Tuning in to the Individual: Customizing Individualized Music Listening for Diverse Needs in People with Dementia

Lisa Schön,[1] Lisette Weise,[2] and Gabriele Wilz[3]

[1,2,3] *Department of Counseling and Clinical Intervention, Institute of Psychology, Friedrich-Schiller-University Jena, Germany*

[1]lisa.schoen@uni-jena.de, [2]lisette.weise@ uni-jena.de, [3]gabriele.wilz@ uni-jena.de

Abstract

Individualized Music Listening (IML) is a promising non-pharmacological intervention that uses personally meaningful music to improve the emotional well-being of Persons with Dementia (PwD). Given the complexity of behavioural and psychological symptoms of dementia (BPSD), such as agitation, depression, and apathy, tailored interventions are essential to improve health outcomes and reduce caregiver burden. This paper presents three behavioural sequence examples illustrating different responses to IML, each categorized into one of ten behavioural types based on a typology of reactions of PwD to IML. Each example highlights the importance of adapting the music listening experience to the individual's spatial and social environment, as well as their unique musical preferences. Data were collected from a research project conducted in five nursing homes in Thuringia, Germany, to assess the impact of IML on the quality of life and social participation of PwD. Our findings indicate that the interplay between environmental factors and music selection is crucial for optimizing IML outcomes. We also provide recommendations for caregivers to improve the effectiveness of IML interventions and to demonstrate how our research observations can be translated from theory to practice.

Keywords: cognitive impairment, non-pharmacological intervention, behavioral analysis

Introduction

Dementia affects more than 55 million people worldwide, with nearly 10 million new cases reported each year (World Health Organization, 2021). While cognitive decline is a characteristic feature of dementia, the way it manifests and progresses is significantly influenced by behavioural and psychological symptoms of dementia (BPSD), such as agitation, depression, and apathy (Kales et al., 2015). These symptoms are associated with worse health outcomes for Persons with Dementia (PwD), increased caregiver stress, and higher care costs. As "one size fits all" solutions are not appropriate due to the unique nature and complexity of BPSD, non-pharmacological interventions tailored to the individual with dementia are recommended as a first-line strategy (Kales et al., 2015), with music interventions being one of the most promising approaches. While the influence of music on emotions and well-being is already significant in non-pathological ageing (Laukka, 2007), it becomes crucial in pathological ageing. Anxiety, depression, and agitation often become major challenges for PwD (Ferreri et al., 2019) and music is increasingly being used to enhance their well-being. One particularly effective intervention is individualized music listening (IML), which refers to personally meaningful pieces of music that were an important part of the person's life before the illness, and are associated with positive experiences and feelings (Jakob et al., 2021).

Recognizing familiar music is considered emotionally significant for PwD, even in the later stages of the disease. Their musical identity is influenced by psychosocial factors such as life events and personality traits, but also by the severity of the dementia (McDermott et al., 2014). It has been shown that IML has a positive impact on anxiety, agitation and depression and promotes relaxation (Särkämö et al., 2012; Sittler et al., 2021; Sung & Chang, 2005). Despite studies highlighting benefits and other positive changes of IML (Hillebrand et al., 2024; Weise et al., 2020), it is often neglected how people with different psychological symptoms of dementia respond to music differently. For example, PwD with increased depressive symptoms or a history of depression are more likely to recall negative memories, which can also be triggered by listening to music. IML should therefore be based not only on favourite or personally meaningful music, but also on the specific symptoms of a PwD and their psychiatric history (Garrido et al., 2018).

Furthermore, participants' responses to IML can be marginal and vary widely, yet most PwD derive pleasure from listening to music (Ragneskog et al., 2001). This leads to the question of how to meet the individual needs of PwD and how to tailor IML to their needs in terms of both the music listening situation and the music selection itself.

Research objective

In this article, we present three examples of behaviours that show different responses of PwD to IML. We assign each example to one of ten behavioural types we defined in a typology of reactions of PwD to IML (Töpfer et al., 2024), explain what characterizes the respective type, and provide recommendations on how the individualized music listening situation can be best adapted to the needs of this type in this particular situation. We consider both the spatial and social environment as well as the individualized music selection. Using these examples, we demonstrate how our research observations and analyses can be translated from theory to practice.

Method

The data for the present investigation were collected as part of the research project *Individualized Music for People with Dementia - Improving Quality of Life and Social Participation for People with Dementia in Institutional Care*. The project was conducted from January 2018 to April 2021. Its objective was to investigate the impact of an IML intervention on the quality of life, problem behaviour, and social participation of PwD recruited from five nursing homes in Thuringia, Germany (Weise et al., 2018).

Study design

The study followed a pre-post design, with all participants being randomly assigned to either the intervention (IG) or control group (CG). IG participants listened to individualized music, while CG participants received standard care. We recruited 130 nursing home residents in Thuringia, Germany. Twelve individuals were excluded prior to randomization due to death, ineligibility, or withdrawal, leaving 118 PwD who were randomized to the IG (n = 61) or the CG (n = 57). The present study focuses solely on IG participants.

Based on Gerdner (2021), a questionnaire was used to assess the music preferences of PwD and to create the individualized playlists. The questionnaire was completed by caregivers or family members. Where possible, PwD were asked about their music preferences. Three playlists, each lasting 20 minutes, were created for each person in the IG. The IG participants listened to their music via headphones and MP3 players for 20 minutes every other day for six weeks. The music interventions were carried out by the project team, employees of the nursing home, volunteers and relatives.

For both study groups, 60-minute behavioural observations were conducted at three points in time during the intervention period. For the IG, these included listening to the individualized music, so that 20 minutes before, 20 minutes during and 20 minutes after the music intervention were observed. Behavioural observations were conducted using the Dementia Coding System (DeCS), an observation scale developed by the project team to systematically assess the effects of nonpharmacological interventions, such as IML, in PwD. The DeCS was designed following a systematic time-sampling approach, i.e. observing PwD in prescribed time intervals. Over a 60-minute period, the behaviour of PwD is assessed at four-minute intervals in three categories: positive, challenging, and music-related behaviours of PwD (Hillebrand et al., 2022). Where consent was given, behavioural observations were filmed by the project team.

Individual needs of people with dementia

Based on the collected data we conducted two extensive studies examining aspects of individualization in relation to the spatial and social setting of music listening (Töpfer et al., 2024) and the individually chosen music (Schön, 2025). Both studies were based on analyses of 108 video recordings of 60-min behavioural observations of 45 PwD in the IG.

Focusing on the spatial and social setting of the music listening situation, we have conducted an ideal-type analysis (Stapley et al., 2022) which yielded 10 types of reactions ("expressing and sharing joy," "self-disclosure stimulated by music," "concentrated, absorbed listening," "blissful enjoyment," "experiencing the music as bittersweet," "sharing memories," "releasing tension," "tensing up and rejecting," "predominant search for social exchange," "no interpretable reaction") and 3 dimensions ("valence" from negative to positive, "arousal" from calm to activated, "communicative activity" from defensive/resistant to proactive), providing a holistic representation of reaction types to IML (Töpfer et al., 2024).

Focusing on music related influencing factors on the reaction of PwD on IML, ten case studies were conducted, which showed distinctive music-related reactions during IML. Five fields of impact addressing music-related influencing factors of IML on PwD were identified ("individual adaptation of music selection and listening situation", "synchronization and orientation through rhythm", "music-related memory and nostalgia", "the influence of own music-making", "sadness and farewell"). The three behavioral sequence examples presented in this article can be found in the first, second and sixth of these ten case studies (Schön, 2025).

Results

Behavioural sequence example 1:

On the third visit, the PwD's most striking reaction is to the song *The Rain in Spain!* from the musical *My Fair Lady*. Right at the beginning of the song, the lyrics "Enough, Professor Higgins!" are sung emphatically, and the PwD joins in laughing. She seems completely consumed by her emotion and infects the project team with it. When the musical character Eliza repeats the words: "The green gets greener when Spain's blossoms bloom" after the professor, the PwD laughs and repeats: "The green gets greener" and looks at the project team, who then ask, "Do you know this song?" She replies, "Yes, yes." When the same line of lyrics is sung by the musical characters Higgins, Eliza and Pickering together, the PwD takes turns tapping out the basic beat with her hands on her lap. She laughs at the lyrics and smiles at the project team [case study 1, behavioural sequence 3].

Characterization of reactions and recommendations for tailoring the intervention: Based on our typology, the behaviour of the person with dementia can be classified along the following three dimensions:

- Valence: Positive / high (6–9)
- Arousal Activated / medium (3–6)
- Communicative activity: Proactive / medium (3–6).

According to the ranking on the dimensions and the observed behaviour in this particular example, the PwD showed the highest agreement with the "expressing and sharing joy" type, which is characterized by behaviours such as seeking and initiating contact and social interactions to express (in this case, laughing and tapping to the beat) and to share joy (seeking eye contact with the project team and initiating conversation through the lyrics of the song). The PwD was also pleased when the project staff responded to her offer of contact. At the same time, the conversational comments were solely about the music, as the music gave impulses for communication. The PwD also alternated between initiation of communication and listening to music by herself (Töpfer et al., 2024).

The following factors can be considered in relation to the spatial and social setting of the music listening situation and the individually chosen music: Instead of listening through headphones, it can be helpful to listen to the music together, e.g. through loudspeakers, to get more involved with the PwD and to be able to mirror their reactions of joy in order to make them feel comfortable. Depending on the reactions of the PwD, in this case tapping and repeating text passages of the lyrics, one should take up and show resonance to the impulses of the PwD by moving along and also referring to certain text passages (Töpfer et al., 2024). Considering the choice of music, it is of striking importance to be familiar with the music the person is currently listening to be able to join into the lyrics and for example sing along together. In this case, it may be helpful for the caregiver to bring the lyrics with them for reference. Titles that elicit such a clear positive reaction can be used to guide the selection of alternative titles. In this case, these would be songs from musicals during the PwD's youth, with descriptive, uplifting lyrical content that they can relate to (Schön, 2025).

Behavioural sequence example 2:

During the first part of the song *I Love Life* (*'Ich liebe das Leben'*) by Vicky Leandros, the PwD sits quietly; when the banjo and rhythm section join in, she moves her legs and head rhythmically. During the quieter interludes, she also becomes calmer outwardly, and when the music gets livelier, she moves her legs right along with it. The swaying of her legs is transferred to her upper body. As she moves, she keeps to herself and makes no contact with the project team. To the following song, *Two Guitars by the Sea* (*'Zwei Gitarren am Meer'*) by Fred Bertelmann, she slowly rocks her upper body back and forth, then moves her legs to the beat throughout the song, as if she were dancing while sitting. After the music, she turns to the project team and thanks them for the music, in contrast to the music listening period when she was socially withdrawn [case study 2, behavioural sequence 24].

Characterization of reactions and recommendations for tailoring the intervention: Based on our typology, the behaviour of the PwD can be classified along the following three dimensions:

- Valence: Positive / high (6–9)
- Arousal Activated / high (6–9)
- Communicative activity: Proactive / low (0–3).

According to the ranking on the dimensions and the observed behaviour in this example, the PwD showed the highest agreement with the blissful enjoyment type, which is characterized by behaviours such as being excited and enthusiastic, shown by physical reactions (in this case, dancing while sitting, rocking her upper body back and forth) that are not directed at another person. The PwD was also focused on and absorbed by the music and did not interact with the project team while listening (Töpfer et al., 2024).

The following factors can be considered in relation to the spatial and social setting of the music listening situation and the individually chosen music: If possible, the PwD should be able to listen to their music by themselves through headphones in an undisturbed environment. If they cannot be in a room without another person present, the caregiver should get out of sight and engage in other activities. For some PwD, it may be helpful to look into the distance, for example by sitting outside or by a window overlooking a garden (Töpfer et al., 2024).

As for the choice of music, this example shows a specific, rhythmic response, as the PwD responded to the music exclusively motorically. Synchronization to music becomes easier the more clearly the pulse structure can be perceived. PwD, who often have difficulty orienting themselves in time and space, can be helped to synchronize to music by a clear pulse structure. The sense of orientation provided by rhythm provides a contrast to the everyday life of many PwD and can lead to a sense of security and well-being. It is advisable to choose songs that have a clear rhythmic pulse structure and a tempo that is appropriate for the person, so that they can synchronize their movements with the music (Schön, 2025).

Behavioural sequence example 3:

As she listens to the quiet opening section of *I've never been to New York* (*'Ich war noch niemals in New York'*) by Udo Jürgens, the PwD looks around in her room, listens attentively and does not comment or sing, but whispers parts of the lyrics. Sadness is now clearly visible in her expression; her head and eyes are lowered. At a point in the lyrics where it says, "To be full of dreams once more", she nods and tells the story of a friend who had invited her to her house but who died the next day. She comments: "A beautiful death. That's what I always want. To go to sleep and not wake up". She rests her head in her hands. The project team listens attentively. The following song is the love song *Plaisir d'amour* by Peter Alexander. At the part of the lyrics "Come to me, love is here for you too", she says: "Yes, love, that was beautiful. My husband died a long time ago." She tells the story of the day he died. Then she nods, turns to the project team and looks at them for a long time. Soon after, the music changes to the next song, and as she hears the new melody, she starts to sing along [case study 6, behavioural sequence 41].

Characterization of reactions and recommendations for tailoring the intervention: Based on our typology, the behaviour of this PwD can be classified along the following three dimensions:

- Valence: Negative / low (-3 to 0)
- Arousal: Activated / medium (3–6)
- Communicative activity: Proactive / medium (3–6).

According to the ranking on the dimensions and the observed behaviour in this example, the PwD showed the highest agreement with the type called self-disclosure stimulated by music, which is characterized by a music-stimulated self-disclosure about painful issues (in this case, the death of a beloved one). The music helped to contain the accompanying feelings and provided a time frame within which to act. In comparison to the joy expressing and sharing type, biographical accounts are based on themes from the lyrics of the song. In this example, the love song brought back memories of the beloved husband (Töpfer et al., 2024).

In this situation, the following factors can be considered in relation to the spatial and social setting of the music listening situation and the individually chosen music: The emotional experiences that are shared are of existential value to the PwD. Sharing these emotions can help them to cope with the upcoming feelings, so it is important for the caregiver to normalize and validate the emotional experiences. Since the music itself is leading the person to open up about a personal experience, the caregiver does not necessarily have to participate in the conversation, but should actively listen to make the PwD feel heard (Töpfer et al., 2024).

Music can be a distraction when PwD are in a sad mood. At the same time, it can intensify sadness if elements of the music reiterate sadness, for example if lyrics echo the mood of PwD through words such as "alone" or "sad". These songs should be chosen with caution. When mixed emotions occur, as in this case, music can help by providing a framework for expressing sadness. In a playlist that uses different types of music to evoke different emotions, a song can be used to evoke a more challenging emotion such as worry or grief. If this is followed by an uplifting, activating song, this may help the PwD to get into a different mood to prevent the sadness from becoming overwhelming. When creating the playlist, songs that PwD react to with sadness do not have to be omitted completely, but can be placed between relaxing, distracting or generally positive songs (Schön, 2025).

Discussion

The aim of this investigation was to demonstrate how our research observations and analyses can be translated from theory to practice using three examples from our study project. The three examples were chosen to show the complex nature of individual responses to IML. They stress the importance of addressing the PwD's needs based on their current condition. The examples also illustrate the diverse nature of the positive effects that IML can have on PwD. The different, enriching experiences that PwD have when listening to their favourite music clearly show the benefits of this personalized intervention that can respond to individual needs.

While the first step in IML is the appropriate selection of individually meaningful music, the environment and social support systems are equally important for the outcomes of such interventions (Garrido et al., 2018). The benefits of the intervention can be enhanced by having another person present who engages with the PwD through singing, clapping, or dancing, thereby expressing and sharing joy, as shown in the first example. This person also normalizes and validates emotional experiences, shows interest in the individual's memories, and initiates conversations for social exchange. However, there are cases, where listening to music by oneself is key to improving the wellbeing of PwD through IML, as shown in the second example, and flexibility in the music listening situation is one of the most important skills that caregivers should develop.

The combination of spatial, social, and music-related factors in the application of IML in this paper also shows that the spatial and social environment of the PwD as well as the choice of music are closely linked and cannot be considered separately. The lyrics of certain songs in particular can trigger activating, joyful reactions in PwD (example 1), as well as feelings of sadness or grief (example 3). This can then be responded to by either selecting more songs that have similar characteristics to the song that caused the positive reaction. Similarly, songs that evoke mixed feelings or sadness can be embedded in a context of stimulating and relaxing songs. If, in the context of listening to music, it becomes clear that feelings of sadness, grief or worry are overwhelming for the PwD, the respective songs can be removed from the playlist. However, it is important to note that the expression of sadness in PwD, which may appear burdensome from the outside, can be a valuable experience. There are often few opportunities in everyday care, especially for PwD in care homes, to deal emotionally with issues that trigger sadness. Music that provides access to emotions such as grief can be helpful for PwD, and listening to music can provide a safe environment for these emotions. Feelings of sadness are just as relevant to the individual and their well-being as feelings of activation or joy, as they are part of their own life experience and therefore inextricably linked to their own identity. Particularly in later life and in the context of a care home, issues such as saying goodbye to one's own home and coping with death are important and should be given space (Schön, 2025). This space can be created through music, which again underlines the relevance of this form of intervention.

The excerpts presented here provide only a brief insight into the numerous visits and music listening sessions that were conducted with PwD in the IG as part of the study project. The selection of these three short excerpts as examples is intended to provide practical insight into the behaviour of PwD. These observations should not be taken as generalizations, but they illustrate the great potential of IML for PwD, who can experience joy, be physically activated, or access burdensome memories through listening to music. It can be seen from the examples that their mood can change abruptly when they listen to music. On the one hand, this may be due to their condition, for example, if a PwD has been generally exhausted that day. However, as shown in example 3, mood can also change significantly based on individual pieces of music. The types of music

presented and the associated recommendations for tailoring the intervention are intended to raise general awareness of the situation of listening to music. In all cases, it is clear that PwD require increased attention during IML.

Our study shows positive immediate effects of using IML with PwD (Hillebrand et al., 2023), as illustrated by the behavioural sequences. For this reason, we recommend incorporating IML into the everyday care setting to ensure the continued benefits of its positive effects. The success of IML can be further enhanced by taking into account the recommendations we give regarding the listening environment, the social situation and the musical factors. From our experience, we see that considering the individual needs of PwD contributes to their well-being and that caregivers can be sensitized to the needs of PwD in order to provide a valuable experience through music listening, not only for PwD, but also for themselves.

Conclusions

This investigation highlights the importance of IML as an effective non-pharmacological intervention for PwD. By recognizing the diverse behavioural responses to IML and tailoring the listening experience to each individual's needs, taking into account both their personal history with music and their current emotional state, caregivers can significantly improve the quality of life for PwD. The integration of spatial and social factors in addition to personalized music selection is essential to maximize the benefits of IML. Our findings support a flexible approach to implementing IML that prioritizes individual differences, ultimately fostering a more supportive environment for PwD.

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