“I felt sad and did not enjoy life”: Cultural context and the associations between anhedonia, depressed mood, and momentary emotions

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Abstract
The meanings of “anhedonia” and “depressed mood,” the cardinal emotional symptoms of major depression, may be shaped by cultural norms regarding pleasure and sadness. Thirty-two European Americans, 26 Hispanic Americans, 33 Asian Americans, and 20 Russian Americans provided reports of (a) depressive symptoms, (b) momentary emotions and pleasure, and (c) global subjective well-being. Momentary reports were collected over 10 days using handheld personal digital assistants. Reports of anhedonia were associated with heightened levels of momentary low arousal negative emotions (e.g., sadness), whereas reports of depressed mood were associated with dampened levels of momentary positive emotions (e.g., happiness). Symptoms of anhedonia and depressed mood interacted in their associations with momentary pleasure. In addition, the associations of anhedonia and depressed mood with positive emotions and life satisfaction differed across cultural groups. Specifically, these symptoms were associated with dampened positive emotions in the Asian American group only. Additionally, anhedonia was associated with dampened global life satisfaction in the European American group only. These results suggest that reports of anhedonia and depressed mood cannot be interpreted at face value as specific and culture-free indicators of...
emotional deficits. Instead, they appear to signal changes in the balance of positive and negative emotions, with the exact nature of these signals shaped at least in part by cultural context. This conclusion has important consequences for the clinical interpretation of depressive symptoms in multicultural societies.

Keywords
anhedonia, culture, depressed mood, momentary sampling, well-being

Introduction

Major depressive disorder is a leading cause of poor health and disability worldwide (Moussavi et al., 2007). Although the various symptoms of this disorder represent problems in the cognitive, somatic, and interpersonal spheres, the two key symptoms of major depression—depressed mood and anhedonia—reflect problems in emotional functioning. Depressed mood involves prolonged and excessive feelings of sadness, whereas anhedonia involves markedly diminished interest or pleasure in all, or almost all, activities (American Psychiatric Association, 2013). Most depression inventories (e.g., the Center for Epidemiologic Studies Depression Scale, CES-D; Radloff, 1977) assess these symptoms with retrospective statements such as the ones appearing in the title of the paper (“I felt sad” and “I did not enjoy life”). How should clinicians and researchers interpret these reports when assessing depression in people from diverse cultural contexts? It is easy to assume that these symptoms tap into actual emotional changes. Yet, we know little about their significance for well-being and moment-to-moment emotional experiences.

Depressed mood and anhedonia—or indeed, any symptom—cannot be understood without knowing their meaning and implications within a particular cultural context (Ryder, Ban, & Chentsova-Dutton, 2011). Symptoms are shaped by culture, understood as a loosely organized system of widely shared norms, beliefs, and values and their manifestations in institutions, cultural products and symbols, and observed behavior. Depressed mood and anhedonia do not emerge in a cultural vacuum, but rather are detected, reported, and interpreted within a framework of cultural norms and beliefs regarding emotions (Eid & Diener, 2001; Mesquita & Walker, 2003; Oishi, 2002; Scollon, Howard, Caldwell, & Ito, 2009), and common ways to experience and express these emotions in a given cultural context (Matsumoto, Yoo, & Fontaine, 2008; Scollon, Diener, Oishi, & Biswas-Diener, 2004). These symptoms may reflect actual changes in emotional reactivity (e.g., Dworkin & Saczynski, 1984; Loas, 1996) or generalized cultural beliefs about feelings (Robinson & Kirkeby, 2005). Scollon et al. (2004) called for cross-cultural studies comparing reports of clinical symptoms and global reports of well-being with experienced emotions, warning that reliance on retrospective clinical measures could, “indicate cultural differences that are not apparent in daily experience” (p. 322). The present report takes on this challenge, examining whether depressed mood and anhedonia are reflective of deficits in emotional experiences and well-being.
among people from different cultural contexts (European American, Hispanic American, Asian American, and Russian American). Before introducing the study, we will first briefly review the literatures on the cultural shaping of sadness and pleasure, and on cultural variation in momentary versus recalled affect.

Cultural norms regarding emotions

Sadness and pleasure are the emotional states most closely tied to reports of depressed mood and anhedonia. As with all emotions, sadness and pleasure have both functional and dysfunctional aspects (Frijda & Mesquita, 1994; Parrott, 2001). They offer intrapersonal and interpersonal benefits (e.g., sadness aids in recruitment of social support; pleasure contributes to motivation) and also extract costs (e.g., sadness reduces energy; pleasure limits investment in long-term goals). Faced with the dilemma of balancing these outcomes within the framework of core cultural concerns (e.g., concerns about group harmony or independence), cultural contexts promote different solutions for maximizing the benefits of these emotions while minimizing their costs. Over time, these solutions become encoded in shared cultural norms regarding emotions. Studies suggest that cultural norms shape experience and expression of pleasure and positive emotions more than sadness (Scollon et al., 2004; Tsai, Chentsova-Dutton, Freire-Bebeau, & Przymus, 2002). Based on these findings, we will primarily focus on the norms regarding positive emotions and pleasure and their relationship with anhedonia, while examining sadness and its relationship with depressed mood in an exploratory fashion.

Cultural norms regarding pleasure. Cultural contexts are known to differ in the value placed on the experience and expression of pleasure (Rozin, 1999). Many North, Central, and South American cultural contexts are thought to place a relatively high emphasis on the benefits of pleasure when compared with East Asian or Eastern European cultural contexts. In particular, the European American cultural context is thought to promote the open expression of pleasure and positive emotions (Bellah, Sullivan, Tipton, Swidler, & Madsen, 1985; Wierzbicka, 1999). Although research on Hispanic cultural contexts is sparse, an argument has been made that expressions of pleasure are purportedly harnessed for promotion of relational warmth in these contexts (Albert, Mesquita, & Bianchi, 2006; Klein, 2001; Triandis & Marín, 1984). In contrast, East Asian (Bond, 1991; Russell & Yik, 1996) and Russian (Lyubomirsky, 2000) contexts are thought to stress the importance of moderating pleasure and positive emotions and being aware of their negative consequences. Indeed, in line with these descriptions, European American and Hispanic nonclinical samples are more likely to value, experience, and express pleasure and positive emotions than their East Asian and Eastern European counterparts (Balatsky & Diener, 1993; Eid & Diener, 2001; Kitayama, Markus, & Kurokawa, 2000; Licht, Goldschmidt, & Schwartz, 2007; Mesquita & Karasawa, 2002; Schwartz & Bardi, 1997, 2001; Scollon et al., 2004; Tsai et al., 2002).
Cultural norms regarding pleasure shape not only the reports of pleasurable experiences, but also the extent to which these experiences affect life satisfaction. In European American cultural contexts, the inability to feel, express and/or acknowledge experiencing pleasure and positive emotions may contribute to dissatisfaction with one’s emotional functioning and/or social disapproval (Meehl, 1975). Over time, this may lead to diminished life satisfaction. Prior studies suggest that the magnitude of associations between reports of emotions and well-being varies across cultural contexts (Dorahy et al., 2000; Schimmack, Radhakrishnan, Oishi, Dzokoto, & Ahadi, 2002; Simpson, Schumaker, Dorahy, & Shrestha, 1996; Suh, Diener, Oishi, & Triandis, 1998). Dampened levels of pleasure and positive emotions show stronger negative associations with life satisfaction in cultural contexts that emphasize positive emotional experience and pleasure relative to sadness (e.g., European American).

Cultural norms regarding sadness. In contrast to the proliferation of research on the cultural shaping of pleasure and positive emotions, relatively few studies have focused on sadness. That limited work has been done very tentatively suggests that sadness is viewed less favorably in European American than in Russian and possibly East Asian cultural contexts. Over the course of the last century, sadness has become increasingly pathologized in North America (Horwitz & Wakefield, 2007). In contrast, Russian (Rancour-Laferriere, 2003; Wierzbicka, 1998, 1999) cultural context places an emphasis on sensitivity to losses and ability to experience and express sadness. The same may be true of East Asian cultural contexts (Lock, 1995). Empirical research is yet to bear these predictions out. No cultural differences have been observed in the experience of sadness across groups of European Americans, Hispanic Americans, and Asian Americans (Scollon et al., 2004; Tsai et al., 2002; Tsai, Levenson, & Carstensen, 2000). The only study that detected differences showed that nondepressed European Americans tended to be more, rather than less, reactive to a sad film clip relative to Asian Americans (Chentsova-Dutton et al., 2007). More research examining cultural similarities and differences in experiences of sadness is needed.

Much prior work on cultural norms regarding pleasure and sadness has relied on retrospective measures of these emotions. An underexplored issue in research on cultural differences in depression is that recalled emotions (e.g., clinical reports of feeling sad) do not always reflect in-the-moment emotions. Hence, an examination of the ways in which emotional symptoms of depression reflect or fail to reflect changes in emotional functioning across people from different cultural contexts is long overdue.

Experienced versus retrospectively recalled emotions. In order to report one’s own anhedonia, a person needs to attend to the question, review days or even weeks worth of momentary emotional information, and synthesize this information into global ratings. Global and retrospective reports tend to draw not only on bottom-up information about experienced emotions, but also on top-down heuristics or
generalized beliefs about how intensely and how frequently one typically feels or ought to feel certain emotions. How accurate are these reports and to what extent do cultural norms affect their accuracy?

Accumulating studies show that although cultural norms shape what we feel in the moment (e.g., I am feeling sad now), they exert more influence on what we remember feeling (e.g., I felt sad this week; Oishi, 2002; Scollon et al., 2004; Scollon et al., 2009; Wirtz, Chiu, Diener, & Oishi, 2009). Different cultural contexts foster different heuristics for synthesizing momentary experiences of emotional states into global and retrospective ratings (see Scollon, Koh, & Au, 2011, for a review). One previous study suggests that European Americans’ and Asian Americans’ recall of positive and negative emotions relies more on experienced emotions than that of Hispanic Americans (Scollon et al., 2004). If replicated, this pattern suggests that European Americans and Asian Americans may be more likely than Hispanic Americans to attend to their actual emotional experiences when analyzing and reporting their general emotional state. No studies have extended these findings to examine the relation between experienced emotions and retrospective ratings of clinical symptoms. The present study takes a first step in this direction.

The present study

This emerging literature from cultural and clinical psychology reveals a need for studies examining how emotional functioning is associated with the symptoms of anhedonia and depressed mood. Although we know that depression is associated with changes in momentary affect (e.g., Peeters, Berkhof, Delespaul, Rottenberg, & Nicolson, 2006; Peeters, Nicolson, Berkhof, Delespaul, & deVries, 2003), prior studies have not examined whether this association differs across cultural contexts. The present study begins to address these questions, building on previous work in several important ways.

First, the study compares four cultural groups of people believed to differ in their exposure to norms regarding pleasure and sadness, and in their reliance on experienced emotions in constructing retrospective reports of these emotions: European Americans; Hispanic Americans; (East) Asian Americans; and Russian Americans. These groups were selected for the study based on prior ethnographic observations and research comparing emotional norms across cultural contexts. Second, this study is the first to examine the association of depressive symptoms with in-the-moment reports of emotions in these cultural groups. Momentary sampling is a reliable and valid approach that captures momentary emotional states and minimizes recall bias (Csikszentmihalyi & Larson, 1987; Scollon, Kim-Prieto, & Diener, 2003). It allows for observation of emotional functioning and well-being as they unfold in participants’ daily lives over a large number of randomly selected occasions. In the present study, momentary reports were collected at frequent intervals for a period of 10 days, capturing participants’ emotional responses to a wide variety of situations.
Finally, prior studies have compared people meeting the criteria for major depressive disorder or scoring high on measures of depressed mood to nondepressed controls. This approach allows researchers to examine the association of the syndrome of major depressive episode with emotional functioning and well-being. Given that the concept of this syndrome itself may be culturally shaped, these studies may have missed people who experience depressed mood and/or anhedonia in ways that do not match the Western-derived diagnosis of major depressive disorder (Ryder & Chentsova-Dutton, 2012). It is important to examine the associations of anhedonia and depressed mood with well-being in an effort to understand the significance of these emotional symptoms across cultural contexts.

Based on prior work on cultural variation in experienced and recalled emotions, we tested three hypotheses. First, we anticipated that cultural groups in our study would differ in their experiences of emotions. More specifically, we predicted that European Americans and Hispanic Americans would experience more intense positive emotions and pleasure than Asian Americans and Russian Americans. Because few prior studies observed cultural variations in sadness, we made no predictions regarding cultural group differences in this emotion.

Second, we predicted that retrospective reports of anhedonia and depressed mood would not tap into the same emotional experiences across cultural contexts. Rather, these clinical symptoms would be more likely to reflect momentary experiences among European Americans and Asian Americans than among Hispanic Americans. Because no prior work on this question has included Russian samples, we made no predictions for this group.

Finally, based on prior work on the relationship between positive emotions and life satisfaction, we predicted that the endorsement of anhedonia would show a stronger negative association with life satisfaction in cultural contexts that emphasize the importance of positivity (European American and possibly Hispanic cultural contexts). In contrast, we anticipated that anhedonia would be less likely to contribute to lower well-being in East Asian and Russian cultural contexts.

**Method**

**Participants**

Participants were 32 European Americans (EA; 13 men), 25 Hispanic Americans (HA; 10 men), 33 Asian Americans (AA; 8 men), and 20 Russian Americans (RA; 4 men). They were recruited through a psychology subject pool and community advertisements.

In order to ensure that each study group was relatively homogeneous and clearly defined, potential participants were screened based on their ethnocultural backgrounds, as assessed by self-report demographic questions about place of birth, place(s) where parents were born and raised, and ethnic origin of self and parents. Selected EAs were born in the US and had parents of Western European descent who were born and raised in the US. Selected AAs were born in the US or East
Asian countries (China, Korea, Japan) and had parents of East Asian descent who were born and raised in East Asian countries. HAs were born in the US or in Central or South America and had parents of Hispanic descent who were born and raised in Central or South America. RAs were born in the US or the former Soviet Union and had parents of Russian descent who were born and raised in the former Soviet Union. We relied on these indicators of ethnicity as proxies for exposure to relevant cultural contexts. See Table 1 for demographics. Cultural groups differed in age, with RAs being older than other groups. Statistically controlling for this difference did not affect the results.

### Measures

#### Cultural orientation.
To ensure that participants were oriented to the cultural contexts under which they had been grouped, they completed the 38-item General Ethnicity Questionnaire (GEQ) assessing mainstream American cultural orientation (Tsai, Ying, & Lee et al., 2000). GEQ uses a 5-point Likert scale (1 = “strongly disagree”; 5 = “strongly agree”). HAs, AAs, and RAs also completed a version of the GEQ assessing orientation to heritage cultural contexts. GEQ-American (α = .84 for EAs; .90 for HAs; .94 for AAs; .81 for RAs) and GEQ-Hispanic/East Asian/Russian (α = .91 for HAs; .91 for AAs; .88 for RAs) were reliable. As expected, HAs, AAs, and RAs reported significantly lower orientation to American culture than EAs. HAs had significantly higher orientation to their

### Table 1. Sample characteristics.

<table>
<thead>
<tr>
<th></th>
<th>EA</th>
<th>HA</th>
<th>AA</th>
<th>RA</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>F/X² df</td>
</tr>
<tr>
<td>Descriptive characteristics</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Age**</td>
<td>21.38 a 4.35</td>
<td>20.76 a 4.68</td>
<td>22.18 a 5.05</td>
<td>27.35 b 8.59</td>
<td>6.27 106</td>
</tr>
<tr>
<td>Family income**</td>
<td>3.47 a 1.05</td>
<td>2.68 b 1.03</td>
<td>3.21 a 1.02</td>
<td>2.58 b 0.75</td>
<td>4.92 106</td>
</tr>
<tr>
<td>Years in US</td>
<td>n/a</td>
<td>11.43 a 5.59</td>
<td>9.86 a 9.86</td>
<td>7.95 b 5.21</td>
<td>0.67 41</td>
</tr>
<tr>
<td>GEQ-American**</td>
<td>4.27 a 0.35</td>
<td>3.60 b 0.50</td>
<td>3.79 b 0.66</td>
<td>3.71 b 0.36</td>
<td>10.42 105</td>
</tr>
<tr>
<td>GEQ-ethnic**</td>
<td>n/a</td>
<td>3.97 a 0.52</td>
<td>3.49 b 0.67</td>
<td>3.44 b 0.49</td>
<td>5.63 105</td>
</tr>
<tr>
<td># of responses</td>
<td>64.16 a 19.44</td>
<td>55.40 a 23.79</td>
<td>57.48 a 20.45</td>
<td>57.35 a 20.34</td>
<td>0.99 106</td>
</tr>
<tr>
<td>Symptom Endorsement (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anhedonia</td>
<td>68.8% a</td>
<td>60.0% a</td>
<td>54.5% a</td>
<td>75.0% a</td>
<td>1.97 3</td>
</tr>
<tr>
<td>Depressed mood</td>
<td>65.6% a</td>
<td>68.0% a</td>
<td>78.8% a</td>
<td>70.0% a</td>
<td>1.68 3</td>
</tr>
</tbody>
</table>

Note. Family income was measured on a 1–5 scale of increasing self-reported family income while growing up, with “3” equivalent to middle class income.

EA = European Americans; HA = Hispanic Americans; AA = Asian Americans; RA = Russian Americans; GEQ = General Ethnicity Questionnaire; DID = Diagnostic Inventory for Depression. Means having the same subscript (e.g., mean) within rows do not differ significantly at p < .01. **p < .01.
heritage cultural contexts than AAs or RAs. Statistically controlling for these differences did not affect the results.

**Reports of depressive symptoms.** The Diagnostic Inventory for Depression (DID; Zimmerman, Sheeran, & Young, 2004) is a self-report inventory that assesses the severity and frequency of the DSM-IV symptoms of major depressive disorder. The DID has well-established reliability; in particular, items measuring anhedonia and depressed mood have previously shown test–retest reliabilities of .69 and higher (Zimmerman et al., 2004). The DID also has demonstrated agreement with structured clinician-rated diagnostic interviews, such as the SCID (Structured Clinical Interview for DSM-IV; First, Spitzer, Gibbon, & Williams, 1995). Zimmerman et al. (2004) reported that items measuring anhedonia and depressed mood are positively correlated with the SCID items measuring these symptoms. Finally, the DID items measuring these symptoms are sensitive to the presence of the clinical diagnosis of major depression (Zimmerman et al., 2004).

Using the DID, we examined participants’ reports of: (a) loss of interest in or the amount of pleasure derived from usual activities (anhedonia); and (b) feelings of sadness or depression (depressed mood). Because participants’ reports of these symptoms were not normally distributed, we compared participants who did and did not endorse these symptoms at any level of severity. We also examined reports of the extent of impairment in usual activities. Participants described the extent to which symptoms of depression have interfered with their usual daily responsibilities, ranging from 0 = “not at all” to 4 = “extremely.” The scale included six items (e.g., “Participation and enjoyment in leisure and recreation activities”) and had adequate internal consistency, $\alpha = .87$.

The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), a 21-item self-report inventory, was also used to assess symptoms of depression. For each symptom, respondents selected one of four self-descriptive statements that increase in severity, rated from 0 to 3. This measure showed adequate reliability across the four cultural groups ($\alpha = .93$ for EAs, 0.90 for HAs, .89 for AAs, .88 for RAs).

**Life satisfaction.** The Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) is a five-item scale measuring the evaluative component of subjective well-being. The items ask how satisfied respondents are with their lives using a 7-point Likert scale (1 = “strongly disagree”; 7 = “strongly agree”). The SWLS showed adequate reliability across the four cultural groups ($\alpha = .93$ for EAs, .90 for HAs, .90 for AAs, .79 for RAs).

**Momentary reports of emotions and pleasure.** Participants completed a questionnaire during each personal digital assistant (PDA) prompt (see Appendix). This scale assessed in-the-moment emotions (e.g., “Immediately before the beep how sad did you feel?”) using a 5-point rating scale (1 = “None”; 5 = “Extreme”). We sampled reports of positive affect (aggregated ratings of pleasant feelings, happiness, interest, and satisfaction, $\alpha = .87$), pleasure (aggregated ratings of enjoyment of touch or
movement, taste, seeing, or hearing something pleasant, being with others, and thinking or learning, $\alpha = .84$), and low arousal negative affect (aggregated ratings of sadness and feeling upset, $\alpha = .81$). These momentary report scales were formed based on their correspondence to the clinical reports of anhedonia and depressed mood. The remaining questions tapped other emotional states and were not relevant to the current study.

Multilevel mixed models with autoregressive covariance structure were used to examine whether reports of (a) presence versus absence of anhedonia, (b) presence versus absence of depressed mood, (c) cultural group, or (d) their interactions were associated with momentary reports of positive affect, pleasure, and low arousal negative affect. This way of modeling data accounts for the fact that each of our participants provided repeated, and likely correlated, measurements of emotions over time. In multilevel mixed models, data for momentary reports of emotions were nested within participants.

Procedure

Participants signed informed consent documents and completed a packet of questionnaires, including measures of depressive symptoms and subjective well-being. They were then trained to use personal digital assistants (PDA; Palm Z22, 2005) and asked to carry these PDAs with them at all times for 10 days. The Experience Sampling Program (ESP; Barrett & Feldman Barrett, 2000) triggered the questionnaire on the PDAs at random intervals for a total of nine times a day. This sampling rate was chosen with an expectation that participants would miss some prompts (Christensen, Feldman Barrett, Bliss-Moreau, Lebo, & Kaschub, 2003). Indeed, on average, participants missed approximately 3–4 daily prompts due to a variety of situational constraints (e.g., busy, did not hear the signal; see Table 1 for average numbers of responses). All prompts were delivered during participants’ waking hours, and were customized according to participants’ schedules. Each questionnaire took approximately 5 minutes to complete. Participants were asked to respond to prompts immediately; if they did not respond, the prompt disappeared and was not replaced. Participants received course credits or cash compensation for their effort.

Results

Participants’ gender did not interact with anhedonia and depressed mood in shaping momentary reports of emotions and pleasure or life satisfaction. Hence, we have excluded gender from our presentation of the results.²

Levels of depressive symptoms and impairment

First, we examined whether cultural groups differed in their levels of depressive symptoms. A one-way ANOVA yielded no cultural group differences in BDI levels,
Next, we established that anhedonia and depressed mood functioned as indicators of depression and impairment across cultural groups. We conducted three-way ANOVAs for BDI and impairment in important activities, with presence versus absence of anhedonia, presence versus absence of depressed mood, and cultural group as independent variables. Symptoms of anhedonia and depressed mood were excluded from the BDI score to ensure that the results were not due to these symptoms. This procedure yielded a final total of 19 items representing a mix of affective, cognitive, and somatic symptoms of depression.

These analyses revealed that both anhedonia and depressed mood were associated with heightened levels of other depressive symptoms, $F_s = 8.92$ and 8.75, respectively, both $p < .01$, both $\eta^2_s = .09$. Participants who endorsed anhedonia ($M = 9.14; SD = 6.45$) and depressed mood ($M = 8.71; SD = 6.93$) had higher modified BDI scores than those who did not ($M = 3.90, SD = 6.45$ and $M = 3.32, SD = 3.26$, respectively). There was no main effect of cultural group and no interactions between endorsement of symptoms and cultural group, all $F_s(1, 94) < 0.90$, ns.

An analysis conducted on levels of impairment in important activities yielded a significant main effect of anhedonia, $F(1, 94) = 7.14, p < .01, \eta^2 = .07$. Participants who endorsed anhedonia reported a higher level of impairment ($M = 1.71, SD = 1.10$) than those who did not ($M = 1.20, SD = 1.25$). There was no main effect of depressed mood, no main effect of cultural group and no significant interactions, all $F_s(1, 94) < 1.44$, ns. In sum, reports of anhedonia and depressed mood pointed to a pattern of depressive symptoms and impairment that was similar across cultural groups. This allowed us to compare their influence on momentary emotions and life satisfaction across cultural groups.

The associations of anhedonia and depressed mood with momentary reports of emotions and pleasure

Positive affect. The model for momentary reports of positive affect revealed no main effect of anhedonia, $F(1, 189.15^3) = 1.56, p = .21$. Participants who reported depressed mood showed lower levels of moment-to-moment positive affect than other participants, $F(1, 189.16) = 5.77, p < .05$. There was no fixed effect of cultural group, $F(3, 187.23) = 1.00, p = .39$; however, cultural group interacted with both anhedonia, $F(3, 187.22) = 3.10, p < .05$, and depressed mood, $F(3, 187.24) = 5.00, p < .01$. For AAs but not for other cultural groups, reports of depressed mood and anhedonia were associated with lower levels of momentary positive affect, anhedonia parameter estimate for AAs, $t(179.37) = 2.77, p < .01$; depressed mood parameter estimate for AAs, $t(201.27) = 2.89, p < .01$ (see Figure 1 for a graphic depiction of these results).

Pleasure. Anhedonia, $F(1, 171.48) = 0.13, p = .91$, and depressed mood, $F(1, 171.49) = 1.79, p = .18$, were not associated with momentary reports of pleasure. There was an interaction between them, $F(1, 171.48) = 6.66, p = .01$, indicating...
that the combination of these symptoms was associated with a drop in momentary pleasure. Cultural groups also differed in their experiences of momentary pleasure, $F(3, 169.50) = 6.45, p < .001$. HAs ($M = 3.80, SE = .97$) tended to report higher levels of momentary pleasure than RAs ($M = 3.28, SE = .98$), with AAs and EAs not differing from the other groups. Cultural group did not interact with anhedonia, $F(3, 169.49) = 1.32, p = .27$, or depressed mood, $F(3, 169.51) = 1.69, p = .17$, in its association with momentary reports of pleasure.

**Low arousal negative affect.** Anhedonia was associated with increases in momentary levels of low arousal negative emotions, $F(1, 198.97) = 7.85, p < .01$. There were no
fixed effects for depressed mood, $F(1, 198.97) = 0.81, p = .37$, nor for cultural group, $F(3, 197.72) = 2.31, p = .08$. Finally, cultural group did not interact with either anhedonia, $F(3, 197.72) = 1.51, p = .21$, or depressed mood, $F(3, 197.72) = 2.21, p = .09$, in its association with momentary reports of low arousal negative emotions.

**The association of anhedonia and depressed mood with global reports of subjective well-being**

Finally, we conducted a three-way ANOVA to examine the associations of reports of anhedonia and depressed mood with life satisfaction. There was no main effect of anhedonia, $F(1, 94) = 2.75, p = .10$, or cultural group, $F(3, 94) = 0.58, p = .63$; however, the association of anhedonia with life satisfaction depended on cultural group, $F(3, 94) = 2.95, p < .05, \eta^2 = .09$. EAs who endorsed anhedonia had lower life satisfaction than those who did not ($p = .002$). This relation did not hold for HAs ($p = .38$), AAs ($p = .18$), or RAs ($p = .19$); see Figure 2. There was also a significant main effect of depressed mood, $F(1, 94) = 12.49, p = .001, \eta^2 = .12$. Those who endorsed it had lower life satisfaction ($M = 4.05, SD = 1.42$) than those who did not ($M = 5.41, SD = 1.23$). There were no other interactions, all $F$s$(1, 94) \leq 2.21, ns$.

**Discussion**

We observed both cultural similarities and cultural variation in momentary experiences of emotions. Cultural variation emerged in daily experiences of pleasure. Partially in line with our predictions, RAs were less likely to experience pleasure in their daily lives than HAs. While Hispanic cultural contexts have been described as emphasizing pleasure, there is some evidence to suggest that Russian contexts are relatively sparse in positive daily events (Balatsky & Diener, 1993). Russians are also less likely to value happiness and to express positive emotions and are more likely to suffer from symptoms of depression than their counterparts in the US, Western Europe, and Latin America (Ferrari et al., 2013; Lyubomirsky, 2000; Matsumoto, Takeuchi, Andayani, Kouznetsova, & Krupp, 1998).

Indeed, the current findings support the notion that Russian cultural contexts may discourage the detection, experience, or communication of pleasure. A number of aspects of Russian culture, from Orthodox Christian influences to daily life events, might contribute to this pattern (Chentsova-Dutton, Senft, & Ryder, 2013). Interestingly, the pattern observed for pleasure did not hold for positive emotions, suggesting that broad descriptions of cultural norms that treat positive emotions and pleasure as similar may oversimplify the complexity of these norms. In addition, and despite prior literature suggesting such a pattern, we did not observe differences between experiences of pleasure of European American and Asian American samples. This study adds to the literature showing that cultural differences derived from retrospective or global reports of emotions do not always hold for emotions as they are experienced in the moment (e.g., Oishi, 2002).
The association of clinical symptoms and experienced positive affect also depended on cultural group. We predicted that Asian Americans and European Americans would be more data-driven in their reports of clinical symptoms, but actually observed a much more narrow pattern of results. Although reports of anhedonia and depressed mood were associated with dampened momentary experiences of pleasure across cultural groups, their association with dampened experiences of positive emotions was specific to the Asian American cultural group. If replicated, this may mean that Asian Americans’ reports of clinical symptoms of depression are relatively more sensitive to drops in their in-the-moment happiness or satisfaction. One reason for this may be that norms regarding experience of positive emotions are relatively more pronounced for the other groups, making their endorsement of the symptoms of anhedonia and depressed mood more theory-driven (i.e., dependent on generalized beliefs about one’s emotions) rather than data-driven (e.g., dependent on momentary emotions) in the domain of positive emotions.

Another pattern of cultural differences was observed in the association of anhedonia with global life satisfaction. For EAs, but not for other groups, anhedonia was linked with drops in global life satisfaction. This is consistent with the notion that in the European American cultural context, anhedonia represents a departure from a norm of maintaining a cheerful emotional state and pursuing pleasure (Lutz, 1985; Mesquita & Walker, 2003). Anhedonic EAs may have perceived a discrepancy between their own emotions and the emotional states valued in their cultural context, contributing to their levels of dissatisfaction. Although Hispanic cultural contexts have been described as similar to European American contexts in this regard (e.g., Triandis & Marin, 1984), we did not observe the same pattern for HA participants. It is possible that Hispanic cultural norms about positive emotions are specific to the interpersonal domain (e.g., simpatía). If so, HA’s satisfaction may be specifically affected by social pleasure and interest rather than by more general hedonic experiences.

Our hypotheses regarding the associations of retrospective reports of anhedonia and depressed mood with experienced emotions and well-being were partially supported. Across groups, anhedonia, depressed mood, and their combination were linked to momentary experiences of pleasure and positive and negative emotions. The direction of some of these links, such as the association of the low levels of momentary pleasure with a combination of anhedonia and depressed mood, was intuitive. The nature of other links observed across cultural groups was surprising. The clinical literature tends to treat symptoms of depression at face value, assuming that reports of anhedonia and depressed mood reflect actual impairments in emotional reactivity to positive and negative stimuli, respectively (e.g., Meehl, 1975). We found that anhedonia was associated with negative affect more than positive affect, whereas the opposite was true for depressed mood. That is, participants who characterized themselves as unable to feel interest and pleasure were more likely to experience sadness in their daily lives, whereas those who characterized themselves as sadder were less likely to experience happiness in their daily lives. Why might this pattern occur?
When people report symptoms of anhedonia and depressed mood, they rely on their memories of how they felt over extended periods of time. These reports are cognitively demanding, encouraging people to rely on heuristics (Robinson & Kirkeby, 2005) rather than on actual changes in emotions. Our results suggest that reports of both anhedonia and depressed mood may signal perceptions of changes in the balance between positive and negative emotions. Excesses of negative affect may highlight the fact that positive affect is insufficiently high to help regulate one’s emotional state, and vice versa. Taken together, our findings indicate that clinical symptoms of anhedonia and depressed mood are rooted in momentary experiences across cultural groups, albeit not in the specific experiences that correspond to retrospective reports.

Limitations and future directions

This study is the first to examine the association of major depression symptoms with momentary and global subjective well-being across cultural contexts. There are several limitations that should be addressed in future research. First, we relied on a self-report measure of depressive symptoms and included participants with subthreshold levels of anhedonia and depressed mood. Therefore, our results may underestimate the full impact of these symptoms. We also did not focus on symptoms that may serve as better indicators of distress for some cultural groups, such as somatic complaints or interpersonal dysfunction (Kirmayer, 2001; Ryder et al., 2008). Future studies should extend this work to people with full-criterion symptoms of anhedonia and depressed mood, and access the extent to which somatic and interpersonal difficulties may be associated with changes in momentary affect.

Second, our immigrant samples were composed of participants at least somewhat acculturated to the mainstream European American cultural context. This may, on the one hand, obscure cultural differences due to acculturation, or on the other hand, accentuate them due to factors such as preservation of cultural norms regarding emotions (see Tsai & Chentsova-Dutton, 2003) or discrimination and the consequent stress linked to minority status (Noh, Beiser, Kaspar, Hou, & Rummens, 1999). Moreover, many of our participants were college students, a group that may potentially systematically differ from the general population in their levels of emotional awareness (Ciarrochi, Caputi, & Mayer, 2003). Future studies should examine the ways in which depression is associated with emotional functioning and well-being in community samples of immigrants with different acculturation experiences and in different countries. Future work should also focus on identifying and examining cultural mediators of the observed differences, such as measures of cultural norms regarding emotions.

Finally, momentary reports of emotions depend not only on the ability of people to experience emotions, but also on availability and selection of emotional elicitors. Anhedonic participants in our study may have experienced sadness more intensely than other participants because they were more likely to encounter sad situations. Future research should combine ecologically valid momentary sampling studies
with in-the-lab studies of emotional reactivity that control for the nature and intensity of emotional elicitors.

**Implication and conclusions**

These data have potential clinical implications. They suggest that attention to cultural norms regarding emotions and to heuristics for integrating emotional experiences into recall can be important as part of culturally sensitive assessment and treatment practices. Many forms of therapy for depression (e.g., cognitive-behavioral therapy, mindfulness-based therapy) include elements of attending to momentary emotions and examining accuracy of such recall to challenge and potentially change people’s ideas about their own mood. Uncovering and discussing discrepancies in generalized and momentary levels of subjective reports of emotions can help depressed individuals recognize and correct biases in their beliefs about their emotions. This can be done more effectively if clinicians have data regarding the relationships between clinical symptoms and experienced emotions. We need to recognize that some cultural contexts (e.g., East Asian) may encourage more data-driven recall of positive emotions. Although people do not think, feel, and behave as carbon-copies of their cultural norms, this information may indicate that some therapeutic techniques, such as mood tracking, may be less effective for depressed people who are oriented to these cultural contexts.

This study brought together two lines of inquiry on emotional functioning and well-being. With a few exceptions (e.g., Ryder et al., 2008), separate bodies of literature have examined ways in which psychopathology and culture are associated with emotional functioning; the present study is one of the first to integrate them. These data revealed both cultural similarities and differences in the ways in which reports of feeling sad and not enjoying life are associated with global and momentary reports of subjective well-being. The results suggest that cultural norms regarding the experience and expression of emotion can shape the meaning of emotional symptoms of depression. In doing so, they lay the groundwork for further research on cultural variation in the associations between psychopathological symptoms and normative emotions.

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**Notes**

1. One participant did not fill out the GEQ forms due to an oversight.
2. Women reported experiencing more intense positive emotions, $F(1, 135.17) = 15.13$, $p < .01$, and pleasure, $F(1, 117.72) = 14.96$, $p < .01$, in their daily lives compared to men. These gender differences were significant for all cultural groups, with the exception of HAs, for whom men and women did not differ (Gender x Cultural Group
interaction $F(3, 144.11) = 3.51, p = .02$ for positive emotions and $F(3, 129.26) = 2.97, p = .03$ for pleasure).

3. The denominator degrees of freedoms are not integers for the tests of fixed effects in mixed models. These values do not have exact $F$ distributions and are estimated using a Satterthwaite approximation.

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Appendix

Momentary reports of emotions and pleasure questions

Immediately prior to this beep, how PLEASANT did you feel?
Immediately prior to this beep, how SAD did you feel?
Immediately prior to this beep, how HAPPY did you feel?
Immediately prior to this beep, how UPSET did you feel?
Immediately prior to this beep, how INTERESTED did you feel?
Immediately prior to this beep, how SATISFIED did you feel?
Immediately prior to this beep, I enjoyed TASTING something pleasant?
Immediately prior to this beep, I enjoyed SEEING something pleasant?
Immediately prior to this beep, I enjoyed HEARING something pleasant?
Immediately prior to this beep, I enjoyed TOUCH or MOVEMENT?
Immediately prior to this beep, I enjoyed BEING WITH OTHERS?
Immediately prior to this beep, I enjoyed THINKING OR LEARNING?