

# **Influence of Caregiver Singing and Background Music on Posture, Movement, and Sensory Awareness in Dementia Care**

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**ABSTRACT.** *Background and Aim:* Previous research suggested caregiver singing could influence persons with severe dementia to communicate with increased competence, to cease aggression, and to cease disruptive screaming, while at the same time they seemed to understand what was going on when being cared for during morning care sessions. The aim of this study was to illuminate the posture, body movements, and sensory awareness of patients with dementia during three types of morning care sessions with professional caregivers: (a) the usual morning care situation, (b) a caring session in which familiar background music was played, and (c) a caring session in which the caregiver sang to and/or with the patient throughout. Nine patients with late-stage dementia and 5 professional caregivers participated in this study, and 27 sessions were videotaped (9 patients x 3 caring situations). *Data Collection and Method:* Data collection was done by means of video recording and the data were analyzed using qualitative content analysis. *Results:* During the usual caring situation, patients demonstrated slumped posture, sluggish and asymmetric motion, listlessness, minimal awareness of both egocentric space and the physical environment, and a poor ability to perform to completion activities necessary for personal care. Both background music playing and caregiver singing had strong influences on the body and on sensory awareness. Patients had straightened posture, stronger and more symmetric movements, and a greatly increased awareness of themselves and their environment. Patients appeared to regain skills necessary for daily living, and demonstrated that they could perform tasks with intention, purpose, and competence. Caregiver singing, in particular, was very effective at drawing out capabilities that appeared to be lost in these patients. In addition, caregiver singing elicited a larger degree of mutuality in the interaction between patient and caregiver than was seen with background music. *Discussion:* These results provide further support for the use of caregiver singing in dementia care, and the findings on how caregiver singing can be used to help in dementia caring situations are discussed.

**KEYWORDS:** Dementia; caregiver singing; background music; posture; movement; sensory awareness; spatial awareness; qualitative methods

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People with dementia experience a host of debilitating symptoms that have a profound influence on their ability to function in day-to-day situations, symptoms such as aphasia, agnosia, and apraxia (American Psychiatric Association, 1994). In a previous study (Götell et al., 2002), we illuminated the impact of such symptoms on the verbal communication between dementia patients and their caregivers during morning care situations. The current study takes a similar tack but looks at symptoms related to posture, movement, and sensory awareness, in other words *nonverbal* aspects of the communication between patients with dementia and their caregivers. Studies in persons with dementia have pointed to clear signs of apraxia, motor inaccuracy, slowness of movement, and balance problems in this population (Pettersson et al., 2002; Thomas et al., 2002; Waite et al., 2000).

Beyond considerations of physical well-being alone, the issues of posture, movement, and sensory awareness are important symbols of the gestural communication that transpires between persons with dementia and the people with whom they interact. Poor posture and unsteady movement are not merely indicators of a compromised physical condition but oftentimes of a poor psychological state as well. Such physical signs are often accompanied by the well-known behavioral symptoms that are familiar to caregivers of persons with dementia, namely confusion, disorientation, mutism, agitation, aggressiveness, and the like. Therefore, our interest in exploring interventions with an influence on posture, movement, and sensory awareness was as much related to communicative meaning as to physical well-being.

One factor that has been shown repeatedly to have a dramatic influence on the behavioral symptoms of persons with dementia is music (Aldridge, 2000; Clair, 2000; Swartz et al., 1989). Aldridge (2001b) reviewed the remarkable ability of music—and especially active music-making—to decrease agitation, increase socialization, and improve overall mood among persons with dementia. Music and dance can increase the involvement of persons with dementia in social interactions (Mark Mathews et al., 2001), increase their overt signs of pleasure and happiness (Götell et al., 2000; Jansson et al., 1993), and improve posture, body awareness, and physical capabilities (Nyström, 2002; Palo-Bengtsson & Ekman, 2002). Such effects are often seen in persons with dementia who have little or no language capacity. Music and dance are thus interventions that convey gestural and emotional meanings that go well beyond simple words. From a caring perspective, devices like music and dance promote an enhanced quality of life and permit caregivers to focus on “possibilities” rather than on “limitations” (Norberg, 2001).

In our previous study of verbal communication, we illuminated the interaction between patients with dementia and their caregivers during three types of morning care sessions: (a) the usual morning care situation, (b) a caring session in which familiar background music was played, and (c) a caring session in which the caregiver sang to and/or with the patient throughout (Götell et al., 2002). What we observed was a paradoxical effect: Whereas in the usual caring situation the caregiver used extensive verbal narration and instruction in order to help the patient to perform activities

necessary for personal care, when the caregiver sang to the patient there was no narration or instruction related to the caring activities at hand (the words of the songs were simply the lyrics of folk songs) and yet the patient showed a greatly improved capacity to perform activities necessary for self-care as well as a much greater understanding of the caregiver's gestural (nonverbal) communication. Overall, there was a reduction in aggression, screaming, and confusion as patients seemed to develop an implicit understanding of what was going on.

The purpose of the current study was to illuminate the movement and sensory awareness characteristics of persons with dementia and their caregivers during usual morning care sessions, morning care sessions with background music playing, and morning care sessions in which caregivers sang to and/or with patients. As with our previous study, we illuminated the influence of our interventions both on the caregiver and on the patient, because the research literature has tended to place an overwhelming emphasis on patients alone and has therefore failed to consider interpersonal communication in and of itself.

## METHODS

### Participants

The study was carried out in a special care unit for 24 patients who had severe dementia; the unit was located in an urban area in Sweden. Eight women and two men initially participated in the study. One woman dropped out after the start of the study because she did not want to be recorded on video, and so a total of nine patients were analyzed.

Patient selection was carried out based on the recommendations of the head nurse, who informed us of patients and caregivers who had an extensive history of interaction. There were no rigid inclusion-exclusion criteria for the study except the requirement that patients have late-stage dementia. It is highly unlikely that there was selection bias by the head nurse, because she was completely unaware of the design or hypotheses of the study. Patients' next of kin or trustees gave written permission for participation in the study, which was approved by the ethics committee of the Huddinge University Hospital (Ethics Committee protocol number 239/95, 246/96). The first author obtained permission from the caregivers.

All patients scored between 0 and 12 points (out of 30;  $M = 1$ ) on the Mini-Mental State Examination, a test of cognitive function (Folstein et al., 1975). Participants were between 80 and 90 years of age ( $M = 84$ ), were native speakers of Swedish, and had resided in the special care unit for a period of between 9 months and 5 years 9 months ( $M = 3$  years 1 month). One of the patients was wheelchair-bound. Five female caregivers participated in the study. All were licensed practical nurses or mental health nurses. They were between the ages 20 and 39 ( $M = 29$ ), and were fluent speakers of Swedish (one was a native speaker of Spanish). They had worked in geriatric care between 2 and 19 years ( $M = 10$  years) and had been caring for the participating patients for at least 1 year prior to the start of the study.

### Design and Data Collection

Morning care sessions constituted the study's basic unit of analysis. The sessions occurred in a bathroom between 7 a.m.

and 9 a.m. and lasted between 6 and 22 minutes. Typical morning care sessions proceeded as follows. (a) Patients were sitting on a toilet, and their nightclothes were removed. (b) Their faces and upper bodies were washed; and deodorant, skin lotion, and perfume (for the women) or after-shave (for the men) were applied. When patients were naked, only their upper bodies were recorded; when dressed, their entire bodies were recorded. (c) Clothes, socks, and shoes were put on. (d) Patients stood up, were led to the sink (one patient used a wheelchair), and were directed towards a mirror. (e) While patients were at the sink, their teeth were brushed, hair was combed, and hands were washed. (f) While facing the mirror, patients were encouraged to behold their image.

The basic design of the study consisted of three situations of the morning care routine for each patient: the usual caring routine (i.e., the control situation), a caring routine done with recorded music playing in the background, and a caring routine in which the caregiver sang to and/or with the patient. Between data collection sessions, morning care was carried out as in the control situation. The study consisted of 27 observations (9 patients x 3 caring situations). All but one of these was video-recorded; for technical reasons, one session was documented by means of note-taking alone. Every patient was cared for by the same caregiver during the three morning care sessions. Each caregiver participated with two separate patients, except for the caregiver who worked with the patient who dropped out of the study, and who therefore participated with only one subject. The schedule of the three sessions varied because of the patients' state of health and ability to participate as well as the caregivers'

work schedules. The second session (i.e., background music) occurred, on average, 3 days after the first (range, 1-27 days). The third session (i.e., caregiver singing) occurred, on average, 9 days after the second (range, 1-21 days). Thus, the average observation period for a patient was 13 days but varied between 3 and 49 days. Although one sequence of sessions was used for all patients (i.e., control situation first, background music second, and caregiver singing third), we doubt that there were any "order influences" in this study, because an average of 9 days separated the second and third sessions, thus minimizing possible carryover influences from the background music session. Moreover, in one instance, a fourth situation was included, which consisted of another control session. Although the fourth session was not analyzed in this study, preliminary observation of this session showed that the communication between the patient and caregiver was the same as that seen in the first situation.

In selecting music for the second session, we used familiar, preferred music, as suggested in the literature (Clair, 2000; Gerdner, 2000). Because none of the patients had the ability to express their musical preferences, relatives of the patients or, when patients lacked relatives, participating caregivers were interviewed about the kind of music patients preferred. The suggested music was then played on a CD player, and the patients were asked if they enjoyed the music. Based on a combination of verbal and facial responses from the patients, the first author selected music to be played during the second session. The music typically consisted of popular songs from the

1920s to the 1960s, as sung by a male vocalist and accompanied by an orchestra. The caregivers stated that prior to participation in this study, they had never listened to music while performing the morning care routines.

In the third session, caregivers sang to or with the patients while performing their duties. The caregivers were not trained or required to sing particular songs for the study. All of this was up to the will and musical knowledge of each caregiver, but children's songs or sing-along songs were suggested as possibilities. The songs that were used generally consisted of folk songs or

popular songs from the early part of the 20th century, including children's songs and drinking songs. Most caregivers sang songs with words, but a few hummed the melodies alone. As with the second session, caregivers had no experience before this study of singing to patients while carrying out morning care routines. Although one caregiver had had experiences in singing in a choir, the other four had no experience in singing beyond occasional celebrations. When younger, at least five of the female patients had sung to their children. One patient had had vocal training and had played the guitar in public,

**TABLE 1. Five-Stage Qualitative Content Analysis**

Stage	Description
1	<ul style="list-style-type: none"> <li>• View videos several times to gain a first impression, that is, to develop an overview of the movements and expressions that patients and caregivers performed and expressed during the three types of morning care sessions.</li> <li>• Briefly compare the three recorded sessions for each patient and document a preliminary interpretation.</li> </ul>
2	Use the preliminary interpretation to construct a coding system. The current study analyzed eight coded parameters: posture, quality of movement, body movement in space, performance of tasks (i.e., acts of daily living, such as speaking, standing, walking, sitting, and washing), facial expressions, and the senses of vision, hearing, and touch.
3	Divide the caring sessions into units, i.e., tasks that were performed. For example: <ul style="list-style-type: none"> <li>• Removing the nightclothes</li> <li>• Washing and drying the face</li> <li>• Washing and drying the body</li> </ul>
4	View the videos two times: <ol style="list-style-type: none"> <li>1. Analyze the <i>patients</i>, i.e., assign codes for posture, quality of movement, body movement in space, performance of tasks, facial expressions, and the senses of vision, hearing, and touch.</li> <li>2. Analyze the <i>caregivers</i>, i.e., assign the above codes for the same parameters.</li> </ol> <i>Note:</i> Videos were played back and forth, and so viewing was not linear.
5	Formulate themes using the videos and the descriptions documented in Stage 4. <p><i>Note.</i> The themes appear to be highly demarcated when described in the Results section, but in reality they are highly interrelated within the context of the videos.</p>

and another had sung in a choir. Analysis suggested that there was no overall relationship between the patient's musical background and the results obtained during the musical interventions.

### Data Analysis

Table 1 summarizes the five-stage qualitative content analysis used in this study (Berg, 2001). In a humanistic scientific paradigm, the health of the human being is not *measured* but is described and interpreted. Using a qualitative content analysis, the researcher performs an in-depth description and analysis of the observed experiences, and attempts to weave them into a coherent interpretation of the lived experience of the person. This is typically done by characterizing a series of "themes" that describe general features of the experiences being observed. The advantage of videotaping is that it can capture behavior and interaction, and permit the researcher to repeatedly view the same sessions in order to develop an in-depth understanding (Latvala et al., 2000). When using videotaping as a data collection method, researchers must keep in mind the possibility that their presence may lead to a modification in the behavior of the people they are observing. However, most researchers find that the persons being filmed acclimate to the presence of the camera and quickly become unaware of it (Latvala et al., 2000). The researchers in this study had the impression that the participants they observed used normal expressions and behaviors during the three sessions. It is important to point out that the results of this study are context-dependent and are thus best applied to similar dementia care contexts.

Data were analyzed by the first author according to the methods listed in Table 1. In order to assess the reliability of the data, a coassessment was done by the third author, who was familiar with video analysis and qualitative content analysis. She assessed six of the video recordings; the same two patients and caregivers were tracked through two recordings of the control session, background music session, and caregiver singing session, respectively. The themes and subthemes developed by the first author were presented to the third author as the most probable ones in terms of the study's purpose. Agreement between the two assessments was high. The findings of the first author were confirmed in a discussion of each analysis, except for the analysis of facial expressions of one patient. The third author's descriptions of this are included in the current analysis.

### RESULTS

Four general themes were found to be descriptive of all three types of morning care sessions, and four subthemes of these themes were found to be associated with each individual type of session. Each subtheme describes characteristic features of each type of morning care session across the group of patients and caregivers in the study. The various subthemes for each theme reflect important differences in patient and caregiver characteristics among the three types of morning care sessions. Table 2 presents an overview of the themes and subthemes for this study. In what follows, the results are described in detail.

## **Theme 1: Balance and Sensory Awareness**

***Subtheme in the Usual Morning Care Session: Flaccid, Unbalanced Bodies With Subdued Sensory Awareness.*** During usual morning care sessions, patients typically demonstrated the following characteristics: forward-leaning and drooping posture with curved backs; wobbly or unsteady balance; faltering gait; and slow, small, shaky movements. When standing, patients often supported themselves by leaning on the sink or wall, or by receiving support from the caregivers. When sitting, they either grasped steadily or clutched onto the arm of a chair, or they bent their arms and cupped or closed their hands, which they held at their sides or in front of their chests. Their heads were often bent toward their chests. All patients had similar facial expressions, namely drooping faces with stiff or no expression, lowered eyelids, downward gaze, and open mouths. Oftentimes, the tip of the tongue protruded through the lips. One patient had his entire tongue hanging out of his mouth. Another patient, with flaccid posture and a nearly expressionless face when relaxed, changed posture and facial expression when reacting with aggression toward the caregiver. This patient stretched her body and looked with forceful anger at the caregiver. When this patient's assault ended, her body and facial expression returned to a state of flaccidness once again.

The visual awareness of the patients was demonstrated by the fact that they spent much of their time looking downward and that they lifted their gaze only very slowly. When patients could lift their gaze, it sometimes appeared as though it was not fixed and that they were staring

into empty space. Their hearing abilities seemed impaired because they did not often react when the caregivers spoke nor did they respond to their questions. The patients seemed to have a reduced level of sensory awareness. Oftentimes they did not react to their clothes being put on. One patient, as an initial reaction, always tried to pull off her clothes when being dressed, and hit, pinched, and pushed the caregiver away when the latter helped her get dressed. Another patient did not react when, while cleaning her dentures with a toothbrush, she brushed her fingers at the same time. Some patients immediately and loudly expressed pain, and some screamed when, for example, caregivers helped them put on their shoes or brush their teeth.

***Subtheme With Background Music: Lengthened Bodies, Improved Balance, Stimulated Senses.*** When background music was played during the caring session, patients used their bodies in a different manner compared to the usual session. Their posture while sitting or standing up was elongated and their backs were not bent. Balance was steadier and wobbling was considerably reduced. Patients' movements seemed to mirror the rhythm of the music, being faster, broader, and more extensive; movements were livelier, less stiff, and less shaky. When patients sat, their arms and hands rested lightly on the arms of the chair or they sat without support with their hands resting on their laps. The hands were open with elongated and separated fingers. They held their necks straight, and placed their heads forward, looking out straight ahead. When patients looked serious, they tended to keep their mouths closed. When they demonstrated lively

**TABLE 2. Overview of Themes and Subthemes for the Three Types of Morning Care Sessions**

	Theme 1: Balance and Sensory Awareness	Theme 2: Physical Strength and Body Symmetry	Theme 3: Use of Space	Theme 4: Caregivers Helping Patients Live in Their Bodies
Session 1: Usual morning care	Subtheme: Flaccid, unbalanced bodies with subdued sensory awareness	Subtheme: Physical weakness, asymmetric and fragmented actions	Subtheme: Living in a limited space	Subtheme: Helping patients living in stiff, unbalanced bodies
Session 2: Background music	Subtheme: Lengthened bodies, improved balance, stimulated senses	Subtheme: Increased physical strength, more symmetric actions, and a tendency to complete tasks	Subtheme: Living in an expanded space	Subtheme: Helping patients living in flexible, partially balanced bodies
Session 3: Caregiver singing	Subtheme: Straight, balanced bodies, alert senses	Subtheme: Physical strength, symmetric actions, and completed tasks	Subtheme: Living in a greatly expanded space	Subtheme: Helping patients living in flexible, balanced bodies

facial expressions, they appeared concentrated, vigilant, interested, happy, and satisfied. No patient reacted by hitting, pinching, or pushing the caregiver during sessions with background music.

Patients demonstrated sensory awareness in a way that differed from the usual caring session. They looked around the room, and often maintained continuous eye contact with the caregiver. Their hearing seemed to be enhanced, because they responded more often to the caregiver's comments and questions. Moreover, they seemed to hear and be aware of the melodies that were being played, as evidenced by the fact that some patients hummed the melody, while others sang short passages. Patients seemed to have a greater degree of physical sensitivity, as they used their hands, for example, to adjust the position of the sleeve of a garment to make it fit better. Their reactions to pain seemed different as well. There was much more control over the manner of expression and much more use of words to indicate that something was hurting.

***Subtheme With Caregiver Singing: Straight, Balanced Bodies, Alert Senses.*** When caregivers sang to patients during the caring sessions, the patients' body expressions differed from those of the previous two sessions. The patients had upright posture with relaxed, straight shoulders. They moved in a calm, smooth, and harmonious manner. They sat upright and relaxed, with hands resting on their laps without, as a rule, obvious difficulties with balance. When standing, their arms were relaxed, hanging to the sides of the body. Patients straightened their necks and kept their heads and chins high. Their mouths were closed when they were relaxed. When looking around the room, their eyes

looked bright, and their movements were smooth. Facial expressions shifted in a smooth, easy way. All patients demonstrated seriousness and concentration. Most of them demonstrated warm, smiling, and blissful facial expressions; only one showed anger. No patient assaulted a caregiver. When the caregivers sang, the patients could sway their bodies while beating the rhythm of the music with their hands.

Sensory awareness differed compared to the previous two sessions. Patients were bright-eyed and gazed around attentively—mostly looking at caregivers, with whom they had continuous eye contact. The patients took notice of details, such as product labels or signs in the bathroom, and they could partly read this text. In addition, they took notice of individual garments (e.g., a skirt, a shirt, etc.), and could discuss details regarding, for example, hairstyles, i.e., how the hair looked or how it was combed. Their hearing seemed to be further sharpened, as they seemed to be highly attentive to the caregivers' singing, thereby demonstrating an increase in arousal and vigilance. Patients could demonstrate an understanding of a song by nodding when caregivers finished singing a given line from a song or completed singing the song. When the patients sang a song with words along with the caregiver, they demonstrated a knowledge of the text of the song. It seemed as though patients acquired renewed physical awareness because they reacted immediately when clothes were put on, for example, by checking how a dress fit and by immediately straightening it so that it fit well or by using the hands to feel how a collar was folded around the neck. Any expressions of discomfort were demonstrated the same way as in the background

music session. One patient used a full sentence to indicate that it hurt when the caregiver put dentures into her mouth.

## **Theme 2: Physical Strength and Body Symmetry**

***Subtheme in Usual Morning Care Session: Physical Weakness, Asymmetric and Fragmented Actions.*** When patients moved around and performed tasks, their actions were stiff and shaky. Movements were small and slow, and were performed in a generally aimless manner. Patients' arms were bent and sat close to their bodies, and their hands were cupped. In addition, their grip was weak. There was a general tendency to perform tasks unimanually with the right hand only. In addition, there was a tendency to groom the left side of the body only, and to do so in a fragmentary manner. For example, patients would wash the left side of the body (with the right hand) but not wash the right side or wash it in a much less complete manner than the left. The same was true when it came to washing the face. One patient who started washing her face from the middle often left the chin unwashed. When performing grooming tasks, patients had a tendency to stop in the middle of the activity rather than see it through to completion. When patients rinsed their mouths after brushing their teeth, they either spit the water out weakly or just let the water stream passively from the mouth into the sink. Some patients discontinued brushing in the middle of the task, and the caregivers had to remind them to finish. On many occasions patients performed actions incorrectly. Although most patients were capable of performing parts of tasks—whether that be washing the body, brushing the teeth, or buttoning a blouse

or shirt—they tended to perform the activities either incorrectly or incompletely. In addition, when patients were finished using a particular object, they either handed it to the caregiver with bent arms and cupped/closed hands or they simply maintained their hold on the object in a shaky way. Table 3 describes how one patient performed various tasks, such as standing, walking, and looking in the mirror.

***Subtheme With Background Music: Increased Physical Strength, More Symmetric Actions, and a Tendency to Complete Tasks.*** When background music was played, the patients stood more firmly, had greater balance, and performed movements in sync with the music. As they performed tasks, they demonstrated increased strength and an increased ability to direct their movement while using the two hands either together or in alternation. Patient movements appeared more powerful and distinct, and they had a tendency to wash both sides of the body. All patients washed a larger area of the body and face compared to the usual caring routine. For example, the entire face, including the neck, was washed all in one go. When brushing the teeth, patients seemed to rinse their mouths carefully before spitting forcefully into the sink. They often buttoned their blouses and shirts spontaneously, something that was not seen in the usual caring situation. When they handed objects over to the caregivers after a task was done in its entirety, patients generally extended their arms and opened their hands.

***Subtheme With Caregiver Singing: Physical Strength, Symmetric Actions, and Completed Tasks.*** When caregivers sang to patients, the latter stood up solidly, and their bodies moved

**TABLE 3. Description of a Patient and Caregiver During Hair Combing**

Usual	Background Music	Caregiver Singing
<p>Caregiver G (CG) and Patient 1 (MMSE score = 0) stand beside the sink in front of a mirror. Patient 1 is slumped and bent forward, CG looks into Patient 1's face while giving her a comb. Patient 1 does not meet CG's gaze. Patient 1 combs her hair with her right hand. She keeps her right arm close to her body. She looks at herself in the mirror. Her face is serious and drooping. She grimaces as she is combing out tangles in her hair. Her hair is carefully combed on the right side, followed by the left side. Finally the back of the head is combed but less carefully than the sides. With her right hand, Patient 1 puts the comb on the right side of the sink. Patient 1 and CG have no eye contact during the session.</p>	<p>CG stands somewhat away from Patient 1, whose back is toward CG. Patient 1 is turned toward a CD player. Music is playing in the background: a waltz called <i>Hjärtats saga</i> ("The Heart's Saga"). Patient 1 turns, looks into CG's eyes, and walks towards CG, who gives her a comb. Patient 1 stands with straight posture, fairly far from the mirror and sink. She grips the comb with her right hand, looks at the comb, and turns it to get a proper grip before starting to comb her hair while standing fairly far from the mirror. With an alert, smiling face, she blinks several times. She looks with concentration into the mirror, while combing her hair with the right hand, using light, relaxed, and long strokes. Finally, Patient 1 shapes the hair on both sides with the comb so that her hairdo looks pleasing around her face. After finishing, she looks into CG's eyes and thanks her for the help.</p>	<p>CG and Patient 1 stand facing one another beside the sink. Patient 1 looks relaxed and is standing straight. With soft, smooth movements, CG gives a comb to Patient 1. CG hums a children's song: <i>Blinka lilla stjärna där</i> ("Twinkle Twinkle Little Star"). She puts herself about 2–3 meters behind Patient 1. Patient 1 grips the comb with her right hand, beholds herself in the mirror with bright eyes and a composed, serious facial expression. With smooth, relaxed strokes, she combs the right side and then the left side of her head. When she combs the back of her head, she raises her left hand and uses it to assess if the hair is combed on the crown. She lowers her left hand close to the left side of her chest. With her right hand, and using calm, smooth strokes, she continues to comb the right side. She concentrates on her image in the mirror. She again raises her left hand, puts it on the crown of her head, and molds the hair with her hand. She turns smoothly around—about 180 degrees—while keeping the left hand on top of her hair. She looks at CG and enquires whether her hair is neatly combed in the back.</p>

Note. MMSE = Mini-Mental State Examination.

smoothly. Compared to during background music sessions, they seemed to perform tasks with enhanced decisiveness, drive, and completeness. They worked calmly and methodically with the two arms. The hands were held open, and the fingers were elongated and together. Patients washed more parts of their bodies, for example, the face, neck, and upper body. The two arms were washed in consecutive order. When using washcloths, patients worked with one hand at a time or with both hands together. They would then put the washcloths on the sink, pick up a towel lying on the sink, and dry the washed body part. Then they would return the towel to the sink or give it to the caregiver.

Patients demonstrated enhanced competence at grooming tasks and greater smoothness of movement. For example, when one patient dried her face, she held the towel toward her face with both hands, puckered her lips, and performed a complex movement with her mouth when drying it. When brushing the teeth, patients did so carefully. They sipped larger quantities of water, rinsed their mouths, and oftentimes bent their heads back and gargled before spitting forcefully into the sink. The ability to dress oneself also appeared to be enhanced. Patients checked the way in which a blouse or a shirt should be held before accurately slipping their arms into the sleeves. They buttoned buttons and, without looking at the blouse or shirt, used their fingers as guides in finding the location of the buttons and buttonholes. Overall, there was a much greater sense of competence and coherence to the activities compared to the two previous situations.

### Theme 3: Use of Space

**Subtheme in the Usual Morning Care Session: Living in a Limited Space.** Related to our discussion of sensory awareness in the first theme was the more specific case of *spatial* awareness. During usual morning care situations, patients gave the impression of having very limited spatial awareness. They seemed unable to recognize bathroom objects, and often failed to recognize things shown to them, for example, towels, cloths, or a mirror. They often demonstrated difficulties understanding movement of the body, such as how to be seated on the toilet. One patient seemed to have a diminished ability to understand the caregiver's movements when the latter reached toward her. She reacted by hitting, pinching, and pushing away the caregiver. In addition, patients showed poor self-awareness as shown by their difficulties in looking at themselves in the mirror. The overall consequence was that patients appeared to live in a very limited space.

**Subtheme With Background Music: Living in an Expanded Space.** Much of this changed when background music was played. Patients seemed to have a much greater awareness of exocentric space. They gazed around the room and seemed to recognize different objects. They appeared to be sitting on the toilet on their own volition. They moved with a steady gait from the toilet to the sink as if implicitly understanding the spatial trajectory involved in making this movement. Patients seemed to know the mirror's location in the bathroom and could look at themselves in the mirror with a definite sense of self-recognition. They moved and extended their bodies in space, for example, by reaching for a towel when needed. Many

turned the faucet of the sink on and off, which they never did in the usual caring situation. One patient even cleaned the sink, firmly and confidently using her two hands in rinsing the entire sink before turning off the water faucet.

***Subtheme With Caregiver Singing: Living in a Greatly Expanded Space.*** When caregivers sang to patients, it seemed that, without any type of coaching by the caregiver, patients could seat themselves, stand, walk around the room, and gaze at themselves in the mirror. Caregiver singing seemed to stimulate a great sense of spatial awareness. Patients seemed to be aware of where the caregiver was standing and, as a rule, turned toward the caregiver during these sessions. The patients were able to use items by themselves, for example, reaching for and grabbing a washcloth, using it, rinsing it under the faucet, wringing it out, and putting it on the sink. When one patient discovered a garment lying on the floor, she approached it, bent down, picked it up, and gave it to the caregiver. In sum, compared to the usual caring situation, there was a dramatic improvement in awareness of both exocentric space and personal space.

#### **Theme 4: Caregivers Helping Patients Live in Their Bodies**

***Subtheme in the Usual Morning Care Situation: Helping Patients Living in Stiff, Unbalanced Bodies.*** When patients performed tasks for daily living during the usual morning care sessions, it was very common that caregivers had to use their bodies to support the patient and facilitate movement. In helping patients move around, the caregivers walked close to one side of the patient, holding one arm around the patient's arm

and the other arm around the back, thereby giving the impression that they were supporting the patient's body weight. The caregivers seemed to be using their bodies as a guide so that the patients could understand which direction they should move. In doing this, they took great pains to reduce balance problems in the patient. For example, caregivers significantly twisted their bodies to one side and seemingly used great strength as they helped rigid and unsteady patients change their body position. Table 4 describes how a caregiver helped a patient stand, walk, and then stand in front of a sink.

When grooming activities were performed, the caregivers stood closely in front of the patients or at their sides. With slightly cupped hands, they handed items such as washcloths or garments to the patients. When patients stopped in the middle of their tasks and failed to wash one side of their bodies, the caregivers would point towards and then touch the unwashed side with their hand and encourage the patient to continue washing. On other occasions, caregivers would finish washing the patient's entire body on their own. It was common for the caregiver to help a patient start or continue a task by placing her hand on the patient's hand, thereby demonstrating how to perform the task.

The caregivers reached out their arms toward the patients to take items that they held in their rigid, shaky, bent arms and closed hands. Caregivers also helped patients to loosen their grips around items when they grasped things in a spastic manner. One of the caregivers, when reaching toward the patient, would get slapped, pinched, or pushed away. To avoid being further assaulted, she would

**TABLE 4. Description of a Caregiver Helping a Patient to Stand and Walk in the Room**

Usual	Background Music	Caregiver Singing
<p>Caregiver C (CC) helps Patient 2 (MMSE score = 0) to stand. Patient 2 sits on a chair. CC is standing on Patient 2's right side. CC bends down deeply and twists around behind Patient 2's back. CC puts her hands on Patient 2's hips and helps her to stand. Patient 2 is stiff and reluctant to move. CC then uses her right hand to hold onto Patient 2's right arm, while with her left arm, she holds on around Patient 2's back and supports her as she moves from the chair to the sink. Patient 2 stands before the sink with her head bent, body stiff, and balance wobbly. They have no eye contact during the session.</p>	<p>CC squats with straight back before Patient 2, who sits on a chair. The waltz <i>Den gamla dansbanan</i> ("The Old Dance Hall") is playing in the background. Patient 2's posture is straightened. CC and Patient 2 look into each other's eyes with happy, smiling glances. CC quickly and playfully extends her right hand toward Patient 2, with her palm and extended fingers turned up. Patient 2 extends her two hands and holds CC's hand. CC stands up. Patient 2 loosens the grip with her left hand and places it on the chair's arm. Her hand is open and her fingers are separated. Patient 2 gets up by herself while holding her right hand in CC's right hand. CC places her left hand as light support around Patient 2's right upper arm until she stands up stably. Patient 2 stands by herself. Then CC, providing light support, holds Patient 2's right hand while she moves toward the sink with quick, unsteady steps. Patient 2 walks the the last few steps by herself.</p>	<p>CC and Patient 2 just sang together a children's song: <i>Sov du lilla viding</i> ("Sleep, You Young Willow"). CC squats with straight posture before Patient 2, who is sitting on a chair. Patient 2 sits with relaxed, straight posture. CC and Patient 2 look into each other's eyes with friendly, soft facial expressions. With a smooth movement, CC extends her right hand toward Patient 2's right hand; CC's hand is smoothly bent with the fingers together and pointing toward the floor. Patient 2 holds CC's hand. At the same time that CC stands, Patient 2 stands, supporting herself with her left hand, which is placed on the chair's arm. Patient 2 stands straight and balanced. CC holds Patient 2; CC's right arm is around Patient 2's right forearm. CC lightly supports Patient 2 while they walk to the sink.</p>

Note. MMSE = Mini-Mental State Examination.

position herself as far away as possible from the patient, with her upper body bent forward, looking as though she was defending herself from abuse. She tried to curb the patient's ability to hit her by holding the patient's hands or by placing her hands on the patient's hands.

During dressing, the caregivers presented garments to the patients and then opened the garments so that the patients could place their arms through the sleeves. Alternately, the caregivers demonstrated to the patients what they should do. The caregivers checked that garments fit well by running their hands over sleeves, blouses, and shirts, to ensure a smooth, evenly distributed fit. The caregivers helped patients button garments if they lacked this ability.

Caregivers frequently helped the patients to gaze at themselves in the mirror, and in doing so, they stood closely beside the patients. The caregivers often pointed toward the mirror while asking the patients to behold their image in the mirror. The patients generally gave the impression that this task was a great burden. Sometimes the caregivers failed to help the patients look into the mirror. For example, one caregiver put her hand under the patient's chin and lifted the patient's face in the direction of the mirror. The patient continued to look downward and did not look up. On many occasions, the caregivers tried to achieve eye contact with the patients. At these times, the caregivers knelt before the patients' forward-leaning heads. The caregivers looked friendly and interested while calling the patients by name, seeking to achieve eye contact. Caregivers also stood beside the patients and twisted their bodies forward underneath the patients' faces to catch their gaze. Often-times patients were incapable of meeting the caregivers' looks.

***Subtheme With Background Music: Helping Patients Living in Flexible, Partially Balanced Bodies.*** When background music was played, it looked like the caregivers' posture and movements were altered compared to the usual caring session. Caregivers stood with straighter backs. Their movements were more extended and agile. They touched the patients and grooming items with open hands and elongated, separated fingers. Their facial expressions were altered. They looked more alert, and most of them smiled or laughed continuously. On many occasions, they moved their bodies in a playful manner in sync with the music. For example, caregivers moved their heads from side to side while kneeling in front of the patients to help them with tasks. The caregivers adapted their movements to the patients in a different way. The patients seemed to have improved balance and strength, and so the caregivers also worked with increased balance. They did not need to twist and bend their bodies in the extreme manners that they did during the usual caring situation. When caregivers helped patients walk, they did not need to offer as much support when holding the patients' arms compared to the usual caring situation. The caregivers did not need to hold one arm around the patients' back nor did they need to provide the same amount of body guidance when helping patients walk in the appropriate direction. No caregiver needed to defend herself from being slapped, pinched, or pushed by a patient when background music was played. Caregivers frequently stood beside the patients, looking into their eyes and smiling.

When patients got dressed, they seemed to need less help from caregivers compared to the usual caring situation. Patients displayed an ability to put

on blouses or shirts, and many could button their garments without help. The caregivers stood or kneeled beside the patients, and often complimented them on their appearance or clothing. The caregivers touched the patients differently. They kept their hands open and their fingers straight and spread. They helped groom the patients in a friendly and conscientious manner. For example, the caregivers used their hands to check how collars laid around patients' necks or they adjusted the patients' hairdos so that they looked especially neat. Oftentimes the caregivers and the patients looked at one another in the mirror. As a rule, they demonstrated alert, satisfied, and sometimes even happy facial expressions.

***Subtheme With Caregiver Singing: Helping Patients Living in Flexible, Balanced Bodies.*** Caregivers seemed to be influenced by their own singing. They stood upright, with relaxed posture, and they moved calmly, smoothly, and harmoniously. They kept their hands open and their fingers straight and close together. They required little effort to kneel next to the patient and then rise to their feet. When helping patients stand, they put one arm around a patient's arm for light support.

When moving, it looked like the caregivers no longer needed to use their bodies to guide the patients in a specific direction. Extreme twisting and bending movements were eliminated. Most caregivers had friendly, sincere, and peaceful facial expressions when standing beside the patients and singing. When the caregivers washed and dressed the patients, they worked with smooth, cautious movements. The caregivers and patients met each other in motion as they exchanged grooming items in a kind of

mutual flow. Overall, there was much greater mutuality in the interaction between caregiver and patient. In addition, compared to the two previous situations, patients showed a much greater competence at and understanding of how to perform tasks.

## DISCUSSION

The purpose of this study was to illuminate the postural control, movement abilities, and sensory awareness of dementia patients during usual morning care sessions, caring sessions with background music, and caring sessions in which caregivers sang to and/or with patients. A qualitative content analysis was performed, and a series of themes related to posture, physical strength, sensory awareness, motor competence, use of personal space, and caregiver-related characteristics were analyzed.

During usual morning care situations—the kind experienced by the overwhelming majority of patients with dementia in their day-to-day lives—patients demonstrated a host of sensory and physical symptoms that reflected not only a diminished sense of physical and emotional well-being but a highly impaired ability to support effective channels of communication with their caregivers. Patients' movements and facial expressions were restrained and muted. Results in this study confirmed previous reports that persons with mild and severe dementia have gait disorders, balance problems, and slowness of movement (Pettersson et al., 2002; Thomas et al., 2002; Waite et al., 2000), thereby demonstrating that dementia can have effects on the entire body. Patients demonstrated poor physical

strength, an inability to perform grooming acts competently and completely, and a highly limited sense of personal space. At the level of interpersonal interactions, it was not uncommon for patients to assault caregivers in some form. Much of this may have been triggered by a perceived invasion of body space. Chou and colleagues (1996) have shown that limited body space can trigger patients with dementia to assault personnel and cause caring problems that, according to Åström and coworkers (2002), evoke feelings of powerlessness, sadness, anger, and dissatisfaction among caregivers, leading to exhaustion, stress, and burnout.

When background music well matched to the cultural background of the patient was played throughout the morning care situation, there were dramatic changes compared to the usual situation. These included better posture, less shakiness in movement, a significantly improved competence at performing grooming acts, and a clearly evident increase in general sensory awareness. Patients showed an improved perception and use of personal space. In addition, they presented less confusion, less resistance, and, importantly, no aggression towards caregivers. Instead, they showed facial expressions of vigilance or even happiness. As in the previous situation, there was a direct relationship between sensorimotor abilities and communicative abilities. Both showed improvements when background music was played.

When caregivers sang to and/or with patients during morning care situations, similar improvements in patient capacities and behaviors were seen to those when background music was played, although they seemed even more dramatic. There were improvements in pos-

ture, body strength, flexibility, motor competence, smoothness of movement, and mental alertness, especially with regard to spatial cognition (see Table 2). Singing caregivers were able to elicit physical and mental capabilities of patients with dementia oftentimes thought to be lost. Patients could behold their image in a mirror with enhanced self-awareness, hear a request and respond to it, and remember previous information and skills. Physical actions were performed with intention and purpose. The patients seemed to live in a comprehensible world. Perhaps the most profound change, though, was that related to the communication between caregiver and patients. Patients seemed to have an implicit understanding of what caregivers were communicating, and this clearly transcended the use of verbal instruction, as the caregivers were singing about folk themes, such as love and nature, and not about the caring activities at hand (see also Götell et al., 2002). Compared to the two previous situations, there was greater mutuality in the interaction. There seemed to be a genuine dyad of communication. The patient and caregiver were able to understand one another's body language in a way not seen in the other two situations. It is important to note that compared to the background music situation, singing had a much greater effect on the caregivers themselves. In other words, caregivers were highly influenced by their own singing. This is not surprising given that singing is a form of active and volitional music-making.

It is difficult to identify a unifying mechanism that can account for the broad array of physical and mental changes that were brought on by music in this study. One general characteristic

that we suggest merits serious consideration is *arousal*. Many of the changes that were observed in this study could be due to an influence of music and singing on attention, arousal, and vigilance. This could account not only for the improvements in sensory and spatial abilities but for the corresponding influence that these abilities might have on body image, intentionality of movement, motor competence, and even personal awareness of the caregiver. The influence of background music on modulating arousal has been well described (see Brown & Theorell, 2001). What has been less well described is the influence of singing on adults. Instead, one has to examine the literature dealing with singing by mothers to their infant children. It is clear that the modulation of arousal is one of the key factors influencing maternal singing to prelinguistic infants (Dissanayake, 2000; Fernald, 1992). We have argued in previous publications that mother-infant interaction might well serve as a reasonable model for the influence of caregiver singing on patients with dementia, especially aphasic patients (Brown, Götell, & Ekman, 2001; Götell, Brown, & Ekman, 2002). Whereas our previous analyses focused on verbal communication, we now see—analogue to parallel effects of maternal singing on mutuality of gaze, crying behavior, and the like—that caregiver singing can have a profound influence on a host of physical traits, and that, secondarily, this can be reflective of improved gestural communication between patient and caregiver, leading to a mutuality of their interaction. This highlights the oft-neglected point that responsiveness to the sound of the singing voice is maintained throughout human life and is not merely a feature of childhood.

We have devised the term “music-therapeutic caregiving” to describe the use of active music-making by caregivers during the course of their caring activities, especially with cognitively impaired patients (Brown et al., 2001). Singing is a very simple and direct intervention that could perhaps obviate the use of more invasive therapies. For example, there is a continuing concern about ways to subdue the aggressiveness of persons with dementia towards themselves and their caregivers (Åström et al., 2002; Chou et al., 1996). Lonergan and colleagues (2002) have pointed out that the use of drugs such as haloperidol for the reduction of agitation in patients with dementia presents the risk of inducing drowsiness and dizziness, thereby increasing the risk of falling. We believe that caregiver singing might provide a nonpharmacological adjunct or alternative to such drug treatments. Based on the results of this study, such an intervention might not only reduce the risk of falling due to drug side effects but may actually lead to improvements in overall posture and movement abilities.

Improving the quality of patient care is a global concern among dementia researchers and clinical practitioners. According to Aldridge (2001a), there is a great challenge for clinical practitioners to expand their treatment repertoires in persons with dementia. We suggest that singing might be a powerful addition to the treatment repertoire. This is so not only because singing appears to be an effective intervention but because of a more general need to focus on interpersonal interaction in dementia care. There is too much of a tendency in the dementia literature to focus on “skills” and “capacities” and not enough on

communication, such as that which is so intrinsic to patient care. When a perspective based on communication is considered, then it becomes clear that mind and body—including words and gestures—work hand in hand to achieve communicative ends. In examining the three types of caring situations that we looked at in the current study, it was quite clear that “capacities” and “skills” were reflected in the quality of communication between patient and caregiver in all cases. In the usual caring situation, both were poor. When caregivers sang to patients, both showed dramatic improvements. All of this highlights the point that we use our bodies not only to perform motor activities but also to communicate our feelings and intentions. Because music is about both emotion and structure—or actually the relationship between emotion and structure—it might provide the best model to understand the holism of mind and body in dementia care. Norberg (2001) argues that persons with severe dementia need “consoling care” in order to recapture a sense of feeling at home. Things like background music and personalized singing can perhaps help the patient acquire a sense of feeling at home. The results of this study shed light on communication opportunities for patients and their caregivers during dementia care.

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