

Emotional Expression During Mid- to Late-Stage Dementia

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ABSTRACT. This study examined the quality of emotional responsivity in mid- to late-stage dementia patients. Eighty-two nursing home patients with a DSM-III-R diagnosis of primary degenerative dementia of the Alzheimer type served as subjects. Patients were staged using the Global Deterioration Scale. The level and type of patient affectivity were assessed by family reports, aide reports, and direct observation and coding of patient facial expressions during a family visit. All three measures indicated that patients with Alzheimer's disease expressed a range of affective signals. Some showed an intact and functional emotion system even during the last stage of the disease; one third of end-stage dementia patients expressed sadness at the departure of their relatives as coded by an objective facial affect coding system.

Much of the research on Alzheimer's disease (AD) and related dementing illnesses over the past two decades has concentrated on the cognitive and functional symptoms associated with the disease. The emotional aspects of the illness have typically received less attention, despite the fact that caregivers rate behavioral problems such as explosive emotional reactions and other changes in emotional reactivity as some of the most stressful aspects of caregiving (Kumar et al., 1988; Wragg & Jeste, 1989).

This inattention to affective processes in dementia is in part a consequence of the dramatic expansion of dementia research in the 1970s, when the behavioral sciences were in the midst of a cognitive revolution, and which led subsequently to a preoccupation with cognition at the expense of other issues. However, more recently, various models of emotion and emotion-cognition interaction have been elaborated in the developmental literature, and it has become clear that there is a close connection between affect, cognition, and behavioral adaptation (Izard, 1977, 1991; Labouvie-Vief et al., 1989; Lawton, 1984; Plutchik, 1980). Thus, the field of dementia research is now ripe for an examination of how emotional and cognitive processes relate to one another during the course of the illness.

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Another impetus for the study of emotion in dementing illness is related to patient care. It has become obvious that the care and treatment of dementia patients must involve attention to their emotional as well as functional needs. A greater understanding of the nature and course of emotional processes will have implications for treatment—for behavioral management that is sensitive to the feelings of the patient and not just to his or her routine care, and to more effective psychopharmacologic interventions for depression in late-stage dementia.

Although there has been little systematic research on the emotional expressions and reactions in AD and other dementing illnesses, there are scattered references to changes in emotionality over the course of the disease. For example, a number of studies have indicated that there is an increase in anger and paranoia and a decrease in interest as the illness progresses (Burns et al., 1990; Swearer et al., 1988). Reisberg and colleagues (1989) have noted more specific changes as assessed by the Global Deterioration Scale (GDS), which recognizes several stages in the illness process. In the early stages of the disease, usually at Stage 3, anxiety is a prominent feature. In Stages 4 and 5, a decrease in affectivity has been described. Stage 5 behavior includes tearfulness and shame. Stage 6 seems to involve an increase in overt agitation (pacing, perseverative behavior) and paranoia, along with separation anxiety. Stage 7, the last stage of the disease, involves nonverbal agitation. Other investigators (Cohen-Mansfield et al., 1990) have noted an increase in nonverbal expressions of anger as verbal expressions of anger decline.

Finally, two small-sample studies of the facial expressions of end-stage dementia patients indicated that patterned facial activity may degrade in this terminal stage but that expressions can be interpreted as reflecting emotional responses to caregiving routines (Jansson et al., 1992-1993) and as indexing comfort or discomfort during pleasant and unpleasant stimulus conditions (Asplund et al., 1991).

The present investigation was designed to gather more complete descriptive data on the emotional aspects of behavior in patients with primary degenerative dementia. Specifically, there were two main questions:

1. What is the quality of emotional responsivity in dementia patients? We hypothesized on the basis of previous research (Magai et al., 1992) that dementia patients would retain the ability to express the basic emotions. In this study we assess affect in the later stages of dementia using three sources of evaluation: reports of family members, reports of nursing home aides, and direct observation by research staff trained in the objective measurement of affect.

2. How does emotional expression change from mid- to late-stage dementia? Here we wanted to examine whether there were stage-linked changes in emotional expression that paralleled those found in cognition and functional status. Because emotion is subserved by a phylogenetically older brain system than that which subserves cognition (Izard, 1977; Izard & Malatesta, 1987; Malatesta-Magai & Dorval, 1992), we did not expect there to be a one-to-one correspondence between declines in affect and cognition during the dementia process.

METHOD

Design Overview

There were two paper-and-pencil measures and one family visit. Families completed a measure of patient affectivity at home and either mailed it back or brought it with them during the family visit. Upon arrival at the nursing home, the family member visited with his or her relative for a 20-minute session during which the patient's facial behavior was coded. Nurses' aides were given a measure of patient affectivity to take home and complete.

Subjects

The medical charts of 198 nursing home residents were screened to identify patients with a diagnosis of primary degenerative dementia of the Alzheimer type and to rule out those with medical or diagnostic complications (i.e., patients who had mental retardation or major depression, who were on neuroleptics, who did not speak English, who had cancer, Parkinson's disease, or stroke, or who had severe sensory impairment). Ninety-two patients qualified for inclusion in the study. A clinical psychologist confirmed the diagnoses of primary degenerative dementia of the Alzheimer type using criteria of the revised third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R; American Psychiatric Association, 1987). Families were contacted for proxy consent. Ten families (9%) declined to participate, leaving a total subject pool of 82 patients and families. The mean age of patients was 84 years ($SD = 6.8$) and 77% were female.

Materials and Measures

Cognitive Staging. A clinical psychologist trained in geriatric assessment conducted the Brief Cognitive Rating Scale (BCRS; Reisberg et al., 1983), which yielded scores on four axes: orientation, concentration, recent memory, and past memory. The assessments were conducted in the resident's room with the exception of a few patients who preferred to remain in the day room and were therefore assessed in a quiet corner of this location. Functional ability was assessed via the Functional Assessment Staging (FAST; Reisberg, 1988). The scale contains 7 stages; Stages 6 and 7 have 11 substages. In the present study, the 11 substages are most relevant. The general level of patient impairment was assessed by the GDS (Reisberg et al., 1982), which is based on the data collected on the BCRS and FAST. There are seven GDS stages: Stages 1 to 3 represent unimpaired functioning, subjective deficits in recall, or early signs of objective impairment; Stages 4 and 5 represent a moderate degree of deterioration, and Stages 6 and 7 represent severe cognitive and functional impairment.

In the present study, all patients scored in the mid-to-late range (i.e., GDS Stages 5, 6, or 7). Examination of the distribution of scores indicated that Stage

5 patients were poorly represented ($n = 5$) and that they clustered closely with early Stage 6 patients (FAST Stages 6a and 6b). A second cluster consisted exclusively of individuals who were diagnosed as being in FAST Stage 6e. This natural breakpoint is related to the fact that incontinence (which occurs at late Stage 6) is often the precipitating reason for institutionalizing a family member. Two groups of Stage 7 individuals could be differentiated on the basis of how they performed on the four axes of the BCRS; subjects who were classifiable as GDS Stage 7 but who scored at least a 6 or higher on one or more of the four axes of the BCRS constituted one group; another group of subjects who scored 7 (no measurable response) on all four BCRS scales constituted the remaining, most deteriorated group. Our division of Stage 7 into two groups was dictated by two considerations. First, our discussions with floor nurses and aides indicated that they make a distinction between patients who are still responsive to interpersonal interactions and those who are "out-of-it" or "near the end." A second consideration was an attempt to make finer distinctions in psychological awareness within Stage 7. Stage 7 begins with the loss of productive language, but the stage itself stretches over years of decline and includes a wide range of functional statuses.

In the analysis section we will refer to the aforementioned four groups as Cog Groups 1 to 4, with Cog Group 1 representing the highest level of functioning and Cog Group 4 representing the lowest level of functioning. These designations not only distinguished between naturally occurring groups of subjects, but resulted in a better distribution of scores than a more general breakdown into GDS Stages 5, 6, and 7 for subsequent analysis of variance (ANOVA).

Affect Measures. Affect was assessed by (a) direct observation of patient facial expressions during a family visit, and by (b) the Adult Behavior Questionnaire as completed by nurses' aides and a family member.

1. *Observation of facial expressions.* Patient facial expressions of emotion were recorded during a family visit. The family visits all took place in the resident's room. The family member was instructed to "visit with ____ as you normally would, but bring the session to a conclusion after 20 minutes." The family member was signaled when 20 minutes was up, at which point the family member took leave of his or her relative. Five of the relatives concluded their session with the resident a few minutes before the 20 minutes was up; these sessions were prorated. During the observation, the family member sat to one side of the resident at about arm's length, and the observers at the other side at a distance. This afforded the observers a clear view of the resident's face during interaction but also made their presence relatively unobtrusive.

The patient's emotional behavior was coded in real time using Everex LX 386 laptop computers that were programmed to log the onset and offset of facial behaviors indexed by the Maximally Discriminative Facial Movement Coding System or MAX (Izard, 1979). MAX is an anatomically and theoretically based coding scheme that codes movement changes in the brows, eyes, and mouth region on a continuing basis; one research assistant coded the brow/eye region and the other coded the mouth region.

Prior to the observation sessions, the two research assistants trained on the MAX system until they achieved a reliability with the training tape material (Izard, 1979) of at least .80 (kappa coefficients) on each of the emotion codes and with one another. They then trained on tapes featuring older adult faces (Malatesta-Magai et al., 1992), and established interrater reliabilities for all codes at .80 or better, before proceeding with the nursing home study. Codes were subsequently translated into emotion terms by formulas provided in the MAX manual. Although the coders trained on all the original MAX codes, only a limited subset are typically observed in older adult faces (Malatesta-Magai et al., 1992). Expressions that were coded in the present study were interest, joy, sadness, anger, contempt, fear, disgust, and a knit brow expression; the latter is associated with effortful processing during mental activities (Malatesta et al., 1989; Malatesta-Magai et al., 1992). Their kappa coefficients were as follows: interest = .88, joy = 1.0, sadness = .86, anger = .90, contempt = 1.00, fear = 1.00, disgust = .90, and knit brow = 1.0.

Although all of the families agreed to participate in an observational session with their relatives, illness and scheduling difficulties limited the actual participation rate to 43 families. *T*-tests and chi-square analyses comparing the patients with family visits versus those without indicated that there were no significant differences in patient characteristics with respect to age, gender, or stage of the disease.

Inspection of the raw data on facial expressions indicated that the fear and disgust expressions occurred with insufficient frequency to use in parametric analysis. Therefore, only the anger, joy, interest, knit brow, and contempt expressions were treated in subsequent analysis. However, it is of interest to note that the fear and disgust expressions occurred almost exclusively in the last stages of the disease (seven patients showed fear or disgust during GDS Stage 7, and one patient showed fear during Stage 6).

2. *Adult Behavior Questionnaire*. The Adult Behavior Questionnaire, or ABQ, is a scale that was designed to measure affect in dementia patients (Magai & Cohen, 1996). It was modeled after the Infant Behavior Questionnaire (IBQ, Rothbart, 1979), which assesses temperament/affect in the infant and preverbal child. Like the IBQ, the ABQ relies almost exclusively on nonverbal cues of affectivity and is based on frequency estimations that are behaviorally anchored. Like the original IBQ, which assesses behaviors under routine caregiving circumstances (feeding, bathing, dressing), the ABQ assesses behaviors under the activities of daily living (ADL) that are applicable to the care of dementia patients. The only substantial difference in the infant and adult measures is that the items are tailored to the demented adult versus newborn and young infant. For example, within the feeding behavior domain, the items refer to responses to prepared food in the case of adults, versus breast-feeding and bottle-feeding in infants. There are two versions of the ABQ—the ABQ-C for caregivers such as nurses' aides, with 102 items, and the ABQ-F for family members, with 85 items. The measures differed primarily in that a broader array of ADL areas are tapped in the caregiver version because aides supervise more of a patient's personal care routines.

The ABQ was designed to tap the five most basic emotions (anger, fear, joy, interest, sadness). An example of an item under the fear/anxiety domain asked respondents to indicate how often during the past 2 weeks the patient seemed "anxious and worried." The scale for all items ranged from 1 (never) to 7 (always). The ABQ meets criteria of face validity, convergent validity, and internal consistency (Magai & Cohen, 1996). Both measures are available from the authors on request.

ABQ protocols were excluded from the data set if more than 5% of the items were missing or if instructions were not followed correctly. In the case of family members, failure to complete the measures adequately was primarily due to the fact that many of the spouse and sibling informants were elderly and impaired themselves. In the case of aides, many of them were foreign-born and had an inadequate mastery of English. The number of usable family and nurses' aides ABQs were 52 and 62, respectively. *T*-tests and chi-square analyses comparing the patients with complete and incomplete ABQs indicated no significant differences in patient characteristics with respect to age, gender, or stage of the disease.

The Cronbach alphas for the Interest, Anger, Fear, Sadness, and Joy subscales of the family ABQs (ABQ-F) were .39, .92, .86, .81, and .88, respectively. The alphas for the same subscales on the ABQs from the nurses' aides (ABQ-C) were .90, .92, .87, .86, and .96. As indicated, only the alpha for the family ABQ Interest subscale was inadequate. We examined the individual items on this five-item scale and dropped the two items that had the lowest correlations with the total and recalculated alpha. This resulted in improving the scale's internal consistency with alpha at .48; this alpha is generally regarded as acceptable for scales with three or fewer items.

Statistical Analyses. One-way ANOVAs were used to assess differences in level of emotional expressivity as measured by facial expressions and scores on the ABQ-C and ABQ-F at each stage of the disease. Cog Group level (1, 2, 3, 4) served as the independent variable, with Cog Group 1 being the least cognitively impaired and Cog Group 4 being the most cognitively impaired. Least squares difference tests were used to determine whether differences between groups were significant.

RESULTS

Table 1 presents the means and *SD*s of facial expressions of emotion during the family visit as a function of Cog Group level. The ANOVA result for the knit brow expression, which is a signal of effortful processing rather than an emotion, was significant, $F(3, 43) = 13.82, p < .0001$ (Cog Group 1 > 3, 4), indicating that effortful processing peaks at late Stage 6. There was also a significant effect of Cog Group level for joy, $F(3, 43) = 2.4, p < .05$ (Cog Groups 1 and 2 > 4), indicating that there was a reduction only in late Stage 7. There were no significant differences across Cog Group level for sadness, anger, interest, and contempt.

The data on facial expressions provided a means of validating the functional significance of emotional expression in terms of its communication value in interpersonal process, although the validation is limited to one expression in the present study. The data on sad facial expressions indicated that they were emitted predominantly during the last 2 minutes of the interaction, typically when the family member was preparing the resident for his or her departure. Thirty-five percent of the residents displayed sadness exclusively at the end and 12% both at the end and during the session. Even within the most deteriorated group (Cog Group 4), 29% showed sadness exclusively at the end and 6% both at the end and during the session. Thus, one third of the very-late-stage AD patients—those who scored at the most deteriorated stage of the disease—behaved in a way that suggested that they were aware of their relative's imminent departure and were saddened by it.

Table 2 presents the means and *SDs* of the ABQ-F ratings of emotion by family members and the significant findings of ANOVA tests. There was a significant Cog Group effect for interest, $F(3, 37) = 3.90, p < .02$ (Cog Group 1, 2, 3 > 4), indicating that family members see interest as decreasing only at late GDS Stage 7. There was also a significant effect for joy, $F(3, 39) = 3.61, p < .02$ (Cog Group 1, 2, 3 > 4), indicating that joy is seen as decreasing only at late Stage 7. There was no difference in emotion expression across Cog Group levels for anger, fear, and sadness.

TABLE 1. Facial Expressions of Emotion During Family Visit as a Function of Level of Cognitive Function ($n = 43$)

	Cog Group 1		Cog Group 2		Cog Group 3		Cog Group 4	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
Interest	16.3	6.8	15.6	8.6	11.8	9.9	9.5	11.9
Anger	1.4	2.5	0.0	0.0	1.8	5.3	0.4	0.8
Contempt	2.6	4.2	0.30	.75	0.8	1.5	1.0	3.1
Sadness	6.9	16.1	1.0	1.1	0.2	0.4	2.2	4.9
Joy ^a	10.9	8.2	11.1	12.9	8.3	9.1	2.3	5.2
Knit brow ^b	11.9	5.5	19.7	8.4	4.5	5.0	5.3	4.7

^aCog Group 1 > Cog Groups 3 and 4; Cog Group 2 > Cog Groups 1, 3, and 4. ^bCog Groups 1 and 2 > Cog Group 4.

TABLE 2. Family's Ratings of Patient Emotions by ABQ-F ($n = 52$)

	Cog Group 1		Cog Group 2		Cog Group 3		Cog Group 4	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
Interest ^a	4.35	1.38	3.60	.50	3.92	1.51	2.75	1.17
Anger	2.11	1.29	1.70	.84	1.70	.70	1.69	.86
Fear	2.61	1.19	2.26	1.18	2.92	.77	1.71	1.32
Sadness	2.23	1.10	2.15	.90	2.51	1.06	1.92	.84
Joy ^b	5.07	1.23	5.36	.89	5.00	2.16	3.59	1.70

Note. ABQ-F = Adult Behavior Questionnaire—family members' version.

^aCog Groups 1, 2, and 3 > Cog Group 4. ^bCog Groups 1, 2, and 3 > Cog Group 4.

Table 3 presents the means and *SDs* of the ABQ-C ratings of emotion by the aide/caregivers and the significant findings of the ANOVA tests. The ANOVA for interest was significant, $F(3, 54) = 6.30$ (Cog Group 1 > 2, 3, 4), indicating that according to aides, interest shows a drop early in Stage 6. The ANOVA for sadness was significant, $F(3, 59) = 2.0$, $p < .05$ (Cog Group 1 > 2, 4), indicating that sadness decreases between Stages 6 and 7. Finally, there was a significant effect of Cog Group for joy, $F(3, 57) = 2.74$, $p < .05$ (Cog Group 1 > 3, 4), indicating that joy drops between Stages 6 and 7. There were no Cog Group differences for fear and anger.

In addition to the findings on declines in certain emotion expressions across the stages of dementia, the data indicated that a good deal of affectivity was still intact. An examination of the means in Tables 1 to 3 indicates the presence of affect across Cog Group levels. That is, aides and family members rated a range of affects at nonzero levels, and an objective facial affect coding system validated the presence of discriminable affect, even in patients on whom it was impossible to obtain a cognitive score on any of the BCRS axes. In general, even though the levels of affectivity were fairly low and family members rated the positive emotions of interest and joy as higher than the aides did, with aides rating anger as higher than family members did, both groups of raters still perceived discriminable levels of affectivity in dementia patients even in late-stage dementia.

Finally, with respect to the intercorrelations between the various measures, we found no significant association between ABQ-C and ABQ-F ratings on four emotions—fear, sadness, interest, and anger. Only joy met conventional levels of significance ($r = .43$, $p < .03$). On the other hand, three of the four ABQ-F ratings were significantly correlated with the objectively coded facial expressions in the family visit: interest ($r = .31$, $p < .04$), anger ($r = .61$, $p < .001$), and joy ($r = .41$, $p < .03$). The facial expressions of fear occurred at too low a frequency and were too skewed for analysis. Among the aides, there were significant correlations between facial expressions and ABQ-C scales for two of four ratings, interest ($r = .36$, $p < .05$) and joy ($r = .56$, $p < .0009$).

TABLE 3. Aides' Ratings of Patient Emotions by ABQ-C ($n = 62$)

	Cog Group 1		Cog Group 2		Cog Group 3		Cog Group 4	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
Interest ^a	3.63	1.94	2.58	1.10	1.77	.56	1.74	1.12
Anger	2.95	1.70	2.33	1.44	2.31	1.49	2.49	1.62
Fear	2.73	1.36	1.75	.59	2.28	1.43	2.20	1.27
Sadness ^b	2.80	1.63	1.71	.67	2.21	1.07	1.91	.86
Joy ^c	3.70	1.56	3.24	1.27	2.73	1.27	2.50	1.34

Note. ABQ-C = Adult Behavior Questionnaire-caregivers' version.

^aCog Group 1 > Cog Groups 2, 3, and 4. ^bCog Group 1 > Cog Groups 2 and 4. ^cGroup 1 > Cog Groups 3 and 4.

DISCUSSION

The results of the study are discussed in the context of the two main issues that guided the investigation, namely those involving the emotional expressivity of dementia patients and the relation of affect to mental function. We hypothesized that dementia patients would retain the ability to express the basic human emotions. We also hypothesized that decreases in emotional expressivity would not necessarily follow those of cognitive-functional decline. Both hypotheses were supported.

Patient emotional functioning was assessed in three ways: an objective facial affect coding system applied to patient behavior and by caregiver and family reports of affective behavior. The correlation between family ratings of patient emotion and observer-rated facial expressions of emotion was substantial, probably because observer-rated coding was done during a family visit—the same context in which family members see their relatives. The correlation between aide ratings of emotion and observer ratings, and between aide and family ratings, was relatively poor by comparison. We believe that this can be accounted for by the fact that aides interact with patients in a different capacity than family members and outside observers. Indeed, if we break down the aides' ratings into social and caretaking domains, we find that family members noted more joy in patients during social situations than did aides ($t = 3.38, p = .002$), probably because family members tended to be the cause and recipient of the patient's happiness. Conversely, aides rated patients as more angry than family members did ($t = .88, p = .008$), but this occurred primarily during caregiving situations such as toileting and bathing, which the aides supervised.

Given the aforementioned findings, it appears that all three measures of patient emotion employed in the current study provide information on patient emotional functioning; aides may more often be exposed to patient anger than family members because their caregiving routines more frequently provide a context for conflict; family members may rate patient joy and interest expressions as higher than aides do because of the heightened intensity of patient positive affect during family visits. There may also be some projection of informants' feelings that could contaminate the ratings and reduce the amount of congruence between family and aide ratings of patient affectivity. Nevertheless, family and aide reports are reliable, as supported by the high internal consistencies of the various emotion subscales within the ABQ-C and ABQ-F.

Despite the manifest variability across instruments and sources of report with respect to the amount and type of emotion, it was clear that dementia patients display behaviors that are widely perceived to be emotional in nature. Patients who have AD and other progressive dementing illnesses seem to express interest, happiness, sadness, fear, and anger. Much of this emotional responsivity appears preserved even in moderately to severely demented individuals.

Moreover, our analyses indicate that emotional expressivity does not vary much as a function of stage of the disease, at least during the middle to late

stages. In terms of behaviorally coded facial expressive behaviors, only one emotion was found to be lower at the end stage of the disease than at earlier stages, that of joy. Family members and aides rating the ABQ also reported that joy decreased at the very last stage. Caregivers reported that interest declined early in GDS Stage 6, although family members reported a decline only at late Stage 7. In addition, caregivers reported a decline in sadness between Stages 6 and 7, although family members saw no change in level of sadness across stages. Neither caregivers nor family members reported a difference in the rate of fear or anger expression across the different stages of the disease. The failure to detect differences in the rates of these latter expressions could be due to weak or insensitive measures or small sample size. However, the fact that three measures of affectivity agreed on the lack of change in anger and fear would weigh against the insensitivity argument. Of course, we must remember that the current data are cross-sectional, and that longitudinal research may be more sensitive to the detection of change over time.

Although there were some differences in emotional expressivity across the stages of the disease, these changes did not appear to closely follow decrements in cognitive-functional status. Discrete emotions theory (Izard, 1991; Izard & Malatesta, 1987; Magai & McFadden, 1995) has proposed that the emotion system is separate from other psychological subsystems such as cognition. Work by Cicchetti (1978, 1990) has substantiated the separation between emotion and cognition in children with Down's syndrome. The present study extends the observation to another group of individuals who have cognitive impairment. Moreover, our finding that one third of end-stage dementia patients displayed a functionally intact ability to register sad events and to react to them appropriately challenges the notion that the emotion system is as compromised as the cognitive system during late-stage dementia, at least as measured by contemporary cognitive batteries. If, as Izard and Malatesta (1987) argue, cognition and emotion are both information-processing systems, it would appear that the information-processing abilities of at least some dementia patients have been underestimated in past research that relied exclusively on cognitive tests of mental function. As recognized by Magai and colleagues (1992), one of the difficulties in doing assessment of mental function in dementia patients is that linguistic and motoric abilities are typically quite compromised; these features of the disease may then mask patients' true level of comprehension.

The present study has treatment implications as well. Depression in late-stage dementia is both common and largely undiagnosed (Cohen, 1995), in part because nursing home staff believe that late-stage patients do not experience depression, and because of the widespread assumption, even among clinicians, that affect in late-stage dementia disappears or is severely blunted. The present study challenges such assumptions. Our data indicate that there is a substantial range of emotional expressions and that these expressions are evident in even the most deteriorated patients. Although the rates of emotional expressivity were found to be relatively infrequent, without a control group of nondemented elderly patients, we cannot say whether the expressions of dementia patients are significantly lower than those of other older adults. It is likely that the rates are

somewhat lower, but this may be due to the lack of social stimulation experienced by dementia patients in institutional settings rather than to their ability to experience and express emotional feelings. Thus, linguistically impaired dementia patients may suffer the same fate as prelinguistic infants who, when neglected or exposed to nonresponsive caregivers, show a rapid decline in their expressive behaviors (Magai & McFadden, 1995).

In summary, our study has shown that: (a) despite the low frequency of expressive behavior in dementia patients, some of the more basic human emotions are preserved and are meaningfully expressed; (b) emotional expressions bear a functional relation to patient likes and dislikes—e.g., anger being more frequently expressed during routine caregiving than during visits with relatives, sadness being generally reserved for leave-taking—and that a good deal of patients' ability to signal their wants, needs, goals, and fears remains intact through the final stages; (c) although there is no way of establishing whether the facial expressive behaviors actually index underlying feeling states in patients bereft of the ability to provide a self-report, the convergence across measures of affectivity, as well as the coherent association between particular expressions and particular environmental contingencies, strengthens this position.

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