Profile of Discrete Emotions in Affective Disorders in Older Primary Care Patients

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Purpose: This research examined whether the frequencies of specific emotions are associated with major and minor depression in older primary care patients. Design and Methods: Older primary care patients (N = 146), prescreened with a depression questionnaire, completed a diagnostic interview and an emotions questionnaire. Results: Controlling for age, sex, and other psychiatric and medical illnesses, major depressives differed from nondepressed controls in nine emotions; minor depressives differed from controls in four emotions. Major depressives differed from the controls more in sadness, joy, and interest—but not anger, fear, or guilt—than in comparison sets of emotions. Minor depressives differed from the controls more in sadness and inner-directed hostility—but not guilt, anger, fear, joy, or interest—than in comparison sets of emotions. Implications: The frequencies of discrete emotions are differentially associated with major and minor depression; future research is needed to determine their specific diagnostic and treatment implications.

Key Words: Major depression, Minor depression, Comorbidity, Late-life psychopathology

Disturbances in emotion are central components of major and minor depressive mood disorders across the life span, yet few studies have specifically examined the emotional experiences of older, depressed people. Studying the relationships between emotions and mood disorders is useful, as it may help bridge the gap between theories of normal human emotion and theories of late-life psychopathology.

Differential Emotions Theory (DET; Izard, 1977), a general biopsychosocial theory that emphasizes discrete emotion states, suggests that maladaptive linkages of specific types or patterns of emotions with cognitive or behavioral systems that normally help their regulation may lead to depressive disorders. In addition, particular emotions, such as sadness, may become linked maladaptively with others, such as anger or guilt. DET suggests that depressive states tend to be characterized by particular patterns of discrete emotions. This viewpoint contrasts with the perspective that affective experience can be effectively accounted for by two broad dimensions, positive and negative affect, and that distinctions among particular emotions within each dimension are relatively unimportant (Watson & Kendall, 1989). Izard (1977) characterized the emotion patterns of adult depressives in terms of the relative magnitudes of the reported intensities of various discrete emotions, but did not compare these patterns with those of control subjects. Later studies, in which the emotion patterns of depressed children and adolescents were compared with nondepressed control subjects, tended to corroborate the earlier patterns found in depressed adults, though irritability was more prominent in the children and adolescents (Blumberg & Izard, 1985, 1986; Izard & Schwartz, 1986). The present study extends this line of work by examining the patterns of emotions in elderly people with major and minor depression and comparing them with nondepressed controls.

A more detailed description of the phenomenology of emotions in depressed older persons may contribute to earlier detection and treatment, which in turn may decrease morbidity and improve long-term course (Keller et al., 1992). Enhanced assessment is particularly needed because late-life depression is underdiagnosed and undertreated (Freeling, Rao, Paykel, Sireling, & Burton, 1985; Ormel et al., 1990). Moreover, the phenomenology of depressive disorders may be less apparent in older than in younger persons (Alexopoulos et al., 1995; Gallo, Anthony, & Muthen, 1994; Garvey & Schaffer, 1994; Koenig, Cohen, Blazer, Krishnan, & Sibert, 1993).
Another reason for examining discrete emotions in late-life depression is that the frequencies of discrete emotions may help distinguish normal mood states from major and minor depressive disorders. Although evidence suggests that subsyndromal depression is associated with morbidity and mortality (Broadhead, Blazer, George, & Tse, 1990; Wells et al., 1989) and higher risk for subsequent major depression (Horwath, Johnson, Klerman, & Weissman, 1992; Wells, Burnam, Rogers, Hays, & Camp, 1992), the proposition that minor depression is a distinct psychopathological condition remains controversial (Angst & Ernst, 1993; Remick, Sadovnick, Lam, Zis, & Yee, 1996; Skodol, Schwartz, Dohrenwend, Levav, & Shout, 1994). In gerontology, these issues are especially salient because major depression is less prevalent in geriatric populations (Blazer, Hughes, & George, 1987), but older persons endorse some depressive symptoms on questionnaire measures more frequently than younger persons (Mirowsky & Ross, 1992; Newmann, 1989; Zung, Broadhead, & Roth, 1993), indicating age differences in clinical symptoms that are insufficiently reflected in the diagnostic criteria. Diagnosing depression in older medical patients is complex in part because the criteria include symptoms that may be caused by medical illness (Koenig, George, Peterson, & Pieper, 1997). A more detailed understanding of the emotional experience of older depressed and nondepressed persons can help identify depression-related symptoms in older patients that are not directly attributable to medical problems.

The frequencies and intensities of particular emotions may have prognostic and therapeutic implications. For example, the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV; American Psychiatric Association, 1994) criteria for the melancholic features specifier for major depressive disorder include either loss of pleasure in activities or lack of reactivity to pleasurable stimuli, along with several other symptoms. In contrast, the atypical features specifier includes mood reactivity as its primary symptom. Both specifiers have important prognostic implications. A systematic investigation of differences in the experience of a broad range of emotions may help to refine the criteria for such subtypes of depressive disorders and may help clinicians predict the likely course of their patients’ depressive illnesses. Such understanding may also contribute to more effective, individually tailored psychotherapy and pharmacotherapy for depression.

Previous research has shown that older residents of a long-term care institution with major and minor depressive disorders differed from nondepressed controls in a variety of pleasant and unpleasant affective states (Lawton, Parmalee, Katz, & Nesselroade, 1996). Specifically, major depressives differed from the controls in five pleasant (happy, content, warmth, interest, and energy) and five unpleasant (sad, depressed, irritated, annoyed, and worried) affects. The minor depressives (defined as dysthymics or depressive adjustment reactions) differed from the controls in reporting less happiness and contentment, and more depression, sadness, and worry. A study of an overlapping sample (Katz, Parmalee, & Streim, 1995) classified the subjects as either major depressives, dysphorics (defined as reporting significantly depressed mood for 2 weeks or longer), or nondepressed controls. Each group differed from the other two groups in the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) factors of depression, anger, vigor, fatigue, tension, and confusion.

These investigations help to provide a differentiated description of the affective states associated with major and minor depression in older persons. Whereas diagnostic assessments are made partly on the basis of the presence of particular emotions such as sadness and guilt, the dimensional measurement of their frequency is not synonymous with the categorical rating of their presence “most of the day, nearly everyday, for 2 weeks or longer” (American Psychiatric Association, 1994). Moreover, diagnoses of major or minor depression do not require the presence of even these two emotions, and the degree to which they are present in older persons having either of these disorders remains unclear. Further research with older depressed patients is necessary to determine the frequencies of other emotions (Ekman, 1993; Frijda, Kuipers, & ter Schure, 1989; Izard, 1977; Lazarus, 1991), and to compare and contrast various emotions with each other in the magnitude of their relationships with major and minor depression. Previous studies have not determined whether particular emotions, relative to others, are differentially correlated with these two disorders in older persons. It is unclear whether all unpleasant emotions are similarly elevated in older persons with major or minor depression, or whether particular unpleasant emotions are especially prominent. It also is uncertain whether one or both of the emotions of joy and interest, which are treated jointly in one of the diagnostic criteria for the two disorders, are lowered in frequency in older depressed people.

In the present investigation, older primary care patients with either major or minor depression were each compared with nondepressed patients in the self-reported frequencies of 12 emotions. Most older depressed persons are diagnosed and treated in primary care settings (Shepherd & Wilkinson, 1988). DET (Izard, 1977) provided the general theoretical framework and taxonomy. Basing its taxonomy on the ability of observers to distinguish characteristic facial expressions, DET distinguishes 11 basic emotions and a 12th, labeled inner-directed hostility. The latter composite emotion consists of a blend of anger, disgust, and contempt directed against the self and is posited to be prominent in depression. Finally, to compare different emotions in the relative magnitudes of their relationships with major and minor disorder, we examined whether differences between the frequencies of specific emotions varied as a function of the subjects’ diagnosis. The associations between emotions and these diagnoses were examined while controlling for the effects of confounding vari-
ables: age, gender, and comorbid medical and psychiatric conditions.

We had the following hypotheses:

1. Consistent with related previous findings (Katz et al., 1995; Lawton et al., 1996), persons with either major or minor depression would differ from nondepressed controls across a broad spectrum of pleasant and unpleasant emotions.

2. Based on the fact that sadness, guilt, and inner-directed hostility are reflected in the DSM-IV criteria for major and minor depression, these emotions would be related to major and minor depression more strongly than the average of a set of other unpleasant emotions (i.e., anger, fear, disgust, contempt, shame, and shyness).

3. Based on related findings in previous studies (Garvey & Schaffer, 1994; Katz et al., 1995), anger and fear would be related to major and minor depression more strongly than the average of a set of other unpleasant emotions (i.e., disgust, contempt, shame, and shyness).

4. Based on the fact that lower joy (i.e., diminished pleasure) and interest are reflected in the DSM-IV criteria for major and minor depression, these emotions would be related to major and minor depression more strongly than surprise, which is not reflected in the DSM-IV criteria.

**Methods**

Participants (N = 146) aged 60 years or older were recruited from private internal medicine offices (n = 87) or from a freestanding, University-affiliated Family Medicine Center (n = 59) using sampling procedures detailed below. The 146 participants were classified into three groups: those with a current major depressive disorder (n = 13); those with dysthymic disorder (n = 1) or current minor depression, defined as meeting the research criteria for minor depressive disorder in the appendix to DSM-IV (n = 11); and the remaining participants who did not meet criteria for current or past episodes of major depressive disorder (n = 121). Two of the participants who were placed in the major depression group had both current major depression and dysthymic disorder. Participants in this study overlapped with those in other published studies (not cited to preserve anonymity).

The final sample was selected from a larger number of patients from the primary care sites based on sampling procedures and their completion of several steps of data collection. To obtain an older sample that was enriched with persons having significant depressive symptoms, research personnel or office staff administered the Center for Epidemiologic Studies–Depression scale (CES-D; Radloff, 1977) to patients aged 60 and older arriving for scheduled appointments. The CES-D was completed by 949 patients (84%) who were asked and were sufficiently fluent in English to participate. Stratified sampling procedures were used to include patients with a full range of CES-D scores. Specifically, all subjects who scored 22 or above (n = 113) were asked to participate in the study, as were a random sample (n = 323) of those who scored below 22 (n = 836). Each week, a random number table was used to select potential subjects from those patients who scored below the cutoff on the screening measure during the previous week. The number that was selected depended on the number of patients screened and the availability of interviewer time. The cutoff of 22 was used because a receiver operating curve analysis found 22 to be the optimum cutoff for detecting major depression in older primary care patients (Lyness et al., 1997). This cutoff is consistent with unpublished data on the CES-D from a mixed-age sample collected at the University of Pittsburgh (Herbert Schulberg, PhD, oral communication, January 1994). Of 436 patients who were selected as potential participants in the study, 216 (50%) agreed to complete a diagnostic interview within a predetermined time-frame of one month. Subjects above the cutoff who participated in the interview (n = 56) did not significantly differ in CES-D scores from those above the cutoff who did not participate (n = 57). Similarly, those below the cutoff who participated in the interview (n = 160) and those below the cutoff who did not participate (n = 163) had comparable scores. Participants and nonparticipants could not be distinguished on the basis of age or sex (M = 71.50 years vs M = 71.37 years, not significant (NS); 62% women vs 70% women, NS; respectively).

The diagnostic interview was conducted using the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, 3rd ed., revised (SCID; Spitzer, Williams, Gibbon, & First, 1990), a validated and reliable instrument that depends on rater clinical judgment using all available sources of data including the patient’s report, family report when available, and medical records to arrive at Axis I diagnoses. Raters, trained to administer all the measures used in the study, conducted the SCID and rated the severity of depressive symptoms using the highly validated, 24-item version of the Hamilton Depression Rating Scale (Ham-D; Williams, 1988). A physician–investigator reviewed the primary care record for all subjects, along with all other available outpatient and inpatient medical and psychiatric records. The interviewer presented the results of the clinical interview at a weekly consensus conference of investigators, raters, and other research personnel. Consensus diagnoses on Axis I were assigned based on all available data (primarily the SCID, Ham-D, and record review). These diagnoses were used for placing subjects into the major depression, minor depression, or control groups for the present study. A focus of the consensus conferences was determining whether there was clear evidence that subjects met the DSM-IV symptom criteria for the various depression diagnoses, and on whether such diagnoses.
should be ruled out because of evidence that the symptoms had physical causes such as stroke or dementia. Based on the medical record review and other information collected in the SCID interview, the physician-investigator assigned a rating of overall medical burden using the Cumulative Illness Rating Scale (CIRS; Linn, Linn, & Gurel, 1968). The CIRS is a reliable and validated (Conwell, Forbes, Cox, & Caine, 1993) measure of pathology based on the sum of 5-point ratings of impairment for 13 independent areas grouped under 6 body systems.

At the conclusion of the clinical interview, participants were asked to complete and mail back in a postage-paid envelope the Differential Emotions Scale-IV (DES-IV; Izard, Libero, Putnam, & Haynes, 1993), a reliable and valid 36-item questionnaire measure of the frequencies of 12 emotions recognized in DET. In the instructions for the DES-IV, participants were asked to consider their emotions during the past week and indicate how often in their daily life they experienced each emotion. Each of the 12 emotions is represented by 3 items, such as “feel sad and gloomy, almost like crying?” (sadness) and “feel scared, uneasy, like something might harm you?” (fear). Items are rated on a 5-point scale: “rarely” (1), “hardly ever” (2), “sometimes” (3), “often” (4), or “very often” (5). Ratings for the three items representing each emotion are summed. In seven instances in which participants omitted one of the three items measuring an emotion, the score for the missing item was replaced by the average of the other two.

Of the 216 patients who completed the diagnostic interview, 175 met the diagnostic criteria for inclusion in the study (no past or present schizoaffective or bipolar disorder, no major depression in full or partial remission). Of these, 146 (83%) returned the DES-IV. Patients with major depression in full or partial remission were excluded a priori from the analyses because it seemed likely these diagnoses might affect current emotional functioning, but their categorization in either the major or minor depression groups seemed inappropriate. Participants with current or past episodes of bipolar disorder or schizoaffective disorder were excluded a priori for the same reason. Presence of other non-mood Axis I disorders was not an exclusionary criterion, partly because comorbid psychiatric disorders are common in late-life depression and excluding participants with such comorbidity would result in groups that were unrepresentative of the population of interest. Within the group with major depression, two participants had dementia, two had somatoform disorder, one had both sedative dependence and somatoform pain disorder, one had sedative dependence, one had delusional-paranoid disorder, and one had simple phobia. Within the group with minor depression, one participant had a somatoform disorder. Within the nondepressed group, three participants had dementia, one had organic personality disorder, one had social phobia, and one had somatoform pain disorder.

Participants included in the study with either a major or minor depression did not significantly differ in age, sex, or Ham-D scores of depressive symptom severity from patients with either of these disorders who did not complete the DES-IV. Control subjects who were included in the study did not differ in age or sex from nondepressed patients who did not complete the DES-IV, but they had slightly lower Ham-D scores ($M = 5.73$, $SD = 3.42$ vs $M = 8.00$, $SD = 4.84$, $t(137) = 2.48, p < .05$). As 87% of the nondepressed patients completed the DES-IV, however, the mean of 5.73 was only slightly lower than that for the entire pool of nondepressed patients ($M = 6.02$). Control subjects who completed the DES-IV did not significantly differ in their CIRS scores from potential control subjects who did not complete the measure, but participants in the study with major or minor depression had slightly lower CIRS scores than the depressed patients who were excluded because they did not complete the DES-IV ($M = 7.16$, $SD = 2.27$ vs $M = 9.73$, $SD = 2.90$, $t(34) = 2.87, p < .01$).

**Results**

**Demographic and Clinical Characteristics of the Sample**

Table 1 describes the three groups in terms of mean age, the percentage who were male, the percentage with a non-mood Axis I disorder, and the mean CIRS scores. In the analyses to be reported, covariates were included to adjust for differences between the groups in these factors.

**Transformation of Emotion Scores and the Removal of Statistical Outliers**

In the analyses to be reported, a square root transformation was applied to the raw emotion scores in order to achieve acceptable homogeneity of variance. In addition, outliers whose standardized residuals exceeded three were removed from all analyses. The number of outliers removed from a given analysis never exceeded two. Statistical outliers are inconsistent with the analysis of variance (ANOVA) assumption of normally distributed errors, and tend to disproportionately influence the outcome of statistical tests. They may derive from a variety of factors, but it is difficult to know the reason with certainty in a given case. Their removal affected only two findings,

<table>
<thead>
<tr>
<th>Covariate</th>
<th>Major Depression</th>
<th>Minor Depression</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male, % ($n$)</td>
<td>46.15 (6)</td>
<td>58.33 (7)</td>
<td>43.80 (53)</td>
</tr>
<tr>
<td>Age, $M$ ($SD$)</td>
<td>68.85 (8.02)</td>
<td>74.75 (8.34)</td>
<td>72.32 (7.19)</td>
</tr>
<tr>
<td>CIRS score, $M$ ($SD$)</td>
<td>7.15 (1.72)</td>
<td>7.17 (2.82)</td>
<td>5.75 (2.58)</td>
</tr>
<tr>
<td>Comorbid psychiatric diagnosis, % ($n$)</td>
<td>61.54 (8)</td>
<td>8.33 (1)</td>
<td>4.96 (6)</td>
</tr>
</tbody>
</table>

Note: CIRS = Cumulative Illness Rating Scale (Linn et al., 1968).
and in these instances they will be discussed in further detail.

**Group Differences in Individual Emotions**

The descriptive statistics for the 12 DES-IV raw emotion scores for each of the three diagnostic groups are shown in Table 2. Prior to testing group differences in the frequencies of each of the individual emotions, a multivariate analysis of covariance (MANCOVA) was conducted to test for group differences in the set of 12 emotions (sadness, guilt, inner-directed hostility, fear, anger, disgust, contempt, shame, shyness, joy, interest, and surprise). In this analysis, the 12 emotions were the dependent variables; depression diagnosis was the independent variable; and age, gender, presence or absence of a concurrent Axis I diagnosis, and the CIRS were covariates. The effect of diagnostic group was significant (Wilks’s lambda $F(24,254) = 3.17, p < .0001$).

Next, hypothesis 1 was tested by examining group differences in the reported frequencies of each of the 12 emotions using separate analyses of covariance (ANCOVAs). In addition to the overall effect of depression diagnosis, Scheffé-adjusted $t$ tests were conducted to examine the pairwise differences between the major depressives and the nondepressed controls, and between the minor depressives and the nondepressed controls, respectively. Due to the relatively small size of the two depression groups, pairwise differences between them were not examined. In each analysis, one of the 12 transformed emotion scores was the dependent variable, depression diagnosis was the independent variable, and the four covariates described previously were included.

The ANCOVA $F$ statistics for the effect of diagnostic group on the transformed emotion scores, controlling for the four covariates, are shown in Table 2. Supporting Hypothesis 1, the ANCOVAs indicated that there were significant differences among the three diagnostic groups for 11 of the 12 emotions. Only surprise, which may be hedonically positive or negative, was unrelated to depression diagnosis. Also shown in Table 2 are the results of the Scheffé-adjusted group contrasts between the major depressives and the controls and the minor depressives and the controls.

The removal of outliers affected two of the findings: The pairwise group comparisons between the major depressives and controls for disgust and contempt changed from marginally significant to significant after their removal. One control subject, who was removed from both analyses, had unusually high scores on most negative emotions, but did not meet the diagnostic criteria for a depressive disorder. This subject appeared to have clinically significant depressive symptoms that were not captured by the diagnostic criteria, but also tended to be inconsistent in reporting emotions and symptoms across different instruments. Another control subject, who had dementia, was removed from the analysis of disgust.

**Group Differences in Patterns of Emotions**

We next examined the relative magnitude of the associations of the emotions with depression diagnostic group. As preliminary tests, two repeated-measures MANCOVAs were conducted to determine whether diagnosis group was (a) associated with any one unpleasant emotion more than another unpleasant emotion, and (b) associated with any one pleasant emotion more than another pleasant or hedonically neutral emotion. In the first analysis, the unpleasant emotions (sad, guilt, inner-directed hostility, fear, anger, disgust, contempt, shame, and shyness) were treated as dependent variables, and in the second analysis, the pleasant or neutral emotions (joy, interest, and surprise) were treated as depen-

Table 2. Alphas, Means, and SDs of the DES-IV Emotion Subscale Scores and Results of Analysis of Covariance (ANCOVA) Tests

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Alpha</th>
<th>Major Depression $n = 13$</th>
<th>Minor Depression $n = 12$</th>
<th>Control Group $n = 121$</th>
<th>ANCOVA Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>df</td>
</tr>
<tr>
<td>Sadness</td>
<td>.86</td>
<td>10.54 (1.56)$^{a,c}$</td>
<td>7.92 (2.19)</td>
<td>5.32 (2.18)</td>
<td>138</td>
</tr>
<tr>
<td>Guilt</td>
<td>.68</td>
<td>8.00 (1.73)</td>
<td>6.92 (2.19)</td>
<td>5.41 (1.76)</td>
<td>139</td>
</tr>
<tr>
<td>Inner-directed hostility</td>
<td>.78</td>
<td>8.23 (2.45)</td>
<td>7.25 (2.34)</td>
<td>4.79 (1.76)</td>
<td>137</td>
</tr>
<tr>
<td>Fear</td>
<td>.82</td>
<td>7.31 (2.29)</td>
<td>5.54 (2.35)</td>
<td>4.36 (1.76)</td>
<td>138</td>
</tr>
<tr>
<td>Anger</td>
<td>.77</td>
<td>8.92 (2.60)</td>
<td>6.67 (2.61)</td>
<td>5.72 (2.11)</td>
<td>138</td>
</tr>
<tr>
<td>Disgust</td>
<td>.73</td>
<td>7.00 (2.52)</td>
<td>5.67 (2.67)</td>
<td>4.72 (1.93)</td>
<td>137</td>
</tr>
<tr>
<td>Contempt</td>
<td>.65</td>
<td>6.62 (2.79)</td>
<td>4.75 (1.60)</td>
<td>4.88 (1.80)</td>
<td>138</td>
</tr>
<tr>
<td>Shame</td>
<td>.72</td>
<td>6.92 (3.17)</td>
<td>6.17 (2.37)</td>
<td>4.95 (1.84)</td>
<td>137</td>
</tr>
<tr>
<td>Shyness</td>
<td>.78</td>
<td>7.38 (3.10)</td>
<td>6.17 (3.33)</td>
<td>4.75 (1.93)</td>
<td>139</td>
</tr>
<tr>
<td>Joy</td>
<td>.76</td>
<td>8.69 (2.43)</td>
<td>9.25 (1.71)</td>
<td>11.70 (1.69)</td>
<td>138</td>
</tr>
<tr>
<td>Interest</td>
<td>.71</td>
<td>8.77 (1.24)</td>
<td>9.17 (1.80)</td>
<td>11.08 (2.03)</td>
<td>139</td>
</tr>
<tr>
<td>Surprise</td>
<td>.65</td>
<td>8.50 (2.42)</td>
<td>6.33 (2.19)</td>
<td>7.43 (2.21)</td>
<td>139</td>
</tr>
</tbody>
</table>

**Notes:** DES-IV = Differential Emotions Scale-IV (Izard et al., 1993). ANCOVAs were based on transformed data with 0–2 outliers removed, controlled for age, gender, comorbid Axis I disorder, and medical illness.

$^{a}$Scheffé-adjusted, significant difference between controls and major depressives.

$^{b}$Scheffé-adjusted, significant difference between controls and minor depressives.

$^c_{n = 12}$ due to missing data.
dent variables. In both analyses, diagnostic group was the main predictor, and age, gender, CIRS score, and presence or absence of a comorbid psychiatric diagnosis were covariates. An interaction of diagnostic group with the within-subjects effect for type of emotion would indicate that at least one emotion included in the analysis was more strongly related to diagnostic group than another emotion. For example, if sadness and fear were rated as having similar frequencies in the control group, but as having different frequencies in the major depression group, it would be reflected by an interaction of depression group with the within-subjects effect for type of emotion, and would suggest that one of these emotions was more strongly related to major depression than the other. This interaction was significant both in the analysis of the unpleasant emotions, Wilks’s lambda $F(16,262) = 2.17, p < .01$, and in the analysis of the pleasant emotions, Wilks’s lambda $F(4,274) = 2.84, p < .0005$.

Having obtained these interactions of diagnostic group with type of emotion in the repeated measures MANCOVAs, Hypothesis 2 was then tested by conducting three separate ANCOVAs. In these analyses, the dependent variable was the mathematical difference between either sadness, guilt, or inner-directed hostility, respectively, and the mean of the remaining set of six unpleasant emotions (fear, anger, contempt, disgust, shame, shyness); the independent variable was diagnostic group; and the covariates were age, sex, CIRS score, and presence or absence of a nonmood psychiatric diagnosis. The results are shown in Table 3. They indicated that sadness and inner-directed hostility, but not guilt, were more strongly related to diagnostic group than the mean of the other unpleasant emotions. Pairwise group comparisons revealed that sadness distinguished both the major depressives ($t[138] = 3.82, p < .0002$) and the minor depressives ($t[138] = 3.67, p < .0003$) from the nondepressed controls more than the mean of the other unpleasant emotions. Inner-directed hostility distinguished the minor depressives ($t[138] = 3.56, p < .0005$), but not the major depressives ($t[138] = 0.79, NS$), from the nondepressed controls more than the mean of the other unpleasant emotions. Guilt did not distinguish either the major or the minor depressives from the nondepressed controls more than the mean of the other unpleasant emotions.

To test Hypothesis 3, two further ANCOVAs were conducted in a parallel manner using difference scores as the dependent variables. One of these tested whether diagnostic group was more strongly related to anger than to the mean of the set of emotions comprising disgust, contempt, shame, and shyness. This hypothesis was not supported. The second tested whether diagnostic group was more strongly related to fear than to the mean of the same set of four negative emotions. This hypothesis also was not supported.

To test Hypothesis 4, we conducted two more ANCOVAs to examine whether joy and interest, relative to surprise, were more strongly associated with diagnostic group. As shown in Table 3, diagnostic group predicted the differences between both joy and interest from surprise. Pairwise group comparisons revealed that relative to the nondepressed controls, the major depressives reported less difference between their frequencies of joy and surprise ($t[138] = 3.46, p < .0007$), and less difference between their frequencies of interest and surprise ($t[138] = 3.09, p < .0024$); however, the differences between these pairs of emotions were similar for the minor depressives and the nondepressed controls.

Table 3. Analysis of Covariance Tests of Group Differences in the Relative Frequencies of Specific Emotion Contrasts

<table>
<thead>
<tr>
<th>Hypothesis/Dependent Variable</th>
<th>$df$</th>
<th>$F$</th>
<th>$p$</th>
<th>Pairwise Group Contrasts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sadness minus mean of comparison emotions</td>
<td>2,138</td>
<td>12.63</td>
<td>.0001</td>
<td>Major depression&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Inner-directed hostility minus mean of comparison emotions</td>
<td>2,138</td>
<td>6.41</td>
<td>.0022</td>
<td>Minor depression&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Guilt minus mean of comparison emotions</td>
<td>2,137</td>
<td>1.00</td>
<td>NS</td>
<td>Control group&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Hypothesis 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anger minus mean of comparison emotions</td>
<td>2,138</td>
<td>0.17</td>
<td>NS</td>
<td>Major depression&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fear minus mean of comparison emotions</td>
<td>2,139</td>
<td>1.27</td>
<td>NS</td>
<td>Minor depression&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Hypothesis 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joy minus surprise</td>
<td>2,138</td>
<td>6.31</td>
<td>.0024</td>
<td>Major depression&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Interest minus surprise</td>
<td>2,138</td>
<td>4.80</td>
<td>.0097</td>
<td>Minor depression&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Notes: Comparison emotions for Hypothesis 2 were fear, anger, disgust, contempt, shame, and shyness. Comparison emotions for Hypothesis 3 were disgust, contempt, shame, and shyness. Covariates for each analysis were age, sex, physical illness burden (CIRS score), and presence or absence of a non-mood psychiatric diagnosis. In the group contrasts, groups that differed significantly with respect to the dependent variable have different superscripts; nonsignificance is denoted by overlapping superscripts. NS = not significant.
Discussion

Several limitations to this study should be kept in mind when interpreting these results. First, the participants may not be representative of the broader population of older primary care patients, in part because a limited number of physicians’ practices were sampled, and in part because the need to complete several phases of data collection may have deterred individuals with poorer emotional or physical health from participating. On the other hand, this is the only study to our knowledge to examine the emotions of older clinically depressed patients in a primary care setting, where most depressed elders are diagnosed and treated. The relatively small sample sizes for the major and minor depression groups in particular limited the representativeness of these groups, gave insufficient power to test pairwise differences between them, and may have limited our ability to detect other group differences in individual emotions or emotion patterns, though many hypothesized group differences were detected. Limited sample sizes and multiple tests also increase the possibility of type one errors. The presence of comorbid mental disorders, although typical in this population, might also have affected the group differences in emotions. Although this possible effect was controlled through the use of a single covariate, this control was limited. A covariate was not used to adjust for antidepressant treatment, in part because it would likely remove variance in emotion associated with depression diagnosis. Therefore, there may have been an uncontrolled effect of antidepressant treatment on the emotions, though probably in the direction of reducing rather than increasing group differences. Limitations of the measure of emotions should also be acknowledged. The DES-IV consists of only three-item scales for each emotion. Whereas previous findings (Izard et al., 1993), the alphas reported in Table 2, and other findings presented in this article suggest the scales have acceptable reliability and validity, replication of the findings with alternative self-report and nonself-report measures is needed.

Extension of Previous Studies of Emotion in Late-Life Depression

The results of this study complement previous studies by demonstrating that the reported frequencies of 11 emotions, many of which have not been examined previously in depressed older persons, were associated with depression diagnoses. While sadness was reported to be the most frequently experienced emotion in the major depressives, it often was accompanied by high frequencies of self-directed hostility, anger, disgust, and contempt. This suggests that major depression in older adults is frequently characterized by both inner- and outer-directed hostility. It is notable, however, that the reported experiences of outer-directed anger, disgust, and contempt were not prominent in minor depression. In the context of minor depression, therefore, an increase in these “hostile” emotions may signal the development of a major depressive episode, though further research is necessary to confirm this possibility.

Whereas joy and interest significantly distinguished both the major depressives and the minor depressives from the nondepressed controls, these pleasant emotions were by no means absent in the two depressed groups. In fact, the major depressives reported that joy and interest occurred at moderate frequencies, and the minor depressives reported that they occurred at least as often as any unpleasant emotion. These findings should alert clinicians that major and minor depressive disorders, at least in older patients from primary care settings, are more characterized by an increase in unpleasant emotions than a decrease in pleasant emotions. Pleasant emotions, although decreased in frequency, are unlikely to be absent or rare. Whereas normal emotional experience was characterized by high frequencies of joy and interest and infrequent unpleasant emotions, major depression was characterized by moderate frequencies of joy and interest, and moderate to high frequencies of unpleasant emotions. These observations do not rule out the possibility, however, that there may be depressive subtypes that are characterized by diminished measurable emotions rather than an increase in unpleasant ones. These findings do suggest that the frequencies of the positive and negative emotions were relatively independent in their relationships with major and minor depression. The independence of positive and negative affects has been reported and discussed in other contexts (Diener & Emmons, 1985; Larsen & Ketelaar, 1991; Watson, 1988).

The results also demonstrated that major and minor depression are not uniformly associated with various pleasant and unpleasant emotions, respectively, but are associated more strongly with particular emotions than with others. Specifically, sadness distinguished both the major and minor depressives from the control subjects more than a set of other unpleasant emotions. Inner-directed hostility also distinguished the minor depressives, but not the major depressives, from the nondepressed controls better than other unpleasant emotions. Whereas guilt, anger, and fear were associated with having a depression diagnosis, these emotions were not more elevated in the depressed groups than were comparison sets of other unpleasant emotions. Because guilt is specifically included in the DSM-IV criteria for major and minor depressive disorders, the lack of a differential elevation of guilt relative to other unpleasant emotions is noteworthy, particularly in the context of other research suggesting the lack of prominence of guilt in late-life depression (Wallace & Pföhl, 1995). Whereas joy and interest were reported to be more frequent than surprise by both the nondepressed controls and the minor depressives, this was not the case for the major depressives. This suggests that joy and interest are differentially reduced in frequency in major depression but not in minor depression.
The findings in this older sample provided partial support for the views of DET toward emotional experience in clinical depression (Izard, 1977), and suggest a refinement of those views. As postulated by DET, clinically depressed patients differed from the nondepressed controls across a broad spectrum of positive and negative emotions, and the groups differed in certain emotions more than others, most prominently in sadness. Also consistent with previous findings, inner-directed hostility and anger were notably elevated, though not necessarily significantly more than other unpleasant emotions. The specific pattern of secondary emotions involved in clinical depression seems to vary depending on the age of the sample, but further research is needed to bear this out. The present findings suggest that the relative degree of association of particular emotions with late-life depression varied depending on whether the diagnosis was major or minor depression. For example, inner-directed hostility was elevated relative to a comparison set of emotions in minor but not in major depression, apparently because several emotions in the comparison set were substantially more elevated in major depression than in minor depression. Similarly, the positive emotions of joy and interest were comparatively more reduced in frequency than was surprise in major depression but not in minor depression. These findings suggest that the severity of depressive illness (i.e., minor vs major depression) is associated differently with different emotions—in other words, is associated with the quality and tone as well as with the intensity of the overall emotional state.

**Future Research**

Although the present study clarifies the relations of discrete pleasant and unpleasant emotions with late-life major and minor depressive disorders, future research is necessary to examine the implications of these relations.

1. Future studies are needed to examine whether a predisposition for “hostile” emotions such as anger, disgust, and contempt are risk factors for major depression or for longer duration, greater likelihood of recurrence, or greater risk for suicide. Further, possible mediators of the effects of emotions on clinical outcome variables, such as interpersonal conflict or cognitive processes, may be examined.

2. Future studies are needed to test whether particular patterns of emotions in depressive disorders are indicative of the likelihood of responding to particular types of antidepressant medications or psychotherapeutic treatments or approaches. For example, mood disorders accompanied by high levels of fear or anxiety may respond relatively better to particular types of medications or psychotherapies than those not characterized by anxiety.

3. Future studies are needed to investigate whether emotional experience is indicative of distinct causal pathways for late-life depression. For example, studies could examine whether secondary depressive disorders, those “due to a general medical condition” (American Psychiatric Association, 1994), are characterized by specific patterns of emotions that are distinguishable from those patterns experienced in primary depressive disorders. A related issue is whether early-onset and late-onset depressive disorders are associated with distinct emotion patterns (Balducci & Tomenson, 1995; Conwell, Nelson, Kim, & Mazure, 1989). As understanding of the neurobiological and psychosocial mechanisms of mood disorders increases, individual differences in emotional functioning are likely to become important indicators of specific types of underlying dysfunction.

**References**


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