



Assessing the impact and social perception of self-regulated music stimulation with patients with Alzheimer's disease

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ABSTRACT

We assessed the impact and social rating of an active and a passive music condition implemented with six patients with Alzheimer's disease. In the active condition, the patients used a simple hand response and a microswitch to self-regulate music stimulation inputs. In the passive condition, music stimulation was automatically presented throughout the sessions. Active and passive stimulation sessions were preceded and followed by control (non-stimulation) sessions. The active condition sessions showed an increase in the patients' indices of positive participation (e.g., singing or music-related movements, and smiles) greater than that observed in the passive condition sessions for five of the six patients. Positive intervention effects could also spread to the post-intervention sessions. Social raters (42 care and rehabilitation staff members working with persons with multiple disabilities) favored the active condition on a six-item questionnaire dealing with, among others, conditions' suitability, respect of patients' dignity and independence, and practicality. The implications of the findings as to the plausibility/desirability of an active stimulation condition were discussed.

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1. Introduction

Patients with Alzheimer's disease, an irreversible neurodegenerative condition with progressive deterioration of cognitive and behavioral functions, pose serious questions in terms of treatment and care (Arkin, 2007; Fernandez, Mainoiloff, & Monti, 2006; Giovannetti et al., 2007; Gitlin et al., 2008; Graff et al., 2008; Mihailidis, Boger, Canido, & Hoey, 2007; Raggi et al., 2007). The general view is that, beside pharmacological interventions, these patients need the support of behavioral strategies to manage activity engagement or other forms of positive participation (Ferrero-Arias et al., 2011; Giordano et al., 2010; Hulme, Wright, Crocker, Oluboyede, & House, 2010; Padilla, 2011; Phinney, Chaufhury, & O'Connor, 2007; Vernooij-Dassen, 2007; Wood, Womack, & Hooper, 2009). For example, patients who are within the mild and higher half of the moderate stage of the disease may learn to use systematic (technology-aided) instruction strategies to manage the

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performance of relevant daily activities (Lancioni et al., 2008, 2010, 2012; Lancioni, Pinto, et al., 2009; Lancioni, Singh, O'Reilly, Sigafos, et al., 2009; Lancioni, Singh, O'Reilly, Zonno, et al., 2009).

Patients in the severe and, possibly, lower end of the moderate stage of the disease would not be able to benefit from those strategies and perform daily activities. Rather, they might benefit from the availability of music stimulation employed as a strategy to reduce their behavioral disturbances and improve their participation and mood (Gerdner, 2000; Guétin et al., 2009; Hicks-Moore & Robinson, 2008; Janata, 2012; Raglio et al., 2010; Zare, Ebrahimi, & Birashk, 2010). Music stimulation can be envisaged and implemented in different ways. For example, some studies have reported the active involvement of a therapist or professional musician in playing music directly to the patients (Cevasco, 2010; Chatterton, Thy, Baker, & Morgan, 2010; Gotell, Brown, & Ekman, 2009; Ho et al., 2011). Other studies have relied on the simple presentation of music recordings (i.e., without any specific musician or therapist participation) (Gerdner, 2000; Raglio & Giannelli, 2009; Svansdottir & Snaedal, 2006; Wall & Duffy, 2010; Wollen, 2010; Zare et al., 2010).

Recently, an effort was made to enable patients diagnosed in the severe and low moderate stages of the disease to regulate their music input. To this end, a basic technology was used that (a) allowed them to determine the continuation of the music stimulation via simple microswitch responses and (b) reminded them about (reoriented them on) the responses and music in case of response failures (i.e., attention/memory blips that can occur in their condition) (Lancioni et al., *in press*). An active (self-regulated) stimulation approach was deemed useful for (a) allowing the patients to exercise a form of adaptive (reality-oriented) behavior considered relevant to counter their gradual detachment from the immediate reality/context and (b) providing them a more positive and socially acceptable image (Giordano et al., 2010; Raggi et al., 2007; Smith-Marchese, 1994; Wollen, 2010). The results for the 10 patients involved in the study indicated that the impact of the active music condition on the patients' positive participation (e.g., music-related movements, positive verbal comments, and smiles) was largely comparable with the impact of a passive (environmentally arranged) music condition. The social ratings of 140 university psychology students significantly favored the active music condition on a six-item questionnaire dealing with, among others, conditions' suitability, respect of patients' dignity and independence, and practicality.

In light of these preliminary research results, one could argue that an active music stimulation condition supported by adequate technology can be viable, effective, and socially preferable. The present study was aimed at extending such research by (a) comparing the impact of an active, technology-supported music condition with the impact of a passive music condition with six new patients and (b) conducting a social validation assessment of the two conditions with raters who had practical experience in the care and rehabilitation of patients with multiple disabilities (i.e., with patients presenting a range of problems similar to those occurring in the severe and low moderate stages of the Alzheimer's disease) (Callahan, Henson, & Cowan, 2008; Kennedy, 2005).

2. Method

2.1. Participants

The six patients involved in this study (Giselle, Esther, Carole, Celine, Neil, and Nancy) were between 76 and 89 ($M = 81$) years old. All of them were diagnosed as being in the severe stage of Alzheimer's disease, based on their scores on the Mini Mental State Examination (Folstein, Folstein, & McHugh, 1975) and daily observations. They were reported to be usually passive (withdrawn) and were provided with various types of medication that could include antipsychotics (for Celine and Nancy), antipsychotics and antidepressants (for Giselle, Carole, and Neil), or antipsychotics, antidepressants, and antiepileptics (for Esther). They lived in residential social-medical centers, in which interventions were largely focused on their personal care and basic forms of communication and engagement (e.g., television and prayers). They all had regular visits from their family members. These members had signed a formal consent authorizing their involvement in this study, which had been approved by a Scientific and Ethics Committee.

2.2. Setting, sessions, microswitch responses, and data collection

The setting for the study was a room of the residential center that the patient attended. Sessions lasted 5 min for Giselle and Esther, and 10 min for Carole, Celine, Neil, and Nancy. The length differences were based on staff suggestions and on practical environmental considerations. Sessions involved music stimulation (i.e., intervention sessions of the active and passive conditions) or no music stimulation (i.e., baseline sessions and pre- and post-intervention control sessions; see below).

Data collection concerned (a) indices of positive participation (i.e., during all sessions), (b) microswitch responses/activations (i.e., during the baseline sessions and the intervention sessions of the active condition), and (c) computer verbal reminders (i.e., during the intervention sessions of the active condition). Indices of positive participation included singing or music-related (rhythmic) movements of hands, feet, or body, positive verbal comments, and smiles. Microswitch responses/activations consisted of the patient (a) applying pressure on a box-like microswitch sensor fixed into the palm of the right hand (Giselle) or on a circular microswitch sensor placed on the table in front (Esther, Neil, and Celine) and (b) clapping hands to activate a mini shock-absorber kept on the back of the left hand with an elastic band or medical tape (Carole and Nancy) (Lancioni, Singh, O'Reilly, & Sigafos, 2011). The response selected was the one considered more suitable for the

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