

Sounds of Intent: Interactive Software to Assess the Musical Development of Children and Young People With Complex Needs

Music and Medicine
3(3) 189-195
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DOI: 10.1177/1943862111403628
<http://mmd.sagepub.com>


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Abstract

This article outlines research in the final phase of the *Sounds of Intent* project, which explores musical development in children and young people with complex needs. This has been undertaken through observation and analysis using the previously developed “Sounds of Intent” schedule, which was designed through amassing 630 observations of children’s engagement in musical activities, fused with the findings of mainstream developmental music psychology and ‘zygonic’ theory, a psychomusicological approach to understanding how music makes sense to us all and building on previous extended fieldwork in schools. The main output will be a musical development framework package of web-based technology, containing video, photographs, and descriptions of children’s musical engagement. Practitioners can use the software to assess their pupils/clients, record their attainment and progress, and download curriculum materials. The software is designed to become a user-owned constantly evolving, “wiki-based” resource, to which practitioners would contribute their own resources, ideas and views.

Keywords

music education, music therapy, development, PMLD, SLD

Introduction

The *Sounds of Intent* project began in 2001 to investigate the musical engagement and development of children and young people with severe learning difficulties (SLD) and profound and multiple learning difficulties (PMLD). At the project’s core is an empirically based framework of musical development for children and young people with complex needs. In the current phase of the project, an interactive software package, based on this framework, is being produced to be used by practitioners, potentially from across the world. This web-based resource will allow practitioners to assess their pupils’ level of musical development, record their attainment and progress as individual profiles, and have ready access to curriculum materials.

The *Sounds of Intent* project followed a survey into the music provision of special schools in England. The results of this study, published as the PROMISE report¹ showed that although music education and therapy were valued in schools, the approaches and resources used were inconsistent at best. At the time, in the UK, there was no nationally-recognized music curriculum for children with SLD or PMLD. In the light of these findings, it was determined that clearer guidance on how to frame music provision for pupils with SLD and PMLD (collectively termed as “complex needs”) was essential.

Subsequently, the then Qualifications and Curriculum Authority in the UK published the “P-Levels,” “Planning, teaching and assessing the curriculum for pupils with learning difficulties.”² However, the standards set within the music curriculum did not appear to be based on empirical evidence of musical development in children with learning difficulties, and often the skills noted were irrelevant to pupils’ musical abilities and development. It was clear that, for pupils with complex needs to have access to a more informed music curriculum, a comprehensive understanding of how to support and encourage such pupils to engage in music was needed. The *Sounds of Intent* project was set up to explore these issues, working with colleagues across the special education sector

Supplementary material for this article is available on the *Music and Medicine* Web site at <http://mmd.sagepub.com/supplemental>

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Figure 1. Sounds of Intent Framework of Musical Development.

in the United Kingdom to gather evidence of how children and young people with complex needs develop musically.

Phase I: The Sounds of Intent Framework of Musical Development

Phase I of the *Sounds of Intent* project (2005-2007) focused on investigating the musical development of children and young people with complex needs and refining the information gathered into a conceptualized framework.³⁻⁵ In order to do this, the research team, supported by a group of practitioners active in the field, made 630 systematic observations of pupils engaged in musical activity.³ A further 793 observations have been made in the most recent phase of the project. These observations were fused with findings of mainstream developmental music psychology⁶⁻⁹ and “zygonic” theory, a

musicological theory of how music makes sense to us all.¹⁰ The culmination of this work resulted in the view that musical behaviors could usefully be conceptualized as occurring in 3 domains. These were “reactive” (*responding* to music and sound), “proactive” (*creating, causing, or controlling* music and sound) and “interactive” (engagement occurring in the context of potential or actual communication with others). Furthermore, within each domain, varying levels of musical development were noted and captured across the SLD and PMLD categories as 6 levels of progression. These categories form the basis of the *Sounds of Intent* framework of musical development reported here.

After extensive refinement and trialing, the framework was represented visually as a set of concentric circles (see Figure 1). The six levels are conveyed within each of the domains as segments, starting from an inner ring at Level 1 and moving out

Table 1. CIRCLE: Further Conceptualization of the *Sounds of Intent* Framework

Level	Description	Core Cognitive Abilities
1	Confusion and Chaos	None: no awareness of sound as a distinct perceptual entity
2	Awareness and Intentionality	An emerging awareness of sound as a distinct perceptual entity and of the variety that is possible within the domain of sound
3	Relationships, Repetition, Regularity	A growing awareness of the possibility and significance of <i>relationships</i> between the basic aspects of sounds
4	Sounds Forming Clusters	An evolving perception of <i>groups</i> of sounds, and the relationships that may exist between them
5	Deeper Structural Links	A growing recognition of whole pieces, and of the frameworks of pitch and perceived time that lie behind them
6	Mature Artistic Expression	A developing awareness of the culturally determined “emotional syntax” of performance that articulates the “narrative metaphor” of pieces

toward Level 6, with the progression of musical development following this pattern (R.1–R.6, P.1–P.6, and I.1–I.6).

The six levels of the framework might also be understood using the acronym CIRCLE as seen in Table 1.

The circular framework extends or “explodes” into a table that breaks down each level into 4 elements. For example, the Reactive Domain of Level 2 (R.2) “child shows an emerging awareness of sound” is broken down into the further 4 descriptors that follow: “shows an awareness of sound, potentially of an increasing variety” (R.2.A), “makes differentiated responses to the qualities of sounds that differ” (R.2.B), and so on, following a progression from A to D. Tables 2 and 3 illustrate the elements of the framework for Levels 1 and 2.

Sounds of Intent Interactive Software

The final step in the *Sounds of Intent* project is utilizing the emergent developmental framework to inform the design of a piece of interactive software that will be accessible via the internet. A secure website with the framework at its core will allow practitioners to assess their pupils’ musical engagement and development and create profiles of their pupils, making it possible to track their development over time.

Videos of Children and Young People Engaged in Music

The software will include video examples and photographs, obtained during group and individual sessions of children engaged in music, providing concrete illustrations of the 72 elements of the *Sounds of Intent* framework. Practitioners have

worked alongside the research team to analyze the videos in relation to the framework and to write descriptive text (such as that seen in Tables 3 and 4) to explain the videos’ context. Overall, the images captured vary in range, showcasing a number of pupils and practitioners, using a variety of strategies and styles of music, and including vocal, instrumental, group, and individual work.

An example of the length and type of video clip that will be available on the web-based resource is available at <http://mmd.sagepub.com/supplemental>. A description of its content follows, illustrating Level 5 of the framework.

The clip provides an example of Freddie, a young boy with a diagnosis of autism, engaged in music. Freddie sings and plays the tune of “Twinkle, twinkle little star.” He begins to sing, improvising and ornamenting the melody in various keys, always in tune and in time. Freddie has absolute pitch and a habit of playing the piano “silently,” touching the keys without pressing them down, and singing the notes that he can hear in his head. He can be seen to do this in the beginning of the clip. To understand the video’s context within the framework, Table 6 depicts Level 5 with text in bold referring to elements that correspond with the musical engagement that is seen.

The video emphasizes the multifaceted aspects that one musical interlude may encompass and that the framework emphasizes. Freddie has the ability to perform the piece (P.5.A) as well as vary the material and improvise (P.5.B). In order to perform, he is able to attend to the whole piece of music (R.5.A) and shows an ability to recognize a prominent structural feature (R.5.B), in this case the harmonic structure, above which he improvises a new melody. The content of clips such as this for this level of the framework embody the advanced degree of musical development that some children with autism and others with conditions such as Williams-Beuren Syndrome display,¹¹ and that can be encouraged. It is a feature of the *Sounds of Intent* framework and software that all levels of musical engagement and development are represented, highlighting the importance of music education and therapy across the spectrum of ability and need. The above is only one example of 180 clips to date.

As well as providing video illustrations of the framework, the software will allow practitioners to create profiles of musical development for pupils based on their individual abilities. Textual information will be provided with strategies on how one might support a pupil’s current level of engagement as well as promote progress. This will include curriculum ideas, resources, and references. Furthermore, practitioners will be able to document their pupils’ level using a tool for gauging engagement and consistency.

Gauging Engagement and Consistency

Practitioners will be able to gauge their pupils’ levels of engagement and consistency using the software within each element of the *Sounds of Intent* framework. A recent study has demonstrated that the framework can be used to chart incremental progress over time using the framework.¹² Table 7 illustrates an example of the method that will be used for gauging engagement and consistency and deriving a measure. Here,

Table 2. Elements A Through D for the Reactive, Proactive and Interactive Domains of Level 1 for the *Sounds of Intent* Framework

Segments	Level 1		
	R.1.	P.1	I.1
	Encounters sounds	Makes sounds unknowingly	Relates unwittingly through sound
<i>Elements A</i>	R.1.A Is exposed to a rich variety of sounds	P.1.A The sounds made by life-processes are enhanced and/or involuntary movements are used to make or control sounds	I.1.A Co-workers seek to stimulate interaction by prompting with sounds and responding empathetically to any sounds that are made
<i>Elements B</i>	R.1.B Is exposed to a wide range of music	P.1.B Sounds are made or controlled through co-active movements	I.1.C Co-workers model interaction through sound
<i>Elements C</i>	R.1.C Is exposed to music in different contexts	P.1.C Activities to promote sound production and/or control occur in a range of contexts	I.1.C Activity to promote interaction through sound occurs in a range of contexts
<i>Elements D</i>	R.1.D Is exposed to music and musical sounds that are linked to other sensory input	P.1.D Some activities to promote sound production and/or control are multisensory in nature	I.1.D Some activities to promote interaction through sound are multisensory in nature

Table 3. Elements A Through D for the Reactive, Proactive, and Interactive Domains of Level 2 for the *Sounds of Intent* Framework

Segments	Level 2		
	R.2	P.2	I.2
	Shows an emerging awareness of sound	Makes or controls sound intentionally	Interacts with others using sound
<i>Elements A</i>	R.2.A Shows awareness of sounds—potentially of an increasing variety	P.2.A Makes sounds intentionally, potentially through an increasing variety of means and with greater range and control	I.2.A Sounds made by another stimulate a response in sound
<i>Elements B</i>	R.2.B Is exposed to a wide range of music	P.2.B Sounds are made or controlled through co-active movements	I.2.B Sounds are made to stimulate a response in sound by another
<i>Elements C</i>	R.2.C responds to musical sounds increasingly independently of context	P.2.C Produces sounds intentionally in a range of contexts	I.2.C Interactions occur increasingly independently of context
<i>Elements D</i>	R.2.D Responds to musical sounds linked to other sensory input	P.2.D Produces sounds as part of multisensory activity	I.2.D Interaction through sound involves activity that engages the other senses too

element P.5.B is shown, corresponding to Level 5 of the above clip. A similar system will be available for each of the 72 elements of the framework. The process of deriving a measure using the software will be highly efficient as the user will simply choose the level of engagement observed from a drop-down menu (for example, “Improvises on at least one piece using one type of musical variation with a moderate degree of competence”) and this will be stored electronically, such as for retrieval and reporting subsequently.

Practitioners will be able to assign a formatted identificant code for the pupils they wish to assess and for whom they want to create a profile, ensuring that the information stored in a central database remains anonymous, and accessible only to the practitioner concerned. Observations will be “time stamped,” enabling change, status, or progress to be represented graphically over time.

This system allows for progress to be shown individually within each element of the *Sounds of Intent* framework, an

Table 4. Examples of Text That Will Accompany Images of Children and Young People Engaged in Music for Levels 1 to Levels 3^a

<p>Reactive</p> <p>In the sensory suite A lies on a waterbed while a practitioner supports her physically. The lights of the room change color as the music plays and the practitioner holds small strings of lights for Emilie to see, which also change color. (R.1.D: is exposed to music and musical sounds that are systematically linked to other sensory input)</p>	<p>Observational Text Level 1</p> <p>Proactive</p> <p>In the outdoor garden of the school, E is encouraged to play the bells in front of her by using a switch placed behind her head. When the switch is pressed, the bells rotate, creating sound. As E is still learning to use her head switch at this stage, the teacher presses the switch for her. (P.1.C: activities to promote sound production and/or control occur in a range of contexts)</p>	<p>Interactive</p> <p>The teacher and practitioners model interaction using imitation. The teacher plays a simple pattern on the drum. Each practitioner holds a drum as they are seated next to each pupil, modeling a response by copying the patterns that are introduced. (I.1.A: coworkers seek to stimulate interaction by prompting with sounds and responding empathetically to any sounds that are made)</p>
<p>Reactive</p> <p>P smiles and laughs in response to the music getting louder as she is being sung to during the “hello” song. (R.2.B: makes differentiated responses to the qualities of sounds that differ eg loud/quiet and/or change eg get louder)</p>	<p>Observational Text Level 2</p> <p>Proactive</p> <p>As B moves her mouth, she creates the sound of the saxophone through soundbeam. She simultaneously creates the sound of a cymbal with the movement of her left hand on the switch. She plays with intention, however, not yet employing any distinct rhythmic or melodic patterns. (P.2.A: makes sounds intentionally, potentially through an increasing variety of means and with greater range and control)</p>	<p>Interactive</p> <p>As the music therapist sings hello, U vocalizes and smiles in response. At this stage, his vocalizations are not yet in imitation of what he hears. (I.2.A: sounds made by another stimulate a response in sound)</p>
<p>Reactive</p> <p>While in the multisensory room G engages in representational play with a practitioner. She pretends to go to sleep and wake up in the morning, responding to the sounds of “beep, beep, beep, beep,” which represent the sound of an alarm. (R.3.D: responds to musical sounds used to symbolize other things)</p>	<p>Observational Text Level 3</p> <p>Proactive</p> <p>S claps along with the regular beat of the music, creating a pattern through a regular beat. (P.3.B: intentionally makes simple patterns through a regular beat)</p>	<p>Interactive</p> <p>R initiates tapping on the drum. Each time R pauses in her playing she takes the music therapist’s hands, placing them on the drum, emphasising that the music therapist responds to the sounds she is making and showing recognition that her patterns are being imitated, further emphasized by her smile and laughter after her vocalisation is sung back to her. (I.3.C: recognizes own patterns in sound being imitated)</p>

^a Corresponding elements follow each example

Table 5. Examples of Text That will Accompany Images of Children and Young People Engaged in Music for Levels 4 to Levels 6^a

<p>Reactive</p> <p>R responds, smiling and vocalising, when she hears the repetition of the short piece written for her. (R.4.B: recognizes and responds to musical motifs being repeated or varied)</p>	<p>Observational Text Level 4</p> <p>Proactive</p> <p>G sings a “potpourri” song, in which she links together melodic phrases of “Little Ducks” with “It’s Raining, it’s Pouring” creating a coherent whole by juxtaposing these motifs. (P.4.C: juxtaposes different musical motifs coherently)</p>	<p>Interactive</p> <p>The class plays simple rhythmic patterns, which they have been practising over a few weeks. Here L and N are drumming a simple rhythm and an underpinning regular beat. An interaction between the two can be seen here as L watches and listens to N, using imitation in playing and maintaining the pattern. (I.4.B: imitates distinctive groups of musical sounds-“motifs”-made by others as in call and response)</p>
<p>Reactive</p> <p>It is the end of the lesson and R recognizes and responds to the “goodbye” song, playing along with her teacher and closing the lids of both pianos. (R.5.D: responds to pieces through connotations brought about by their association with objects, people or events in the external world)</p>	<p>Observational Text Level 5</p> <p>Proactive</p> <p>Here, M plays “Boating Lake” on the piano, using both left and right hands, for the ABRSM prep test. He learned the piece by ear, supported by enlarged notation. (P.5.A: performs short and simple pieces of music, potentially of growing length and complexity, and increasingly “in time” and (where relevant) “in tune.”)</p>	<p>Interactive</p> <p>M plays the cello as part of a string ensemble, maintaining his part in a round of “Frere Jacques”. (I.5.B: performs with others, using increasingly developed ensemble skills and maintaining an independent part)</p>
<p>Reactive</p> <p>D performs “Greensleeves” on the piano in the style of Oscar Peterson, illustrating his familiarity with a particular style of performance. (R.6.C: becomes familiar with different performances of pieces and styles of performances and develops preferences)</p>	<p>Observational Text Level 6</p> <p>Proactive</p> <p>W Plays Liszt’s Liebestraum No. 3 in Ab on the piano with a high level of skill and expression. (P.6.A: plays or sings expressively using familiar conventions of performance, at the highest level producing original interpretations)</p>	<p>Interactive</p> <p>N plays the cello, rehearsing with a local community orchestra for the evening’s concert. He attends the orchestra regularly. (I.6.D: develops increasingly advanced ensemble skills, managing material of growing technical and musical complexity as part of a group)</p>

^a Corresponding elements follow each exam

Table 6. Level 5 of the *Sounds of Intent* Framework

Level 5		
R.5	P.5	I.5
Attends to whole pieces, recognizes prominent structural features (eg choruses); responds to general characteristics (eg tempo); develops preferences	(re)creates short and simple pieces of music, potentially of growing length and complexity; increasingly in time' and where relevant "in tune"	Performs and/or improvises music of growing length and complexity with others, using increasingly developed ensemble skills
R.5.A	P.5.A	I.5.A
Attends to whole pieces of music becoming familiar with an increasing number and developing preferences	Performs short and simple pieces of music, potentially of growing length and complexity, and increasingly "in time" and where relevant "in tune"	Performs simple pieces simultaneously with others, sharing a common part
R.5.B	P.5.B	I.5.B
Recognizes prominent structural features (such as the choruses of songs)	Improvises on familiar pieces of music, varying the original material in simple ways	Performs with others, using increasingly developed ensemble skills and maintaining an independent part
R.5.C	P.5.C	I.5.C
Responds to general characteristics of pieces (such as mode, tempo and texture)	Creates short and simple pieces of music, potentially of increasing length complexity, and coherence, whose general characteristics may be intended to convey particular moods or feelings. And which may be linked to external associations	Improvises with others, repeating, varying and/or building on the material that is offered in simple ways
R.5.D	P.5.D	I.5.D
Responds to pieces through connotations brought about by their association with objects, people of events in the external world	Has the physical capacity to produce short and simple pieces of music, potentially evolving to meet the needs of material of growing complexity and length	Improvises with other consciously offering material for them to use

Table 7. Gauging Engagement and Consistency

Gauging a participant's level of engagement	Score
No evidence	0
Improvises on at least one piece using one type of musical variation with a moderate degree of competence	1
Improvises on at least two pieces using one type of musical variation or more with a moderate degree of competence	2
Improvises on at least three pieces using one type of musical variation or more with a moderate degree of competence	3
Improvises competently on at least four pieces using two types of musical variation or more	4
Improvises competently on five pieces or more using two types of musical variation or more	5
Gauging consistency	
Coherent improvisation is observed <i>rarely</i> (on around one in eight occasions or fewer) given appropriate opportunities	1
Coherent improvisation is observed <i>occasionally</i> (on around one in four occasions) given appropriate opportunities	2
Coherent improvisation is observed <i>regularly</i> (on around one in two occasions) given appropriate opportunities	3
Coherent improvisation is observed <i>frequently</i> (on around three in four occasions) given appropriate opportunities	4
Coherent improvisation is observed <i>consistently</i> (on around seven in eight occasions or more) given appropriate opportunities	5
Deriving a measure	
Multiply the "level of engagement" score by the "consistency" score. Change can be measured by comparing scores over a period. The minimum score is 0 (where there is no available evidence) and the maximum score is 25.	

important aspect of the software because it can record incremental change. Furthermore, practitioners can subsequently relate higher or lower levels of engagement with particular strategies, activities or events, and seek to understand which may have been more-or-less effective for a particular pupil.

Next Steps

The website will be launched in the spring of 2011 after it has been trialed with a number of partner schools in England. On completion, the software will be accessible via any platform,

via touchscreens and on mobile devices, and available to users worldwide. As well as the resources described, the website will build to contain strategies and curriculum ideas linked to each level of the framework. Full resources, as well as referenced materials, will be accessible and downloadable. A member's forum will be set up, facilitating dialogue between users.

Acknowledgment

The authors would like to acknowledge and thank the staff and pupils of partner schools who have taken part in the project.

Declaration of Conflicting Interests

The author(s) declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research and/or authorship of this article: The Sounds of Intent project is generously supported by the Esmée Fairbairn Foundation.

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Bios

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