Unpacking Cultural Differences in Alexithymia: The Role of Cultural Values Among Euro-Canadian and Chinese-Canadian Students

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Abstract
The current study provides a cultural examination of alexithymia, a multifaceted personality construct that refers to a general deficit in the ability to identify and describe emotional states, and that has been linked to a number of psychiatric illnesses. Though this construct has been critiqued as heavily rooted in "Western" norms of emotional expression, it has not received much empirical attention from a cultural perspective. Recently, Ryder et al. (2008) found that higher levels of alexithymia among Chinese versus Euro-Canadian outpatients were explained by group differences in one component of alexithymia, externally oriented thinking (EOT); they proposed that Chinese cultural contexts may encourage EOT due to a greater emphasis on social relationships and interpersonal harmony rather than inner emotional experience. The current study examined the hypothesis that EOT is more strongly shaped by cultural values than are two other components of alexithymia, difficulty identifying feelings (DIF) and difficulty describing feelings (DDF). Euro-Canadian (n = 271) and Chinese-Canadian (n = 237) undergraduates completed measures of alexithymia and cultural values. Chinese-Canadians showed higher levels of EOT than Euro-Canadians ($p < .001$). EOT, and not DIF or DDF, was predicted by Modernization and Euro-American values in both groups. Furthermore, cultural values mediated the effect of group membership on levels of EOT. These results suggest that cultural differences in alexithymia may be explained by culturally based variations in the importance placed on emotions, rather than deficits in emotional processing. The study also raises questions about the measurement and meaning of EOT, particularly from a cross-cultural perspective.

Keywords: cultural psychology, emotion, clinical/abnormal

The related fields of cross-cultural and cultural psychology, cultural psychiatry, and medical anthropology have provided rich examples of the ways in which culture is intimately tied to the experience and expression of emotional distress (e.g., Chentsova-Dutton & Tsai, 2009; Kirmayer, 2001; Kleinman, 1982; Lee, Kleinman, & Kleinman, 2007; Ryder et al., 2008). Work in this area demonstrates the complex interplay between cultural context, norms, beliefs, and values, on the one hand, and psychological processes, clinical symptoms, and syndromes, on the other. Our understanding of cultural variations in the clinical presentation of emotional distress can often be informed by examining how culture shapes various emotional processes (Kirmayer, 2001). Working within this tradition, the current study examines alexithymia, a multi-faceted personality construct that refers to a general deficit in the ability to identify and describe emotional states (Taylor, 2000). Though this construct has been critiqued from a cultural perspective, these critiques have not been studied empirically. Alexithymia offers an interesting focal point for the study of culture and emotion for several reasons. First, it is conceptualized as a dimensional construct (Parker, Keefer, Taylor, & Bagby, 2008), lying on a continuum from non-pathological to pathological, and therefore holds relevance for both clinical and non-clinical research. Second, the construct evokes a major recurrent theme in cross-cultural discussions of emotion—the relative lack of emotional expressiveness in certain groups as compared to others. Finally, alexithymia has been controversial within the cultural literature and has been the subject of theoretical critique (e.g., Dion, 1996; Kirmayer, 1987). These critiques suggest that alexithymia is strongly linked to "Western" values regarding emotional

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experience and expression and that the construct may lead to the unwarranted pathologization of individuals from other cultural contexts. Informed by such critiques, the current study seeks to "unpack" cultural differences in alexithymia among Euro-Canadians and Chinese Canadians. "Unpacking" or "unpackaging" culture refers to a paradigm whereby cultural differences are clarified by examining specific underlying "context variables" (Matsumoto & Yoo, 2006) that help to explain both within- and between-group variation (e.g., Singelis, Bond, Sharkey, & Lai, 1999). In the current study, the underlying variable examined was cultural values, due to the position of values as a fundamental aspect of culture and in line with cultural critiques of alexithymia.

Alexithymia

The construct of alexithymia was first introduced in the 1970s by Nemiah, Freyberger, and Sifneos (1976, as cited in Luminet, Rimé, Bagby, & Taylor, 2004) and emerged from Sifneos's observations of patients suffering from "classical" psychosomatic illnesses. Based on ancient Greek, the literal meaning of the term *alexithymia* is "no words for feelings" (De Gucht & Heiser, 2003). Four main features define this construct: (1) difficulty identifying feelings and distinguishing them from physical sensations of emotional arousal; (2) difficulty describing emotions to others; (3) reduced imaginal capacities, or low fantasy-proneness; and (4) an externally oriented thinking style, with an emphasis on external, concrete stimuli rather than inner emotions (Luminet et al., 2004; Taylor, 2000).

There has been a substantial expansion of the alexithymia research literature in the past 10 to 15 years. The topic remains particularly popular in the psychosomatic literature, as high levels of alexithymia have been associated with various psychosomatic illnesses (Lumley, Neely, & Burger, 2007; Porcelli et al., 2003). The construct has also been linked to a number of other disorders, including depression, eating disorders, and post-traumatic stress disorder (Taylor, 2000). Increased support for the validity of the construct has come from emotional processing studies, which have produced results consistent with the theoretical proposition that alexithymia is characterized by deficits in the cognitive processing of emotion (Parker et al., 2008; Taylor, 2000). For example, people with higher levels of alexithymia, versus those with lower levels, are less accurate in identifying posed emotional facial expressions and in matching emotional stimuli with emotional responses (e.g., Lane et al., 1996; Parker, Taylor, & Bagby, 1993).

Measurement of Alexithymia: The TAS-20

Early alexithymia research was plagued by poor measurement, with initial measures characterized by both poor reliability and validity (Taylor, 2000). There has been substantial improvement in the measurement of this construct over the past two decades, with the development of new self-report, observational, and interview measures. Self-report measures are the most commonly used tool, and the most popular and well-validated self-report measure is the Twenty-Item Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994). As this measure has been used in the majority of recent research, including the current study, the research findings reviewed here are limited to studies that have used the TAS-20 in assessing alexithymia.

The TAS-20 contains three subscales, corresponding to three of the key components of alexithymia: Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF), and Externally Oriented Thinking (EOT). Sample items from the DIF subscale include: "I am often confused about what emotion I am feeling" and "I don't know what's going on inside me." Sample items from the DDF subscale include: "It is difficult for me to find the right words for my feelings" and "People tell me to describe my feelings more." Finally, sample items from the EOT subscale, of particular interest for the current study, include: "I find examination of my feelings useful in solving personal problems" (reverse coded), "Being in touch with emotions is essential", "I prefer to analyze problems rather than just describe them" (reverse coded), and "I prefer talking to people about their daily activities rather than their feelings".

The reliability and validity of the TAS-20 have been supported across a number of samples, including student, community, and clinical samples (Bagby, Parker et al., 1994; Bagby, Taylor et al., 1994; Parker, Taylor, & Bagby, 2003). The measure has also been translated into over 18 languages, including Chinese, with general cross-cultural support for the three-factor structure (Taylor, Bagby, & Parker, 2003; Zhu, Yao, Ryder, Taylor, & Bagby, 2007). Furthermore, adequate to good internal reliability has been found for the total TAS-20, along with the DIF and DDF subscales, across cultural and linguistic groups. However, the EOT subscale repeatedly demonstrates poor internal reliability, particularly in samples where English is not the primary language (Taylor et al., 2003). This consistent finding suggests the need for further study, particularly from a cultural perspective, of this subscale and the construct it is designed to measure.

Externally Oriented Thinking

While psychometric issues call our attention to the EOT subscale, further examination suggests that EOT may differ from DIF and DDF in several important ways. To begin with, EOT is conceptually distinct from the deficit-based components of "difficulty identifying feelings and distinguishing

them from physical sensations of emotional arousal" and "difficulty describing feelings to others." Indeed, EOT can be understood as an approach to thinking about emotions rather than an explicit emotional deficit or difficulty. High levels of EOT are conceptualized as being linked to the difficulties that characterize high levels of alexithymia but are not themselves defined by an actual deficit. The notion that EOT stands out conceptually from the other two factors of the TAS-20 has been raised by other authors (e.g., Moriguchi et al., 2007) but has not been the topic of much empirical research.

In line with the notion that EOT does not necessarily reflect a difficulty or deficit, a review of recent studies suggests that EOT is in fact less associated with pathology than DIF and DDF. For example, EOT has repeatedly been found to show no significant association with negative affect, in contrast to DIF and DDF (Bailey & Henry, 2007). Joukamaa et al. (2008) found that total TAS-20, DIF, and DDF scores were significantly higher among a sample of mental health patients as compared to a sample of primary care patients, while EOT scores showed no group difference. Furthermore, the total score, DIF, and DDF showed significant associations with measures of abuse and neglect among the primary care patients, while EOT did not. Similarly, a recent study on alexithymia and dissociation found that the total TAS-20 score, DIF, and DDF were each associated with measures of dissociation, while EOT was not (Grabe, Rainermann, Spitzer, Gänsicke, & Freyberger, 2000). Lastly, Saarijärvi, Salminen, and Toikka (2001) examined alexithymia and depression over a 1-year follow-up period and found that DIF and DDF were associated with changes in mood over the follow-up period, while EOT was not. These varied findings suggest a pattern in which EOT is less associated with pathological variables than the other components of alexithymia, in line with its conceptualization as a way of thinking about the world, rather than a difficulty per se.

This set of theoretical and empirical observations regarding EOT are intriguing from a cultural perspective, particularly in light of the literature on culture and emotion. This is because a thinking style that places a relative emphasis on external stimuli rather than internal emotional experiences is likely to be strongly shaped by norms, values, preferences, and beliefs about the place of emotion in one's daily life. In other words, one might well expect EOT to be quite strongly shaped by culture, since cultural contexts can vary substantially in the importance placed on inner emotional life and the expression of emotions with others (e.g., Eid & Diener, 2001; Markus & Kitayama, 1991; Matsumoto, Yoo, & Fontaine, 2008). In addition, the inclusion of EOT within the alexithymia paradigm implies that an externally focused cognitive style is problematic and is linked to emotional deficits. However, this notion may well be culturally bound and rooted in a "Western" emphasis on individual emotional experience and expression (Kirmayer, 1987). Indeed, the general idea that alexithymia—or components of alexithymia— may demonstrate important cross-cultural variation, and that such variation may not be associated with actual emotional deficits, has been raised by a number of authors as an important critique of the alexithymia construct.

Cultural Critique of Alexithymia

A fundamental issue for authors critically examining alexithymia from a cultural perspective is that the construct emerged from clinical observations of a particular group of patients in North America and Western Europe, within a specific historical and sociocultural context (Fukunishi, Nakagawa, Nakamura, Kikuchi, & Takubo, 1997; Kirmayer, 1987). Indeed, Sifneos's early writings on alexithymia were based on his observations of a subset of psychosomatic patients who failed to respond to insight-oriented psychotherapy (Sifneos, 1967, as cited in Lumley et al., 2007). It is quite clear that the origins of alexithymia are strongly rooted in the psychodynamic framework and model of therapy, as well as a "Western" ideal of a mature self (Kirmayer, 1987). As Kirmayer (1987) suggests, alexithymia can be linked to a "preoccupation with the verbal expression of emotion in psychotherapy" (p. 119). Such verbal expression is also implicitly held up as the most desirable form of expressing one's emotions, and therefore, the construct of alexithymia fails to acknowledge cultural variations in idioms of distress, which can include greater emphasis on the body and on social context.

Cultural critiques of alexithymia have largely targeted the construct as a whole, though some have suggested the importance of separately examining the individual components (e.g., Kirmayer & Robbins, 1993). We propose that a cultural perspective may be particularly relevant for EOT, since the emphasis or importance placed on emotional experiences is strongly related to cultural norms and values. In certain cultural contexts, high levels of EOT may well be linked to particular cultural variables, and not necessarily to actual deficits in emotional processing, suggesting a nonpathological understanding of cultural variation in levels of alexithymia.

Culture and Alexithymia: Selected Recent Empirical Findings

In addition to theoretical work, a handful of recent empirical studies have examined alexithymia from a cultural or cross-cultural perspective. In line with the groups in the current study, a brief review of findings among samples of Chinese and Western European descent will be presented here. Dion (1996) examined levels of alexithymia among a diverse sample of undergraduate students in Canada. He found that students who reported being most proficient in a Chinese

dialect, assumed to be a proxy for ethnicity, scored higher on the total TAS-20, and the three subscales, as compared to native speakers of English and other European languages. Dion suggested a "sociocultural" explanation of this finding, focusing on cultural differences in somatic versus psychological idioms of expressing emotional states, in Chinese versus "Western" contexts. Dion (1996) also proposed that cultural differences in levels of alexithymia might stem from "different types of cognitive appraisals relating to emotion" (p. 536).

Zhu et al. (2007) validated a Chinese translation of the TAS-20 (TAS-20-C) in mainland China, among both a student sample and an outpatient sample, and found adequate psychometric properties for the measure, as well as support for the three-factor structure. In addition, total alexithymia scores in the Chinese samples were slightly higher than scores in similar English-speaking Canadian samples. Unfortunately, these authors did not present separate results for the three TAS-20 subscales.

Finally, in a study of Euro-Canadian and Chinese depressed clinical outpatients, Ryder et al. (2008) found significantly higher levels of alexithymia in the Chinese patients. However, this group difference was explained by higher levels of EOT in the Chinese patients as compared to the Euro-Canadians, with no group difference on DIF or DDF. These authors proposed that higher levels of EOT within a Chinese context might be driven by greater cultural emphasis on interpersonal relationships, social harmony, and contextual factors, and relatively less emphasis on inner emotional experience (e.g., Heine, 2001; Markus & Kitayama, 1991).

The cultural explanation proposed by Ryder et al. (2008) fits with the general literature on culture and emotion, and with the substantial body of work on cultural variations in emotional processes between East Asian (most often Chinese and Japanese) and "Western" populations. This literature has laid out a general set of cultural differences, whereby East Asian contexts are characterized by a relative emphasis on emotional restraint, the importance of attending to social cues, and the maintenance of harmonious social relations. In contrast, "Western" contexts, exemplified by North America, are characterized by a greater emphasis on individual emotional experience and expression, personal autonomy, and the importance of individual happiness. Cultural variations in line with these broad differences have been found in a variety of emotional processes, including emotion socialization, expressivity, the use of emotion-related cues, and the importance placed on positive versus negative emotions (e.g., Eid & Diener, 2001; Mesquita, 2001; Yuki, Maddux, & Masuda, 2007). This general pattern of cultural differences, along with the findings of Ryder et al. (2008), helped to inform the research questions and hypotheses of the current research.

The Current Study

The current study examined the general hypothesis that the EOT component of alexithymia, as assessed by the TAS-20, is culturally shaped, among Euro-Canadian and Chinese-Canadian students. More specifically, we sought to address two main research questions: Do cultural values help to explain higher levels of EOT among people of Chinese versus Euro-Canadian heritage; and, is EOT particularly shaped by cultural values, in contrast to DIF and DDF? Based on our theoretical expectations, and the findings of Ryder et al. (2008), we formulated four hypotheses: (1) that Euro-Canadians would show lower levels of EOT as compared to Chinese Canadians; (2) that of the three TAS-20 subscales, only EOT would be predicted by cultural values; (3) that EOT would be negatively predicted by modernization and Euro-American values, and positively predicted by Asian values; and (4) that cultural values would mediate the association between group membership and EOT.

Method

Participants

Participants were undergraduate students at two Canadian English-language universities situated in large urban centers. Participants completed an Internet-based survey consisting of self-report measures, which took approximately 90 minutes to complete; all participants completed the questionnaires in English. The majority of participants were enrolled in at least one undergraduate psychology course; all participants provided informed consent prior to completing the study and received course credit for their participation.

Euro-Canadian ($n = 271$) and Chinese-Canadian ($n = 237$) groups were selected from the larger diverse student sample, based on their responses to several demographic questions. Euro Canadian participants self-identified themselves as belonging to the "White" ethnoracial group, were born in Canada, and had at least one parent born in Canada. Chinese-Canadian participants self-identified themselves as belonging to the "East Asian, South-East Asian, and Pacific Islander" ethnoracial group, were either themselves born in the People's Republic of China, Hong Kong, or Taiwan, or had at least one parent born in one of these locations. Furthermore, support for the classification of these two groups was obtained by examining participants' responses to an open-ended question that asked them to label their heritage culture. Over 70% of Euro-Canadian participants referred to Canadian, North American, or Western European cultural groups (e.g., British, Italian) in their response; over 95% of Chinese-Canadian participants referred to a Chinese cultural group (e.g., Chinese, Taiwanese) in their response.

The Euro-Canadian participants were 77.0% female and had a mean age of 22.1 years ($SD = 4.5$). The majority, 87.1%, had grown up in a large or small city.

The Chinese-Canadian participants were 73.7% female and had a mean age of 21.0 years (*SD* = 3.5). The majority, 96.2%, had grown up in a large or small city. A minority of the Chinese-Canadians, 27.4%, were born in Canada, while a majority, 77.1%, were Canadian citizens. Among the Chinese-Canadians born in Canada, 89.2% reported that both of their parents were born outside of Canada. Among the Chinese-Canadians born outside of Canada, the average length of time since their arrival in Canada was 9.3 years (*SD* = 5.70). With regards to language background, 85.7% of Chinese Canadians reported a Chinese dialect as their mother tongue. All participants were required to demonstrate English language proficiency for entrance to the universities where the data were collected.

Measures

The survey completed by participants contained a variety of self-report measures regarding mental health, emotional processing, and cultural variables. Only the four measures relevant to the current study will be discussed here. Alexithymia was assessed using the TAS-20. Cultural values were measured in two different ways: (1) a bipolar contrast of modernization versus traditionalism using the Modernization scale (MOD) of the Chinese Personality Assessment Inventory (CPAI; Cheung et al., 1996) and (2) a bidimensional approach to cultural values measurement using the European American Values Scale for Asian Americans–Revised (EAVS AA-R; Hong, Kim, & Wolfe, 2005) and the Asian Values Scale–Revised (AVS-R; Kim & Hong, 2004) to measure Euro-American and Asian values, respectively.

TAS-20. The TAS-20 (Bagby, Parker et al., 1994; Bagby, Taylor et al., 1994) consists of 20 items, answered on a 5-point Likert-type scale ranging from *completely disagree* to *completely agree*. A total score is computed across all items, after recoding reversed items. Subscale scores are calculated by summing the scores on the items corresponding to each of the three subscales: DIF (7 items), DDF (5 items), and EOT (8 items).

MOD. The MOD scale of the CPAI (Cheung et al., 1996) is a 15-item measure that assesses respondents' endorsement of modern as opposed to traditional values and beliefs. Although the CPAI was originally developed as an indigenous Chinese measure of personality, cross-cultural research using the English version of the CPAI has found support for the measure's validity and relevance across cultural contexts, including in a Euro-American sample (Cheung, Cheung, Leung, Ward, & Leong, 2003). A single mean score is computed for the MOD scale, after recoding reversed items[1]; higher scores represent more liberal values and a rejection of traditional beliefs and customs, while lower scores represent greater endorsement of traditional values and practices (Cheung, Kwong, & Zhang, 2003).

EAVS-AA-R and AVS-R. Both the EAVS-AA-R (Hong et al., 2005) and the AVS-R (Kim & Hong, 2004) are 25-item measures of adherence to particular sets of cultural values. The EAVS-AA-R assesses European American or "Western" values, such as individual achievement and personal autonomy. The AVS-R assesses values common in East and Southeast Asian cultural contexts, such as filial piety, conformity to norms, and collectivism. The items on both measures are phrased as general values statements and do not include specific cultural references or terms. Respondents rate their level of agreement with each item using a 4-point scale ranging from *strongly disagree* to *strongly agree*. For both measures, a single mean score is computed after recoding reversed items.

Results

Measurement Equivalence

When conducting cross-cultural research, it is critical to first examine whether scales have measurement equivalence in the cultural groups under consideration. To address this issue, we tested for uniform and non-uniform differential item functioning (DIF) across the two groups using ordinal logistic regression. These analyses were conducted separately for the total TAS-20, the three TAS-20 subscales, MOD, EAVS-AA-R, and AVS-R. Following Zumbo (1999), individual items serve as dependent variables and predictors are added in three steps: (1) total score; (2) total score + cultural group; (3) total score + cultural group + (total score * cultural group). A significant X^2 difference accompanied by a large change in the Nagelkerke pseudo-R^2 (i.e., $\geq .13$) between Steps 1 and 2 indicates uniform DIF, and between Steps 2 and 3 indicates non-uniform DIF. No items on any of the scales showed uniform or non-uniform DIF (all Nagelkerke pseudo-$R^2 \leq .044$). Therefore, no scale modifications were required before proceeding with our main analyses.

Scale Reliability and Intercorrelations

Cronbach's alpha coefficients of the measures are shown separately for the two groups in Table 1. Consistent with previous studies, the EOT subscale showed the lowest reliability of the TAS-20 subscales in both groups. In particular, the EOT subscale showed poor reliability in the Chinese Canadian group. Examination of the item-level reliability statistics for the EOT subscale revealed that, for both groups, there were no items whose removal would increase the subscale's reliability. Therefore, the standard eight items were retained. All three values measures showed moderate to adequate reliability.[2] Both groups showed a similar pattern of correlations among the values measures. MOD was positively correlated with the EAVS-AA-R (*r*s = .58 and .53, in the Euro-Canadians and Chinese Canadians, respectively) and negatively correlated with the AVS-R (*r*s = –.58

Table 1

Reliability of TAS-20 Total Scale and Subscales, MOD, EAVS-AA-R, and AVS-R by Group.

	Euro-Canadian		Chinese-Canadian	
	α	Inter-Item *r*	α	Inter-Item r
TAS-20	.85	.22	.83	.19
DIF subscale	.83	.41	.84	.43
DDF subscale	.77	.41	.70	.32
EOT subscale	.67	.20	.56	.14
MOD	.67	.13	.71	.14
EAVS-AA-R	.73	.10	.67	.08
AVS-R	.75	.11	.69	.08

Note. TAS–20 = Twenty-Item Toronto Alexithymia Scale; DIF = Difficulty Identifying Feelings; DDF = Difficulty Describing Feelings; EOT = Externally Oriented Thinking; MOD = Modernization scale; EAVS–AA–R = European American Values Scale for Asian Americans–Revised; AVS–R = Asian Values Scale Revised.

and –.55, in the Euro-Canadians and Chinese-Canadians, respectively). The AVS-R and EAVS-AA-R were negatively correlated in both groups (*r*s = –.47 and –.36, in the Euro-Canadians and Chinese-Canadians, respectively). All correlations were significant at the $p < .01$ level. These correlations fit with expectations and provide support for the construct validity of the values measures.

Group Comparisons

Group differences on the TAS-20 and the values measures were examined using independent sample *t* tests.[3] As shown in Table 2, the Chinese-Canadian group had significantly higher scores on the total TAS-20 than the Euro-Canadians. In support of Hypothesis 1, this group difference was driven by significantly higher EOT scores among the Chinese-Canadians as compared to the Euro-Canadians. There were no significant group differences on either the DIF or DDF subscales. These findings replicate the results of Ryder et al. (2008). Table 2 also displays group comparisons for the three values measures. As expected, the Euro Canadians reported significantly higher scores on MOD and the EAVS-AA-R and significantly lower scores on the AVS-R, as compared to the Chinese-Canadians. These findings provide further support for the construct validity of the cultural values measures.

Regression Analysis

To examine our hypotheses regarding the prediction of EOT, DIF, and DDF by cultural values, multiple linear regression analyses were conducted separately in each group. One set of analyses examined MOD, while a second set examined the EAVS-AA-R and AVS-R together. This approach allowed for internal replication of our findings regarding the link between values and alexithymia. For each regression analysis, one TAS-20 subscale was entered as the dependent variable; the other two subscales, age, and sex were entered as predictors in the first step of the regression; and the relevant values score(s) were entered in the second step. As three analyses were conducted in each group, one per TAS-20 subscale, Bonferroni adjusted alpha levels of .017 per test were used (.05/3). Results meeting this criterion are reported as significant at the $p < .05$ level; results not meeting this adjusted alpha level are reported as non-significant. In support of Hypothesis 2, EOT was predicted by cultural values in both groups. In the Euro-Canadian group, MOD significantly negatively predicted EOT, $\beta = -.25$, $p < .05$; the addition of MOD to the model resulted in a significant R^2_{ch} of .06, $F1, 255) = 21.01$, $p < .05$. In the second regression model, the EAVS-AA-R also significantly negatively predicted EOT, $\beta = -.20$, $p < .05$, though the AVS-R did not account for unique variance in EOT, $\beta = .07$, *ns*. The addition of the EAVS-AA-R and AVS-R to the model resulted in a significant R^2_{ch} of .05, $F2, 254) = 9.02$, $p < .05$. Similarly, in the Chinese-Canadian group, MOD significantly negatively predicted EOT, $\beta = -.31$, $p < .05$; the addition of MOD to the model resulted in a significant R^2_{ch} of .09, $F1, 227) = 27.76$, $p < .05$. In the second model, the EAVS-AA-R also negatively predicted EOT, $\beta = -.27$, $p < .05$, while the AVS-R was not a significant predictor, $\beta = .12$, *ns*; the addition

Table 2

Group Comparisons on TAS–20 Total Scale and Subscales, MOD, EAVS–AA–R, and AVS–R.

	Euro-Canadian			Chinese-Canadian			Comparison		
	n	*M*	*SD*	*n*	*M*	*SD*	*t'*	*df*	*d*
TAS-20	271	45.39	10.48	237	48.89	9.67	–3.92***	504.54	–0.35
DIF subscale	271	15.02	5.15	237	15.89	4.91	–1.96	502.15	–0.17
DDF subscale	271	12.45	3.92	237	12.90	3.54	–1.38	505.48	–0.12
EOT subscale	271	17.92	4.19	237	20.10	3.93	–6.03***	503.51	–0.54
MOD	271	1.99	0.32	237	1.79	0.31	6.79***	499.85	0.64
EAVS-AA-R	271	1.99	0.27	237	1.76	0.24	10.19***	505.92	0.90
AVS-R	271	1.25	0.26	237	1.44	0.22	–9.08***	505.13	–0.79

Note: TAS–20 = Twenty–Item Toronto Alexithymia Scale; DIF = Difficulty Identifying Feelings; DDF = Difficulty Describing Feelings; EOT = Externally Oriented Thinking; MOD = Modernization scale; EAVS–AA –R = European American Values Scale for Asian Americans–Revised; AVS–R = Asian Values Scale Revised; *t'* = Welch's *t*; *d* = Cohen's *d*. ***$p < .001$.

of the EAVS-AA-R and AVS-R to the model resulted in a significant R^2_{ch} of .10, $F2, 226) = 14.70$, $p < .05$. Therefore, Hypothesis 3 was partially supported in both groups, with both MOD and the EAVS-AA-R significantly predicting EOT in the expected direction, but the AVS-R not acting as a significant predictor. Also in line with Hypothesis 2, neither DIF nor DDF were significantly predicted by cultural values in either group. In the Euro-Canadians, MOD did not significantly predict DIF or DDF, βs = .05 and .03, *ns*, and neither did the EAVS-AA-R, βs = –.10 and .03, *ns*, or AVS-R, βs = –.12 and .09, *ns*. Similarly, in the Chinese-Canadians, MOD did not significantly predict DIF or DDF, βs = –.04 and –.01, *ns*, and neither did the EAVS-AA-R, βs = –.11 and –.07, *ns*, or AVS-R, βs = .02 and –.04, *ns*. The addition of cultural values did not result in a significant R^2_{ch} in any of the models predicting DIF or DDF, in either group. To help address the statistical problems associated with examining null hypotheses, statistical power calculations for multiple regression were conducted. When examining the prediction of DIF by cultural values, the current study had sufficient power (>.80) to detect a minimum R^2_{ch} of .025 and .027 in the MOD model and .031 and .033 in the EAVS-AA-R and AVS-R model, in the Euro-Canadians and Chinese-Canadians, respectively. When examining the prediction of DDF, the study had sufficient power to detect a minimum R^2_{ch} of .023 and .025 in the MOD model, and .028 and .031 in the EAVS-AA-R and AVS-R model, in the Euro-Canadians and Chinese-Canadians, respectively. Though these calculations strengthen our interpretation of the DIF and DDF results, the possibility remains that there are real, albeit small, effects for these variables.

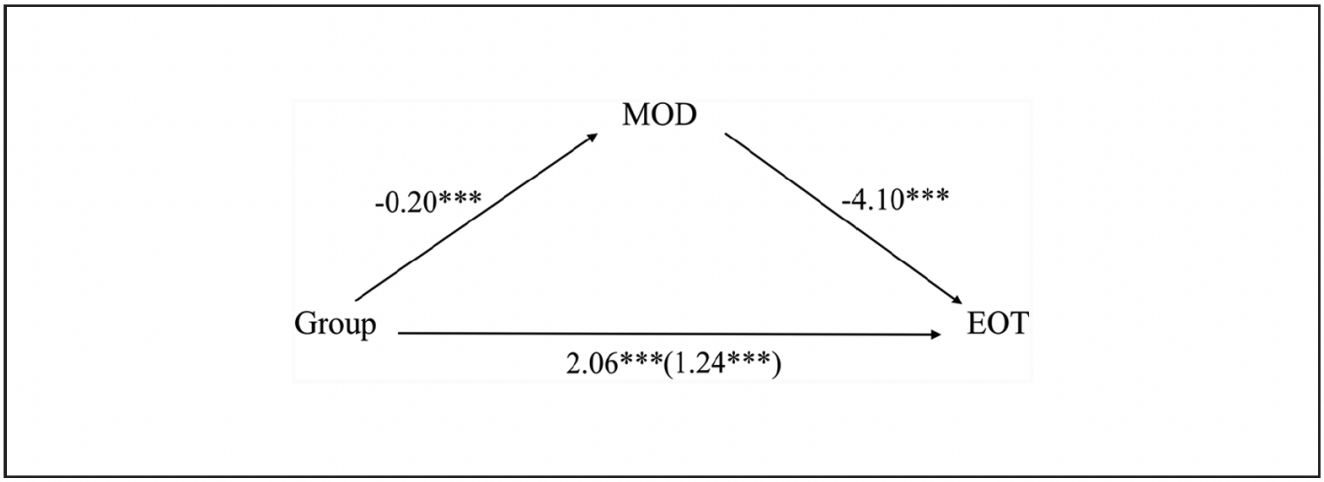
Mediation Analysis

In order to examine our hypothesis that cultural values would mediate the effect of group membership on EOT, we conducted bootstrapping analyses using methods described by Preacher and Hayes (2008) and an SPSS macro created by these authors that allows for multiple mediators and covariates in a single model. Bootstrapping is a non-parametric approach to mediation analysis that better controls for Type I error and has higher power than traditional approaches; it is increasingly recognized as a preferred method for evaluating mediation effects (see Biesanz, Falk, & Savalei, 2010; Hayes, 2009; Preacher & Hayes, 2008). The results presented in the current study are based on 5,000 resamples and percentile confidence intervals (Biesanz et al., 2010; Hayes, 2009). MOD was examined in a simple mediation model, while the EAVS-AA-R and AVS-R were examined together in a two-mediator model. For both analyses, EOT was entered as the dependent variable, group membership was entered as the independent variable (Euro-Canadian = 0; Chinese-Canadian = 1), and age and sex were entered as covariates.

The results with MOD showed that the total effect of group membership on EOT (total effect = 2.06, $p < .001$) was reduced when MOD was included in the model (direct effect of group membership: 1.24, $p < .001$). The total indirect effect of group membership on EOT through the mediator was significant (point estimate = 0.82, 95% Percentile

Figure 1

MOD Mediates the Effect of Group Membership on EOT, Controlling for Age and Sex.



Note. Path values represent unstandardized regression coefficients. The value outside of the parentheses represents the total effect of group membership on EOT, prior to the inclusion of the mediating variable. The value inside the parentheses represents the direct effect, based on bootstrapping analyses, of group membership on EOT after the mediator is included in the model. MOD = Modernization scale; EOT = Externally Oriented Thinking. ***$p < .001$.

confidence interval (PCI) [0.53, 1.13]), meaning that MOD was a significant mediator. These results suggest that MOD partially mediated the effect of group membership on EOT and provide support for Hypothesis 4 (see Figure 1 for the full mediational model).

The results with the EAVS-AA-R and AVS-R also provide strong support for Hypothesis 4. The total effect of group membership on EOT (total effect = 2.06, $p < .001$) was reduced to non-significance when the two values measures were included in the model (direct effect of group membership = 0.61, *ns*). In addition, the total indirect effect of group membership on EOT through the two cultural values mediators was significant (point estimate = 1.45, 95% PCI [1.01, 1.92]). This suggests that the EAVS-AA-R and AVS-R fully mediated the effect of group membership on EOT, in support of Hypothesis 4. Bootstrapping also allows for the examination of the specific indirect effects of each proposed mediator (e.g., the effect of group membership on EOT through Euro-American values). Both the EAVS-AA-R (point estimate = 1.08, 95% PCI [0.70, 1.52]) and AVS-R (point estimate = 0.37, 95% PCI [0.06, 0.69]) were significant unique mediators. The contrast testing the two mediators was also significant (point estimate = –0.72, 95% PCI [–1.32, –0.16]), meaning that the indirect effect of the EAVS-AA-R was significantly larger than the indirect effect of the AVS-R (see Figure 2 for the full meditational model).

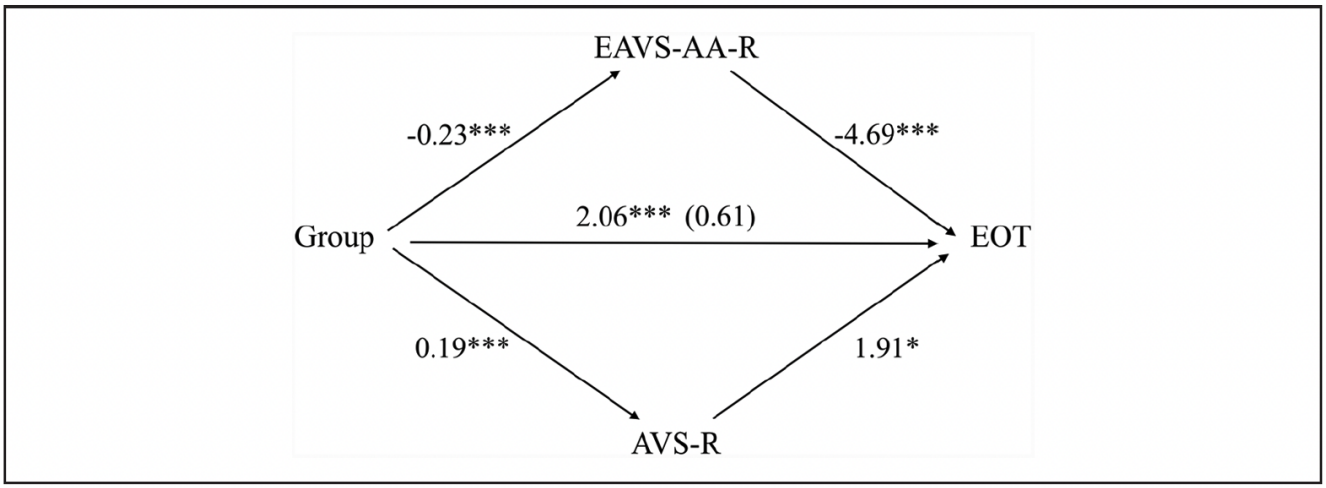
Discussion

The results of the current study provide generally strong support for our hypotheses. As predicted, the Chinese-Canadian group reported significantly higher levels of EOT than the Euro Canadians, and there was no group difference on either DIF or DDF. These results replicate those of Ryder et al. (2008) in their study of Chinese and Euro-Canadian outpatients and suggest that higher levels of alexithymia among samples of Chinese heritage as compared to Western European heritage may be specifically driven by higher levels of EOT. However, Dion (1996) also studied students of Chinese and European heritage and found group differences on all three TAS-20 subscales, suggesting the need for further replication.

Our hypotheses regarding the role of cultural values in predicting EOT and in mediating the effect of group membership on levels of EOT were also largely supported. As expected, higher levels of Modernization predicted lower levels of EOT among both Euro-Canadians and Chinese Canadians. These findings suggest that the endorsement of more modern or liberal values is linked to a relative emphasis on one's inner emotions. As the Modernization scale is understood as bipolar, these results also suggest that values and beliefs seen as traditional within a Chinese context promote a relative emphasis on external, concrete stimuli rather than on inner emotional experience. In line with the Modernization results, higher levels of Euro-American values also predicted

Figure 2

The EAVS-AA-R and AVS-R Mediate the Effect of Group Membership on EOT, Controlling for Age and Sex.



Note: Path values represent unstandardized regression coefficients. The value outside of the parentheses represents the total effect of group membership on EOT, prior to the inclusion of the mediating variables. The value inside the parentheses represents the direct effect, based on bootstrapping analyses, of group membership on EOT after the mediators are included in the model. EAVS–AA–R = European American Values Scale for Asian Americans–Revised; AVS–R = Asian Values Scale Revised; EOT = Externally Oriented Thinking. *$p < .05$; ***$p < .001$.

lower levels of EOT in both groups. This suggests that Euro-American values foster greater emphasis on internal emotional stimuli, rather than external stimuli, consistent with the cross-cultural emotion literature briefly reviewed earlier. In contrast, Asian values as assessed by the AVS-R did not significantly predict EOT in either group. The lack of a significant association between Asian values and EOT was unexpected, and any interpretation must remain tentative. However, as discussed below in the context of the mediation results, it is possible that the values captured by the AVS-R are relatively unrelated to EOT due to the "Western" origins of the alexithymia construct.

Neither DIF nor DDF were significantly predicted by cultural values in either group. These results support our proposal that EOT may be particularly shaped by cultural context, in contrast to the other main components of alexithymia. While the expected lack of association of DIF and DDF with cultural values represents an attempt to evaluate null hypotheses, the pattern of findings fits well with our theoretical model.

The results of our meditational analysis also provide strong support for our hypotheses. In a simple mediation model, Modernization was a significant mediator of the effect of group membership on EOT, suggesting that group differences in EOT are partially explained by differences in the relative level of modern versus traditional values in these two groups. In a two-mediator model, Euro-American and Asian values together fully mediated the effect of group membership on EOT, and each set of values also acted as an independent mediator of this effect. Though Asian values did not significantly predict EOT within either group, regression results were in the expected direction, allowing the effect to attain significance in the combined sample. These results suggest that the group difference in levels of EOT between the Euro-Canadians and Chinese-Canadians can be explained by differences in their average endorsement of Euro-American and Asian cultural values. Taken together, the results of both meditational models suggest that cultural values that differentiate Euro-American versus Chinese cultural contexts help to explain group differences in the relative importance placed on emotion-related stimuli.

Consistent with the regression results, Euro-American values had a significantly stronger mediating effect than Asian values in the two-mediator model. The stronger association between Euro-American values and EOT was not predicted, and any potential explanations remain speculative. However, it is possible that this finding reflects the "Western" roots of alexithymia, as discussed earlier. Since the construct can be understood as grounded in "Western" norms regarding emotional expression and the place of emotions in daily life, perhaps it is not surprising that variations in Euro-American values would have a particularly strong bearing on levels of

EOT. Further research is required to examine and clarify this issue.

The current findings offer several important implications for the study of alexithymia. First, our results highlight the importance of separately examining the individual components of this construct. Such an approach has been recommended as clinically valuable (Kirmayer & Robbins, 1993), and the current study demonstrates the value of studying the individual components from a cultural perspective. A more critical implication is that the inclusion of EOT in the total TAS-20 score may lead to a cultural bias in the measurement of alexithymia. Our results suggest that relatively high levels of EOT may be driven by factors unrelated to emotional processing deficits, such as cultural values. Therefore, the calculation of a total alexithymia score that contains a significant amount of EOT-related content is likely to overestimate the levels of alexithymia in certain groups, particularly those with lower levels of "Western" values and higher levels of "traditional" values. This suggests that researchers conducting cross-cultural examinations of alexithymia should be cautious in drawing conclusions from simple group comparisons and be especially attuned to differences across the individual components.

Furthermore, the current findings may offer a nonpathological explanation for cultural differences in alexithymia. Group differences driven by variations in EOT may be based on cultural differences in the emphasis placed in emotional experiences, rather than actual emotional difficulties. High levels of EOT are likely to be driven by emotional processing deficits in certain contexts, such as those characterized by more "Western" values, and therefore be clearly related to overall alexithymia. However, in cultural contexts with lower levels of "Western" values and greater levels of "traditional" values, high levels of EOT may instead be driven by cultural factors and be relatively unrelated to emotional deficits. This theoretically driven proposal remains speculative at this point and requires further empirical investigation.

Our results also illustrate the value of moving beyond simple cultural comparisons and examining specific variables that can help to explain group differences on psychological constructs. As mentioned earlier, such an approach has been referred to as "unpacking" or "unpackaging" culture (Matsumoto & Yoo, 2006; Singelis et al., 1999). Studies that reveal cultural differences have been helpful in throwing light on the problematic assumptions of universality that have long characterized the field of psychology. Methods that move beyond the discovery of group differences and towards an empirical understanding of such differences can make particularly important contributions by revealing specific mechanisms that underlie various psychological processes (Heine & Norenzayan, 2006; Matsumoto & Yoo, 2006).

There are several important limitations to the current study. Firstly, the EOT subscale showed poor reliability in both groups. Though this is consistent with previous studies, it remains somewhat problematic for interpreting results. In future studies extending the themes of the current research, it may well be valuable to include measures of other cognitive styles relevant to our discussion of EOT to help bolster these findings. Similarly, the use of cultural values measures with improved reliability would also be a valuable addition in future research, as would the inclusion of other cultural-level variables. To complement the use of broad cultural values measures in the current study, future variables of interest may include more narrow sets of values, such as values about emotional control (Mauss, Butler, Roberts, & Chu, 2010). The generalizability of the current findings is also limited by the use of a student sample. However, the current study provides an initial examination of a set of theory-driven hypotheses, which will be examined in clinical and community samples in future studies. Future research should also examine the extent to which our findings extend to other Chinese heritage samples, including those from Chinese majority societies. As our hypotheses were based on previous work with samples from China, we predict that our findings would extend to such groups. Finally, the use of self-report measures can introduce certain limitations, particularly in the assessment of alexithymia—a con struct defined by a difficulty in reporting one's psychological experiences. Though this is a limitation shared by much alexithymia research, replication of the current findings using alter native assessment methods would be desirable. The authors of the TAS-20 have recently developed the Toronto Structured Interview for Alexithymia (TSIA; Bagby, Taylor, Parker, & Dickens, 2006), and a cultural examination of alexithymia using this tool would be a valuable addition to the literature.

The current study highlights the value of taking a cultural perspective in examining clinically relevant psychological constructs. Our findings hold implications both for researchers interested in the links between culture and emotional processes, as well as for mainstream alexithymia researchers. Furthermore, the model proposed here has implications for understanding cultural variations in the presentation of depressive symptoms among individuals of Chinese and North American heritage, a longstanding line of inquiry in the cultural psychiatry literature (e.g., Kleinman, 1982). Ryder et al. (2008) found that EOT partially mediated the relation between group membership and somatic symptom reporting among Chinese and Euro-Canadian outpatients. Future studies should examine the question of whether or not cultural values and EOT help to explain the relative emphasis on somatic versus psychological symptoms in these two cultural groups.

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Notes

1. While CPAI scales generally use a true/false response format, the current study used a 4-point Likert type scale ranging from *strongly disagree* to *strongly agree*, in order to facilitate multivariate analyses used in additional studies.

2. Alternative estimate of reliability analyses using structural equation modeling techniques (e.g., Raykov, 1997) were conducted, but did not consistently result in appreciable changes in estimates of reliability. The details of these analyses are available upon request from the first author.

3. Given the unequal group sizes, Welch's *t* test (i.e., t') was used in place of the regular *t* test, to account for potential differences in variance; one consequence of this test is a reduction in degrees of freedom, which are no longer restricted to whole numbers.

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