Investigating how memorable songs can support people living with dementia
Introduction

Memory Tracks began from research undertaken by musician and composer Fabia Anderson. In her final year dissertation for her Music degree, Fabia considered how memorable, or reminiscence music from early years can be used to support people living with dementia. This led to the idea of Song-Task Association. A significant challenge of dementia is confusion that results from memory loss, which can often lead to agitation and distress during the provision of personal care. It is now accepted that the earliest memories are the most resistant to the damage by dementia and are retained by people living with dementia for longer. Music is particularly memorable, has a unique access to our brains, and is able to connect to five areas; hearing, words and language, movement, vision and emotion. This raised the question of whether it could be used to support dementia by taking reminiscence music pertinent to each individual and connecting them to daily tasks. Taking this idea, Gordon Anderson believed that effective use of technology could become a platform to deliver the premise of associating songs to tasks. With experience in taking digital products to market, Gordon founded Memory Tracks as a social enterprise in 2017. In the latter part of that year an Android app was developed through which reminiscence songs can be assigned to daily tasks.
The Memory Tracks App

Memory Tracks is an app that connects specific daily tasks to selected memorable songs. Users can trigger the music by tapping on the relevant task or automatically by scheduling a time of day. The choice of device used in the pilot test was made by considering ease of use, practicality and cost. The team selected an Android tablet that had a loud, forward-facing speaker and an effective protective case to ensure ease-of-use, and user safety. The devices used were Lenovo Tab 3 730F & Lenovo Tab 7304F fitted with a BobjGear Rugged Tablet Cases and tempered glass protective screens. The tablet and app combination were also designed to be used offline, without an Internet connection, which is not always available nor desirable in the context of a care home.

To access the relevant music libraries, Memory Tracks partnered with Startle Inc.; a company that manages the BBC Archives Digital Juke Box. This enabled access to one of the largest digital song libraries in the world. The most memorable music for those living with dementia are songs remembered in their earliest years. Most of the residents were 80 years or older, and this necessitated songs primarily from the 1930s and 40s with additional songs from the 1920s and 50s.

Using an online database, MusicVF.com, that lists the most popular 100 songs annually from 1900 to 2018, the team selected the top 10-20 songs from the relevant early years. These songs were then played to groups within the study age range and their level of recall noted. Through this process we selected a list of the 100 most recognised songs spread between 1928 and 1962. In the second phase of the Memory Tracks research in Caernarfon we identified that many of the residents spoke Welsh as their first language and so added a further 10 songs to the database; six well-known traditional Welsh language songs and four folk songs.

“As soon as the tablet [Memory Tracks] was there she was calm throughout the whole day”
Research Background

A key challenge for the progress of Memory Tracks was that the app, and Song-Task Association in particular had not been trialled with people living with dementia. Mark Brill (Senior Lecturer at University for the Creative Arts) had been working with Memory Tracks on the technology strategy and app development. Whilst at a CREST event he proposed research that would consider the on-boarding process for the music tracks, the effectiveness of the app user experience and whether it was possible to identify the association between songs and tasks. Along with Mark, Dr Stuart Cunningham (Senior Lecturer at Manchester Metropolitan University and Visiting Professor at Wrexham Glyndŵr University), Dr Harry Whalley (Senior Lecturer at University for The Creative Arts) and Rebecca Read (Postgraduate Researcher at Wrexham Glyndŵr University) formed a team that received a seed-funding grant from CREST to research these areas. Through a previous association, Stuart connected the team to the Pendine Park Care Organisation based in north Wales. Sarah Edwards, Artist in Residence at Pendine, joined the research team and subsequently identified residents for the study.

“She’s calmer, completely calmer with eating, getting dressed, from somebody who wasn’t very calm. There is a difference in her character, personality, she eats better.”
Research Findings

The results of the initial study were encouraging and demonstrated a strong potential for Memory Tracks to support those living with dementia. An unexpected, but very positive response came from the carers themselves. They felt that it made their care role much easier - the use of music through Song-Task association led to calmer and happier residents.

Quantitative Data

As an initial study to test the on-boarding1, staff training and survey process, a small group of residents were selected.

- 14 residents took part across two care homes in Wrexham and Caernarfon from May to September 2018
- Care work staff at Pendine Park took part in training sessions to understand how to use the observation tools
- Five specific daily tasks were identified for each resident and a relevant song based on date of birth and location of their earliest years was allocated to each of these tasks
- Following a training session with the Memory Tracks team, the care work staff at Pendine Park used a daily observation sheet that considered six measures including memory, physical health and happiness
- An initial baseline was established for each resident by taking daily observations for 2-3 weeks without the use of Memory Tracks
- Observations were taken for 4 weeks for each resident with use of Memory Tracks

Using the six measurements, there was a significant difference noted in overall average happiness of the residents studied whilst using Memory Tracks. There were improvements across the other five measures, however they were not statistically significant. We recognise the limitations of this research, but with no negative impact observed, it points to the potential for a larger study over a longer period to fully determine the efficacy of Memory Tracks.

“[The resident] recognised every song... with [the resident] it made my job easier and happier, you know, because you'd be smiling and laughing”

“[The resident] recognised every song... with [the resident] it made my job easier and happier, you know, because you'd be smiling and laughing”

“[The resident] recognised every song... with [the resident] it made my job easier and happier, you know, because you'd be smiling and laughing”

“[The resident] recognised every song... with [the resident] it made my job easier and happier, you know, because you'd be smiling and laughing”

“[The resident] recognised every song... with [the resident] it made my job easier and happier, you know, because you'd be smiling and laughing”

“[The resident] recognised every song... with [the resident] it made my job easier and happier, you know, because you'd be smiling and laughing”

“When she needs the toilet, she grabs the tablet [Memory Tracks] as if to tell me lets go”
Qualitative

In addition to the observation data a series of interviews were undertaken with care staff at the end of the Memory Tracks trial. Quotes from these interviews have been included throughout this report. When these interviews are considered in conjunction with the quantitative data they form a holistic view of the positive impact that Memory Tracks had on the residents at Pendine Park.

- Interviews were conducted with 33 care home staff.
- The majority of staff responses were positive, with just a few suggesting there was no particular impact on the residents they were caring for.
- In addition to the impact on residents, staff were also asked to comment on the user experience of the app. Feedback was positive, and no staff reported any challenges with the functionality. The positive response to the app and user interface is an encouraging outcome for Memory Tracks.

The response from care staff was more positive than anticipated. During the training sessions, some of the care team had not used technology in conjunction with their work, but they quickly took to using it in practice. In some encouraging feedback, interviewees found that key tasks, such as personal care of residents, was easier to manage. As a result it allowed more time to offer higher quality care to residents. There was also broad affirmation of the quantitative findings on general improvements in happiness. Some staff, and the care home management, suggested that longer-term use of Memory Tracks could lead to health improvements and a reduction in the need for external professional care, such as GP or nurse visits.

As a testament to the benefits, care staff asked to continue using Memory Tracks after the initial study. As one carer said:

“Basically, if I was going to come into a care home then that’s [Memory Tracks] what I would want to actually help me.”
Limitations and Challenges

A limitation of the quantitative data was that a viable sample from only ten residents was obtained. The individual nature of each participant, their background and demographic may impact their amenability to using reminiscence music for task association. These limitations may include the location of their earliest years, or complex cognitive issues in addition to dementia. Scaling the study would help understand these limitations further. The research team were pleased with the positive response from carers to the app functionality and impact upon their ability to work with the residents. The key challenges in respect to the technology were quite simple; ensuring that the tablets remained charged. This was addressed by allocating a specific member of the care team to take responsibility for charging.

1Note: The observations were taken by the care staff at Pendine Park Care Organisation. Six measures were taken daily. Three of these were from the Self-Assessment Manikin (SAM) scale, using numeric intervals from 1 and 9, to capture each resident’s emotion on the dimensions of: valence (happy to sad); arousal (excited to calm); and dominance (dependent to independent). The second three measures were questions taken from the Quality of Life in Alzheimer’s Disease (QOL-AD) questionnaire, measured using ordinal ratings of “poor”, “fair”, good” and “excellent”, to assess each resident’s: physical health; memory; and life as a whole.

Performing a statistical test on the average scores of the participants before and during the use of the Memory Tracks software, we found a significant different in the SAM dimension of valence – participants overall showed moved further towards the ‘happy’ end of the scale and away from the ‘sad’ end. No significant differences were found in the other five measures. However, due to the sample size there is a very limited sensitivity to detect the effects of Memory Tracks.

“[The resident] does tend to shout out, but he wouldn’t do with the music, he would listen to the music and be calm.”
Next Steps

We aim to continue our research into Song-Task Association with a much larger sample size and increased length of each observation. Future test groups will include those in domestic care as well as care home residents. As part of this research we are interested in developing the song selection process with the addition of a music recommendation algorithm. To support the observation monitoring, a form will be added to the app to allow real-time data submission. Additional baseline and control measures will also be introduced.

The project aims to develop the Memory Tracks technology to utilise behavioural and physical triggers through sensors. That will bring more context and predictive functions to the Song-Task Association. The development of the app, sensors and platform will progress in parallel, enabling Memory Tracks to deliver the service to care homes and home carers in 2019. We hope Memory Tracks can be utilised across many areas of health and wellbeing and would welcome any discussions around research and trials to consider on other health challenges.

This study was funded by CREST and carried out by academics at The University for The Creative Arts, Wrexham Glyndŵr University and Manchester Metropolitan University in collaboration with Memory Tracks. We are especially grateful to the amazing staff and residents at the Pendine Park Care Organisation for their help and support. Memory Tracks® also received support in 2018 from UnLtd.