nature of dialectical thinking, East Asians may be more likely than Westerners to expect and accept negative appraisals of the self. This is evident by East Asians’ heightened sensitivity to self-critical information and to accept failures as readily as successes (Heine et al., 2001; Kitayama et al., 1997). Therefore, although dialecticism encourages the tolerance of both good and bad, it is possible that increased emphasis on negative aspects of the self could lead to poorer psychological health. There is evidence that increased dialecticism is associated with lower life satisfaction and self-esteem, as well as greater major depression and anxiety symptoms among Chinese participants (Spencer-Rodgers et al., 2004). Researchers have proposed that the inverse relationship between dialectical thinking and psychological well-being is related to the contradictory nature of the world that dialectically-oriented individuals typically hold.

On the contrary, however, there is evidence that individuals from cultures with relatively higher dialectical foci may be more resilient in the wake of adverse events than individuals from cultures with relatively lower dialectical foci (e.g., Cheng, 2009; Ji,
Zhang, Usborne, & Guang, 2004; Oishi, Diener, Choi, Kim-Prieto, & Choi, 2007); thus, some researchers argue that the dialectical thinking may have a positive impact on mental health (e.g., Ji, Nisbett, & Su, 2001; Spencer-Rodgers et al., 2009). For example, if an individual is experiencing adversity or depressed moods, the tendency to consider the positive aspects of the event or situation may act as a resilience strategy to combat further suffering (Spencer-Rodgers, Williams, & Peng, 2010). In addition to the tolerance of contradictions, the nature of dialecticism to perceive reality as constantly changing rather than stagnant may influence East Asians to remain hopeful when experiencing hardship and be less affected by negative experiences overall (Spencer-Rodgers et al., 2004). Given the contradictory theories regarding the effect of dialectical cognitions on mental health, more research is needed to better understand the implication of specific cognition patterns on the psychological well-being of individuals across different cultures.

The extant evidence in the literature points to distinct differences in cognition between members of Western and East Asian cultures; however, gaps remain regarding how cultural variations in cognition may be reflected in the experience of major depression between individuals of Canadian and Chinese descent. For example, it is not known whether the expectation for change over stability, as emphasized by the dialectical orientation of the Chinese culture, would influence the negative view of the future—as identified by the cognitive theory of depression as one of the hallmarks of a depressive experience. More generally, much is unknown regarding how the different cognitive tendencies between Westerners and East Asians may differentially impact major depression-related thoughts about the self, the world, and the future.
The Cognitive Theory of Depression

Beck’s (1967) early work in major depression indicated that depressed individuals possess cognitions that differ systematically from those of their nondepressed counterparts. Beck subsequently posited the cognitive theory of depression to explain the heightened vulnerability for major depression among individuals who have biased cognitive appraisals that distort the processing of information (Beck, 1967; Beck et al., 1979). The cognitive theory of depression posits that major depression is the result of negatively distorted information processing. Central to Beck’s theory is the construct of schemas. Beck (1967) defines schemas as a set of neural networks related to core beliefs and assumptions that govern the individual’s perception and reaction to events. Schemas are deep-seated cognitive structures that remain dormant until they are activated by stressors (e.g., stressful life events and dysphoric mood), which then influence the screening, encoding, interpretation, and retrieval of information. Once activated, negative schemas direct attentional resources to a complex system of negative themes and cognitions—particularly rigid and extreme dysfunctional attitudes about the self, the world, and the future. These three areas are cumulatively defined by Beck as the “negative cognitive triad”. Not only do negative schemas result in a global negative interpretation of reality, Beck postulated that the negative cognitive triad contributes to the development of depressive symptoms, such as deficits in affective, motivational, behavioural, and physiological functioning, and therefore is responsible for the onset of the disorder.

The cognitive theory of depression engenders several descriptive hypotheses that explain how major depression is cognitively experienced and how cognitions may
contribute to the onset and maintenance of major depression (Clark et al., 1999; Haaga, Dyck, & Ernst, 1991). The current investigation was designed to evaluate the following five descriptive hypotheses of the cognitive theory of depression.

**Descriptive Hypotheses of the Cognitive Theory of Depression**

1. **Negativity hypothesis (cognitive triad).** According to the cognitive theory of depression, negative automatic thoughts are considered as much a core feature of major depression as other defining traits of the disorder (Clark et al., 1999). Life stressors or dysphoric mood states activate depressive schemas and give rise to negative automatic cognitions regarding the self, the world, and the future. The negativity hypothesis postulates that major depression is characterized by negative and pervasive self-referential cognitions (Clark et al., 1999). The negativity hypothesis is fundamental to the cognitive theory of depression given that deep-rooted negative schemas associated with major depression are inferred by the presence and severity of negative automatic thinking (Beck & Dozois, 2011).

Evidence for the negativity hypothesis has inundated the empirical literature since the inception of the cognitive theory of depression and is largely gathered through self-report questionnaires. One of which is the Automatic Thoughts Questionnaire—Negative (ATQ-N; Hollon & Kendall, 1980). The ATQ-N was created to assess the presence and frequency of negative thoughts related to major depression. The measure’s validity to evaluate the negativity hypothesis has been confirmed in both depressed and non-depressed samples. Numerous studies with Western populations have shown an association between ATQ-N scores and major depression severity, as indicated on various major depression measures (for a review, see Garratt, Ingram, Rand, & Sawalani,
2007). For example, in a study with a clinically depressed patients (Lamberton & Oei, 2008), scores on the ATQ-N significantly predicted depressive symptoms on the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Beck, Steer, & Carbin, 1988). Similarly, in study with a sample of Norwegian undergraduate students (Hjemdal, Stiles, & Wells, 2013), ATQ-N scores significantly predicted levels of major depressive symptoms at the 3-month follow-up ($r^2 = .40$). Additionally, several clinical trials have also demonstrated the relationship between ATQ-N scores and major depression (e.g., Dozois et al., 2009; Oei & Sullivan, 1999; also see Cristea et al., 2015, for a review). The ATQ-N has also been found to associate with major depression in both Western and non-Western countries, including Canada (e.g., Beshai, Dobson, Adel & Hanna, 2016), United Kingdom, Australia (Beshai, Mishra, Meadows, Parmar, & Huang, 2017), China (e.g., Cui, Shi, & Oei, 2013), Iran (Kaviani, Hatami, & Javaheri, 2012), and Singapore (Wong, 2012).

In addition to examining the negativity hypothesis directly, researchers have found support for the negativity hypothesis by investigating related constructs including hopelessness, self-criticism, and self-esteem (Haaga et al., 1991). Depressed individuals have reported more negative self-descriptive adjectives (e.g., Timbremont & Braet, 2004), lower self-esteem (for a review, see Ingram, Miranda, & Segal, 1998), and more self-critical attitudes (e.g., Luyten et al., 2007), than non-depressed controls. In a prospective study with a clinical sample of depressed patients predominantly of Caucasian descent, self-criticism was predictive of major depressive symptoms four years later (Dunkley, Sanislow, Grilo, & McGlashan, 2009).
Most empirical evidence for the negativity hypothesis comes from research with Western populations; however, the negativity hypothesis is also supported among non-Western samples. In a recent cross-cultural study of depressed and non-depressed Canadians and Egyptians, depressed participants from both countries endorsed significantly more negative thoughts about the self and the future than their non-depressed counterparts ($d = 0.71$; Beshai et al., 2016). Furthermore, in a study with a sample of depressed Iranians in Austria, patients in the individual CBT condition and group CBT condition reported significant reductions in negative thinking (i.e., ATQ-N scores; $d = 0.89$ to 0.93) and symptoms of major depression ($d = 0.86$ to 0.93) at post-treatment, with no significant differences between the two intervention conditions (Fathi, Renner, & Juen, 2015).

Some evidence for the negativity hypothesis among non-Western samples is available in the literature, but support among Chinese populations specifically remains limited. In a study with a Chinese adolescent sample, ATQ-N scores correlated positively with depressive symptoms ($r = 0.35$ to 0.76; Cui et al., 2013). In a more recent study with a sample of depressed Chinese patients, self-reported hopelessness is positively correlated with depressive symptoms ($r = 0.42$; Wang, Jiang, Cheung, Sun, & Chan, 2015). While support for the negativity hypothesis among Chinese samples is limited, empirical research assessing the cross-cultural validity of the negativity hypothesis is even more scarce. In one cross-cultural study between Egyptian and Canadian participants, Egyptians endorsed significantly more negative thoughts concerning the self and the world, and higher scores on the ATQ-N, than Canadians after controlling for dysphoria ($d = 0.20$ to 0.35; Beshai, Dobson, & Adel, 2012). However, a
direct investigation of the negativity hypothesis in a Chinese adult population appears absent in the Western/English psychology literature.

2. Exclusivity hypothesis. The exclusivity hypothesis was postulated to explain positive cognitions in major depression. Beck (1987) originally referred to the exclusivity hypothesis as the “automatic exclusion of positive self-evaluations” (p. 8), but contrary to the title of the hypothesis, not only do depressed individuals experience increases in negative thoughts, they also experience a diminution in positive self-referent thoughts (Clark et al., 1999). “Exclusivity” refers not to an absence of positive cognitions, but rather to the tendency for depressed individuals to reject or discount positive thoughts about themselves and the world. The negativity hypothesis has been argued to account for the decline in positive cognitions that characterizes major depression, a decline otherwise predicted by the exclusivity hypothesis, with researchers (e.g., Haaga et al. 1991) recommending that future revisions of the cognitive theory of depression remove the exclusivity hypothesis. However, others (e.g., Beck & Dozois, 2011; Clark et al., 1999) have rebutted asserting that the exclusivity hypothesis considers aspects of major depression not accounted for by the negativity hypothesis. Clark and colleagues (1999) contended that major depression cannot be attributed exclusively to excessive negative thoughts, but that it also involves a reduction of positive cognitions due to the failure or inability to access positive self-schemas.

The notion that, in addition to the overly heightened activation of negative schemas, major depression is also characterized by a relatively diminished activation of constructive schemas that are responsible for positive self-referent cognitions is supported by research showing that self-schemas of depressed individuals contain both
negative and positive content (e.g., Greenberg & Alloy, 1989; for a review, see Rector, Segal, & Gemar, 1998). For example, when participants (predominantly of Caucasian descent) were asked to evaluate the extent to which they identified with interpersonally oriented adjectives, although depressed participants reported more negative and less positive adjectives as self-descriptors relative to healthy controls, depressed participants nonetheless identified some positive adjectives as self-descriptors (Dozois & Dobson, 2001). Findings that the schematic content of depressed individuals is not entirely devoid of a positive nature lend support to the exclusivity hypothesis as one of the fundamental descriptive hypotheses of the cognitive theory of depression.

There is less empirical evidence for the exclusivity hypothesis than for the negativity hypothesis, and has focused on Western/White samples. Ingram and Wisnicki (1988) developed the Automatic Thoughts Questionnaire—Positive (ATQ-P) to assess the frequency of positive self-referent cognitions in both clinical and nonclinical populations. Researchers have consistently found that depressed individuals score significantly lower on the ATQ-P relative to their non-depressed counterparts, thereby lending support for the exclusivity hypothesis (e.g., Beshai et al., 2016; Ingram, Kendall, Siegle, Guarino, & McLaughlin, 1995; Ingram, Slater, Atkinson, & Scott, 1990). In a longitudinal comparison of never-depressed, current clinically depressed, and remitted depressed (i.e., whose major depression had remitted from the initial assessment to follow-up) participants of predominantly Caucasian descent, current depressed and remitted depressed participants scored significantly lower on the ATQ-P than the never-depressed controls at both the initial assessment ($d = 3.03$ and $2.51$, respectively) and the six-month follow-up ($d = 2.33$ and $1.30$, respectively). Remitted depressed participants
reported significantly higher ($d = 0.80$) ATQ-P scores at follow-up relative to their scores in the initial assessment (at which they were depressed), whereas ATQ-P scores for the current depressed and never-depressed participants remained stable at follow-up ($d = 0.02$ and $0.21$, respectively; Dozois, 2007). Moreover, ATQ-P scores at follow-up for the remitted group increased to a nonclinical range, comparable to the normative data of a non-depressed sample (Dozois, Covin, & Brinker, 2003). Similar results were found in a more recent study where depressed inpatients in an American psychiatric clinic reported significantly higher ATQ-P scores at discharge relative to their ATQ-P scores at admission after completing group CBT ($d = 0.98$; Forsyth, Poppe, Nash, Alarcon, & Kung, 2010). The link between improvements in ATQ-P scores and symptoms of major depression suggests that positive self-referent thinking may indeed play a role in the experience of major depression.

Similar to the ATQ-N, researchers have utilized the ATQ-P primarily in studies with Western samples; however, researchers have also utilized the ATQ-P in research with ethnically or culturally diverse samples. For example, ATQ-P scores correlated negatively with depressive symptoms measured on the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) in a Singaporean student sample comprising a diverse ethnic composition of Chinese, Malay, and Indian participants ($r = .74$; Wong, 2012). In a cross-cultural study comparing depressed and non-depressed Egyptian and Canadian participants, Egyptians scored significantly higher than Canadians on the ATQ-P ($d = 0.46$), and depressed participants in both cultures scored significantly lower on the measure than their non-depressed counterparts ($d = 1.37$; Beshai et al., 2016). Using the ATQ-P, researchers have accumulated evidence for the exclusivity hypothesis
in Western and some non-Western populations, including Canadians (e.g., Beshai et al., 2016; Dozois et al., 2009); Americans (Forsyth et al., 2010), Koreans (Choi et al., 2011), and Singaporeans (Wong, 2012), but the evidence appears absent for Chinese samples.

3. **Severity/persistence hypothesis.** The severity/persistence hypothesis predicts that negative and positive self-referent cognitions are linearly related to major depression severity and persistence (Clark et al., 1999). That is, the frequency and pervasiveness of depressogenic cognitions would be greater in a more severe depressive episode of a longer duration. The severity/persistence hypothesis implies that “increases in depressive [symptoms] will be associated with a corresponding increase in negative cognition at each level of depression severity” (Clark et al., 1999, p. 168). As such, negative cognitions may be inconsistent or limited in very mild or transient depressive states, but more pervasive in more severe depressive episodes. Accordingly, negative cognitions will be present—and elevated—during a major depressive episode, but once the episode remits, one would expect a concomitant reduction in negative cognitions. To illustrate, for example, in a study with a sample of depressed participants, depressed participants rated more dysphoric words than non-dysphoric words as self-descriptive at the initial assessment ($d = 1.74$), but this pattern reversed (i.e., endorsing more non-dysphoric words as self-descriptive) by the time their major depression had remitted ($d = 0.39$; Dobson & Shaw, 1987).

Using other measures of negative cognition to evaluate the severity/persistence hypothesis, researchers (e.g., Beevers & Miller, 2005; Disner, Shumake, & Beevers, 2017) have consistently found a positive relationship between negative cognition and major depression severity among Caucasian or Western samples (for a review, see
Garratt et al., 2007). Even in studies (e.g., Jolly & Dykman, 1994; Rose, Abramson, Hodulik, Halberstadt, & Leff, 1994) where the cognitive items on depressive symptom measures were removed to eliminate content overlap across measures, results continue to support a positive relationship between negative cognition and the severity of major depression. Several studies have also demonstrated that cognitive improvement significantly predicts improvement in depressive symptoms. For example, a sample of depressed Australian outpatients demonstrated significant reductions in negative self-referent thoughts ($d = 1.17$) and dysfunctional attitudes ($d = 0.94$) after completing 12 sessions of group CBT (Kwon & Oei, 2003).

Evidence for the severity/persistence hypothesis has predominantly been found for Western populations, with limited evidence of the hypothesis among non-Western samples. In a cross-cultural study of Chinese and American adolescents, scores on measures evaluating negative cognitions correlated positively with depressive symptoms at Time 1 (Chinese $r = .49$ and .54; American $r = .49$ and .66) and again at Time 2 six months later (Chinese $r = .52$ and .56; American $r = .59$ and .67) for both depressed Chinese and American adolescents, though the associations were stronger in the American than the Chinese sample (Stewart et al., 2004). Moreover, negative cognitions significantly predicted depressive symptoms six months later in both samples (Chinese odds ratio = 1.90; American odds ratio = 1.18), with negative cognitions having a stronger predictive value in the Chinese sample compared to the American sample. A cross-national evaluation of the exclusivity hypothesis between a Chinese and a Western adult sample remains to be completed.
4. **Schema activation hypothesis.** The schema activation hypothesis postulates that major depression is characterized by the increased accessibility to negative self-referent schemas (Clark et al., 1999). Accessibility here refers to the speed or ease with which negative thoughts about the self, the world, and the future are brought into conscious processing or accessed (Riskind & Rholes, 1984). Depressed individuals have an increased accessibility to negative schemas compared to non-depressed individuals (Clark et al., 1999). Schemas are posited to be at the deepest level of a hierarchy of dysfunctional information processing (Garratt et al., 2007), which is challenging to assess directly (Clark et al., 1991); as such, researchers have examined cognitions on shallower levels, such as dysfunctional attitudes (Dozois & Beck, 2008), and made inferences about the presence and degree of activation of deep-seated schematic structures (Segal & Swallow, 1994).

Dysfunctional attitudes are “rules for living” characterized by negative errors in thinking (e.g., “If I fail at something, it means I’m a total failure.”; Beck, 2008) and used by researchers to understand the implications of negative self-referent schemas in the experience of major depression (Abela & Skitch, 2007). Weissman and Beck (1978) developed the Dysfunctional Attitudes Scale (DAS) to evaluate the “relative presence or absence of the appropriate distorted, idiosyncratic beliefs that characterize depressed patients” (p. 9). Several research studies have provided evidence supporting the schema activation hypothesis among Western samples. For example, researchers have consistently found higher scores on the DAS among depressed individuals of White or Caucasian descent in comparison to their non-depressed counterparts (e.g., Dobson & Shaw, 1986; Crandell & Chambless, 1986; Sankar et al., 2015). In a study with a
predominantly Caucasian undergraduate sample, depressive symptoms measured by the Center for Epidemiologic Studies—Depression Scale (CES-D; Radloff, 1977) were significantly and positively correlated with dysfunctional attitudes ($r = .38$; Beshai, Prentice, Swan, & Dobson, 2015).

The schema activation hypothesis has also been supported by evidence from non-Western samples. For example, in a clinical trial of a 16-week culturally adapted CBT program for Japanese patients with major depression, depressed patients evidenced significant improvements in dysfunctional attitudes and depressive symptoms, as indicated by significant reductions in DAS and BDI-II scores ($d = 0.89$ and $2.64$, respectively; Fujisawa et al., 2010). In a study with a sample of depressed Chinese adults in Hong Kong, scores on the DAS and a measure of perfectionist attitudes (the Almost Perfect Scale—Revised; Slaney, Rice, Mobley, Trippi, & Ashby, 2001) significantly predicted depressive symptoms ($r = .47$; Wong, Chan, & Lau, 2010). In two randomized controlled trials (RCTs) with Chinese clinically depressed patients, patients in the experimental CBT treatment condition had significantly fewer depressive symptoms ($d = 0.74$ and $0.76$) and dysfunctional attitudes ($d = 0.44$ and $0.88$) than those in the control group (depressive symptoms $d = 0.22$ and $0.20$; dysfunctional attitudes $d = 0.05$ and $0.16$) at the end of treatment. Furthermore, patients in the experimental condition showed improvement in depressive symptoms that were of a clinically significant level (Wong, 2008a; 2008b).

Using dysfunctional attitudes to reflect the content of deep-rooted schemas, empirical studies in various populations have consistently produced convincing evidence for the schema activation hypothesis by demonstrating a relationship between
dysfunctional attitudes and depressive symptoms. Even though empirical support for the schema activation hypothesis exists for Western and Chinese samples, a cross-national examination of the hypothesis remains absent in the literature.

5. Selective processing hypothesis. The selective processing hypothesis in the cognitive theory of depression contends that depressed individuals have a selective bias for mood-congruent information (Clark et al., 1999). Depressed individuals demonstrate a markedly impaired cognitive processing by preferentially attending to or failing to disengage from negative stimuli, and automatically neglecting or filtering out positive stimuli (Beck, 1967; Gotlib & Joormann, 2010). In this regard, depressed individuals have a deficient inhibition of negative information (Goeleven, De Raedt, Baert, & Koster, 2006). For example, there is evidence that when clinically depressed participants and non-depressed controls were presented with a series of sad, happy, and neutral facial expressions, depressed participants were slower to disengage from sad faces but faster to disengage from happy and neutral faces. On the other hand, the non-depressed controls were slower to disengage from happy than from the neutral or sad faces (Levens & Gotlib, 2010). Negative cognitive bias influences various facets of information processing, such as perception, attention, encoding, and memory (Gotlib & Joormann, 2010). Not only is major depression characterized by negative cognitive biases in processing, such biases may also represent a vulnerability factor for the onset and recurrence of major depression (Beck, 1967, 1976).

Researchers have evaluated the selective processing hypothesis in previous work on depression-related biases in memory. There is evidence of a mood-congruent memory bias associated with major depression, where depressed individuals tend to recall
information congruent with their depressive state (Mathews & MacLeod, 2005; Kircanski, Joormann, & Gotlib, 2012). While a memory bias for positive self-referential information reflects the baseline for non-depressed and never-depressed individuals (Matt, Vazquez, and Campbell, 1992), some findings indicate a memory bias for negative information and away from positive information in depressed individuals (Mathews & MacLeod, 2005; Phillips, Hine, Thorsteinsson, 2010). This is illustrated in a meta-analysis where individuals with major depression recalled 10% more negative words than positive words ($d = 0.19$). By contrast, non-depressed individuals demonstrated a memory bias for positive information ($d = 0.15$) in the majority of the studies reviewed (Matt et al., 1992).

More recent studies continue to indicate a mood-congruent bias in memory for depressed individuals (for a review, see Kircanski, Joormann, & Gotlib, 2012). For example, when lists of emotionally valenced and neutral words were presented to clinically depressed and non-depressed participants, depressed participants exhibited less accurate recall of previously presented words across all categories (neutral, positive, negative) relative to the non-depressed controls ($d = 0.81$), and this difference was most pronounced for positive items ($d = 0.89$). Furthermore, depressed individuals recalled a higher frequency of false negative words (negative valence words that were not presented but are semantically similar to words previously shown) than did the non-depressed controls ($d = 0.63$; Joormann, Teachman, & Gotlib, 2009). Similarly, in another study, while non-depressed controls recalled marginally more positive than neutral words ($d = 0.32$), depressed participants recalled significantly more negative than neutral words ($d = 1.07$) and marginally more negative than positive words ($d = 0.39$).
Interestingly, depressed participants also recalled significantly more positive than neutral words \((d = 0.60;\) Jermann, Van der Linden, Laurençon, & Schmitt, 2009).

The preferential recall of negative information is also evident in memory bias for facial expressions, as results indicate a link between major depression and an increased sensitivity for negative emotional faces. For example, results from a facial emotion recognition task showed that clinically depressed participants recognized significantly more sad faces (87.5\%) than happy (73.75\%) or neutral (75.55\%) faces. Conversely, non-depressed participants recognized significantly more happy (88.75\%) faces than both sad (78.13\%) and neutral (78.40\%) faces (Ridout, Astell, Reid, Glen, & O’Carroll, 2003). Similar memory bias for sad facial expressions are also demonstrated in dysphoric individuals (Jermann, van der Linden, & D’Argembeau, 2008; Ridout, Noreen, & Johal, 2009), and healthy participants in an experimentally induced depressed mood state (Chepenik, Cornew, & Farah, 2007). Taken together, previous work on recall performance bias lends support to the selective processing hypothesis by showing that major depression is associated with a heightened sensitivity for mood-congruent information.

Some research in the Western major depression cognition literature indicates that depressed individuals exhibit enhanced recall for information congruent with their negative schemas (Gotlib & Joormann, 2010). However, most evidence are found among Western samples with predominantly White participants, although research among non-Western samples do exist. For example, in an earlier study with a Spanish sample, depressed participants recalled significantly more negative than positive words \((d = 1.54)\), whereas non-depressed participants showed the opposite pattern \((d = 1.46)\).
Furthermore, depressed participants recalled less positive words compared to their non-depressed counterparts \((d = 2.73; \text{Ruiz-Caballero} \& \text{González}, 1994)\). Evidence for a mood-congruent bias in Spanish populations is again demonstrated in a more recent study by Romero, Sanchez, and Vazquez (2014). The abovementioned studies present convincing evidence for the selective processing hypothesis among Spanish samples; however, an earlier study with Spanish participants failed to demonstrate a group difference in memory bias between clinically depressed and non-depressed participants. Specifically, clinically depressed and non-depressed Spanish participants both recalled more negative emotional words than positive and neutral words (Banos, Medina, \& Pascual, 2001). Contradictory findings among Spanish samples regarding a possible memory bias in the experience of major depression undermine the validity of the selective processing hypothesis in the Spanish culture, and possible among other non-Western cultures.

Germaine to the current investigation are findings, albeit very limited, among Chinese or East Asian samples. In a study where a sample of Taiwanese participants were divided into high- or low-trait groups based on their scores on a major depression measure, high-trait participants recognized significantly more sad faces in comparison to low-trait participants \((d = 0.86)\), indicating a preferential bias for mood-congruent stimuli (Hsieh \& Ko, 2004). However, similar to Spanish samples, the selective processing hypothesis may not be as robust among Chinese populations. This is illustrated in a study with depressed and non-depressed Chinese-speaking participants, where no differences were found between the depressed and non-depressed participants in the recall of positive, negative, and neutral valenced items (Yeh \& Hua, 2009). While
much support is found for the selective processing hypothesis among individuals of Western descent, the mixed findings among individuals of non-Western, more pertinently, Chinese descent, call into question the validity of the selective processing hypothesis among non-Western populations. As such, the present study aimed to clarify the mixed findings in the literature, as well as examine the differential impact of a depression-related mood-congruent bias across countries, with a focus on the Canada and China.

In addition to evidence indicating a mood-congruent memory bias, there is a general consensus in the literature that memory impairments may also be implicated in the experience of major depression (Burt, Zembar, & Niederehe, 1995; Mathews & MacLeod, 2005). A recent review on cognitive disturbances in major depression reported that depressed individuals typically have memory difficulties in tasks requiring sustained effort, such as list learning and free recall (Marazziti, Consoli, Picchetti, Carlini, & Faravelli, 2010). Researchers have proposed that depressed individuals have a decreased ability to retain new information due to intrusive and persistent negative thoughts that characterize major depression (for a review, see Gotlib & Joormann, 2010). Similar to a selective bias for mood-congruent information, as hypothesized by the selective processing hypothesis, impairments in memory is another type of depression-related cognitive dysfunction that may offer insight on how major depression is cognitively experienced in different cultures. As such, an exploratory analysis of the selective processing hypothesis was conducted in the present study to examine possible cross-national differences in depression-related memory impairments and to provide cross-national data to support future work in the area of major depression and cognition.
Current Investigation

The cognitive theory of depression is arguably the prevailing model of major depression in contemporary psychology (Beck & Dozois, 2011). The proliferation of empirical support for the model in Western literature has sparked immense interest from researchers around the world. The current investigation has been designed to extend the current literature by assessing components of the cognitive theory of depression in a non-Western sample. The study was designed to assess for evidence of the five descriptive hypotheses derived from the cognitive theory of depression using data from Chinese and Canadian participants stratified into a dysphoric or non-dysphoric group. The dysphoric group constituted participants who exhibited elevated depressive symptoms on the Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001). The results should inform cross-national applications of the cognitive theory of depression for Chinese persons and potentiate more sensitive adaptations of associated treatments.

Hypotheses

The current investigation evaluated five descriptive hypotheses: 1) negativity hypothesis; 2) exclusivity hypothesis; 3) severity/persistence hypothesis; 4) schema activation hypothesis and; 5) selective processing hypothesis. Further, it is noteworthy that predictions regarding national group differences were not initially forwarded due to the scarcity of existing cross-national research comparing the cognitive theory of depression between a Canadian and a Chinese sample.

1. **Negativity hypothesis:** Consistent with past results where depressed Egyptians exhibited more negative depressive cognitions than non-depressed Egyptians (Beshai et al., 2016), dysphoric participants in both Chinese and Canadian
samples were expected to endorse significantly more negative self-referent thoughts, as assessed by the ATQ-N, than their non-dysphoric counterparts.

2. *Exclusivity hypothesis:* Consistent with past results where depressed Egyptians and depressed Canadians endorsed fewer positive self-referent cognitions than their non-depressed counterparts (Beshai et al., 2016), dysphoric participants in both Chinese and Canadian samples were expected to exhibit significantly fewer positive self-referent thoughts, as assessed by the ATQ-P, than their non-dysphoric counterparts.

3. *Severity/persistence hypothesis:* In accordance with studies showing that improvement in negative cognitions is associated with improvement in depressive symptoms (e.g., Kwon & Oei, 2003, also see Garratt et al., 2007, for a review), negative self-referent thoughts (as assessed by the ATQ-N), and dysfunctional attitudes (as assessed by the Dysfunctional Attitudes Scale-24 [DAS-24; Power et al., 1994; Weissman & Beck, 1978]), were expected to positively correlate with depressive symptoms (as assessed by the PHQ-9) and the Center for Epidemiologic Studies-Depression Scale [CES-D; Radloff, 1977]) for the dysphoric and non-dysphoric participants in both Chinese and Canadian samples. Furthermore, positive cognitions (as assessed by the ATQ-P) were expected to negatively correlate with depressive symptoms for the dysphoric and non-dysphoric participants in both Chinese and Canadian samples.

4. *Schema activation hypothesis:* Consistent with previous findings that the presence of dysfunctional attitudes is positive correlated with depressive
symptoms (e.g., Thomas & Altareb, 2012), dysphoric participants in both Chinese and Canadian samples were expected to endorse significantly more dysfunctional attitudes, as assessed by the DAS-24, than their non-dysphoric counterparts.

5. *Selective processing hypothesis:* The selective processing hypothesis presupposes a mood-congruence effect in the recall of facial expressions (Clark et al., 1999). Therefore, in accordance with previous findings (e.g., Ridout et al., 2003), dysphoric participants from both Chinese and Canadian samples were expected to recall more sad faces than their non-dysphoric counterparts. Conversely, consistent with the literature that non-depressed individuals have a bias for positive self-referent information (Gotlib & Joormann, 2010), non-dysphoric participants from both Chinese and Canadian samples were expected to recall more happy faces than their dysphoric counterparts.

**Method**

**Group Design**

Participants in the present study were allocated to groups based on nationality (Canadian or Chinese), which was further stratified by depression status (dysphoric or non-dysphoric). Scores on the PHQ-9 were used to define depression status required for the main analyses. That is, participants with scores of 10 or more on the PHQ-9 were allocated to the dysphoric group, and participants with scores of 5 or less were allocated to the non-dysphoric group. Participants who obtained scores between 6 and 9 were
excluded from the depression status analyses to ensure adequate variability between dysphoric and non-dysphoric subsamples.

**Inclusion and Exclusion Criteria**

To be included in the Chinese sample, participants indicated that (1) China is their place of birth; (2) China is both parents’ place of birth; and (3) either Mandarin or Cantonese is their primary language. To be included in the Canadian sample, participants indicated that (1) Canada is their place of birth; (2) Canada is both parents’ place of birth, and (3) English is their primary language.

Another inclusion criterion was for participants to pass an attention check. Recent studies found that attention check questions (ACQs) enhance data quality by screening out inattentive participants and/or increasing participants’ attention (Aust, Diedenhofen, Ullrich, & Musch, 2013; Buhrmester, Kwang, & Gosling, 2011; Downs, Holbrook, Sheng, & Cranor, 2010; Oppenheimer, Meyvis, & Davidenko, 2009). ACQs are, for example, questions that instruct participants to select specific responses (e.g., “To show that you are paying attention, please select the third option below.”; Downs et al., 2014), as well as “trick” questions (e.g., “Have you ever had a fatal heart attack?”; Paolacci, Chandler, & Ipeirotis, 2010). The present study included two ACQs which required participants to answer a trick question and instructed participants to impute a specific response. Data from attentive participants who correctly answered at least one ACQ were included in the analyses.

**Power Analysis**

The paucity of cross-national research on major depression and cognitions in Canadian and Chinese samples makes it difficult to estimate an optimal sample size for
the present study. A previous cross-cultural study (Beshai et al., 2016) of several foundational hypotheses of the cognitive theory of depression was selected as a basis for the power analysis given that their methodology is similar to the design of the present study. The researchers found that depressed Egyptians and Canadians scored significantly higher on the ATQ-N and the DAS-A, but significantly lower on the ATQ-P than their non-depressed counterparts. The differences between depressed and non-depressed individuals for both groups yielded a large effect size for the ATQ-N \((d = 2.35)\), DAS-A \((d = 1.50)\), and ATQ-P \((d = 1.37)\).

Sample size was calculated using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009). In the present study, which employed a multivariate analysis of variance (MANOVA) design with an alpha level of .01, a large effect size, and a power of .80, a total of 64 participants (32 Canadian and 32 Chinese participants) would be optimal to detect significant effects on primary outcome measures.

**Recruitment Method**

Participants from Canada and China were recruited electronically from CrowdFlower. CrowdFlower is an international crowdsourcing platform. Crowdsourcing platforms are increasingly being used for research by social science and clinical researchers (Chandler & Shapiro, 2016; Le, Edmonds, Hester, & Biewald, 2010). CrowdFlower delegates study tasks to various partner agencies to gain access to multiple unique workforces, thereby CrowdFlower is an appealing platform for cross-cultural scientific survey research due the platform’s high traffic and the concomitant efficiency in recruitment and survey completion. Participant recruitment for the current study was restricted to the target countries (Canada and China) only.
Participants

A total of 481 (319 Canadians; 162 Chinese) participants were recruited and completed the study; however, 222 participants (46%; 119 Canadians; 103 Chinese) were excluded from analysis for failing to meet inclusion criteria, as described above. Further, the data from 39 participants from the Canadian sample and 23 participants from the Chinese sample were excluded from the depression status classification due to having scores on the PHQ-9 between 6 and 9. See Figure 1 for the breakdown of participant inclusions and exclusions at different stages of analysis.

Data from 259 participants were included in the severity/persistence hypothesis analysis, which consisted of 200 Canadian ($M_{age} = 32.46$) and 59 Chinese ($M_{age} = 29.69$) participants. Out of the total 259 participants, the data from 197 participants were included in the analyses for the negativity hypothesis, exclusivity hypothesis, schema-activation hypothesis, and selective processing hypothesis. The data from 39 Canadian and 23 Chinese participants were excluded from the analyses for the descriptive hypotheses in question for having obtained PHQ-9 scores between 6 and 9, thus failing to meet depression status cut-offs. The final Canadian sample for the negativity hypothesis, exclusivity hypothesis, schema-activation hypothesis, and selective processing hypothesis was composed of 129 dysphoric ($M_{age} = 30.50$) and 32 non-dysphoric individuals ($M_{age} = 40.38$), while the final Chinese sample was composed of 18 dysphoric ($M_{age} = 27.67$) and 18 non-dysphoric ($M_{age} = 31.72$) participants.

Measures

**Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001).** The PHQ-9 is a 9-item self-report measure of major depression based on the
Figure 1. Total number of participants after implementing inclusion criteria at different stages.
DSM-IV diagnostic criteria of major depression. Each item (e.g., “Little interest or pleasure in doing things”) is rated on a 4-point Likert scale from “0” (“not at all”) to “3” (“nearly everyday”), with higher scores indicating greater severity of major depression. Scores on the PHQ-9 can range from 0 to 27. PHQ-9 scores were used to examine the correlation between depressive symptoms, and negative and positive self-referent cognitions (severity/persistence hypothesis). Additionally, PHQ-9 scores were also used to allocate participants into the dysphoric or non-dysphoric group.

The psychometric properties of the PHQ-9 are well-established in both clinical and nonclinical populations (e.g., Lee, Schulberg, Raue, & Kroenke, 2007; Nakai et al., 2014). The PHQ-9 has strong convergent validity with other established measures of major depression, including the BDI-II and the CES-D.

The PHQ-9 is translated to more than 80 languages and used among various cultural/ethnic groups such as Kenyan (Monahan et al., 2009), Hispanic (Huang, Chung, Kroenke, Delucchi, & Spitzer, 2006), and Brazilian populations (de Lima Osório, Vilela Mendes, Crippa, & Loureiro, 2009). The psychometric properties and the stability of the factor structure of the instrument are supported in diverse populations. More pertinently, the reliability and validity of the Chinese version of the PHQ-9 (Wang et al., 2014) demonstrated good internal consistency for the full scale (α = .86) and it correlated positively with the Chinese version of the Self-Rating Depression Scale (SDS; Zung, 1965) and negatively with all subscale scores of the Chinese version of the Short Form Health Survey (SF-36; Ware & Sherbourne, 1992).

A cut-off score of 10 on the PHQ-9 is widely recommended in the literature; however, a recent meta-analysis found no substantial differences in the pooled sensitivity
and specificity for scores between 8 and 11 (Manea, Gilbody, & McMillan, 2012). The authors concluded that such scores are acceptable for detecting major depression using the PHQ-9. The authors reported a pooled sensitivity and specificity of .85 and .89, respectively, for a cut-off score of 10, as evaluated in 16 studies. Accordingly, a cut-off criterion of 10 to define dysphoria was implemented for this study.

**The Center for Epidemiologic Studies–Depression Scale (CES-D; Radloff, 1977).** The CES-D is a 20-item measure designed to evaluate the frequency and severity of depressive symptoms. Statements such as, “I had trouble keeping my mind on what I was doing” are rated on a 4-point Likert scale from “0” (“rarely or none of the time/less than one day”) to “3” (“all of the time/five to seven days”). Scores on the CES-D can range from 0 to 60, with higher scores representing more severe and frequent symptoms of major depression. The scale is extensively used across cultures and translated into many different languages, including Chinese, Japanese, Arabic, German, Spanish, and French (Smarr & Keefer, 2011).

The original 20-item CES-D was found to have a 4-factor structure representing the symptom domains of the disorder, such as a negative affect, anhedonia, somatic symptoms, and interpersonal difficulties (Radloff, 1977). Despite the measure’s popularity, some researchers have questioned the robustness and stability of the proposed 4-factor structure (e.g., Schroetens, Sanderson, Van Sonderen, & Ranchor, 2000; Stansbury, Ried, & Velozo, 2006). For example, it has been argued that the original measure did not accurately reflect the diagnostic criteria at the time (i.e., *DSM-II*; American Psychiatric Association, 1968) and that some of the items were identified as biased which potentially resulted in artificially inflated CES-D scores (Huang, Beshai,
Many alternative factor models have been proposed, including one, two, three, and four factors (Boisvert, McCreary, Wright, & Asmundson, 2003; Lee et al., 2008; Williams et al., 2007). A recent confirmatory factor analysis study of the 20-item CES-D identified a more appropriate 3-factor structure model which consisted of negative affect, anhedonia, and somatic symptoms (Carleton et al., 2013). Further, the original 20 items were truncated to 14 items in the modified version of the scale. By directly addressing the shortcoming of previously established structural models, the 3-factor 14-item model is considered more representative of the current conceptualization of major depression. The 14-item CES-D demonstrated excellent reliability and validity among several clinical and non-clinical samples (i.e., undergraduate, community, rehabilitation, and clinical), with internal consistency ranging between .85 to .94 across these samples (Carleton et al., 2013). The 14-item CES-D scale was used in the present study to examine the correlation between depressive symptoms, and negative and positive self-referent cognitions (severity/persistence hypothesis).

Automatic Thoughts Questionnaire–Negative (ATQ-N; Hollon & Kendall, 1980). The ATQ-N is a 30-item self-report measure designed to assess the frequency of negative automatic thoughts associated with major depression. Statements such as “I am a failure” and “I don’t think I can go on” are rated on a 5-point Likert scale from “1” (“not at all”) to “5” (“all the time”), with higher scores indicating more negative automatic thoughts about self experienced in the past week. The scores on the ATQ-N can range from 30 to 150. ATQ-N scores were used in this study to assess the relationship between negative self-referent thoughts and depressive symptoms (negativity hypothesis and severity/persistence hypothesis).
Items of the ATQ-N have demonstrated good internal consistency reliability ($\alpha = .96$ to .97; Dozois et al., 2009; Hollon & Kendall, 1980), as well as strong convergent validity with the Minnesota Multiphasic Personality Inventory (MMPI) Depression Scale, the Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978), the BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), and clinician’s rating of major depression (Harrell & Ryon, 1983; Kaviani, Javaheri, & Hatami, 2011). The ATQ-N successfully discriminated between depressed outpatients from non-depressed controls (Harrell & Ryon, 1983).

The psychometric properties of the ATQ-N are supported in various cross-cultural samples including Malaysian (Oei & Mukhtar, 2008), Iranian (Ghassemzadeh, Mojtabai, Karamghadiri, & Ebrahimkhani, 2006), Canadian, and Egyptian samples (Beshai et al., 2012; Beshai et al., 2016). Furthermore, the Chinese version of the ATQ-N demonstrated excellent internal consistency ($\alpha = .96$) in a sample of adults with chronic physical illness. (Wong, Chau, Kwok, & Kwan, 2007). Similar reliability statistics were reported for the Chinese ATQ-N in a different study in both clinical and nonclinical samples (Cao, Cheng, Tang, & Song, 2011) and the measure significantly correlated with the BDI-II (Beck, Steer, & Brown, 1996).

**Automatic Thoughts Questionnaire–Positive (ATQ-P; Ingram & Wisnicki, 1988).** The ATQ-P is a 30-item self-report measure designed to assess the frequency of positive thoughts over a 1-week period. Statements such as “I am in a great mood” and “I have many good qualities” are rated on a 5-point Likert scale from “1” (“never”) to “5” (“all the time”). Scores on the ATQ-P can range from 30 to 150, with higher scores reflecting more positive thoughts. ATQ-P scores were used in the present study to assess
the relationship between positive self-referent cognitions and depressive symptoms (exclusivity hypothesis and severity/persistence hypothesis).

Items of the ATQ-P have demonstrated excellent internal consistency ($\alpha = .93$ to .95; Burgess & Haaga, 1994; Dozois et al., 2009) and adequate concurrent validity with the BDI ($r = -.47$) and other affective symptoms measures (Ingram et al., 1995). Further, ATQ-P successfully discriminated between psychopathological and non-psychopathological states (Ingram et al., 1995). Researchers have used the ATQ-P among various non-Western samples, including Chinese, Malaysian, Indian, and Israeli samples (Iancu, Bodner, Joubran, Zion, & Ram, 2015; Wong, 2012).

**Dysfunctional Attitudes Scale–24 (DAS-24; Power et al., 1994; Weissman & Beck, 1978).** The DAS-24 is a shortened version of the original DAS form A and form B and was derived through a confirmatory factor analysis of the two original forms (Power et al., 1994; Weissman & Beck, 1978). In a factor analytic study of the original DAS (Power et al., 1994), the authors identified three factors (Achievement, Dependency, and Self-Control) and the top eight items that loaded onto each factor were retained in the new 24-item version. The three factors demonstrated acceptable internal consistency with Cronbach’s alpha values of 0.85, 0.74, and 0.68 for the Achievement, Dependency, and Self-Control scales, respectively.

The DAS-24 assesses schematic content associated with major depression. Statements like, “If I fail partly, it is as bad as being a complete failure” and “I am nothing if a person I love doesn’t love me” are rated on a 7-point Likert scale from “1” (“totally disagree”) to “7” (“totally agree”). Scores on the DAS-24 can range from 24 to 168, with higher scores indicating greater dysfunctional or negative beliefs after reverse-
scoring negatively-keyed items. Scores on the DAS-24 were used in this study to assess the relationship between dysfunctional attitudes and depressive symptoms (schema activation hypothesis and severity/persistence hypothesis).

The DAS-24 has demonstrated good internal consistency, construct validity, and test-retest reliability in past research with Western populations (Lam, Wright, & Smith., 2004; Power et al., 1994, Power, Duggan, Lee, & Murray, 1995). The scale has also demonstrated success in differentiating between currently depressed, remitted depressed, and healthy controls (Power et al., 1995). Further, the Japanese version of the DAS-24 demonstrated good internal consistency ($r = .86$), good test-retest reliability ($r = .79$), and satisfactory concurrent validity with the ATQ-N ($r = .53$), ATQ-P ($r = -.41$) and BDI-II ($r = .44$ to .63) in both clinical and non-clinical samples of depressed outpatients (Tajima et al., 2007).

**Materials**

**NimStim Set of Facial Expressions (Tottenham et al., 2009).** The NimStim Set of Facial Expressions contains 672 stimuli depicting a variety of facial expressions (happy, sad, angry, fearful, disgusted, surprised, calm, and neutral) by female and male actors of different ethnic backgrounds. Tottenham and colleagues (2009) confirmed the reliability and validity of the NimStim stimuli in their original publication. Validity of the stimuli (i.e., accurate identification of expressions by participants) was tested by asking untrained participants to label each stimulus (facial expression) and then measuring concordance between the participants’ labels and the intended expressions depicted by the actors. The overall concordance rate across stimuli was high (mean kappa = 0.79). As for reliability (i.e., intra-participant test-retest reliability), the same
participants were presented, for a second time, the same facial stimuli in a random order and were then asked to relabel them. Reliability testing occurred 20 minutes after the initial presentation of the facial stimuli during the validity check. The reliability scores ranged between 0.68 and 1.00.

In the current study, a total of 36 NimStim stimuli were used to examine the selective processing hypothesis. The selective processing hypothesis proposes that depressed individuals have a mood-congruent selective bias. In the present study, participants from both Canada and China were initially presented with sad, happy, and neutral stimuli and later asked to select the stimuli that were previously shown (see below for details of the procedure). In accordance with the selective processing hypothesis, dysphoric participants were expected to recall more sad stimuli than their non-dysphoric counterparts. Furthermore, consistent with previous work on memory recall performance, non-dysphoric participants were expected to recall more happy stimuli than their dysphoric counterparts.

**Procedure**

All of the study materials—including consent and debriefing forms—were administered to participants electronically over Qualtrics, an internet-based survey and data collection platform. The Qualtrics layout was identical for both groups, with the only difference being the language of the study materials.

To begin the study, participants indicated they read the consent form and consent to participate in the study by checking a box on the webpage. After informed consent was obtained, participants completed a battery of questionnaires composed of the PHQ-9, CES-D, ATQ-N, ATQ-P, and DAS-24, as well as the facial expression recognition
task (described below). The presentation of the questionnaires was randomized to minimize potential survey bias (i.e., responses to previous questions may influence future responses; Smith & Davis, 2013). Following the completion of the questionnaires battery and the recognition task, participants completed a demographics form with questions asking about their gender, age, origin of birth, first and primary language, ethnicity, marital status, education, personal income (in USD), and religious affiliation. Following the completion of the demographics form, participants were directed to the debriefing page and thanked for their participation. All participants (eligible and ineligible) obtained a monetary compensation of $1.25 USD, which is commensurate with crowdsourcing studies with similar length and nature (Chandler & Shapiro, 2016).

**Facial expression recognition/memory task.** A total of 36 stimuli depicting happy, sad, and neutral facial expressions by 12 different actors (six females; six males) were used to test the selective processing hypothesis.

The stimuli were presented in two phases: the familiarization phase and the testing phase. In the familiarization phase, participants were shown a series of 18 stimuli that appeared individually on the screen for six seconds each. The stimuli consisted of six happy, six sad, and six neutral facial expressions portrayed by six different actors—three females and three males (each actor portraying all three expressions). The stimuli shown in the familiarization phase will be referred to as target happy, target sad, or target neutral, from this point forward.

In the testing phase, participants were shown a total of 36 stimuli that consisted of 18 previously shown stimuli from the familiarization phase and 18 new stimuli. The new stimuli also depicted happy, sad, and neutral facial expressions from six different
female and six different male actors, with each actor portraying all three expressions. Participants were then instructed to identify the 18 previously shown stimuli (i.e., target happy, target sad, or target neutral faces). The new stimuli presented in the testing phase that were not shown in the familiarization phase will be referred to as decoy happy, decoy sad, or decoy neutral, from this point forward.

**Translation**

All test materials presented to the Chinese sample were translated from English to Chinese in accordance with the WHO (2007) Guidelines for the Process of Translation and Adaptation of Instruments. According to guidelines, adaptation of instruments consists of essential steps, including forward translation, expert back-translation, and finalizing. In the current study, the materials were first translated into simplified Chinese by a certified translator (with a background in psychology) who is fluent in both Chinese and English. The translated materials were then back-translated to English by another bilingual translator. The back-translated Chinese materials and the original English versions were then cross-checked by the primary investigator who is fluent in both English and Chinese to uncover potential discrepancies between the versions. Any discrepancies identified were revised accordingly in an iterative process (revisions done independently in the forward and back-translations) before being finalized for the commencement of the study.

**Statistical Analyses**

All statistical analyses were tested against the alpha level of .01. An adjustment of the typical alpha level of .05 is recommended in analyses where multiple measures are being tested (Tukey, 1977, Bland & Atman 1995). The alpha level of .01 was selected
because it is conservative enough to reduce the likelihood of a type I error, but also liberal enough to allow for the exploration of results.

**Demographics variables.** Participants’ age was examined using a two-way analysis of variance (ANOVA), with nationality (Canadian and Chinese) and depression status (dysphoric and non-dysphoric) as the between-group variables. Pearson’s correlations were then conducted to determine if age was significantly associated with any of the dependent variables (i.e., ATQ-N, ATQ-P, CES-D, DAS-24). Additionally, a chi-square analysis was conducted to assess differences on key demographic variables between the dysphoric and non-dysphoric Canadian and Chinese participants.

**Negativity hypothesis, exclusivity hypothesis, and schema activation hypothesis.** A two-way multivariate analysis of variance (MANOVA) was conducted with nationality (Canada and China as the two levels) and depression status (dysphoric and non-dysphoric as the two levels) as the independent variables (IVs). With regards to the dependent variables (DVs), ATQ-N scores were entered as the DV for the negativity hypothesis, ATQ-P scores as the DV for the exclusivity hypothesis, and DAS-24 scores as the DV for the schema activation hypothesis. Furthermore, a two-way multivariate analysis of covariance (MANCOVA) was subsequently conducted on the ATQ-N and DAS-24, with age as a covariate.

**Severity/persistence hypothesis.** Pearson’s correlations were calculated to examine the relationships between the self-report measures (i.e., PHQ-9, CES-D, ATQ-N, ATQ-P, and DAS-24) to assess for associations between negative and positive self-referent cognitions and depressive symptoms. Following the Pearson’s correlations,
Fisher’s r-to-z transformation analyses were conducted to compare the strengths of the correlations between the Canadian and Chinese samples.

Additionally, another Pearson’s correlations analysis was conducted as an exploratory analysis to examine the correlations of target sad (i.e., recalled previously shown sad faces) and target happy (i.e., recalled previously shown happy faces) responses with all self-report measures.

**Selective processing hypothesis.** A two-way MANOVA was conducted to assess the selective processing hypothesis. The DVs were entered as part of the abovementioned two-way MANOVA to examine the effects of nationality and depression status on memory bias to sad, happy, and neutral facial expressions. The DVs were as follows: target sad, target happy, target neutral, decoy sad, decoy happy, and decoy neutral.

A second MANOVA was conducted as an exploratory analysis to examine nationality and depression status on total target (i.e., recalled faces across all three valence categories that were previously shown), total decoy (i.e., recalled faces across all three valence categories that were not previously shown), total sad (i.e., combination of target sad and decoy sad responses), and total happy (i.e., combination of target happy and decoy happy responses). The two IVs were, again, nationality (Canada and China) and depression status (dysphoric and non-dysphoric). The DVs were total target, total decoy, total sad, and total happy responses.

**Data Checking and Cleaning**

The data was carefully screened for missing values, outliers, and normality. Missing data were treated by imputing person-level means for the missing items that are
no more than 80% of each scale (Shrive, Stuart, Quan, & Ghali, 2006). Incomplete scale responses (over 20% of items missing per scale) were excluded from further analyses. Person-level mean imputation was applied to a small percentage (~.06%) of the dataset. Using the Mahalanobis’ distance (Rousseeuw & Van Zomeren, 1990), three multivariate outliers were detected and removed from analysis.

Normality of the dependent variables (i.e., ATQ-N, ATQ-P, CES-D, and DAS-24) and the PHQ-9 were assessed using the Shapiro-Wilk test of normality, the skewness and kurtosis of the distribution, and a visual inspection of Q-Q plots and histograms.

**Results**

**Data Checking Results**

There were significant Shapiro-Wilk results for all of the DV (i.e., ATQ-N, ATQ-P, CES-D, and DAS-24) and the PHQ-9, indicating significant departures from normality. As such, skewness and kurtosis for each scale were examined using the recommended cut-off of ±1 (for skewness) and ±1.5 (for kurtosis) to gauge the extent to which the data deviated from normality (Tabachnick & Fidell, 2007). Skewness and kurtosis statistics were as follows: ATQ-N: -.20 and -.54, respectively; ATQ-P: -.02 and 1.14, respectively; CES-D: -.32 and .03, respectively; DAS-24: -.67 and 1.33, respectively; PHQ-9: -.03 and -.41, respectively. None of the variables in question had skewness and kurtosis values that exceeded the recommended cut-offs. Last, a visual inspection of Q-Q plots and histograms revealed that they were similar to that of a normal distribution. Accordingly, no further analyses were required to transform the data to correct for departures from normality.

**Demographic Variables**
There was a significant main effect for nationality on age, \(F(1, 193) = 12.57, p < .001, d = 0.51\), as Canadians (\(M = 32.46, SD = 9.40\)) were older than their Chinese (\(M = 29.69, SD = 7.58\)) counterparts, regardless of depression status. There is also a main effect for depression status on age, \(F(1, 193) = 18.52, p < .001, d = 0.62\), such that dysphoric participants were younger (\(M = 30.15, SD = 6.90\)) than their non-dysphoric (\(M = 37.26, SD = 12.40\)) counterparts. There was a significant negative correlation between age and scores on the ATQ-N (\(r = -.33, p < .001\)), CES-D (\(r = -.22, p < .001\)), and DAS-24 (\(r = -.30, p < .001\)).

Chi-square analyses did not produce significant effects for nationality on gender, \(X^2 (2, N = 259) = 5.05, p = .08, phi = 0.14\), marital status, \(X^2 (4, N = 259) = 8.87, p = .07, phi = 0.19\), or income, \(X^2 (4, N = 255) = 4.63, p = .33, phi = 0.14\). There were significant effects for nationality on education, \(X^2 (9, N = 256) = 27.54, p = .001, phi = 0.33\), and religion, \(X^2 (6, N = 256) = 45.62, p < .001, phi = 0.42\). Chi-square analyses did not produce significant effects for depression status on gender, \(X^2 (2, N = 197) = 2.96, p = .23, phi = 0.12\), income, \(X^2 (4, N = 194) = 1.65, p = .80, phi = 0.09\), or religion, \(X^2 (6, N = 195) = 6.57, p = .36, phi = 0.18\). There were significant main effects for depression status on marital status, \(X^2 (4, N = 197) = 27.54, p = .02, phi = .02\), and education, \(X^2 (9, N = 195) = 21.67, p = .01, phi = .01\). Table 1 presents the chi-square statistics for all demographics variables.

**Reliability Analysis**

Reliability of all self-report measures was determined using Cronbach’s alpha statistics (Tavakol & Dennick, 2011). Table 2 presents Cronbach’s alpha for all self-
Table 1. Demographic Statistics of Canadian and Chinese Participants, Stratified by Depression Status

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Canadian (n = 161)</th>
<th></th>
<th></th>
<th>Chinese (n = 36)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dysphoric (n = 129)</td>
<td>Non-Dysphoric (n = 32)</td>
<td>Dysphoric (n = 18)</td>
<td>Non-Dysphoric (n = 18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender n (%)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>61 (47.3)</td>
<td>15 (46.9)</td>
<td>13 (72.2)</td>
<td>10 (55.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>68 (52.7)</td>
<td>17 (53.1)</td>
<td>5 (27.8)</td>
<td>7 (38.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender Neutral</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>1 (5.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>69 (53.3)</td>
<td>10 (31.3)</td>
<td>13 (72.2)</td>
<td>6 (33.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>53 (41.1)</td>
<td>20 (62.5)</td>
<td>4 (22.2)</td>
<td>11 (61.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separated/Divorced</td>
<td>6 (4.7)</td>
<td>2 (6.3)</td>
<td>1 (5.6)</td>
<td>1 (2.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed/No Income</td>
<td>3 (2.3)</td>
<td>0 (0.0)</td>
<td>1 (5.9)</td>
<td>1 (5.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10,000 – 30,000</td>
<td>21 (16.4)</td>
<td>4 (12.5)</td>
<td>5 (29.4)</td>
<td>3 (17.6)</td>
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<td></td>
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<tr>
<td>30,001 – 50,000</td>
<td>45 (35.2)</td>
<td>9 (28.1)</td>
<td>5 (29.4)</td>
<td>5 (29.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50,001 – 75,000</td>
<td>25 (19.5)</td>
<td>10 (31.3)</td>
<td>6 (35.3)</td>
<td>2 (11.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75,001 and over</td>
<td>34 (26.6)</td>
<td>9 (28.1)</td>
<td>0 (0.0)</td>
<td>6 (35.3)</td>
<td></td>
<td></td>
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<tr>
<td>Education n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Degree</td>
<td>0 (0.0)</td>
<td>1 (3.1)</td>
<td>0 (0.0)</td>
<td>0.0 (0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary/High School</td>
<td>12 (9.3)</td>
<td>9 (28.1)</td>
<td>4 (23.5)</td>
<td>2 (11.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trades Certificate or Diploma</td>
<td>4 (3.1)</td>
<td>2 (6.3)</td>
<td>1 (5.9)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>40 (31.0)</td>
<td>13 (40.6)</td>
<td>8 (47.1)</td>
<td>8 (47.1)</td>
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<td></td>
</tr>
<tr>
<td>Religion n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christianity</td>
<td>74 (57.4)</td>
<td>21 (65.6)</td>
<td>5 (29.4)</td>
<td>7 (41.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buddhism</td>
<td>14 (10.9)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>2 (11.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atheism</td>
<td>16 (12.4)</td>
<td>3 (9.4)</td>
<td>9 (52.9)</td>
<td>7 (41.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agnosticism</td>
<td>16 (12.4)</td>
<td>8 (25.0)</td>
<td>1 (5.9)</td>
<td>1 (5.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>9 (7.1)</td>
<td>0 (0.0)</td>
<td>2 (11.8)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Some subcategories statistics were not included in this table.
Table 2. *Cronbach’s Alpha for Self-Report Measures Stratified by Nationality*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Canadian ($n = 200$)</th>
<th>Chinese ($n = 59$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ-9</td>
<td>.72</td>
<td>.85</td>
</tr>
<tr>
<td>CES-D</td>
<td>.76</td>
<td>.86</td>
</tr>
<tr>
<td>ATQ-N</td>
<td>.93</td>
<td>.97</td>
</tr>
<tr>
<td>ATQ-P</td>
<td>.89</td>
<td>.97</td>
</tr>
<tr>
<td>DAS-24</td>
<td>.68</td>
<td>.73</td>
</tr>
</tbody>
</table>

*Note.* PHQ-9 = Patient Health Questionnaire–9; CES-D = Center for Epidemiologic Studies–Depression Scale; ATQ-N = Automatic Thoughts Questionnaire–Negative; ATQ-P = Automatic Thoughts Questionnaire–Positive; DAS-24 = Dysfunctional Attitudes Scale–24.
report measures, stratified by nationality (Canadian and Chinese). Participant responses to all measures produced adequate to excellent internal reliability.

**Negativity Hypothesis, Exclusivity Hypothesis, and Schema Activation Hypothesis**

There was a significant univariate effect for nationality on the DAS-24, $F(1, 193) = 21.24, p < .001, d = 0.66$ (see Figure 2 and Table 3). The univariate main effect for nationality on the DAS-24 remained significant after controlling for age, $F(1, 192) = 16.45, p < .001, d = 0.59$, as Chinese participants had higher DAS-24 scores than Canadian participants, regardless of depression status.

There was also a significant univariate effect for depression status on the ATQ-N, $F(1, 193) = 224.11, p < .001, d = 2.15$ (see Figure 3), the ATQ-P, $F(1, 193) = 36.66, p < .001, d = 0.87$ (see Figure 4), and the DAS-24, $F(1, 193) = 16.75, p < .001, d = 0.59$ (see Figure 2). Moreover, when age was controlled as a covariate, the univariate main effect for depression status remained significant on the ATQ-N, $F(1, 192) = 188.34, p < .001, d = 1.98$, and the DAS-24, $F(1, 192) = 11.63, p = .001, d = 0.49$. That is, dysphoric participants scored higher on the ATQ-N and DAS-24 but lower on the ATQ-P than their non-dysphoric counterparts, regardless of nationality (see Table 3).

Additionally, there was a significant univariate interaction effect between nationality and depression status on the DAS-24, $F(1, 193) = 8.51, p = .004, d = 0.42$ (see Figure 2). The univariate interaction effect on the DAS-24 remained significant after controlling for age, $F(1, 192) = 7.20, p = .008, d = 0.39$. Specifically, dysphoric Chinese participants scored higher on the DAS-24 than both dysphoric and non-dysphoric Canadians, while non-dysphoric Chinese participants also scored higher than both
Figure 2. Mean score differences between dysphoric and non-dysphoric Canadian and Chinese participants on the DAS-24.
Table 3. *Means and Standard Deviations of Dysphoric and Non-Dysphoric Participants on Self-Report Measures Assessing Primary Outcomes, Stratified by Nationality*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Dysphoric ($n=147$)</th>
<th>Non-Dysphoric ($n=50$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Canadian ($n=129$)</td>
<td>Chinese ($n=18$)</td>
</tr>
<tr>
<td>PHQ-9</td>
<td>14.36 (3.33)</td>
<td>13.50 (2.26)</td>
</tr>
<tr>
<td>CES-D</td>
<td>21.93 (4.82)</td>
<td>21.06 (7.30)</td>
</tr>
<tr>
<td>ATQ-N</td>
<td>88.44 (15.14)</td>
<td>85.28 (22.70)</td>
</tr>
<tr>
<td>ATQ-P</td>
<td>86.76 (15.81)</td>
<td>82.56 (20.31)</td>
</tr>
<tr>
<td>DAS-24</td>
<td>96.10 (11.78)</td>
<td>100.50 (13.61)</td>
</tr>
</tbody>
</table>

*Note.* PHQ-9 = Patient Health Questionnaire–9; CES-D = Center for Epidemiologic Studies–Depression Scale; ATQ-N = Automatic Thoughts Questionnaire–Negative; ATQ-P = Automatic Thoughts Questionnaire–Positive; DAS-24 = Dysfunctional Attitudes Scale–24.
Figure 3. Mean score differences between dysphoric and non-dysphoric Canadian and Chinese participants on the ATQ-N.
Figure 4. Mean score differences between dysphoric and non-dysphoric Canadian and Chinese participants on the ATQ-P.
dysphoric and non-dysphoric Canadians, but lower than dysphoric Chinese participants (see Table 3).

**Severity/Persistence Hypothesis**

In the Canadian sample, PHQ-9 scores were significantly and negatively correlated with ATQ-P scores ($r(198) = -.39$, $p < .001$), and significantly and positively correlated with ATQ-N ($r(198) = .75$, $p < .001$) and DAS-24 ($r(198) = .36$, $p < .001$) scores. In the Chinese sample, PHQ-9 scores were significantly and negatively correlated with ATQ-P scores ($r(57) = -.51$, $p < .001$), and significantly and positively correlated with ATQ-N scores ($r(57) = .78$, $p < .001$), only. Table 4 presents the Pearson’s correlation coefficients, stratified by nationality.

Further, in the Canadian sample, CES-D scores were significantly and negatively correlated with ATQ-P scores ($r(198) = -.52$, $p < .001$), and significantly and positively correlated with ATQ-N ($r(198) = .73$, $p < .001$) and DAS-24 ($r(198) = .47$, $p < .001$) scores. In the Chinese sample, CES-D scores were significantly and negatively correlated with ATQ-P scores ($r(57) = -.62$, $p < .001$), and significantly and positively correlated with the ATQ-N scores ($r(57) = .72$, $p < .001$), only. Given the above effects, Fisher’s r-to-z transformation analyses were conducted. None of the strengths of the correlations were significantly different between the samples. Specifically, the relationship of the PHQ-9 with the ATQ-P ($z = .98$, $p = .33$), the ATQ-N ($z = .43$, $p = .67$), and the DAS-24 ($z = 1.5$, $p = .13$) were not significantly different between the Canadian and Chinese samples. Similarly, the relationship of the CES-D with the ATQ-P ($z = 1.01$, $p = .31$), the ATQ-N ($z = .14$, $p = .89$), and the DAS-24 ($z = 1.69$, $p = .09$) were not significantly different between the two samples.
Table 4. *Pearson’s Correlation Coefficients for Scores on All Self-Report Measures, and Target Sad and Target Happy Responses, Stratified by Nationality*

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PHQ-9</td>
<td></td>
<td>.78**</td>
<td>.78**</td>
<td>-.51**</td>
<td>.15</td>
<td>.09</td>
<td>-.09</td>
</tr>
<tr>
<td>2. CES-D</td>
<td>.73**</td>
<td></td>
<td>.72**</td>
<td>-.62**</td>
<td>.24</td>
<td>.07</td>
<td>-.13</td>
</tr>
<tr>
<td>3. ATQ-N</td>
<td>.75**</td>
<td>.73**</td>
<td></td>
<td>-.49**</td>
<td>.38**</td>
<td>.15</td>
<td>.14</td>
</tr>
<tr>
<td>4. ATQ-P</td>
<td>-.39**</td>
<td>-.52**</td>
<td>-.35**</td>
<td></td>
<td>-.22</td>
<td>-.04</td>
<td>.00</td>
</tr>
<tr>
<td>5. DAS-24</td>
<td>.46**</td>
<td>.47**</td>
<td>.45**</td>
<td>-.26**</td>
<td></td>
<td>.11</td>
<td>-.04</td>
</tr>
<tr>
<td>6. Target Sad</td>
<td>.13</td>
<td>.18*</td>
<td>.23**</td>
<td>-.03</td>
<td>.10</td>
<td></td>
<td>.33*</td>
</tr>
<tr>
<td>7. Target Happy</td>
<td>.09</td>
<td>.23*</td>
<td>.22**</td>
<td>-.10</td>
<td>.08</td>
<td>57**</td>
<td></td>
</tr>
</tbody>
</table>

*Note. Coefficients for Canadian participants are presented on the bottom, and coefficients for Chinese participants are presented on the top; PHQ-9 = Patient Health Questionnaire–9; CES-D = Center for Epidemiologic Studies–Depression Scale; ATQ-N = Automatic Thoughts Questionnaire–Negative; ATQ-P = Automatic Thoughts Questionnaire–Positive; DAS-24 = Dysfunctional Attitudes Scale–24; Target Sad = Recalls of sad faces previously shown in the familiarization phase; Target Happy = Recalls of happy faces previously shown in the familiarization phase.

* significant at the .05 level.

** significant at the .01 level.
In the exploratory analysis, target sad correlated significantly and positively with scores on the CES-D ($r(198) = .18, p = .012$) and ATQ-N ($r(198) = .23, p = .001$), as well as with target happy ($r(198) = .57, p < .001$), in the Canadian sample. Further, target happy correlated significantly and positively with scores on the CES-D ($r(198) = .23, p = .001$) and ATQ-N ($r(198) = .22, p = .001$). In the Chinese sample, target sad correlated significantly and positively with target happy ($r(198) = .33, p = .01$), only. See Table 4 for Pearson’s correlation coefficients for the exploratory analysis.

**Selective Processing Hypothesis**

Although a significant main effect for depression status was not found, there was a trend for target sad, $F(1, 193) = 5.24, p = .02, d = 0.33$ (see Figure 5), and decoy neutral, $F(1, 193) = 5.13, p = .03, d = 0.33$ (see Figure 6), as dysphoric participants recalled more target sad faces than their non-dysphoric counterparts, while non-dysphoric participants recalled more decoy neutral faces than their dysphoric counterparts (see Table 5).

There was a significant univariate main effect for nationality for target sad, $F(1, 193) = 17.81, p < .001, d = 0.61$ (see Figure 5), target happy, $F(1, 193) = 8.30, p = .004, d = 0.41$ (see Figure 7), target neutral, $F(1, 193) = 9.78, p = .002, d = 0.45$ (see Figure 8), decoy happy, $F(1, 193) = 6.85, p = .010, d = 0.38$ (see Figure 9), and decoy neutral, $F(1, 193) = 16.56, p < .001, d = 0.59$ (see Figure 6). Specifically, Canadians recalled more target sad, target happy, and target neutral faces than their Chinese counterparts, whereas Chinese participants recalled more decoy happy and decoy neutral faces than Canadians, regardless of depression status (see Table 5).
Figure 5. Differences between dysphoric and non-dysphoric Canadian and Chinese participants on target sad (i.e., recalled previously shown sad faces) responses.
Figure 6. Differences between dysphoric and non-dysphoric Canadian and Chinese participants on decoy neutral (i.e., recalled neutral faces that were not previously shown) responses.
Table 5. Means and Standard Deviations of Dysphoric and Non-Dysphoric Participants on Selective Processing Hypothesis Outcomes, Stratified by Nationality

<table>
<thead>
<tr>
<th>Measure</th>
<th>Dysphoric (n = 147)</th>
<th>Non-Dysphoric (n =50)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Canadian (n = 129)</td>
<td>Chinese (n =18)</td>
</tr>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Target Sad</td>
<td>5.93 (.36)</td>
<td>5.44 (.86)</td>
</tr>
<tr>
<td>Target Happy</td>
<td>5.88 (.47)</td>
<td>5.44 (1.01)</td>
</tr>
<tr>
<td>Target Neutral</td>
<td>5.86 (.44)</td>
<td>5.50 (.92)</td>
</tr>
<tr>
<td>Decoy Sad</td>
<td>.11 (.45)</td>
<td>.44 (.78)</td>
</tr>
<tr>
<td>Decoy Happy</td>
<td>.12 (.45)</td>
<td>.50 (.86)</td>
</tr>
<tr>
<td>Decoy Neutral</td>
<td>.10 (.41)</td>
<td>.33 (.69)</td>
</tr>
<tr>
<td>Total Target</td>
<td>17.67 (1.13)</td>
<td>16.72 (1.96)</td>
</tr>
<tr>
<td>Total Decoy</td>
<td>.41 (1.76)</td>
<td>1.28 (1.96)</td>
</tr>
<tr>
<td>Total Sad</td>
<td>6.04 (.32)</td>
<td>5.89 (1.08)</td>
</tr>
<tr>
<td>Total Happy</td>
<td>6.00 (.38)</td>
<td>5.94 (.80)</td>
</tr>
</tbody>
</table>

Note. Target Sad = Recalls of previously shown sad faces; Target Happy = Recalls of previously shown happy faces; Target Neutral = Recalls of previously shown neutral faces; Decoy Sad = Recalls of sad faces not previously shown; Decoy Happy = Recalls of happy faces not previously shown; Decoy Neutral = Recalls of neutral faces not previously shown; Total Target = Recalls of faces across all three valence categories that were previously shown; Total Decoy = Recalls of faces across all three valence categories that were not previously shown; Total Sad = Recalls of both previously shown and not previously shown sad faces; Total Happy = Recalls of both previously shown and not previously shown happy faces.
Figure 7. Differences between dysphoric and non-dysphoric Canadian and Chinese participants on target happy (i.e., recalled previously shown happy faces) responses.
Figure 8. Differences between dysphoric and non-dysphoric Canadian and Chinese participants on target neutral (i.e., recalled previously shown neutral faces) responses.
Figure 9. Differences between dysphoric and non-dysphoric Canadian and Chinese participants on decoy happy (i.e., recalled happy faces that were not previously shown) responses.
Figure 10. Differences between dysphoric and non-dysphoric Canadian and Chinese participants on decoy sad (i.e., recalled sad faces that were not previously shown) responses.
Figure 11. Differences between dysphoric and non-dysphoric Canadian and Chinese participants on total target (i.e., recalled previously shown faces across all valence categories) responses.
Figure 12. Differences between dysphoric and non-dysphoric Canadian and Chinese participants on total sad (i.e., target sad and decoy sad responses combined) responses.
Figure 13. Differences between dysphoric and non-dysphoric Canadian and Chinese participants on total decoy (i.e., recalled faces across all valence categories that were not previously shown) responses.
There was a trend towards an interaction effect for decoy sad, $F(1, 193) = 4.16, p = .04, d = 0.29$ (see Figure 10), as non-dysphoric Canadians recalled more decoy sad faces than dysphoric Canadians, whereas dysphoric Chinese recalled more decoy sad faces than their non-dysphoric counterparts (see Table 5).

Additionally, the exploratory MANOVA produced a significant main effect for nationality for total target, $F(1, 191) = 8.99, p = .003, d = 0.43$ (see Figure 11), and total sad, $F(1, 191) = 7.50, p = .007, d = 0.40$ (see Figure 12). There was a trend towards a main effect for nationality for total decoy, $F(1, 191) = 4.93, p = .028, d = 0.32$ (see Figure 13), suggesting that Canadians recalled more target faces and more sad faces than their Chinese counterparts, whereas Chinese participants recalled more decoy faces than their Canadian counterparts (see Table 5). There was also a trend towards a main effect for depression status for total sad recalls, $F(1, 191) = 3.76, p = .05, d = 0.28$ (see Figure 12), suggesting that dysphoric participants recalled more sad faces than their non-dysphoric counterparts (see Table 5).

**Discussion**

The cognitive theory of depression has become the predominant model for the conceptualization and treatment of major depression; however, its applicability across cultures has scarcely been examined. The current investigation examined five core descriptive hypotheses of the cognitive theory of depression in a sample of dysphoric and non-dysphoric Canadian and Chinese individuals. The five descriptive hypotheses were as follows: 1) negativity hypothesis; 2) exclusivity hypothesis; 3) severity/persistence hypothesis; 4) schema activation hypothesis; and 5) selective
processing hypothesis. The results of the study provide support to the cross-national applicability of the cognitive theory of depression in both Canadian and Chinese nations.

**Negativity Hypothesis**

Consistent with predictions, dysphoric Canadian and Chinese participants exhibited significantly more negative self-referent thoughts, as indicated by higher scores on the ATQ-N, than their non-dysphoric counterparts. This result persisted after controlling for age as a covariate, which was found to be negatively associated with major depression and ATQ-N scores. The relationship between age and several outcome variables are discussed below. Further, it is worth mentioning that, although not predicted due to the scant literature on negative self-referent cognitions and culture, there was not a significant difference in ATQ-N scores between individuals from the two national groups in the current study. That is, Canadian and Chinese participants exhibited similar ATQ-N scores across each of the depression status conditions.

The finding that dysphoric individuals endorsed more negative thoughts about the self than non-dysphoric individuals, regardless of nationality, is in accordance with the cognitive theory of depression; more specifically, it validates the negativity hypothesis by demonstrating that major depression is marked by heightened negative self-referential cognitions. This is not surprising given the large body of evidence among Western samples showing that individuals who suffer from major depression tend to have elevated negative thoughts about the self, the world, and the future. For example, the results from the present research are consistent with past results showing that negative thinking as assessed by the ATQ-N significantly reduced as major depression improved for participants in both the treatment (i.e., cognitive therapy in conjunction with
pharmacotherapy) and control conditions (i.e., pharmacotherapy only; Dozois et al., 2009). Such findings are consistent with the major depression literature at large; however, such studies remain limited to Western populations, and accordingly, there is still little support for the negativity hypothesis among Chinese populations. With that said, the present findings are similar to results from a study with Chinese adolescents wherein negative self-referent thoughts were positively related to major depression severity (Cui et al., 2013). The current study extends past research by examining the negativity hypothesis among an adult population. Accordingly, the current investigation makes an important contribution to the literature as it substantiates the negativity hypothesis in both Canadian and Chinese populations.

Interestingly, there were no national differences in the severity of negative self-referent cognitions, although no predictions were made of such a difference given the paucity of this type of cross-national research. Since previous research has consistently shown that East Asian populations have a greater tendency to self-criticize and are more readily accepting of negative appraisals of the self in comparison to Westerners (e.g., Heine et al., 2001; Heine & Hamamura, 2007; Heine & Renshaw, 2002;), it is possible that Chinese participants would endorse more negative thoughts than their Canadian counterpart, regardless of the experience of depressive symptoms. However, although East Asians tend to be more self-critical than Westerners, some research suggest that East Asians do self-enhance in domains that they consider as personally important and that are congruent with their cultural norms. For example, in a past study with Taiwanese participants, participants self-enhanced (i.e., rated the self as more superior than their peers) more on collectivist than individualist attributes (i.e., traits and behaviours;
Gaertner et al., 2008). Similarly, in a prior study, Japanese students self-enhanced more on collectivist than individualistic attributes, whereas American students demonstrated the opposite pattern (Sedikides, Gaertner, & Toguchi, 2003).

An explanation for the non-significant national difference in negative self-referent thoughts may be attributed to nature of the items on the ATQ-N. The heightened tendency for self-effacement as seen in East Asian in comparison to Western cultures is viewed as a way for East Asians to maintain group cohesion and social harmony (Chiu & Hong, 2006); however, majority of the items on the ATQ-N are self-focused (i.e., “There must be something wrong with me.”) with no mention of the self in relation to others. Therefore, Chinese participants may be less inclined to report to having self-referent thoughts as measured by the ATQ-N, as the consequence to endorsing self-referent thoughts do not facilitate benefits to the group. Relatedly, since ATQ-N items reflect extreme negative cognitions about the self, Chinese participants may be reluctant to endorse such extreme views as dialectical cognitions tend to be less polarized (Minkov, 2009). Despite the plausible explanation for the non-significant national difference in negative self-referent thoughts, a more parsimonious explanation may be that the study was insufficiently powered to detect a statistically significant difference between the two national samples due to the small sample size of the Chinese sample.

The present results illustrated that dysphoric participants from both Canada and China exhibited elevated negative thoughts about the self in comparison to their non-dysphoric counterparts. Taken together, the results support the cross-national applicability of the negativity hypothesis of major depression among individuals of Canadian and Chinese descent.
Exclusivity Hypothesis

As predicted, dysphoric participants from both Canada and China exhibited significantly less positive self-referent thoughts, as indicated by lower ATQ-P scores, in comparison to their non-dysphoric counterparts. Further, similar to the pattern for negative thoughts as noted above, there were no main effects for nationality, as Canadian and Chinese participants exhibited similar ATQ-P scores within each of the depression status conditions; though a national difference in ATQ-P scores was not predicted because of the paucity of cross-national research on positive self-referent cognitions.

The present findings are consistent with extant literature (e.g., Beshai et al., 2016; Dozois, 2007; Forsyth et al., 2010) and support the exclusivity hypothesis by demonstrating that positive thoughts about the self are diminished during bouts of major depression. As postulated by Beck (1967) in the exclusivity hypothesis, individuals suffering from major depression may have suppressed activation or consolidation of constructive schemas that are responsible for positive self-referent thoughts (Clark et al., 1999). The exclusivity hypothesis seems to reflect the depression-related positive cognitions of people in both Canada and China, as the hypothesis is supported by the present results that dysphoric participants in both national groups endorsed significantly less self-referent positive thoughts than their non-dysphoric counterparts. Despite the evidence in support of the exclusivity hypothesis among Western samples, the hypothesis has not been fully explored in Chinese populations. While the current findings are consistent with findings obtained by Wong (2012)—the only existing study that substantiates the exclusivity hypothesis in a Chinese sample—which revealed that ATQ-P scores are negatively correlated with major depression as measured by the BDI-
II, the findings also add to the scant literature to support the cross-national validity of the exclusivity hypothesis in both the Canadian and Chinese nations.

Although a national difference in the endorsement of positive self-referent thoughts was not hypothesized, it is noteworthy that Canadians and Chinese participants did not differ in their frequency of positive thoughts as analyses did not reveal a main effect of nationality. This finding is inconsistent with research showing that when compared to members of Western cultures, individuals from Asian cultures have a markedly reduced tendency to report experiencing positive cognitions toward the self (Chentsova-Dutton & Tsai, 2008; Mezulis, Abramson, Hyde, & Hankin, 2004). Moreover, in comparison with members of Western cultures, East Asians have a propensity for self-effacement and reduced self-praise (Chiu & Hong, 2006).

It is possible that the manner in which Chinese participants were asked to rate positive self-referent thoughts may have contributed to the non-significant national difference. A few researchers have found that some individuals are more forthright in reporting personal information when the assessment methodology is a paper-to-pencil format (i.e., self-report questionnaires) as opposed to in-person interviews (Matthey, Barnett & Elliott, 1997). For example, in a study with Asian Americans, participants in the questionnaire condition reported more depressive symptoms than those in the interview condition (Okazaki, 2000). These findings are similar to results obtained in an earlier study in which female Vietnamese participants admitted to endorsing more depressive symptoms on self-report major depression questionnaires than on a clinical diagnostic interview (Matthey et al., 1997). Mental illness is highly stigmatized in East Asian cultures, as people suffering from mental illness are perceived as dangerous and
associated with social disapproval and thereby bringing shame to one’s family (Lauber & Rössler, 2007). As such, reporting depressive symptoms on a self-report questionnaire may be perceived as a way to circumvent the cultural stigmatization of mental illness in East Asian cultures.

Furthermore, findings of past studies indicate a cross-cultural difference in the candidness of emotional information disclosure. For example, compared to members of Western cultures, individuals from Asian cultures are less likely to disclose emotional disturbance to mental health professionals and strangers (Tsui & Schultz, 1985). People from China and other East Asian countries may withhold emotional expression when they are communicating with others, as they may perceive the need to act in accordance with their cultural script favouring emotional suppression; however, these individuals may be more candid in expressing emotions when they are not in direct interaction with another person—such as on a self-report questionnaire. By completing the ATQ-P in private and away from the observation of others, Chinese participants may be able to break away from the cultural expectation to behave in a socially modest manner to preserve interpersonal and group harmony; therefore, more readily admit exhibiting positive cognitions about themselves, regardless of their depression status.

The aforementioned alternative explanations to the non-significant national difference in the endorsement of positive self-referent thoughts are grounded in empirical evidence, but a more parsimonious explanation of the results may be that the small size of the Chinese sample reduced the power to detect possible significant differences between the Canadian and Chinese samples in positive self-referent thoughts. Taken together, the finding that dysphoric Canadians and Chinese exhibited significantly
less positive self-referent thoughts than their non-dysphoric counterparts lends credence to the validity of the exclusivity hypothesis across both nations.

**Severity/Persistence Hypothesis**

The results for the severity/persistence hypothesis were partially consistent with the predictions of the cognitive theory of depression and with findings from previous studies. Specifically, depressive symptoms was meaningfully and significantly related to negative and positive automatic thoughts, and with dysfunctional attitudes among Canadian participants. Only negative and positive automatic thoughts were associated with depressive symptoms in the expected direction among Chinese participants, while dysfunctional attitudes were not associated with depressive symptoms in this sample.

The severity/persistence hypothesis postulates that negative and positive cognitions are linearly related to major depression severity and persistence (Clark et al., 1999). The results that negative and positive self-referent cognitions were correlated with depressive symptoms in both samples validate the hypothesis and corroborate results of earlier studies (e.g., Beshai et al., 2016; Haeffel & Vargas, 2011; Stewart et al., 2004). For example, results from a previous study showed that depressed patients reported less negative self-referent thoughts and dysfunctional attitudes, and more positive self-referent thoughts at the end of successful treatment (i.e., CBT with pharmacotherapy, or pharmacotherapy alone), as evidenced by reductions in depressive symptoms (Dozois et al., 2009). The results from the present study are consistent with previous research on major depression and depression-related cognitions; however, most support for the severity/persistence hypothesis are largely from studies conducted on Western samples. Therefore, findings from the present study offer evidence that the severity/persistence
hypothesis applies to individuals of Chinese descent, and more importantly, provide partial support of this hypothesis of the cognitive theory of depression in China.

As predicted and consistent with the literature, dysfunctional attitudes were meaningfully and significantly correlated with depressive symptoms in the Canadian sample. However, the result that dysfunctional attitudes were not associated with depressive symptoms in the Chinese sample is surprising considering extant findings that suggest otherwise (e.g., Dobson & Shaw, 1986; Kwon & Oei, 2003; Sankar et al., 2015). For example, there is evidence that remitted depressed patients who exhibited more dysfunctional attitudes after a mood prime had a shorter time to relapse than those with less elevated dysfunctional attitudes after the mood prime (Segal et al., 2006). This is in accordance with findings in the literature demonstrating the utility of dysfunctional attitudes in predicting the onset, relapse, and recurrence of major depression (Alloy et al., 2006; Iacoviello, Alloy, Abramson, Whitehouse, & Hogan, 2006; Jarrett et al., 2012). With this said, and as mentioned, most of the research on the relationship of dysfunctional attitudes and major depression has been conducted among Western populations. However, there is some support for this relationship among Chinese samples (e.g., Stewart et al., 2004; Wong, 2008a, Wong, Chan, & Lau, 2010). Inconsistent with past literature, the non-significant results of the present study may suggest that the nomological network of major depression may be different across cultures, with particular deviation in dysfunctional attitudes. However, this alternative explanation may be moot given the small sample size of the Chinese group.

Although the relationship between dysfunctional attitudes and depressive symptoms appeared to differ between the Canadian and Chinese participants in this
study, the finding that the strengths of the correlations were comparable between the two national samples suggest that negative and positive thoughts about the self, as well as dysfunctional attitudes are present in the experience of major depression of people in both Canada and China. However, results may also indicate that dysfunctional attitudes may not be related to the depressive experience of people in China in the same way dysfunctional attitudes are exhibited among people of Western cultures who have elevated symptoms of major depression. Taken together, these findings are partially supportive of the cross-national applicability of the severity/persistence hypothesis among Chinese and Canadians.

**Schema Activation Hypothesis**

As hypothesized, dysphoric individuals from both nations exhibited significantly more dysfunctional attitudes than their non-dysphoric counterparts. There was also a cross-national difference in the endorsement of dysfunctional attitudes, such that Chinese participants reported more dysfunctional attitudes than Canadians overall, regardless of depression status. Additionally, there was an interaction effect between nationality and depression status, as non-dysphoric Chinese participants endorsed more dysfunctional attitudes than both dysphoric and non-dysphoric Canadians. These results persisted after controlling for age, which was found to negatively correlate with scores on the DAS-24.

The schema activation hypothesis postulates that increased accessibility to negative schemas underlies major depression (Clark et al., 1999). According to the cognitive theory of depression, negative schemas are conceptually deeper cognitive structures than dysfunctional attitudes. As such, dysfunctional attitudes are examined as a proxy for the severity of negative schemas. The results from both Canadian and
Chinese samples provide evidence for the schema activation hypothesis and are consistent with findings among Western samples showing that depressed individuals often exhibit elevated dysfunctional attitudes compared to their non-depressed counterparts (e.g., Beshai et al., 2015; Halvorsen, Wang, Eisemann, & Waterloo, 2010; Otto et al., 2007). The depressive experience makes it easier for depressed individuals to access negative schemas, thereby bringing negative thoughts about the self, the world, and the future into the forefront of information processing.

There was a significant main effect for nationality in the endorsement of dysfunctional attitudes, as Chinese participants reported more dysfunctional attitudes than their Canadian counterparts. More surprisingly, non-dysphoric Chinese participants endorsed more dysfunctional attitudes than both non-dysphoric and dysphoric Canadians. Although these results were unexpected, they are in line with extant findings from cross-cultural research on self-enhancement (for a review, see Heine & Hamamura, 2007). Specifically, members of East Asian cultures tend to be more self-critical than members of Western cultures (e.g., Hein & Renshaw, 2002; Heine & Hamamura, 2007). The tendency for Chinese people to view themselves more critically than Canadians may lead them to harbour more negative self-referent cognitions and attitudes.

Relatedly, the finding of a national difference in dysfunctional attitudes may be explained by Chinese participants’ propensity to endorse dysfunctional attitudes on the DAS-24, as the scale items are congruent with collectivist values. Many of the scale items pertain to the domains of social performance and perceived interpersonal relations (e.g., “If I do not do well all the time, people will not respect me.”). Thus, the endorsement of dysfunctional attitudes on the DAS-24 may be an indication that Chinese
participants were identifying with culturally-valued attributes, rather than endorsing dysfunctional attitudes that are theorized to meaningfully relate to major depression. If Chinese participants perceived the questions on the DAS-24 as congruent with cultural norms, then the endorsement of dysfunctional attitudes may not have as much of an adverse effect on their psychological health. This point is supported by the aforementioned non-significant correlation between DAS-24 scores and depressive symptoms in the Chinese sample.

Another possible explanation for the national difference in harbouring dysfunctional attitudes may be derived from the research on perfectionism. Specifically, there is evidence that members of Asian cultures hold more perfectionistic tendencies than members from other cultures (Peng & Wright, 1994). For example, previous research reveals that Asian Americans worry more frequently across many domains, are more concerned about making mistakes, and have greater self-doubt than European Americans (Castro & Rice, 2003; Chang, 1998; Scott, Eng, & Heimberg, 2002). Moreover, researchers have argued that perfectionists are often excessively critical about themselves (Frost, Marten, Lahart, & Rosenblate, 1990). The inclination for members of Asian cultures to demonstrate perfectionistic tendencies may account for the elevated endorsement of dysfunctional attitudes in the present Chinese sample, as the questions on the DAS-24 reflect beliefs across the domains of achievement, dependency, and self-control.

The present results support the cross-national validity of the schema activation hypothesis by demonstrating that major depression is characterized by increased accessibility to depressogenic schemas, as illustrated by a higher endorsement of
dysfunctional attitudes in both national groups. Additional findings revealed that Chinese participants harboured more dysfunctional attitudes than Canadians, regardless of depression status, which may be attributed to the sociocultural environment of China.

**Selective Processing Hypothesis**

According to the selective processing hypothesis of the cognitive theory of depression, depressed individuals typically demonstrate a mood-congruent bias when processing information. The present results partially support the selective processing hypothesis, as dysphoric participants recognized more target sad (i.e., sad faces that were previously shown during the familiarization phase) faces than their non-dysphoric counterparts, regardless of nationality; however, this result was marginally significant, therefore should be interpreted with caution. The finding is consistent with previous research showing that depressed individuals demonstrated better memory recall for information congruent with their depressive experience (e.g., Mathews & MacLeod, 2005; Ridout et al., 2003). In a past study, for example, depressed participants recalled significantly less neutral and marginally less positive words in comparison to the recall of negative words (Jermann et al., 2009). The present results also revealed that non-dysphoric individuals, regardless of nationality, recalled more decoy neutral (i.e., neutral faces that were not shown during the familiarization phase) faces than their dysphoric counterparts. Additionally, there was a significant interaction effect, as non-dysphoric Canadians had higher recall of decoy sad faces than dysphoric Canadians, whereas this pattern is reversed for the Chinese sample, as dysphoric Chinese had higher recall of decoy sad faces than non-dysphoric Chinese. However, all of the abovementioned results
were only marginally significant. Nevertheless, the results are still worthy of a discussion given that they are approaching statistical significance.

Additionally, inconsistent with the hypotheses and results from earlier research (e.g., Matt et al., 1992, Ridout et al., 2003), non-dysphoric individuals did not recall more target happy faces compared to their dysphoric counterparts. Lastly, the exploratory analysis revealed that Canadians recalled more total target and total sad stimuli than their Chinese counterparts. Furthermore, dysphoric participants recalled more total sad stimuli than their non-dysphoric counterparts; however, again, this result was approaching statistical significance.

The finding of a mood-congruent bias for negative faces in major depression is not surprising, given similar extant results from research conducted among Western samples suggesting a dysfunctional cognitive processing for memory in the experience of major depression; only few studies to date have been conducted that examine depression-related selective processing among Chinese participants. The trend that dysphoric participants in this study demonstrated higher recall for target sad faces than their non-dysphoric counterparts is inconsistent with findings by Yeh and Hua (2009) but support the selective processing hypothesis among the Chinese. According to the cognitive theory of depression, depressed individuals are less able to inhibit the processing of negative information due to the activation of depressogenic schemas (Beck, 1976). Such impaired cognitive processing affects various stages of processing, including attention, encoding, interpretation, and retrieval of information. Therefore, as supported by the present results, dysphoric participants may have a heightened attention to—which may lead to better recall of—mood-congruent information.
Additional results from this study are also inconsistent with those reported by Yeh and Hua (2009), wherein depressed individuals in their study reported more decoy negatives and decoy positives (i.e., recalled negative and positive items that were not previously shown in the learning phase) than the non-depressed controls. Dysphoric and non-dysphoric individuals in the present study did not differ in the recall of decoy sad or decoy happy faces (i.e., sad or happy faces that were not previously shown), but they differed in the recall of decoy neutral faces, as non-dysphoric individuals recalled more decoy neutral faces than did their dysphoric counterparts. However, despite these results, the interaction effect found in this study partially replicates the results obtained by Yeh and Hua (2009), as dysphoric individuals demonstrated higher recall of decoy sad faces than their non-dysphoric counterparts only in the Chinese sample but not in the Canadian sample. Such a pattern of results may indicate that Canadians and Chinese process emotional information differently.

Although no a priori predictions regarding a national difference were made because of the sparsity of research in this area, the results did reveal that participants from Canada and China differed in the recognition of emotional facial expressions. Specifically, Canadians demonstrated higher recall of target sad, target happy, and target neutral faces than their Chinese counterparts. On the contrary, Chinese participants demonstrated higher recall of decoy happy and decoy neutral faces than their Canadian counterparts. These findings are corroborated by the results of the exploratory analysis, as Canadians demonstrated higher recall of previously shown stimuli. Although the finding of a national difference in the recognition of various facial expressions is not directly related to the selective processing hypothesis, the results may shed light on how
Canadians and Chinese differ in the processing of emotional information which may in turn explain any possible cross-national differences in the experience of major depression.

Results of the present study suggest that Canadians may have a more accurate and constrained memory for emotional facial expressions, as they demonstrated more target recall of faces in all three valence categories. One explanation may be related to cross-cultural differences in the processing of emotional information. Researchers have posited that there is a cultural variation in the interpretation of facial expressions, with less cultural convergence on the labelling of certain expressions than others (Haidt & Keltner, 1999). However, it is noteworthy that the similarities across cultures are still considerable despite the apparent differences (Masuda et al., 2008).

A key factor for the cultural variation is the context in which the emotions are expressed, for instance, whether in a social, situation, or isolated context. A large literature base indicates that contextual factors affect members of Western and East Asian cultures differently (e.g. Kitayama, Duffy, Kawamura, & Larsen, 2003; Nisbett, 2003; Nisbett, Peng, Choi, & Norenzayan, & 2001). Westerners tend to isolate an object from its context, while East Asians will perceive an object in relation to its context (Masuda et al., 2008; Nisbett, 2003). In the present study, the context of the stimuli used in the memory task may have contributed to the national differences in the target and decoy recall of facial expressions. Namely, all of the faces were portrayed by an actor against a completely bare background, therefore devoid of any social or situation information or cues. This missing piece of information may be detrimental to the Chinese sample, as it may be more difficult for Chinese participants to process the
emotional content of the faces without any context. Since Westerners are better at tasks requiring them to separate an object from its context (e.g., Ji, Peng, & Nisbett, 2000; Kitayama et al., 2003), the stimuli used in the memory task may be advantageous to the Canadian sample as the faces were already isolated, making the emotional information easier to process for the Canadians relative to the Chinese participants. Relatedly, members of particularist cultures such as China, unlike those of universalist cultures, make judgements based on the context of a situation rather than on absolute rules (Trompenaars & Hampden-Turner, 2011). Therefore, it is possible that the emphasis on context may have inhibited the recall of isolated faces by the Chinese participants as the stimuli used were devoid of any contextual information. By contrast, universalist cultures like Canada emphasize objectivity and detachment in situations by setting aside feelings and emotions (Trompenaars & Hampden-Turner, 2011). Canadian participants in this study may have demonstrated greater accuracy in emotions recognition as the stimuli were context-free that may have otherwise hindered objectivity, as is evidenced by the results that Canadian participants recalled more target faces across all three emotional categories than their Chinese counterparts.

A secondary explanation for the more accurate recall performance by the Canadians may be related to the ethnic backgrounds of the actors portraying the emotional faces. Since Canada is a more heterogeneous country than China in terms of ethnic diversity (Fearon, 2003), Canadian participants would have had greater exposure to, and thus may be more familiar with the actors’ ethnic backgrounds. Previous findings indicate that the accuracy of facial recognition improves when the respondent is familiar with the actor’s ethnicity (for a review, see Elfenbein & Ambady, 2002). As such,
Canadian participants’ familiarity of the actors’ ethnic backgrounds may have contributed to their more accurate recall performance relative to the performance of Chinese participants.

Past research investigating a mood-congruent bias in the processing of emotional materials among sufferers of major depression have produced mixed results. In the present study, although the finding that dysphoric individuals in both national samples recalled more target sad faces than their non-dysphoric counterparts were only approaching statistical significance, it is nevertheless supportive of the selective processing hypothesis which posits that depressed individuals have a mood-congruent bias when processing information. In addition, the findings from the present study also highlight potential national differences in the processing of emotional information between Canadians and the Chinese, with differences possibly attributable to contextual factors.

**Relationship of Age with CES-D, ATQ-N, and DAS-24.**

Age was a significant covariate for the CES-D, ATQ-N, and DAS-24, as younger participants reported more depressive symptoms, negative self-referent thoughts, and dysfunctional attitudes than older participants. Dysphoric participants were also younger than the non-dysphoric participants in this study. It is worth noting that when age was controlled as a covariate, the univariate results for the negativity hypothesis and the schema activation hypothesis remained significant. As such, the results suggest that age, although may be associated with depressive symptoms, may not influence the relationship of negative self-referent cognitions and dysfunctional attitudes in the experience of major depression.
The finding that age is related to major depression is consistent with former findings that major depression is more prevalent in younger than older people (Blazer & Hybels, 2005; Kessler et al., 2010; Weissman, Bruce, Leaf, Florio, & Holzer; 1991). Researchers have posited that young individuals are burdened with cohort related stressors such as having to look for a stable career having recently graduated from post-secondary, financial instability due to minuscule savings or personal earnings, and romantic relationship difficulties. While middle-age adults have more financial and career stability, and are more likely to be in a committed relationship and/or marriage (Mirowsky & Ross, 1992). These proposed cohort-related stressors may be the common experience of young individuals across all cultures, as is demonstrated by the present results that age is related to depressive symptoms in both national samples. The experience of these stressors may foster depressogenic thinking patterns, such as negative self-referent thoughts and dysfunctional attitudes, as well as increased mood distress.

Theoretical Implications

The current investigation sought to expand current knowledge regarding the cross-national validity of the cognitive theory of depression by examining five descriptive hypotheses (negativity hypothesis, exclusivity hypothesis, severity/persistence hypothesis, schema activation hypothesis, and selective processing hypothesis) among individuals from Canada and China evidencing different degrees of depressive symptoms. All five descriptive hypotheses were supported in the Canadian sample, whereas four of the five hypotheses were supported in the Chinese sample with the severity/persistence hypothesis partially supported in this sample. A robust finding in
the cross-cultural literature indicates that members from Western and East Asian cultures process information differently due to variations in their respective cultural scripts and norms (Masuda & Nisbett, 2001; Nisbett & Masuda, 2003; Norenzayan et al., 2007; Oyserman & Lee, 2008; Varnum et al., 2010); however, the results from this study suggest that self-referent negative and positive thoughts are still related to the depressive experience of both Canadians and Chinese people, despite cross-national differences in cognitive processing. As alluded to earlier, there are distinct differences in the self-systems of individuals from collectivist and individualist cultures, or as seen in high- and low-context cultures, which may be attributed to variations in cultural scripts. For example, the propensity for self-effacement and the constraint on self-praise is a tactful culture-bound behaviour to facilitate social harmony and minimize interpersonal conflict within collectivist societies (Chiu & Hong, 2006). The present findings suggest that, although cultural scripts dictate the behaviours and cognitive processes of members belonging to that respective culture, some of the cognitive experiences of major depression remain similar between individuals from Canada and China.

The present results also suggest that the effects of depressogenic schemas—as identified by the presence of dysfunctional attitudes—on the depressive experience may differ between individuals from Canada and China. As discussed previously, the differential effects of negative schemas in major depression may suggest that the nomological network of major depression vary across these two cultures, which may be related to how major depression is differentially expressed by Chinese and Canadians—as members of Chinese and other East Asian cultures tend to report somatic as opposed to cognitive symptoms, whereas this pattern is reversed for people from Western cultures
(Ryder & Chentsova-Dutton, 2012). As such, unlike the Chinese or East Asian profile of major depression, the “Western” symptomatic profile is more demonstrative of the fundamental hypotheses of the cognitive theory of depression.

Taken together, the current research provides substantial evidence that the cognitive theory of depression is not exclusive to Western cultures, but that it could be taken as a valid and useful model across a wider range of cultures, with present evidence supporting the theory’s applicability among individuals of Chinese descent. Although the findings from this investigation present a novel cross-national perspective to one of the most highly supported and prevailing theories of major depression in Western psychology, the findings should not be taken to presume that the theory is truly universally applicable. Each culture has its own distinctive norms and values, as well as a set of cultural scripts that guide the interpretations of, for example, experiences, behaviours, emotions, and cognitions (Leu et al., 2010; Miyamoto & Ma, 2011; Ryder et al., 2011; Ryder et al., 2012). Even though the present findings support the cognitive theory of depression among the current sample of Canadian and Chinese individuals, the cultural scripts from other regions of the world may differentially affect the outcomes of the various hypotheses and constructs examined in this study, as well as others outlined in the theory; however, that is not to undermine the importance of this research, as the current investigation addressed a gap in the literature on the cross-cultural applicability of the cognitive theory of depression, and it also presents a valuable roadmap for the possibilities of future cross-cultural research in this area.

**Strengths and Limitations**
The current investigation is, to our knowledge, one of the first cross-national studies to directly compare the validity of the cognitive theory of depression between a Canadian and a Chinese sample. Not only do the present findings support the cross-national validity of the cognitive theory of depression, but this research addressed the gap in the literature, and provides important insights on the experience of major depression among Chinese individuals.

There are several notable strengths of the study that relate to the study design and methodology. First, I successfully recruited participants across a wide range of demographic characteristics. The diversity in participant demographics not only signifies that the results are representative of a larger population, it also indicates that the findings may be generalized across various segments of the population. This is especially important in major depression research as major depression does not discriminate, for example, by age, culture, nationality, sexual orientation, or education level—it is a deleterious condition affecting diverse segments of the population worldwide. With that said, however, it is noteworthy that the small sample size of the Chinese group and the comparatively larger sample size of the Canadian group are not entirely representative of the population of the respective countries. Furthermore, to be able to participate in this study, participants were required to be literate, able to afford the use of an electronic device, have access to the internet, and have the cognitive and motor ability to navigate through CrowdFlower and Qualtrics. Such requirements automatically differentiate participants of this study from others who are unable to and/or do not fulfill the requirements. As such, the results may only be representative of the people who are similar to the current study sample. However, having a sample that is completely
representative of the entire population may be a mere chimera in social science research, especially in cross-cultural research; therefore, the findings from this study is important as the study may establish the groundwork for additional research on major depression in other countries that may address issues that are common in other segments of the population.

Another strength of the methodology is the online crowdsourced nature of the study which allowed for a quick recruitment of a large sample size for the Canadian sample, relative to other methods. However, as suggested by past researchers, such efficient recruitment and completion of study by participants may compromise the quality of the data and ultimately the validity of study results (e.g., Aust et al., 2013; Peer et al., 2013; Peer et al., 2017). As such, following the practices of recent studies (e.g., Downs et al., 2014; Paolacci et al., 2010; Peer et al., 2017), two ACQs were implemented as a quality control of the data, which is another strength of the study design. In the present study, I implemented a lenient criterion wherein the data was retained if participants passed at least one ACQ. The decision to set a lenient as opposed to a stricter (e.g., excluding participants who failed at least one ACQ) criterion was to ensure an adequate sample size that was amply powered to test the a priori hypotheses. The previous study examining crowdsourced data revealed that implementing a strict exclusion policy eliminated the total sample size by up to 73% (Peer et al., 2017); however, having a lax criterion may mean that participants who were actually frivolously responding may have not been flagged, therefore jeopardizing the validity of the data obtained. Despite the potential for unreliable data from inattentive participants, researchers still support the use of crowdsourcing platforms for scientific research, as
crowdsourced participants tend to be more demographically diverse than the student samples commonly utilized in psychological research (Sheehan, 2018). More importantly, there is increasing evidence that crowdsourced data is as valid as data collected from alternative methods, as long as appropriate practices are in place to combat potential pitfalls, similar to the ones described above (Crump, McDonnell, & Gureckis, 2013; Majima, Nishiyama, Nishihara, & Hata, 2017; Paolacci & Chandler, 2014; Sheehan, 2018).

Another strength of the study design relates to the use of popular self-report measures that are empirically supported and have established psychometric properties in both national samples. The use of popular measures in the Chinese sample ensures that any novel findings in this population can be directly compared to extant findings in the literature among Western samples to elucidate potential cross-national differences and/or similarities. Moreover, these measures, along with all other study instruments (e.g., consent, demographics, and debriefing forms), were translated from English to Chinese in accordance to the rigorous guidelines established by WHO (2007) to preserve the authenticity of the original forms in the translated versions. Despite the strength of using translated versions of the original scales in the Chinese sample, I was not able to complete confirmatory factor analyses (CFA) and multi-group confirmatory factor analyses (MCFA) due to sample size limitations. When comparing diverse groups (e.g., national groups), an instrument should measure the same construct in the same way across the groups to be able to make meaningful comparisons. Since neither CFA and MCFA were conducted, any significant group differences found between Canadians and Chinese individuals may be contaminated by psychometric issues. With that said,
concerns regarding the interpretation of scales’ constructs across the two national groups were minimized due to the thorough effort that went into the translation process.

Additionally, the similarity of the reliability statistics (i.e., Cronbach’s alpha values) between the English and Chinese versions of the self-report scales suggest that the scales measured similar, if not the same, constructs across both national groups.

A related limitation is that all of the self-report measures used in this study were developed in Western societies, thereby raising concerns about whether the measures are appropriate to use on participants from China, since Western attitudes and norms may permeate the scale items. Unfortunately, there are limited empirically supported and psychometrically sound Chinese-based self-report measures available, hence the reliance on measures developed in Western societies for the purposes of this research. However, most of the measures used in the study have demonstrated strong psychometric properties among Western and non-Western populations, including various Chinese samples.

Additionally, it is noteworthy that the use of self-report measures instead of interview in may have impacted the outcomes of the study. There is evidence that East Asians are more candid in admitting to mental health problems on questionnaires as opposed to in-person interviews—where these individuals may underreport psychopathology and therefore the scores on interviews may be lower than their true presentation (e.g., Matthey et al., 1997). As such, using self-report measures may be a more appropriate and effective method to assess for depressive symptoms and depression-related thoughts as actually experienced by individuals of Chinese and East Asian descent.
Another strength of the current design is the use of multiethnic stimuli for the memory task. The use of multiethnic stimuli in this study may have mitigated any potential confounding effects from participants being familiar with the ethnicity of the actors portraying the expressions, as past research indicates that the accuracy of emotion recognition improves when emotions are portrayed and identified by members of the same ethnic or national group (for a review, see Elfenbein & Ambady, 2002). Thus, national differences found in the memory task may be more confidently attributed to actual between-group differences, as opposed to confounding effects related to national or cultural identification. With that said, the diversity of the actors in the stimuli may have benefitted Canadians more than the Chinese participants, as discussed earlier, which may be a potential confounding variable and another limitation of the methodology.

Despite the abovementioned strengths, there were several noteworthy statistical limitations. The normality check highlighted concerns with the skewness and kurtosis of the distribution, as results indicated a deviation from normality. This deviation may be explained by the uneven sample size between the Canadian and Chinese samples as there are more Canadians than Chinese participants, and more depressed than non-depressed participants in the Canadian sample. The uneven sample size may also explain the significant Levene’s test statistics. However, given that the MANOVA is fairly robust against violations of assumptions (O’Brien & Kaiser, 1985; Tabachnick & Fidell, 2007), and the appropriate statistics were considered (i.e., reporting Pillai’s trace instead of Wilks’ lambda), a non-parametric test may not be necessary to rectify the violations, and thus, the present results should still be reliable, but interpreted with caution. Relatedly,
although significant group differences were found for most primary outcomes, unequal sample sizes may have resulted in the overall loss of power. As such, non-significant cross-national differences may be due to a lack of power to detect any main or interaction effects of nationality.

Another limitation of the study is the reliance on PHQ-9 cut-off scores to determine depression status. Questionnaires tend to have a weaker sensitivity and specificity than the gold-standard structured diagnostic interviews, such as the Structured Clinical Interview for the DSM-5 (SCID-5; American Psychiatric Association, 2015), in detecting psychiatric disorders. Some researchers (e.g., Kandall, Cantwell, & Kazdin, 1989) have recommended a multiple stage approach in assessing major depression. This approach first involves the use of a screening tool, such as a self-report questionnaire, to identify cases that meet diagnostic criteria according to cut-off scores. Cases that exceed the cut-off criteria will then undergo a more extensive round of assessments that includes a second administration of the self-report questionnaire along with a structured clinical interview to determine psychiatric diagnosis (Timbremont, Braet, & Dreessen, 2004). In the present study, since PHQ-9 cut-offs were only used to distinguish between the dysphoric and non-dysphoric groups as opposed to establishing a clinical diagnosis of major depression, therefore the use of PHQ-9 scores are appropriate for the purposes of this study.

Additionally, since self-report measures were used in this study to examine symptoms of major depression, it is difficult to draw conclusions about clinical major depression based on self-report measures. As such, clinicians should be warned against implementing or adjusting treatment based on the present results without corroborative
evidence from alternative research methods, including clinical interviews. With that said, however, all study measures have demonstrated good psychometric properties in past research, thus their use among this sample of participants from Canada and China, as well as for the purposes of this study are well-justified.

**Future Directions**

As the current investigation is one of the few studies examining the cross-national validity of the cognitive theory of depression among people from Canada and China, it is apparent that more research is needed to explore this line of research, especially with other Western and non-Western populations. Cross-cultural research is not only important to the scientific community, but the findings can also have substantial contributions to the clinical practice. It is increasingly evident that cognitions play a fundamental role in major depression across cultures (Tsai & Chentsova-Dutton, 2002). Moreover, the negative effects of maladaptive or dysfunctional cognitive patterns can transcend cultural boundaries to influence the depressive experience of a wide range of populations. By understanding the mechanisms of major depression through empirical research, clinicians may be better able to adjust existing treatments to more appropriately fit the cultural contexts of sufferers of major depression.

Most findings from the present investigation provide strong support to the cognitive theory of depression; however, contrary to predictions, the current study did not find a significant association between dysfunctional attitudes and depressive symptoms in the Chinese sample, which may be attributed to the small sample size employed in this study. This is unexpected since a central premise of the cognitive theory of depression is that depressogenic schemas, as measured by dysfunctional
attitudes, play a central role in the experience of major depression. More efforts should be devoted to elucidating the role of dysfunctional attitudes and depressogenic schemas in the depressive experience of individuals of Chinese descent. Researchers may also benefit from using larger samples that are sufficiently powered to detect possible significant effects in a Chinese sample.

Additionally, the possible advantage for Canadian participants from utilizing stimuli devoid of context for the facial memory task in this study should also be remediated in future studies to further bolster support for the selective processing hypothesis. Future research may wish to use stimuli both with faces against an isolated background as well as faces appearing within context. Employing such a methodology will allow researchers to isolate the potential extraneous effect of cultural orientation (i.e., individualism versus collectivism) on depression-related cognitive bias. That is, if the results indicate a main effect for nationality, such that participants from one country demonstrated higher recall of target faces in both sets of stimuli, researchers may be more confident in ruling out the extraneous effect of cultural orientation, thereby lending more support to the selective processing hypothesis.

Given that the results of this study partially support the negativity hypothesis and exclusivity hypothesis, wherein dysphoric individuals in both countries exhibited more negative, but less positive cognitions about the self compared to their non-dysphoric counterparts, researchers should extend these findings by examining thoughts about the world and the future. Since I examined the theoretical underpinnings of major depression in the present investigation, future researchers could also extend this study by examining major depression treatment based on the cognitive theory of depression (i.e., CBT) and
its mechanism in a Chinese sample to promote cultural competence in the treatment of major depression among individuals of Chinese descent.

Additionally, future research could further investigate how the increasingly evolving cultural context of China may impact the cognitive processes of people living in China and how that in turn may influence their major depressive experience. Researchers have indicated that the consequence of China’s ideological transformation is evident in the shift towards an individualistic orientation from the longstanding collectivistic orientation that China is known to embody (Steele & Lynch, 2013). China’s shift towards individualism may change the interpretations of the findings of the current investigation. For example, the Chinese sample’s elevated dysfunctional attitudes may not be due to the participants’ identification on items that reflect collectivist values, but rather an actual endorsement of dysfunctional attitudes as traditionally conceptualized to meaningfully relate to major depression. Such an interpretation may bolster the argument that the nomological network of major depression, namely the relationship with dysfunctional attitudes may be systematically different between individuals in Canada and China.

**Conclusion**

The current investigation examined the cross-national applicability of the cognitive theory of depression, namely, the validity of five fundamental descriptive hypotheses derived from the theory among individuals from Canada and China. Overall, the present findings are largely supportive of the application of the cognitive theory of depression for individuals with heightened depressive symptoms in both countries. In line with predictions and past research, dysphoric participants in both national samples
exhibited more negative self-referent thoughts and dysfunctional attitudes, and less positive cognitions about the self than their non-dysphoric counterparts. Furthermore, all of the cognitive constructs examined were significantly and meaningfully related to depressive symptoms among the Canadian sample. Additionally, there was a trend suggesting that dysphoric participants from both national samples demonstrated a mood-congruent bias in the recall of target sad faces over their non-dysphoric counterparts, which is consistent with the premise of the selective processing hypothesis that depressed individuals have a selective bias for mood-congruent information (Clark et al., 1999).

Despite the abovementioned evidence in support of the cognitive theory of depression, the results failed to demonstrate a significant relationship between dysfunctional attitudes and depressive symptoms in the Chinese sample. The non-significant result may be attributed to the small Chinese sample and therefore insufficiently powered to detect any significant effects, as the result is contrary to the robust finding from research among Western and some Chinese populations showing that dysfunctional attitudes is associated with major depression severity and persistence.

Predictions regarding national differences were not initially forwarded due to the sparsity of this kind of research in the extant literature. However, the current study revealed significant national variations in several primary outcomes. First, participants in China endorsed more dysfunctional attitudes than their Canadian counterparts. Second, and relatedly, non-dysphoric Chinese participants endorsed more dysfunctional attitudes than both dysphoric and non-dysphoric Canadians. Third, Canadian participants recalled more target sad, target happy, and target neutral faces than their Chinese counterparts,
whereas Chinese participants recalled more decoy happy and decoy neutral faces than Canadians. Relatedly, Canadians also recalled more target faces across all three emotional categories, while Chinese participants recalled more decoy faces across the categories. Despite these national differences, there were also national similarities. Particularly, the strengths of the correlations between the cognitive concomitants of major depression and depressive symptoms were similar between Canadian and Chinese participants.

Results related to national differences and similarities are not directly related to the fundamental descriptive hypotheses of the cognitive theory of depression, but the findings offer insight into how Canadians and Chinese people differ in the processing of certain cognitive information, and in turn, influence the experience of major depression among individuals of Canadian and Chinese descent. Since major depression is a leading cause of disability globally, cross-cultural research on major depression that has potential implications on the treatment of this deleterious disorder is pivotal.


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Kleinman, A. (1986). *Social origins of distress and disease: Depression, neurasthenia,*


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Smarr, K. L., & Keefer, A. L. (2011). Measures of depression and depressive symptoms: Beck Depression Inventory-II (BDI-II), Center for Epidemiologic Studies Depression Scale (CES-D), Geriatric Depression Scale (GDS), Hospital Anxiety and Depression Scale (HADS), and Patient Health Questionnaire-9 (PHQ-9). *Arthritis Care & Research*, 63(S11).


Appendix A

CONSENT FORM

Project Title: Understanding the Relationship between Thoughts and Mood Across Two Cultures

Researchers: Mabel Yu, B.A. (Hons) Shadi Beshai, Ph.D.
Master’s Student Assistant Professor
Department of Psychology Department of Psychology
University of Regina University of Regina

Contact Info: (306) 585-4459 or (306) 585-4026 or yu422@uregina.ca shadi.beshai@uregina.ca

Purpose and Objective(s) of the Research:
The purpose of the research is to compare the relationships of thoughts and mood across two cultures. This study has clinical implications such that by understanding how particular thinking patterns may affect mood, clinicians can adjust treatments accordingly.

Procedures:
Your role as a participant in the study will include the following tasks:
• You will be asked to complete several questionnaires about how you feel, how you think and act towards yourself and others in certain situations, your day-to-day experiences, and your demographics information (e.g., gender, age, nationality, country of birth, languages spoken, etc.).
• Complete a memory task that involve memorizing images containing different facial expressions (i.e., happy, sad, neutral)
The study will take approximately 30-45 minutes. Please do not hesitate to contact the researchers with questions you may have regarding any part of the study, including procedures and goals of the study, as well as your role as a participant.

Potential Benefits and Risks:
The anticipated benefits include the advancement of scientific knowledge regarding how the interplay between mood and thoughts may differ across cultures. Additionally, the knowledge may be used in the implementation of psychotherapy or treatments targeted to mood problems for individuals of different cultural backgrounds.

There is low risk of emotional or psychological discomfort as a result of completing questions about your personal life and health. You are encouraged to answer only those questions that you feel comfortable with and may skip questions without penalty. You will also be provided with information and resources about depression.
The online survey is being administered by Qualtrics© and CrowdFlower© American software companies. As such, your responses are subject to U.S. laws, including the USA Patriot Act. For example, law enforcement agencies have the right to access any data they feel may be suspicious or indicative of unlawful activities.

**Compensation:**
You will be compensated $1.25 USD for your participation in the study.

**Exclusion Criteria:**
By participating in this study, you are acknowledging that you are at least 18 years of age and can read and communicate effectively in English/Chinese.

**Confidentiality:**
All materials and documentation pertaining to the current research will be securely stored on password protected computer and laptops. Only persons authorized (i.e., primary researchers, research assistants) will have access to the data and materials of this study. The findings from this research will be published and disseminated at academic conferences in aggregate format; therefore, it will not be possible to identify individuals. Furthermore, no identifying information will be collected. Please delete the session cookies at the end of the study.

**Right to Withdraw:**
Your participation is voluntary and you may withdraw from the study at any time without penalty or loss of benefits (i.e., monetary compensation) to which you are entitled. You may wish to withdraw from the study by exiting the web browser and deleting session cookies. Responses that have not been submitted will not be saved (and is thus withdrawn); however, once the responses have been submitted, it would not be possible to remove your data from the aggregate due to the anonymity of the data.

Should you wish to withdraw, your data will be deleted and will excluded from analyses on the condition that your responses have not been submitted. Given the anonymity of the data, it would not be possible to isolate your data or remove them from the aggregate after you have submitted your responses. You may wish to withdraw from the study by exiting the web browser and deleting session cookies. Furthermore, you may skip questions and only answer those that you feel comfortable providing a response for.

**Follow-Up:**
If you are interested in the results of the study, please visit the following link after the commencement of the project (estimated date: December, 2018):
https://www.researchgate.net/profile/Mabel_Yu

**Questions or Concerns:**
Should you have questions or concerns about your participation in the study, please contact the researcher(s) using the contact information provided (see above).
This project has been approved on ethical grounds by the University of Regina Research Ethics Board on December 1, 2017 (REB#: 2017-178). Any questions regarding your rights as a participant may be addressed to the committee at (306-585-4775 or research.ethics@uregina.ca). Out of town participants may call collect.

CONSENT:
☐ By checking the box, you indicate that you have read and understand the description provided on this form; You consent to participate in the research project.

Please print off a copy of this consent form for your records.
Appendix B

DEMOGRAPHICS FORM

Today’s Date (DD/MM/YYYY): _______________________

What is your gender? (Check box) Male □ Female □ Gender Neutral □ Other □ (please specify) _________

Age? _____

With which ethnic group/category do you identify? (Check the appropriate box):

White/Caucasian---- □
Asian----------------- □
Aboriginal----------- □: Please indicate if First Nations, Inuit or Métis: ______________
Black--------------- □
Other----------------- □: Please indicate: ______________

What is your place of birth (Check Box):

Canada----- □ Please specify city: ______________
China------- □ Please specify city: ______________
Other------- □ Please indicate: ______________

What is your mother’s place of birth (Check Box):

Canada----- □ Please specify city: ______________
China------- □ Please specify city: ______________
Other------- □ Please indicate: ______________

What is your father’s place of birth (Check Box):

Canada----- □ Please specify city: ______________
China------- □ Please specify city: ______________
Other------- □ Please indicate: ______________

What was your first language? (Check Box):

English----- □
Chinese----- □ Please specify Mandarin or Cantonese: ______________
Other------- □ Please indicate: ______________

What is your primary language?

English----- □
Chinese----- □ Please specify Mandarin or Cantonese: ______________
Other------- □ Please indicate: ______________
What is your proficiency in your primary language? (0 – not proficient at all; 10 – extremely proficient) ______

What language is primarily spoken in your family’s home?
English-----
Chinese-----
Other------ Please indicate: ______________

What is your marital status? (Check Box):
Single, never married -------
Married ---------------------
Separated/Divorced --------
Widowed -------------------

What is your approximate yearly income? (Check Box):
I’m unemployed/No yearly income ----
10,000 – 30,000 -------------------
30,000 – 50,000 -------------------
50,000- 75,000 -------------------
75,000 and over -------------------
None of the above ---------------- Please indicate: ________________

What is the highest level of education you received? (check off highest level only):
No degree, certificate or diploma ------------------------------------
If so, please indicate the last grade you completed: ______
Secondary (high) school graduation certificate or equivalent ------
Trades certificate or diploma ---------------------------------------
Other non-university certificate or diploma -------------------------
University certificate or diploma below bachelor level ------------
Bachelor’s degree --------------------------------------------------
University certificate or diploma above bachelor level ---------
Degree in medicine, dentistry, veterinary medicine or optometry --
Master’s degree 
Earned doctorate -----------------------------------------------

What religion/belief system do you follow? (Check Box):
Christianity ---------------------
Islam--------------------------
Judaism----------------------
Buddhism---------------------
Atheism----------------------
Agnosticism-------------------
Other------------------------- Please indicate: ________________
Appendix C

DEBRIEF INFORMATION

Understanding the Relationship between Thoughts and Mood Across Two Cultures

Thank you for your participation in this important research. The purpose of this research is to understand how certain thinking patterns can affect mood or the experience of depression. Previous research in this area shows that depressed individuals tend to have more negative self-related thoughts and less positive thoughts than non-depressed individuals. Further, it has been shown that depressed individuals have a bias for negative materials and away from positive materials. Majority of research in this area has been conducted with Western samples; therefore, there is limited findings among non-Western individuals.

In this study, you were asked to fill out several self-report measures designed to assess depression symptoms, and negative and positive thoughts. You also completed a facial expression memory task to ascertain memory bias for emotional items. We predicted that, in consistent with past research, depressed individuals in both cultural groups would endorse more negative thoughts, less positive thoughts, and a negative bias to materials in comparison with non-depressed individuals. We did not hypothesize cultural group differences due to the limited cross-national research on this topic in the current literature.

This research is important because it provides insight into whether cognitive factors that contribute to depression differ across cultures, thereby extending the current knowledge in the field. This information is valuable especially to clinicians in adapting treatments in a way that is both effective and culturally appropriate.

If you are interested in the findings of the study, please visit the following link after December 2018: https://www.researchgate.net/profile/Mabel_Yu

If you have any further questions or concerns about this research, please do not hesitate to contact Mabel Yu at m.mabelyu@gmail.com.

Below are some resources should you experience emotional discomfort as a result of participating in this study. Thank you again for your participation.

Free Resources Available:

Mood Gym - Centre for Mental Health Research at the Australian National University: https://moodgym.anu.edu.au/welcome
Depression Hurts – Mood Disorders Association of Ontario:

Self-Help Books:


Appendix D

PHQ-9

Instructions: Please read each statement carefully and indicate how often you have been bothered by any of the following problems *over the last TWO weeks*.

0 = Not at all  
1 = Several days  
2 = More than half the days  
3 = Nearly everyday  

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly everyday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Little interest or pleasure in doing things.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Feeling down, depressed, or hopeless.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Trouble falling or staying asleep, or sleeping too much.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Feeling tired or having little energy.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Poor appetite or overeating.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. Trouble concentrating on things, such as reading the newspaper or watching television.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around more than usual.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. Thoughts that you would be better off dead or of hurting yourself in some way.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix E

CES-D

Instructions: Circle the number for each statement which describes how often you felt or behaved this way during the past week.

<table>
<thead>
<tr>
<th>During The Past Week:</th>
<th>Rarely or none of the time</th>
<th>Some or a little of the time</th>
<th>Occasionally or a moderate amount of time</th>
<th>Most or all of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was bothered by things that usually don’t bother me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. I did not feel like eating; my appetite was poor.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Felt that I could not shake off the blues even with help from my family or friends.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. I felt I was just as good as other people.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. I had trouble keeping my mind on what I was doing.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. I felt depressed.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. I felt that everything I did was an effort.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. I felt hopeful about the future.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. My sleep was restless.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. I was happy.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11. I felt lonely.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12. I enjoyed life.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13. I felt sad.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14. I could not get “going.”</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix F

ATQ–N

**Instructions:** Listed below are a variety of thoughts that pop into people’s heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you over the last week. Please read each item carefully and select the appropriate number next to each statement.

1 = Never  
2 = Sometimes  
3 = Moderately often  
4 = Often  
5 = All the time

<table>
<thead>
<tr>
<th>Thought</th>
<th>Never</th>
<th>Sometimes</th>
<th>Moderately often</th>
<th>Often</th>
<th>All the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. I feel like I am up against the world.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I am no good.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. Why can’t I ever succeed?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. No one understands me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. I have let people down.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. I don’t think I can go on.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. I wish I were a better person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. I am so weak.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. My life is not going the way I want it to.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. I am so disappointed in myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. Nothing feels good anymore.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21. I can’t stand this anymore.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22. I can’t get started.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Question</td>
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<td>-------------------------------------------------------------------------</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. What’s wrong with me?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. I wish I were somewhere else.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. I can’t get things together.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. I hate myself.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. I am worthless.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. I wish I could just disappear.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. What’s the matter with me?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. I am a loser.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. My life is a mess.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. I am a failure.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. I will never make it.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. I feel so hopeless.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>35. Something has to change.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. There must be something wrong with me.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37. My future is bleak.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38. It’s just not worth it.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39. I can’t finish anything.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Appendix G

ATQ–P

Instructions: Listed below are a variety of thoughts that pop into people’s heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you over the last week. Please read each item carefully and select the appropriate number next to each statement.

1 = Never
2 = Sometimes
3 = Moderately often
4 = Often
5 = All the time

<table>
<thead>
<tr>
<th>Statement</th>
<th>Never</th>
<th>Sometimes</th>
<th>Moderately often</th>
<th>Often</th>
<th>All the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>40. I am respected by my peers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>41. I have a good sense of humour.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>42. My future looks bright.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>43. I will be successful.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>44. I am fun to be with.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>45. I am in a great mood.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>46. There are many people who care about me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>47. I am proud of my accomplishments.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>48. I will finish what I start.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>49. I have many good qualities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>50. I am comfortable with life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>51. I have a good way with others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>52. I am a lucky person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
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<td>---</td>
</tr>
<tr>
<td>53.</td>
<td>I have friends who support me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>54.</td>
<td>Life is exciting.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>55.</td>
<td>I enjoy a challenge.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>56.</td>
<td>My social life is terrific.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>57.</td>
<td>There’s nothing to worry about.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>58.</td>
<td>I am so relaxed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>59.</td>
<td>My life is running smoothly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>60.</td>
<td>I am happy with the way I look.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>61.</td>
<td>I take good care of myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>62.</td>
<td>I deserve the best in life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>63.</td>
<td>Bad days are rare.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>64.</td>
<td>I have many useful qualities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>65.</td>
<td>There is no problem that is hopeless.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>66.</td>
<td>I won’t give up.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>67.</td>
<td>I state my opinions with confidence.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>68.</td>
<td>My life keeps getting better.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>69.</td>
<td>Today I’ve accomplished a lot.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Appendix H

DAS-24

Instructions: This questionnaire lists different attitudes or beliefs which people sometimes hold. Read each statement carefully and decide how much you agree or disagree with the statement.

To decide whether a given attitude is typical of your way of looking at things, simply keep in mind what you are like most of the time.

1 = Totally disagree
2 = Disagree very much
3 = Disagree slightly
4 = Neutral
5 = Agree slightly
6 = Agree very much
7 = Totally agree

1. If I fail partly, it is as bad as being a complete failure.
2. If others dislike you, you cannot be happy.
3. I should be happy all the time.
4. People will probably think less of me if I make a mistake.
5. My happiness depends more on other people than it does on me.
6. I should always have complete control over my feelings.
7. My life is wasted unless I am a success.
8. What other people think about me is very important.
9. I ought to be able to solve my problems quickly and without a great deal of effort.
10. If I don’t set the highest standards for myself, I am likely to end up a second-rate person.
11. I am nothing if a person I love doesn’t love me.
12. A person should be able to control what happens to him.
13. If I am to be a worthwhile person, I must be truly outstanding in at least one major respect.

14. If you don’t have other people to lean on, you are bound to be sad.

15. It is possible for a person to be scolded and not get upset.

16. I must be a useful, productive, creative person, or life has no purpose.

17. I can find happiness without being loved by another person.

18. A person should do well at everything he undertakes.

19. If I do not do well all the time, people will not respect me.

20. I do not need the approval of other people in order to be happy.

21. If I try hard enough, I should be able to excel at anything I attempt.

22. People who have good ideas are more worthy than those who do not.

23. A person doesn’t need to be well liked in order to be happy.

24. Whenever I take a chance or risk, I am only looking for trouble.
Appendix I

Research Ethics Board
Certificate of Approval

PRINCIPAL INVESTIGATOR
Mabel Yu

DEPARTMENT
Department of Psychology

REB#
2017-178

TITLE: Cross-Cultural Examination of the Cognitive Theory of Depression Among Individuals of Chinese and Canadian Descent

APPROVED ON:
December 1, 2017

RENEWAL DATE:
December 1, 2018

APPROVAL OF:
Application for Behavioural Research Ethics Review, Consent Form, Debrief Form, Descrit Questionnaires: Demographics, PHQ-9, ATQ-N, ATQ-P. Centre for Epidemiologic Studies Depression Scale, CBT-CEQ, CBT- TAAS, DAS-24, Cognitive Behavioural Therapy Description

Full Board Meeting [ ]
Delegated Review [X]

The University of Regina Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol, consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in advance of its implementation.

ONGOING REVIEW REQUIREMENTS
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions: http://www.uregina.ca/research/for-faculty-staff/ethics-compliance/human/forms1/ethics-forms.html.

Laurie Clune, PhD
Chair, Research Ethics Board

Please send all correspondence to:
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University of Regina
Research and Innovation Centre 109
Regina, SK S4S 0A2
Telephone: (306) 585-4775 Fax: (306) 585-4893
research.ethics@uregina.ca