

Liquid Vibrations: Project Report
Including Redway Special School

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Introduction

Liquid Vibrations

Liquid Vibrations is an organization that provides underwater listening combined with aquatic body therapy and Watsu for children and adults with special needs at varying levels of ability. Sessions are run in which music is played through speakers located in a hydrotherapy pool, where music and sound can be heard underwater. The sound can be fully heard when a child's ears are immersed in the water and the vibrations of the sound can be felt in the body if the child is sufficiently near to the speakers. The concept is that vibration of sound in water can potentially facilitate individuals' awareness of the world around them. Liquid Vibrations also perceive the following areas to be possible outcomes and benefits for disabled children and adults:

- i.) Educational – the listening sessions create interactive listening environments, which provide a basis for understanding of the environment such as places, people and events.
- ii.) Physical – The sessions combine listening with movement guidance in the Watsu hydrotherapy technique which helps decrease muscle tension and increase the range of motion.
- iii.) Emotional – The rewarding and reinforcing aspects of listening to music contribute to the regulating of emotion.

Music

The music that is used within the hydrotherapy sessions is based on three concepts:

TONAL/FAMILIAR – Music with harmonious tonal progressions and steady rhythms, which serves as a relaxation and increase in opportunity of interaction, as well as for individual pleasure.

ABSTRACT MUSIC – Music is characterized by its used of unconventional sounds, flexible structure and its focus on sonic texture. It serves as a purpose to evoke imagination and support the individual into a mediated state.

NARRATIVE SOUNDS – Use of animals, environments, field recordings, sound effects are a reproduction of the original which serves as a recognition of environment and heighten awareness.

Watsu

Watsu is an aquatic therapy technique which is used in various health settings and populations such as to increase range of motion, muscle relaxation, muscle spasm, decrease spasticity and decrease pain (Leite et al., 2013; Chon et al. 2009, Watsu around the world, n.d). The therapeutic technique that is carried out within the sessions by the Watsu specialist, Stephanie Dutton uses a combination of three disciplines : ASA, Shaw Method and The Alexander Technique into a unique teaching protocol known as The Mind/Body Awareness Programme.

Previous Liquid Vibrations Projects

Liquid Vibrations has carried out several projects in special needs school promoting the benefits of listening underwater to children with special needs at varying levels. The reports from the previous research can be downloaded via their website: www.liquidvibrations.org.uk. The most recent project which was conducted in a special needs school in North London for seven sessions over seven weeks in 2014 found positive impacts on the children and suggested that further research should be developed to separate the various elements in the sessions such as the incorporation of silence in the music which has been added for this phase of research (Vogiatzoglou, 2014).

Current Project

Participants

The participating school, Redway School, in Milton Keynes is a mixed, day special school for children with autism and/or severe learning difficulties or profound and multiple learning difficulties. The school caters for children between the ages of two and nineteen. There were a combination of individual and group sessions. For the purpose of this research only the individual sessions were closely analysed. In total, six children attended those sessions, although numbers varied due to absence on particular dates. The participants involved were chosen by Senior Management at Redway School. The Management Team selected students who would enjoy being in the water and who they believed would get the most out of the sessions as a whole. The children exhibited a range of medical conditions, including epilepsy, visual impairment, degenerative disorders and were all wheelchair bound. These children ranged in age from four to fourteen. Names have been changed in the present report to maintain confidentiality.

Method

The research was conducted over eight weeks, with a break for half term and a cancellation due to timetable clashes. It took place in the school pool on Monday afternoons. All sessions included work with a Watsu specialist. This project consisted of both 'wet' and 'dry' sessions whereby children were exposed to the sounds within both the classroom and hydrotherapy pool. Children were accompanied by their carers into the pool. Each session ran for approximately 10 minutes for each child. Music was played through speakers placed within the pool which began with 2 minute silence and proceeded with intermittent sections of sound and silence, around 15 seconds each; the sound sections became longer as the sessions progressed. A Watsu specialist was present to work with the children individually.

Observations were made during sessions and through the use of video recordings, which were then reviewed to note any responses of the children. The carers were asked about the children's responses and interviews were taken to acquire feedback. The *Sounds of Intent* framework of musical development was used to inform observations and review or analyse video.

In addition to the pool sessions, two dry sessions were carried out (one within the first couple of weeks and one after the last session) in which the participants (accompanied by their carers) sat in a quiet room whilst the music was played. These sessions were also filmed and analysed.

Unfortunately there were difficulties in attendance with the participants, as due to the complex nature of the conditions of each participant, medical issues often meant that they were unable to go into the pool or were not in school.

The Sounds of Intent framework was developed to investigate and promote the music development of children and young people that covers the whole range of ability from profound and multiple learning difficulties (PMLD) to those with autism, with or without exceptional musical abilities. It is a culmination of over ten years of research, which is based on three main elements: observational data of children with learning difficulties and/or autism experiencing or engaging with music over hundreds of observations; analyses that are informed by psychological research pertaining to 'typical' early musical development; the model is underpinned by *zygonic* theory which seeks to explain how music makes sense to us all. The framework covers six levels of musical development with three domains, 'reactive' (listening and responding to sounds), 'proactive' (causing, creating and controlling sounds) and 'interactive' (participation in the context of others). The framework is embedded in a website (www.soundsofintent.org) and is used by practitioners throughout the UK to assess their children musically (Ockelford, 2009; Vogiatzoglou et al., 2011; Welch et al., 2010). See Figure 1

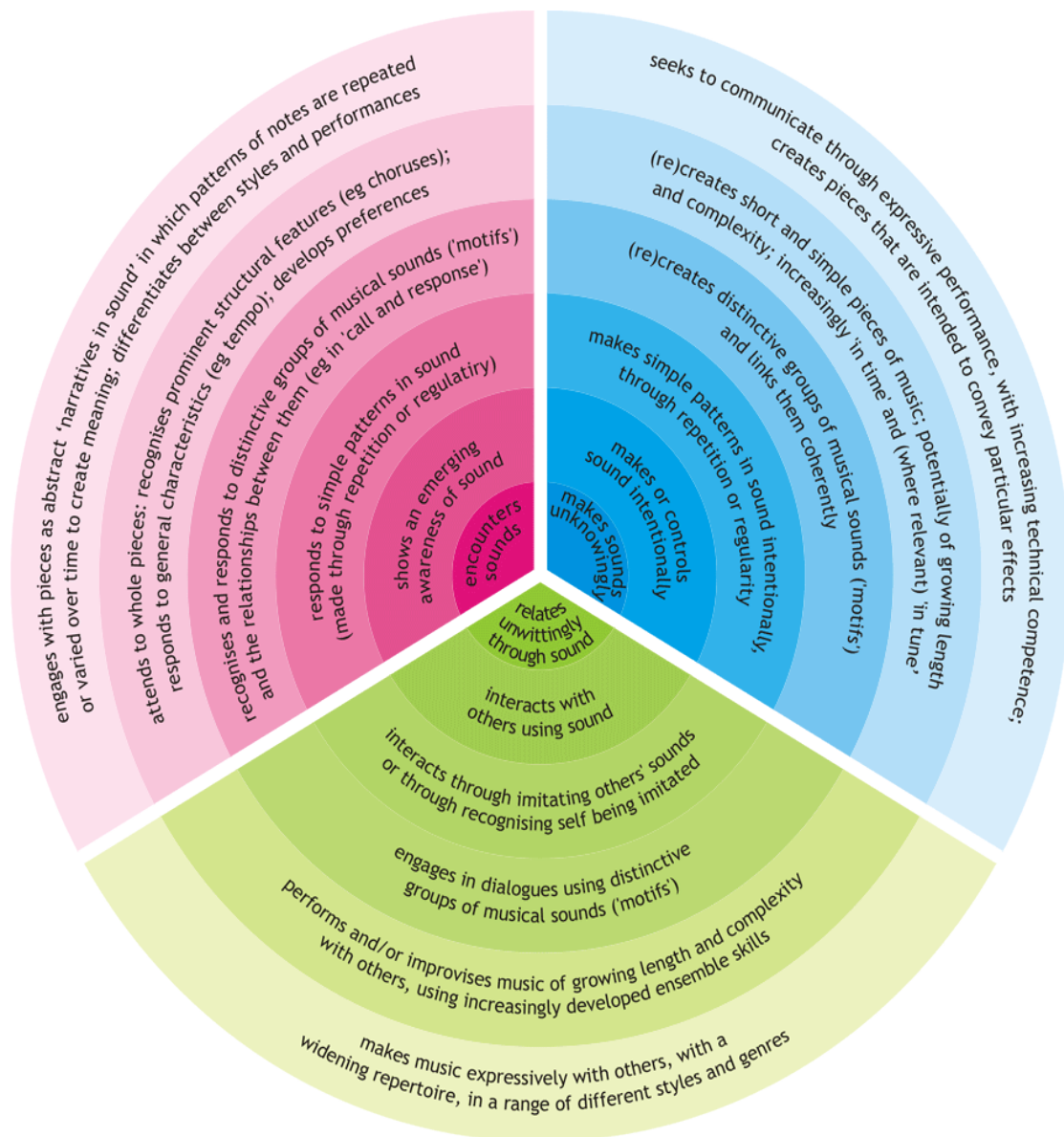


Figure 1: The Sounds of Intent Framework of Musical Development

The Liquid Vibrations sessions are multisensory in nature. They include listening to sound and music, the feeling of the water, the tactile quality of the other's touch during the practice of Watsu and movement. Therefore, observations were made with reference to the framework in terms of music and sound but also in terms of other sensory experiences during the session, particularly movement in this case due to it being a primary element observed during each session.

Summary of Observations

All the children attending the sessions were said to enjoy being in the water. As stated previously, all of the children attending were wheelchair users therefore they were held by the carers/Watsu specialist throughout. It was noted by teachers that the children do not have music lessons. Further information will be discussed in terms of the six children observed individually.

Child 1

Child M attended seven Liquid Vibrations sessions out of eight. She has severe cortical visual impairment and has significant seizures and needs to be supervised at all times. She communicates through a wide range of vocalisations, dependent on how she feels. She will cry when distressed and laugh and smile when happy. She is said to like exploring noisy toys by grasping and shaking them, especially shakers and bells.

In the first session, Child M was uncomfortable in water, even though she was held by Stephanie (Watsu specialist) and her carer, she was constantly moving and vocalizing. It was difficult to settle her. However, when music came through the speakers, she started to feel calm and relaxed. Observations made were such as from the following sessions:

‘Child M had occasional seizures before the sessions and sometimes felt sleepy when she was in the water. The videos have captured Morayo maintaining floating on her back throughout all the sessions with little or no movements at all. Her time in water gave her the opportunity to find stillness in her chaotic involuntary movement.’

Child M adapted to the hydrotherapy sessions. During these interactions, she appeared calm and allowed Stephanie to undertake movements within the water. Child M’s carer suggested it was a positive experience for her saying that:

‘Before Child M started taking these sessions, there were a lot of body movements, arm movements and kicking. She will often stretch out her arms and makes a lot of involuntary movements. As soon as she gets into the water, it

slows down her movement and she seems a lot calmer and relaxed. This maintained all the way through after the sessions in the class as well.'

In terms of music, child M exhibited little awareness of music. During dry sessions, child M showed no response to the music at all. However, when the music was being played in the hydrotherapy pool, child M showed awareness of the sound through expressions and body movements, which were captured on the video and data, was recorded and analysed as follow.

Clip/File name	Time code	Child	Description/Observation	Domain	Level	Element
MVI_8427_1.MOV	00:30	Child 1	Face expression changed when heard music kicking in.	R	2	A
Maria.MOV	2:30		Involuntary movement when music kicks in	R	2	A
	4:09		Body moves when she heard the bells chime	R	2	A
MVI_901	5:05		Hands flapping and smiling on face when music was heard	R	2	A
MVI_9052	4:16		Hands flapping responding to the music	R	2	A
MVI_4552.MOV	4:24		Hands movement responding to the music	R	2	A

From the above table, different reactions and movements towards music were recorded in each session. During the first two sessions, child M showed awareness of sound and reacted to it through facial expression and body movements. For the following sessions, child M reacted to a specific sound (bell chimes) through a range of movements such as hands flapping, smiling and body movements. Overall, child M appeared to have a positive response to the hydrotherapy with the combination of music, which is an encouraging starting point for exploring how this could support and encourage her development and well-being.

Child 2

Child J attended five sessions out of eight. He has Batten Disease, which is degenerative. He is now blind. He loves social interaction with adults and other

children. He was involved in the previous Liquid Vibrations project and had positive reactions to the experience. No school record of his musical abilities and experiences was available. He loves listening to stories and will laugh with the voices of familiar people.

Throughout sessions, child J was calm and relaxed all the time being in the water. Before the sessions, the carer noted that he experienced a lot of involuntary movement. However, once he was put in the water with the Watsu specialist and the music kicked in, his body more relaxed. Unfortunately, child J was unable to attend his last session and we were not able to obtain an interview with his carer.

Child J adapted to the hydrotherapy sessions. This may be due to his previous experience. In terms of music, Jenson was not present for any dry sessions. His responses and awareness to sound in water were recorded as below:

Clip/File name	Time code	Child	Description/Observation	Domain	Level	Element
MVI_9022.MOV	2:40	Child 2	Smile and look up when music was heard	R	2	A
	2:45		Making sound to the music for about 6 seconds with body movements	R	2	A
	3:14		Smile and body movement by kicking his legs	R	2	A
	4:13		Hands and legs movement	R	2	A
GOPRO0045.MP4	3:42		Smile when music was heard	R	2	A
GOPRO 10 min Jenson.MP4	2:22		Eyes looked up and smile with some body movements	R	2	A
MVI_9166Jenson 10 min.MOV	3:49		Eyes looked up and with some body movements	R	2	A
	5:56		Move his body for about 5 seconds responding to music		2	A
	6:59		Kicking in the water	R	2	A

From the table above, Jenson was aware of the music most of the time. He connected to the vibrations of the underwater sound by keeping still and listened attentively to the sound. He reacted to the sound and music often with his facial expression including smiling and looking up. There was one session when he made sounds when he heard the music for about 6 seconds. His eyes

were often closed during the sessions but there were times he would open them when he heard the music. He had very little involuntary movement when there were sounds but would respond to the music through some movements and facial expressions.

It was noted that the sessions have a calming effect on child J and he was constantly aware of the music and sound under the water. His keenness to interact with adults might also be taken into consideration, in terms of how the movement and music might be used in an interactive as well as in a receptive context.

Child 3

Child E also attended five out of eight sessions. He has extremely severe visual difficulties and even though he appears to look at objects, it is more likely that he is turning towards sound. He is prone to various seizures or episodes throughout the day and these have an effect on how alert he is at any one time. According to his carer, child E loves being in the water and this can be observed during the sessions where child E seems calmed and relaxed while undertaking the sessions.

During the sessions, child E was very comfortable being in the pool. He was calmed and relaxed when Stephanie or his carer held him in the water. There were no record of his musical experience and abilities. The observations of his reaction to the music were recorded as follow:

Clip/File name	Time code	Child	Description/Observation	Domain	Level	Element
MVI_9048.MOV	5:51	Child 3	Turn his head into the water	R	2	A
	6:17		Smile and make vocal sound responding to the music	P	2	A
MVI_9090 10 min Edward.MOV	3:34		Makes eye contact when music kicks in	R	2	A
MVI_9163 Edward 10 min.MOV	01:52		Make vocal sound without the music until the music kicks in	P	2	A
	2:14		Stops making sound and listens attentively to the music	R	2	A
	3:17		Makes vocal sound when music is heard	R/P	2	A
	4:35		Makes vocal sound when music is heard	R/P	2	A

From the above table, it can be seen that child E was very attentive to the sounds under the water. From the first two sessions, he was very still and calm in the water and listened to the sound attentively most of the time. This can be seen through his expression such as rolling his eyes. During the third session, he became more proactive in putting his head into the water to look for the sound. He often made eye contact and smiled when sound was heard. During his last session, he started to explore sound on his own through vocalization, until the music came through the speakers, when he stopped and listened attentively. After a minute, he then started to make sounds again when the music was heard.

It is noted that child E was having positive responses. Further sessions might explore this possibility and how to support and work with Edward's musical awareness and promote his well-being.

Child 4 (medical condition)

Child JAS attended four sessions out of eight. She likes to explore sensory materials such as uncooked rice, sand and water. She may vocalize loudly when she wants something. She uses both of her hands in a swishing movement. She is described as liking to be in the water. Her musical experience and ability were not recorded. During the dry session, child JAS was asleep throughout.

During the wet sessions, it can be observed that there were a lot of arm movements from child JAS. It is uncertain that whether she likes the feel of her arms moving through the water or whether it could be a habit that she has formed. She seemed to be comfortable with the water. During the first session, no particular observation was being made. She was flapping her hands most of the time. She showed little awareness of the music. However, as the sessions developed, she tended to be calmer and there was stillness when the music was heard. The observations were made as below:

Clip/File name	Time code	Child	Description/Observation	Domain	Level	Element
MVI_9053.MOV	1:48	Jasmine	The hand movement stopped when music was heard			

There were no other observations being captured in the videos. However, it is noted that the sound or the vibration of the sound had a calming effect on

Jasmine. During her last session, she made a tremendous number of arm movements when she was with her carer. When Stephanie took over the session with her, she quickly connected to the sound and her arm movement stopped. She was quiet and calmed throughout the rest of the session.

Whether the specific combination of music and movement in the water had an impact is difficult to ascertain and would require further consistent observation. Overall, child JAS appeared to have a positive response to the hydrotherapy with the combination of music, which is an encouraging starting point for exploring how this could support and encourage her development and well-being.

Child 5

Child A attended seven sessions out of eight. Her arms are very stiffly held and she needs a lot of help to use her hands in play. She needs regular attention from an adult and is very sociable and responsive to them. Child A likes being in the water. Her musical experience and ability were not recorded.

From the first session, child A adapted well to Watsu movement within the water, working with Stephanie. She was constantly smiling and engaging with eye contact with Stephanie and her carer. During Watsu she was often calm, floating on her back although she has involuntary movement rocking her body from time to time.

During these interactions with Stephanie, she appeared calm and allowed her to undertake movements within the water. Child A's carer suggested it was a positive experience for her saying that:

'She expressed her joyfulness through movements in the water by kicking and also vocalized a lot more than she usually does. She reacts very well to the sessions by indicating it through smiling and giggling. She tends to verbalise louder in the sessions. Her mood tends to be a lot happier after the sessions when she interacts with children in the class. She is more relaxed and her hand is loosened up while in the water.'

During dry sessions, child A showed no reaction to music at all. According to her carer, her reaction to music is varied: 'She may be aware of the music sometimes

by kicking her legs.’ During the hydrotherapy sessions, she was aware of the sound. Observations were made below:

Clip/File name	Time code	Child	Description/Observation	Domain	Level	Element
Ashlyn 1.AVI	1:15	Child 5	Smile and vocalize for about 10 seconds when music was heard	R	2	A
	1:52		Smile, vocalize and kicking the water when music was heard	R	2	A
Ashlyn.MOV	3:44		Smile and engaged eye contact by looking up when music was heard	R	2	A
MVI_9019.MOV	2:37		Eyes looking up and listen attentively	R	2	A
	3:51		Vocalise responding to the music	R	2	A
	6:12		Listen attentively to the bells	R	2	B
MVI_9047.MOV	4:19		Hands flapping and kicking water	R	2	A
	6:08		Smiling, eyes looking up, hands flapping and kicking when bells were heard	R	2	B
MVI_9089 10 min Aslyn.MOV	8:59		Deliberately put her ears in the water to listen to the music	R	2	A
MVI_9165 Ashlyn 10 min.MOV	7:29		Body movements, eyes looking up with hands flapping and legs kicking when music was heard	R	2	A
MVI_9714 Ashlyn 10 min.MOV	6:00		Smiling and looking up when music was heard (bell chimes)	R/I	1	B

From the table above, different reactions and movements towards music were recorded in each sessions. She showed positive responses throughout. During the first few sessions, she showed discomfort towards the end of the sessions by making a crying sound and also facial expressions. However, child A was more comfortable within later sessions. She seemed to be calmer and relaxed for the following sessions. During her third session, she was crying and making sounds of being uncomfortable in the water. However, once the sound (bell chimes) came through, she stopped and listened to the sound attentively. It seemed that she was reacting to the specific type of sound, which was the bells. This was observed in other sessions as well where she responded to the bells through body movements, smiling and eyes engagement.

Overall, Ashlyn appeared to have a positive response to the hydrotherapy with the combination of music, which is an encouraging starting point for exploring how this could support and encourage her development and well-being.

Child 6

Child D is a child with very complex needs. He wears bi-lateral hearing aids and is visually impaired. He has very poor head control and needs a great deal of support and careful positioning. He has been diagnosed with Stridor, which presents as loud labored breathing – when this occurs he needs repositioning as per his personal risk assessment in the planning file. He likes jingly bells, noisy toys, flashing lights and space blankets. His musical ability and experience were not recorded.

Unfortunately Danny only attended the first session. He was hospitalized and therefore no observations were able to be made from Danny's session.

Discussion

Throughout the sessions, relaxation was an obvious consequence of the pool environment with the support of Watsu adapted to the sessions. There was slight change of behavior of the children after the sessions as was commented on by the individual carers throughout the sessions. Indications of this can be seen within many aspects of individual children's behavior including: smiling and laughing; stillness, reduced in involuntary movements; contented body language and facial expressions. As the weeks progressed, the participants began to relax and enjoy the sessions. This can be observed particularly from child A's case study which showed frustration and discomfort for the first three weeks however she started to relax more and was able to stay calm later.

The impact of such relaxation and freeness of movement is likely to have enhanced feelings of well-being and joy in participants who struggle with independent movement.

Level 1 and 2 of the framework can be applied to the children within the sessions. In terms of the Sounds of Intent framework of musical development,

various elements of the model could be used to inform the observations and future work.

Level 2 shows the encountering sound where children and young people are exposed to a rich variety of sound, making sound through voluntary movements and makings sounds in an effort to stimulate responses. This can be observed from all the children at the above where they were exposed to sound under the water. The prominence of stillness to indicate listening and concentration was seen in a number of participants. Making sounds accidentally might be translated into movement within these sessions. For example, child J moves his body when music was heard and child M flaps her hand when she hears the music.

However, there are many factors at play within sessions. This includes the underwater music, the Watsu movement, the sensation of the body within the water, the external sounds heard (other children's vocalization, adults talking, the echo of the pool room). It may be difficult to extract the various elements but perhaps various steps may be taken. This may include, more consistent dry sessions, taking into account the musical ability of children, adding a proactive or interactive element to determine their awareness and engagement with the sound, in particular whether they can control the sound. Future work might make use of collaborating with and gaining information and feedback from class teachers or parents who work regularly with the children.

Overall, positive responses were made by the children, for instance, responses of relaxation in the water. It is understood that a term is insufficient for more definitive statements to be made. Whether the specific combination of music and movement in the water had an impact is difficult to ascertain and would require further consistent observation. Therefore, the current analysis of the project may act as a framework for suggesting further research, over a longer period of time that explores in more depth how children engage with sound and music and the varying senses that are at play within a Liquid Vibrations session.