Developing Categories for Children's Creative and Responsive Musical Actions in Group Improvisation: a Mixed Methods Action Research study

[a]Dr Una M. MacGlone*; [b]Dr Graeme B. Wilson & [c]Prof. Raymond A. R. MacDonald,

[a, b,c] Reid School of Music, ECA, University of Edinburgh.

*Corresponding author: unamacglone@hotmail.com; ORCHID iD https://orcid.org/0000-0003-1326-3320; Twitter: @unabass

Una MacGlone lectures at the Royal Conservatoire of Scotland. She has designed and delivers modules in Cross-Disciplinary Collaboration, Improvisation and Music Psychology. Her research interests include improvisation, pedagogy and impacts of creative music-making. She is co-editor of an anthology: *Expanding the Space for Improvisation Pedagogy* (2019), published by Routledge. She is a double bassist and works in and across different genres appearing on many CDs and radio broadcasts.

Graeme Wilson is a Visiting Fellow at the University of Edinburgh. He has research interests in the theory and practice of group improvisation, particularly in interdisciplinary settings, and in musical participation to improve wellbeing. He has published and lectured widely as a psychologist on improvisation as well as on health, identities and discourse. His composed work has been performed internationally and his saxophone playing features on an array of releases, including his own quartet albums. He is the co-author with Raymond MacDonald of *The Art of Becoming* (2020), published by OUP.

Raymond MacDonald is Professor of Music Psychology and Improvisation at Edinburgh University. His ongoing research focuses on issues relating to improvisation, musical communication, music health and wellbeing, music education and musical identities. He studies the processes and outcomes of music participation and music listening and has a particular interest in collaborative creativity. His work is informed by a view of improvisation as a social, collaborative and uniquely creative process that provides opportunities to develop new ways of working musically.

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Abstract

Defining categories of musical actions in improvisation with young children is challenging due to the spontaneous, creative and emergent nature of interactions in this activity. Following a literature review, two new constructs were proposed to circumscribe and classify different types of musical events in improvisation, Creative Musical Agency (CMA) and Socio-Musical Aptitude (S-MA). These were refined and tested through 8 phases of mixed methods research. Two cycles of improvisation workshops were video-recorded in two separate nurseries. Multimodal Video Analysis of musical, gaze and gestural Modes of Communication was contextualised with field notes was used to refine the constructs. Subsequently, two music education experts independently observed and rated children's improvisations as showing CMA, S-MA or neither, giving any reasons for difficulty or ambiguity in using the constructs in separate interviews. Raters demonstrated fair agreement for CMA (Kappa 0.21) and moderate agreement for S-MA (Kappa 0.5). Interview data highlighted the role of the workshop leader in mediating children's creative and responsive actions and further analysis identified how additional elements influenced their improvisations. Development of these constructs offers a valuable way of understanding the complexity of young children's mental processes and musical actions in improvisation through creating and responding, but also in the different ways they are mediated in an educational setting.

Introduction

Improvisation in music is an important skill, which is an increasingly valued, essential part of curricula at all educational levels. However,

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understandings of improvisation are conflicting, and contradictory approaches exist within improvisation pedagogy. Categorisation of the emergent musical properties of improvisation in a teaching context varies depending on pedagogical approach or teaching purpose. Two broad categories of pedagogical approaches can be described as: model-based, where teachers follow a genre or method's specific rules and customs; and process-based, where teachers base musical responses and activities on the participants' contributions.

Improvisation in model-based approaches has been used as a method for developing specific and assessable musical skills for example, rhythm (Brophy, 2002; 2005; Paananen, 2006; Whitcomb, 2010), or improvisation within a tonal centre (Paananen, 2007; Guilbault, 2009). In this way, children can develop musical skills while having some creative input to the process. However the nature of musical activities is often teacher-directed (MacGlone, in press). Decisions on what musical categories to assess in these studies are bound to the specific goals of the intervention. Some studies (Brophy, 2002; 2005; Paananen, 2006) have sought to demonstrate progressive developmental stages in rhythmic improvising, for example children increasingly combining features such as accents and more complex rhythms, that improved either with age or experience.

Other sequential models attempt to classify musical actions in process-based improvisation, such as Kratus (1995), who offered broader categories which encompass all musical elements: 1.Exploration; 2.Process-oriented improvising; 3.Product-oriented improvising; 4.Fluid improvising; 5.Structural improvising; 6.Stylistic

improving; 7.Personal improvising. These categories were based on Kratus' comparative analysis of characteristics from both novice and expert improvisations, combined with considering Swannick and Tillman's (1996) spiral model of musical development. The seven steps were designed to provide a conceptualisation of a path from early to assured improvisation and so provide a guide for teachers. Such models have received criticism, for example, Johansen (2019) proposes that when students have agency in their learning, they create their own learning goals which resist objectification. Since Kratus' work which focuses on developing individual's skills, there has been growing research interest in characteristics of group improvisation with children (Sawyer 2003, 2007; Wassrin 2019) who emphasise that creativity and collaboration are key features, even from a young age.

In a recent systematic literature review of improvisation education, Siljamakki & Kanellopolous (2019) point to a gap in research in both process-based (or what they term as open-form) group improvisation and a mixed methods approach. Part of the reason for this gap may be that process-based improvisation results in 'unique' events (Johansen, 2019) and has many different musical and communicative facets (MacDonald *et al*., 2012; Welch, 1999). In improvisation, actions and reactions happen very quickly and often unconsciously (Holdhus *et al.*, 2016). These aspects present challenges in choosing suitable methods to capture a characteristically rapid multimodal activity.

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Some work has investigated capacities that develop in process-based improvisation through coding and categorising children's verbal expressions about the music they played (e.g., Burnard, 2002; Kanellopolous 2007; MacGlone 2019). This has demonstrated that children create their own meaning by using conceptual tools (e.g. descriptive phrases) that mediate their understanding of group improvisation. Children can also explore and create different musical roles; for example in MacGlone (2019), children described being able to choose their own musical material or playing *with* other children, while Burnard (2002) identified musical leaders and followers.

What happens musically when children improvise freely together is less clear, therefore there is a need to investigate children's musical expressions in group improvisation. Understanding how individual creativity works in an essentially interactive activity could productively inform pedagogy. Authors such as Hickey (2009) have called for clearer definition of abilities and skills that children can develop through group improvisation. As improvisation is spontaneous, creative (MacDonald *et al.* 2012) and emergent (Sawyer, 2003) circumscribing categories which do not compromise these features is crucial. Capturing the distributed nature of this process is another key aspect and finding methods which offer new scientific insight into the improvisatory creativity of children at this young age is a priority.

This paper will report on a study whose purpose was to develop concepts to provide 'transferable knowledge-making categories' (Kendig, 2015, p739) to describe young children's improvisations in a group. This study is in a relatively unexplored field and age group, and therefore sought to arrive at feasible constructs through a process of intervening and modification (Kendig, 2015) and contribute to proof of concept. This can

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form the basis for further investigation through examining construct validity and reliability (Drost, 2011).

Research questions which this paper addresses are:

1. How can children's creativity and engagement in group improvisation be apprehended and evaluated?

2. How can quantitative and qualitative methods be combined to develop a measure for assessing the development of creative and responsive capacities in children's improvisations?

Methods and results

Workshops

Workshop materials were designed and delivered by the first author for two 6-week cycles of Action Research (AR) for different groups of preschool children. The purpose of these materials was to facilitate children's musical creativity and responsiveness. The study was conceived as AR so that workshop content and delivery could be improved through a research process of action, analysis, and planned change. Activities included giving descriptive instructions (e.g., 'What does a hedgehog sound like?'); giving open instructions (e.g., 'Just play.') and using graphic symbols as a starting point for improvisation. These improvisations were discussed with the purpose that children's interests could be incorporated into subsequent improvisations in an iterative research process. For example, one group created a narrative at one session about princesses going to a bouncy castle, which

informed their musical choices. Children's ideas were developed into a shared repertoire of improvisations enacting or alluding to a narrative which could be returned to later in the workshop programme (e.g., 'Princesses at the bouncy castle', 'Star Music', 'Fireworks') .

Participants

Prior to the onset of the study, full ethical approval for this project was granted by Edinburgh University ECA Ethics Committee. Two separate nurseries were recruited in Glasgow, UK, one for each cycle of AR. Children were randomly selected from the class of children in their pre-school year. Participating children were in their preschool year of nursery education, aged between four years one month and five years three months. Cycle I had four girls and four boys, Cycle II had four boys and two girls. Informed consent was gained from parents, both for their child's *participation* and for the workshops to be filmed.

Research design

Before the workshops commenced, the first author designed two novel conceptualisations of specific capacities that can be developed through process-based group improvisation. Figure 1 demonstrates the subsequent process of creation and refinement of these constructs through this Mixed-Methods, Action Research study. The curved arrows within the boxes indicates the process of abduction where descriptive statistics were used to summarise the observed data and to inform qualitative analysis and refinement of two novel constructs.

Figure 1: Research design

Phase 1

consideration of experience — literature review

creation of constructs

video analysis / field notes

review of constructs

video analysis / field notes

review of constructs

ratings test / interviews with raters

final review of constructs

Phase 2

Phase 3
workshop cycle I

Phase 4

Phase 5
workshop cycle II

Phase 6

Phase 7

Phase 8

Phase 1

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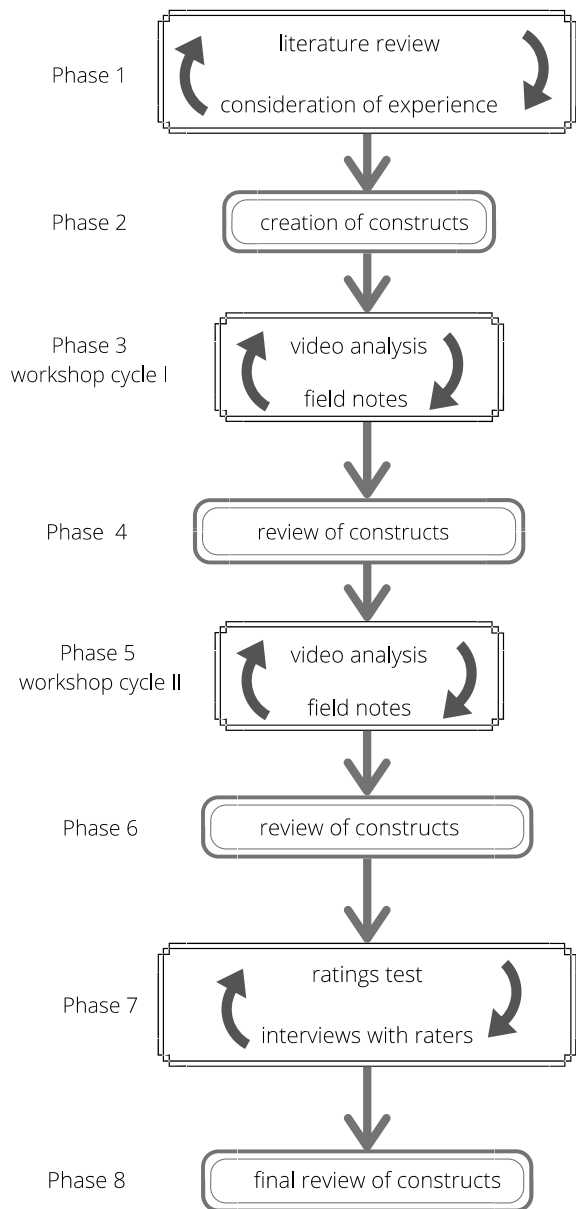
The first phase began with a critical analysis of relevant literature which was considered with and against the first authors' playing and teaching experiences of free improvisation. Key texts included Lewis (2014) who proposed improvisers seek to make a connection to the others in the group through the musical choices they make. Following this, there can be learning about oneself through perceiving the ways in which one's playing can be heard in other musicians' responses. Sawyer (2003) defines key features of improvisation as: 1. Having an unpredictable outcome, 2. Having moment-to-moment contingency, the next action dependent on the one just before, 3. Being open to collaboration, 4. Being embedded in the social context. Sawyer's first point implies a context where there is a wide range of choices for participants. His second point aligns with Lewis (2014), who describes the structure in improvised music as unfolding in real time, in a socially-negotiated interaction rather than following a prescribed form.

Finally, describing and coding musical actions has been carried out by Wilson and MacDonald (2016) who categorised musicians' actions in group improvisation as either *initiating* new musical material or *responding* to others through their choice of musical material. Miell and MacDonald (2000)'s classification of pairs of 11 and 12-year-old children's verbal communications with each other in a collaborative task, as transactive or non-transactive. The music they created in this task was also coded based on the same theoretical framework as the verbal communications:

> *A musically transactive statement was defined as a spontaneously produced refinement, extension or elaboration in music of previously presented musical or verbal ideas. This is in contrast to musical transactive responses which were defined as direct musical responses, clarifications or elaboration of verbal questions or inquiries.* (Miell & MacDonald, 2000, p353).

Phase 2

From the synthesis of literature and reflection, two constructs were designed. The initial definitions were:

i) Creative musical agency (CMA) is the capacity to invent new music and be able to contribute to an improvisatory context. Through this, the child is able to execute their personal musical aesthetic in an effective contribution to an overall group piece.

 ii) Socio-musical aptitude (S-MA) is the capacity to apprehend others' skills and personal qualities within a group that is improvising and to accommodate these in an appropriate musical response. Therefore, the improvisers' intent is both a musical contribution and an interpersonal positioning within the group improvisation.

In phases 3, 5 and 7, empirical data were collected as a basis to test and review these constructs. Data collection and analysis procedures are now described for each corpus of data. Following this, results of each phase will be given.

Quantitative data collection

Video data were sampled from footage of all group improvisations. Criteria for inclusion were defined as a musical episode where some or all of the material is spontaneously created through the course of the performance, and a significant part of the music was negotiated by the participants in real time. In Cycle I this totalled 53 minutes and in Cycle II, 1 hour 24 minutes. The sampled improvisation sections ranged from 9s to 1m 35s.

Multimodal video analysis

A systematic approach to coding the video clips was undertaken with the aim of describing the children's behaviour quantitatively. The seven-stage procedure for framework coding from Gale *et al*. (2013) was followed: 1) transcription, 2) familiarisation with data, 3) coding, 4) developing a working analytical framework, 5) applying the analytical framework, 6) charting data into the framework matrix, 7) interpreting the data.

The unit of analysis was defined as an 'event' where in the course of an improvised section, a child made a change in their playing on one or more musical parameters such as tempo, dynamics or pitch. The second focus of the first research question concerns the children's engagement, therefore, most frequent Modes of Communication (henceforth MoC) two seconds before and two seconds after a music 'event' were transcribed. Possible MoC could be gaze, gesture, proxemics, head position or verbal utterances.

Step 1 was completed by first transcribing music events, then gaze and gesture MoC were transcribed in relation to music events. Repeated viewing of the clips with the transcriptions fulfilled step 2.

The following step was coding. Because the unit of analysis was defined by change in the music MoC, this was examined first. Children's musical actions were coded as representing an instance of either a CMA or S-MA event. CMA events were coded where a child initiated a new musical idea which was qualitatively different from the ongoing musical texture. The CMA event and musical parameter(s) on which this occurred were noted. An example of an event coded as CMA follows:

> The group were playing a rhythmically entrained piece of music on percussion. Dan started playing much faster and louder than the others. Dan's action of playing both faster and louder was noted as a CMA event on two musical parameters: tempo and dynamics.

An event was coded as an S-MA event if a child was observed to change their playing or singing to match another child's on one or more musical parameters, for example:

> Improvisation began with the children singing long *mf* notes. After 10s of this texture Tess began singing short notes at a higher pitch than the group. Jane matched Tess's short, higher notes. This event was coded as S-MA on the musical parameters of articulation and pitch.

Coding the music MoC as being either in a CMA or S-MA category provided the analytical framework (steps four and five) within which to chart data (step six). If a MoC could not be apprehended due to the children's position in relation to the video camera, this was also noted. Gaze and gesture interactions between a child and workshop leader were far more common than child-child interactions, therefore an analytical decision was made to focus on these. Gestures were noted by describing the type of gesture (e.g., moving a hand up and down), the gesturing person, and to whom it was directed. This data was transferred to Excel spreadsheets.

Field notes

Taking and reflecting on field notes is a standard method in educational research (Townsend, 2013). Coghlan's (2001) four stage approach to gathering field notes was employed after every workshop: 1.noting experiences; 2. considering feelings about these experiences; 3. considering how practice and research could be carried out differently and 4. combining these steps to reconceptualise understanding of the aspect under focus.

Rating session

A test was devised to check whether two experienced music education researchers could apply the CMA and S-MA categories to samples of video data, consistently with the original coding. Two raters, who carried out this test after both cycles were completed, were identified on the basis of their music educational expertise and experience encouraging music-

making in early years settings. Both lectured in Music Education in HME and both had PhDs in Music Psychology and extensive classroom or community music teaching experience, including with very young children. As well as a classical conservatoire training , they had experience in using creative music approaches in the classroom or playing in funk and jazz bands. The rating session comprised a short introduction to the study; explanation of the rating test where they independently observed and rated children's improvisations as showing CMA, S-MA or neither, and separate interviews to investigate any reasons for difficulty or ambiguity in using the constructs.

Materials

Before the test, 39 separate video clips of children improvising were created from the sampled improvisation material. These clips were chosen by the first author as the clearest instances of CMA, S-MA events or neither. All of the sampled video clips were rated as 'A', 'B' or 'C', with 'A' being the clearest and best examples; the test used all of the 'A' examples. The second and third authors reviewed and agreed the selection. An information sheet was given to the raters prior to the test. A rating sheet was provided in order for each rater to place a tick in one of three columns (CMA, S-MA or neither) for each particular clip.

Procedures

Before the test began, the raters were shown an example of each category. Each completed the task independently and there was no verbal

communication after the test began. After the all of the clips were viewed, there was a five-minute break where the room was reorganised for holding and recording the interviews. These were later transcribed and then analysed using thematic analysis (Braun and Clarke, 2006).

Cohen's kappa (1960) was used to estimate inter-rater reliability, as it takes into account the amount of agreement that could be expected to occur through chance (Siegel & Castellan, 1988). The resulting statistics were interpreted using values from Landis & Koch (1977) as follows: < 0 as showing poor agreement, 0-0.20 as slight, 0.21-0.40 as fair, 0.41-0.60 as moderate, 0.61-0.80 as substantial and 0.81-0.99 as an almost perfect agreement and 1 as perfect agreement.

Results from Phases 3-8 now follow.

Phase 3

Results

Table 1 gives examples from the systematic analysis of the music MoC in the children's improvisations. Each cell shows an example of an event that was coded as a CMA or S-MA event in one of the different musical parameters. There is also a numeric value underneath for the number of events coded in each category in this cycle.

Table 1. CMA and S-MA events in Cycle I.

	Category	
Parameter	**CMA**	**S-MA**
Tempo	Child sings or plays a new tempo in the group **CI 15**	Child alters their own tempo to match tempo of another child **CI 64**
Dynamics	Child introduces a new dynamic which is louder or quieter than the rest of the group **CI 12**	Child alters their playing or singing to match dynamic of another child **CI 58**
Articulation	Child instigates music which has a different articulation to the rest of the group **CI 19**	Child matches their articulation to another child's **CI 31**
Signs	Child initiates hand signs with the effect of changing the music **CI 23**	Child responds to hand signs shown by another **CI 18**
Pitch	Child initiates a different pitch from the rest of the group **CI 7**	Child matches (or nearly matches) pitch of another child **CI 16**
Arrangement	Child A starts and stops playing or singing **CI 8**	Child B starts and stops with child A **CI 5**
Body percussion	Child makes a percussive action on, or with body **CI 4**	Child imitates percussive action of another child **CI 3**
Alternative vocalizing	Child makes a sound other than speaking or singing with their voice **CI 2**	Child imitates alternative vocal sound of another child **CI 1**

Table 1 illustrates how CMA and S-MA were realised in different musical parameters and also presents these in order of frequency, i.e., CMA and S-MA were observed most often in tempo, then dynamics, and so on to alternative vocalising, the last parameter on the table. Not all improvisations had CMA and S-MA events, 4 improvisations in Cycle I were completely synchronised and unchanging. In these, the children began playing together at the same tempo and dynamic with no changes evident in the improvisation.

MoC around music events

The greatest number of gaze and gesture events were between the child(ren) and workshop leader. 83% of these communications were between child and workshop leader or workshop leader and child. Most of the time (76%) the order of communications was: child initiates communication, CMA or S-MA event, workshop leader responds. Not all of the communications could be transcribed, as the video camera was in a fixed position. This accounts for percentages not adding up to 100% in the following charts. Figure 2 presents

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MoC before CMA and S-MA events and Figure 6 presents MoC after CMA and S-MA events.

Figure 2

MoC preceding CMA and S-MA events in Cycle I
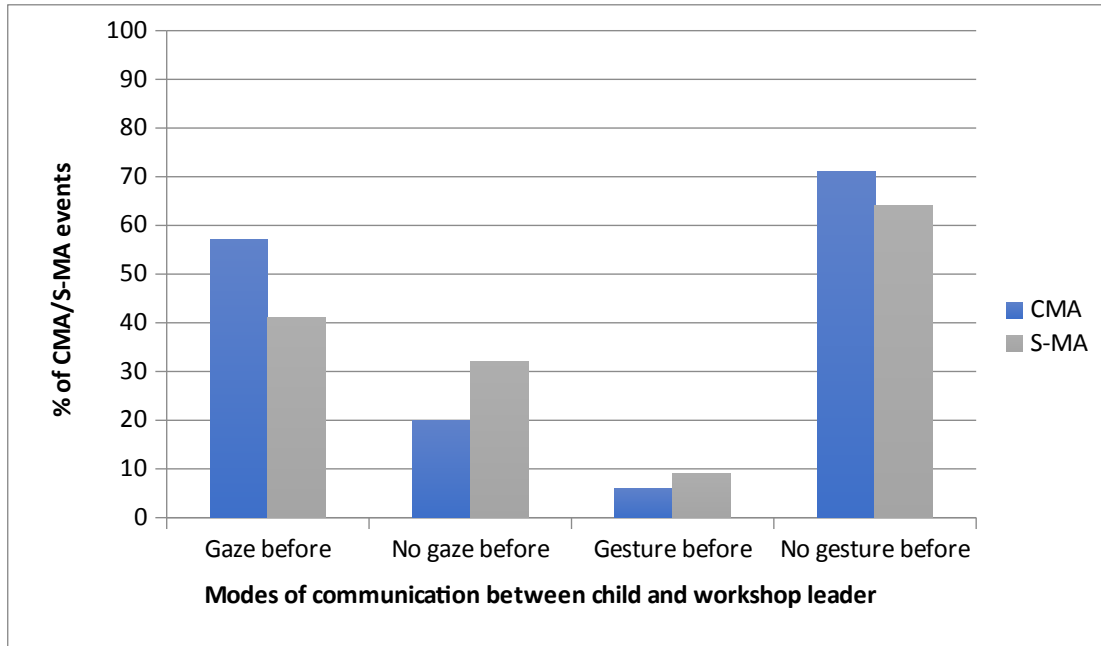
The most frequent MoC before a CMA event was gaze, manifested as a child looking at the workshop leader before they executed a CMA event: 57% of CMA events were preceded by a child looking at workshop leader. Some children consistently looked at the workshop leader before their CMA event, and some children consistently did not. The proportion of S-MA events preceded by gaze was less (41%) than the equivalent proportion of CMA events (57%).

Figure 3

MoC after CMA and S-MA events in Cycle I
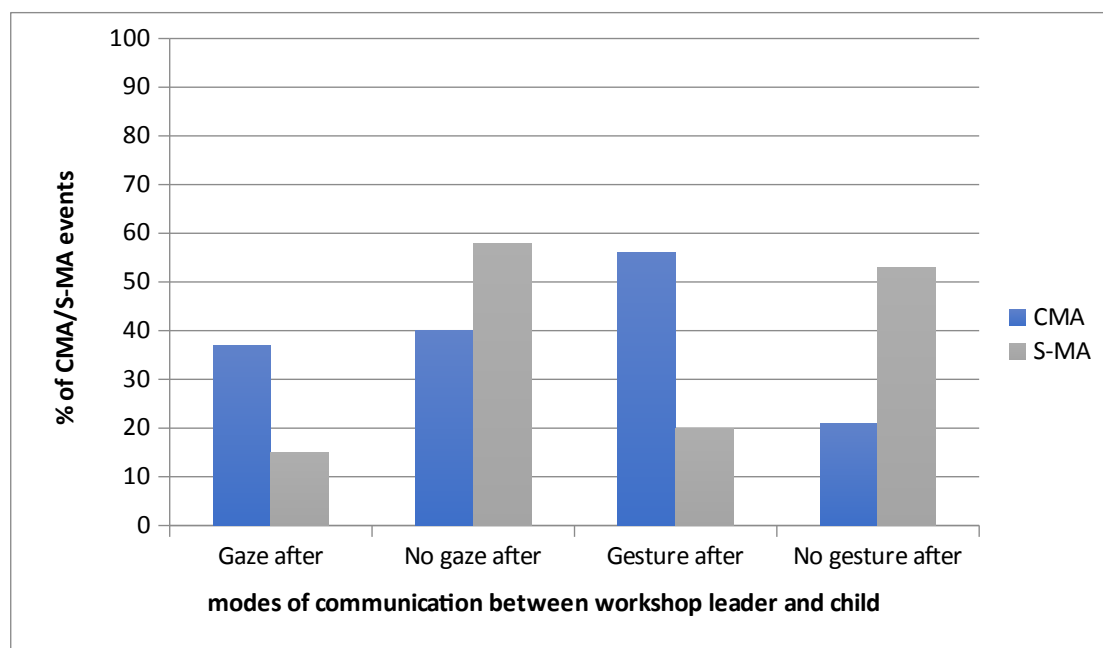
This chart demonstrates that gesture was the most frequent MoC after CMA and S-MA events. This chart also shows that CMA events were responded to with gesture more often than S-MA events. This may be because multiple children executed S-MA at the same time, whereas CMA events were a perceptible change in one or more musical parameters by an individual.

Field notes

One key aspect of the field notes which has relevance to the construct definitions was noted in the children's desire to base improvisations on a wide variety of sources. These included stories, games, and seasonal events (e.g., Fireworks celebrations). They experimented with sounds on the percussion instruments and tried to copy environmental sounds like

running water. Often the direction of improvisations was decided through a group discussion before playing. Another aspect was that some children consistently looked at the workshop leader before their CMA event, and some children consistently did not. This choice to engage with the workshop leader was also noted in some children's preference to talk through options but ultimately carry out their own ideas.

Phase 4

Analysis of the empirical data against the original definitions of the constructs determined that they were not fully realised in the video data. For example, the original version of CMA did not allow for a situation where a child was not enacting a 'personal musical aesthetic'. Fifty-seven per cent of children's CMA events were preceded by a gaze MoC interaction with the workshop leader, suggesting that these events may be socially mediated. Also, group discussions before improvisations about what to play indicate that stories and mental images were being expressed musically as well as an expression of self. Similarly, the original definition of S-MA did not appear to fit all of the instances of a child responding to another in a group improvisation. It did not always seem that a child was capturing another's 'personal qualities' in their musical responses. The variety of mediating factors in children's CMA and S-MA demonstrated the need for a revised version which could accommodate this complexity.

Figure 4 shows the original constructs next to the reviewed versions which were altered based on the analysis from Phase 4.

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Figure 4 Change in constructs

change in constructs from pre to post Cycle I

pre cycle I	post cycle I
CMA is the capacity to invent new music and be able to place this in an improvisatory context. Through this, the child is able to execute their personal musical aesthetic in an effective contribution to an overall group piece.	**CMA:** Child creates novel musical material independently of the group and executes this in the improvisation.
S-MA is the capacity to apprehend others' skills and personal qualities within a group that is improvising and to accommodate these in an appropriate musical response. The improviser's action is musical and also contributes to an interpersonal position within the group improvisation.	**S-MA:** Child creates a musical response in relation to another child's musical contribution in the group improvisation. This response can draw from the original musical event on a range of parameters e.g., tempo, dynamic, pitch and/or articulation.

Phase 5

A second cycle of workshops began after the constructs had been revised. Video data were collected and analysed as in Cycle 1. Table 2 presents results from the systematic analysis of the music MoC in the children's improvisations for Cycle II. 16 out of 72 improvisations were synchronised and unchanging in Cycle II

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Table 2. CMA and S-MA events in Cycle II.

	Category	
Parameter	CMA	S-MA
Tempo	Child sings or plays a new tempo in the group **CII 16**	Child alters their own tempo to match tempo of another child **CII 61**
Dynamics	Child introduces a new dynamic which is louder or quieter than the rest of the group **CII 13**	Child alters their playing or singing to match dynamic of another child **CII 59**
Articulation	Child instigates music which has a different articulation to the rest of the group **CII 14**	Child matches their articulation to another child's **CII 20**
Signs	Child initiates hand signs with the effect of changing the music **CII 6**	Child responds to hand signs shown by another **CII 8**
Pitch	Child initiates a different pitch from the rest of the group **CII 14**	Child matches (or nearly matches) pitch of another child **CII 19**
Arrangement	Child A starts and stops playing or singing **CII 6**	Child B starts and stops with child A **CII 10**
Body percussion	Child makes a percussive action on, or with body (e.g. claps hands, hits floor) **CII 5**	Child imitates percussive action of other child **CII 7**
Alternative vocalizing	Child makes a sound other than speaking or singing with their voice **CII 5**	Child imitates alternative vocal sound of other child **CII 7**
Spoken word	Initiates spoken single words or phrases **CII 2**	Copies spoken word proposal **CII 7**
Sung material (in an instrumental piece)	Initiates sung words or small sung fragments of melody **CII 2**	Joins in with sung words or sings own words or melody **CII 3**

Gaze and gesture around CMA and S-MA events Cycle II

The following charts show MoC before (in fig. 5) and after (in fig. 6) CMA and S-MA events

in Cycle II

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Figure 5 MoC preceding CMA and S-MA events in Cycle II
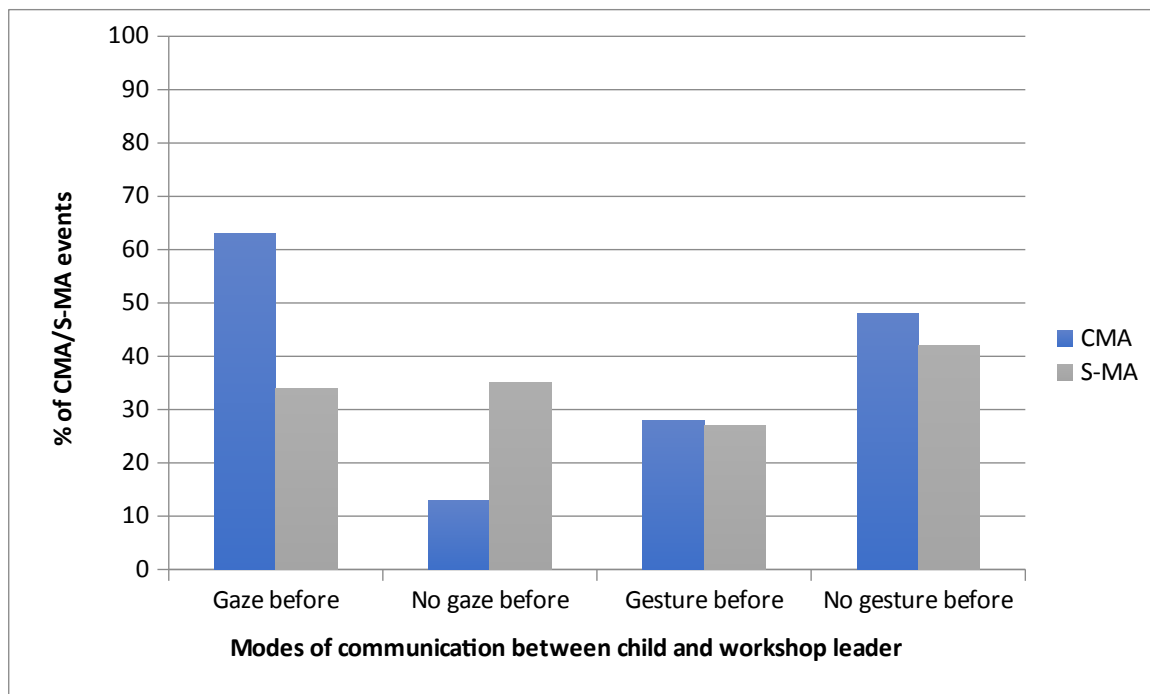
Gaze MoC before CMA events was more prevalent in Cycle II (63%) than Cycle I (57%) and gaze before S-MA events was slightly less prevalent in Cycle II (34%) than Cycle I (40%). Gesture before CMA events was more frequent in Cycle II (28%) than in Cycle I (6%) and preceded S-MA events more frequently in Cycle II (27%) than in Cycle I (9%).

Figure 6 MoC after CMA and S-MA events in Cycle II
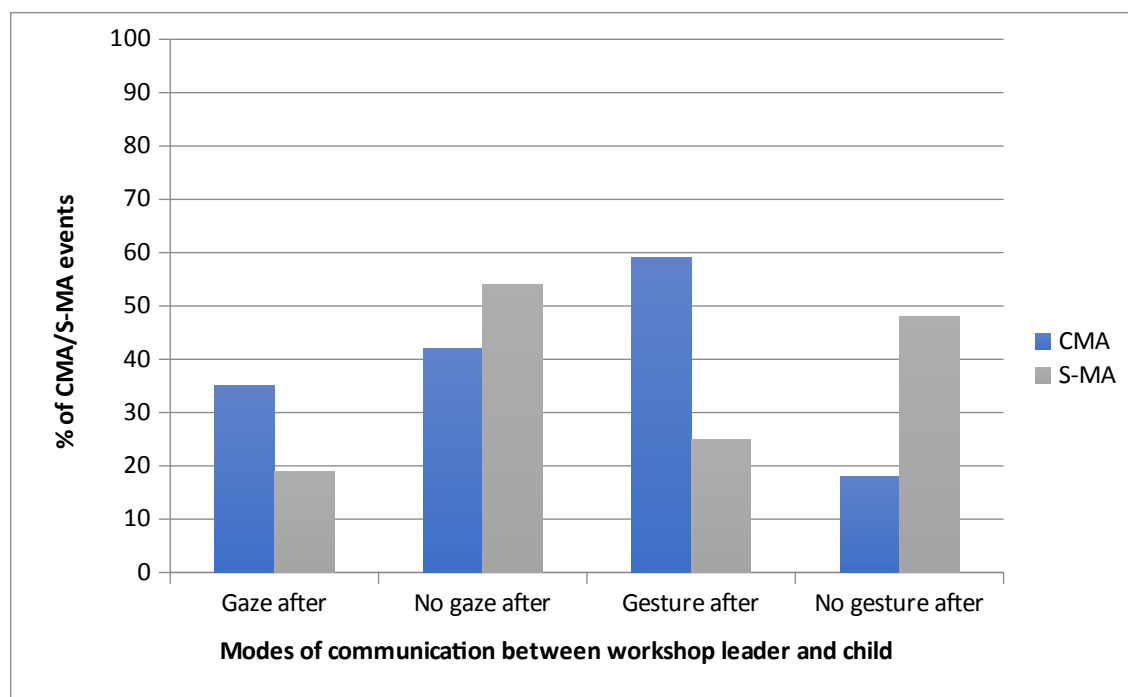
This chart has similar results to the corresponding chart for Cycle I, in that gesture was the most frequently occurring MoC after CMA and S-MA events. Also, Cycle II showed a more frequent gestural response from the workshop leader after CMA and S-MA events than in Cycle I.

Cycle II field notes

Children in Cycle II showed a similar desire to those in Cycle I to base improvisations on a wide variety of sources. They appeared particularly interested in interpreting descriptive phrases musically. They also experimented with different sounds on the percussion instruments and

copied environmental sounds such as a lawnmower outside their nursery. Again, the direction of improvisations was often decided through a group discussion before playing. Cycle II children were noted to be very shy at the start of the workshop programme. They needed gentle encouragement to build confidence to begin with but towards the end of the programme they participated with alacrity. Children from both cycles largely improvised within the same musical parameters, with Cycle II children using more parameters than Cycle I, despite different preferences for activities. Cycle II children initiated gaze communication with the workshop leader more than Cycle I children. and workshop leader made more gesture responses towards the Cycle II group than the Cycle I. This provides evidence to support the field notes that described the workshop leader's perception of the group being very quiet and needing 'drawn out'. Finally, in Cycle II, it was noted that for the less frequent parameters (such as alternative vocalising) the group divided into two sections where a pair of children would be initiating and responding to each other on different parameters from the rest of the group who held an entrained rhythmic pattern.

Phase 6

After reflection on the results from Cycle II, the constructs were not changed. There were key similarities between data from both Cycles such as the most frequent musical parameters and the importance of gaze and gesture MoC. Differences such as the number and range of musical parameters and more MoC around events could be accounted for through the nature of each group. Cycle I children were lively and talkative through the programme and Cycle II children took a few workshops to gain confidence but built up a more cohesive group dynamic with the workshop leader from mid-point onwards.

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Phase 7

Rating results and interviews with raters.

Two raters viewed 39 clips of the children improvising and rated children as demonstrating

CMA, S-MA or neither and were interviewed. Results from the ratings test showed inter-rater

reliability to be 0.21 for CMA events and 0.5 for S-MA events.

The main theme identified from the interview data (*Workshop leader as mediator*) concerned

the ways in which the workshop leader's actions facilitated the children's creativity. As

demonstrated in the fair degree of agreement between raters in rating the CMA (0.21), both

felt that the category needed refining to accommodate an adult role that enabled the

children's CMA events. Rater 2 said:

> *I would argue that, that depending on what your definition of free improvisation is, the kids are able to make choices but it's within a structure and that structure is something that you're actually defining in some of those clips*

This was perhaps reflects her understanding the aesthetic of the workshops, with resulting

pedagogical implications. For example, she may appreciate a difference between her

perception of how she thinks 'free improvisation' should be defined and what she saw in the

video clips. By virtue of the workshop leader defining a structure, the improvisation cannot

be 'free' any more and the children's contribution has to be considered in relation to the

workshop leader. The action of 'defining the structure' for the children may be through non-

verbal MoC. This aspect was also commented on by rater 1: 'I could see them watching for

endings sometimes'. Endings of improvised music can present a complex social negotiation;

this comment highlights the key role of the workshop leader at a potentially ambiguous time.

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Rater 1 then suggested that the workshop leader may have given non-verbal cues which were taken up musically by the children: 'Were they responding to your face? The smiling?' Rater 2 also explained how she saw some of the S-MA events unfolding in a more complex interaction than the researcher's categories had suggested:

> *there's certain kids there that were not necessarily copying the other kids but were copying you when you were copying the others... you are playing a part, and actually for some of those kids, you are playing a vital part*

Thus, the workshop leader can be seen to be acting as a mediator for some of the children. One reason for this could be that S-MA involves more than one process. Firstly, the child has to identify and analyse the music they will respond to, and secondly, they have to create their musical response. For children of this age, one-step instructions with one resulting process are more commonly given. Also, a shy child's input may be mediated through a reassuring communication before, and a validating communication after, S-MA.

Considering the rating test in light of the interview data offers insight into the rating agreement scores. The most common interaction before CMA and S-MA events was a gaze from the child to the workshop leader. The raters also noticed these child-to-adult communications, which may have had the consequence of them having difficulty placing a workshop leader-mediated CMA event into the CMA category. In both cycles, the gaze communication from child to workshop leader before S-MA events was less frequent, which perhaps accounts for the higher 0.5 score for S-MA, if the raters understood the children as acting more independently.
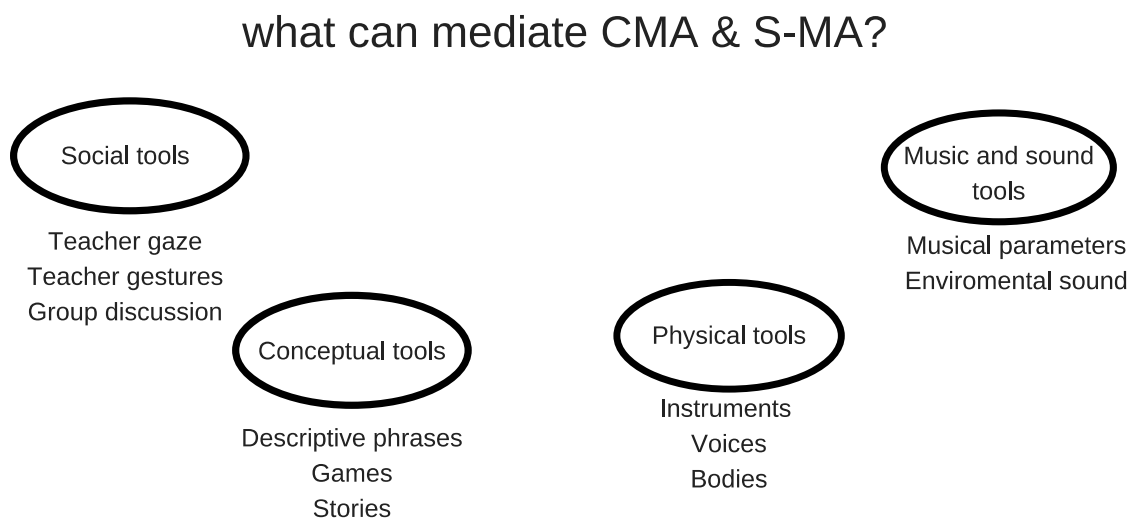
Phase 8

Final review of the constructs

In the last section, raters perceived CMA and S-MA as also being mediated by the teacher's non-verbal MoC. This finding did not require change to the construct definitions as post cycle

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I, the definitions concerned musical intitiatives and responses. The interview data gave an enhanced picture of how they may have been facilitated for some and importantly not all, children in the nursery setting. In other words, the essence of the children's musical actions remained consistent with post-cycle I definitions; even though they may have been mediated by a glance, the workshop leader did not help them to physically play an instrument. As well as this, the teacher is not the only possible mediating factor, Figure 9 outlines the different ways the constructs were mediated in this study.

Figure 7 Mediating CMA and S-MA

what can mediate CMA & S-MA?

Social tools

Teacher gaze
Teacher gestures
Group discussion

Music and sound tools

Musical parameters
Enviromental sound

Conceptual tools

Descriptive phrases
Games
Stories

Physical tools

Instruments
Voices
Bodies

The following discussion considers this paper with reference to research questions and relevant literature.

Discussion

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Two new constructs for categorising young children's musical actions in improvisation were proposed, refined and tested through 8 phases of mixed methods research. First, a literature review identified creativity and responsiveness as key features of group improvisation, and these aspects formed the basis for CMA (Creative Musical Agency) and S-MA (Socio-Musical Aptitude). Multimodal Video Analysis of music, gaze and gesture MoC in pre-school children's group musical improvisation activities were contextualised with field notes and informed refinement of constructs over two cycles of improvisation workshops. Subsequently, two music education experts independently observed and rated children's improvisations as showing CMA, S-MA or neither, and had separate interviews to investigate any reasons for difficulty or ambiguity in using the constructs. Raters demonstrated fair agreement for CMA (K 0.21) and moderate agreement for S-MA (K 0.5). Interview data suggested that the constructs were not fully realised in that the raters considered the children's actions to be mediated by the workshop leader. Another reason may be that both raters, although experienced music educators, had limited experience of using improvisation with children of this age or in their own musical practice. In light of this finding, further consideration of the construct definitions was undertaken. Definitions were not revised in response, but the mediated nature of children's creativity was recognised and further analysis identified various ways in which it manifested in both cycles.

The first research question: How can children's creativity and engagement in group improvisation be appreciated and evaluated? was addressed through a detailed analysis of the musical parameters within which children improvised, demonstrating that children were creative in, and responsive to, many different forms of musical expression. This was seen in children using their voices, instruments and bodies; therefore, children's creativity can be

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appreciated as creating new musical material (CMA) across several musical parameters and with different materials. For some children, these events were mediated through the workshop leader. However, this is not a comprehensive way of capturing children's creativity in group improvisation. For example, children on occasion played their percussion instruments in a synchronised and unchanging tempo and dynamic with no observable CMA or S-MA events. This may reflect a similar option to what Wilson and MacDonald (2016) label as 'maintain', where free improvisers in trios did not change what they played. This musical 'treading water' (p1033) tended to create a group improvisation with a stable texture and was considered to be a creative choice by the musicians.

This paper has provided an effective use of mixed methods to create and define capacities that can be developed through improvisation, which was the focus of the second research question. A strength has been in combining quantitative video analysis with field notes. Insights into the nature of the two different groups could be appreciated in distinct ways, for example, in Figures 5 and 6, there were more MoC noted between the workshop leader and Cycle II children than in Cycle I. This was triangulated by early field notes which, when compared, described a big difference between groups both in confidence both verbally and musically. Also, ratings were contextualised by interview data. Using raters to judge creativity could be problematic if their beliefs about creativity affect consistent coding; employing mixed methods is an important step to understanding such idiosyncracies in ratings procedures (Long & Pang, 2015).

Other research in group improvisation has identified similar concepts sharing some aspects with CMA and S-MA. Burnard (2002, p.167) identified leaders who 'defined the direction in which the others should move' which is similar to CMA, and followers who were 'musically

led and influenced' which is comparable to S-MA. Constructs of CMA and S-MA allow for a more nuanced representation of the ebb and flow of musical communication in group improvisation. Addessi *et al*. (2017) evaluated children's improvisation on criteria including Reflexive Interaction (to create a response that is clearly influenced by another) and Attention (to another). These criteria are similar to S-MA, but in their study the child is improvising with a computer. It is a key point to note that these interactive processes do occur in larger groups. This study is consistent with research that shows another musician or their actions can function as a mediating tool for improvisers (Born 2017; MacDonald & Wilson 2016, Sawyer 2003).

Voyajolu and Ockleford (2016) have proposed a framework for children's musical development from birth to 5 years, based on Ockelford's (2006) 'Sounds of Intent' framework for children with an additional support need. The framework divides children's musical acts into three areas: proactive, reactive and interactive. The interactive area, which describes actions such as 'copy other sounds and like to be copied' and 'engaging with musical dialogues' shares attributes with the construct of S-MA, as both are concerned with the ways in which children recognise and synthesise other children's music acts. The main way in which this is different from this study is the educational purpose. These authors focus on creativity as a way to progress from one level to the next with the aim of being able to 'perform short pieces gradually more in time and in tune' and the ability to 'concentrate on short pieces all the way through and anticipate key features' (Voyajolu & Ockleford 2016, p.102). While these can be seen as important aims, they differ in the educational purpose of workshops in this study which are that children develop their own music within a group, and also a music that belongs to everyone in the group.

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In returning to a key text used in the development of the original constructs, it is possible to compare Miell & MacDonald's (2000) categorisations to CMA and S-MA. CMA is similar to a *musically transactive statement* in that it is spontaneously produced, however, it does not account for a previously stated musical idea that has been elaborated or referenced. Future research could investigate instances of CMA being mediated by a previous musical idea. S-MA maps on to *musical transactive response* as the child's musical contribution is in relation to a previously existing music idea. Another point of comparison is in the 'orientation' of the statements and responses in Miell and MacDonald's study. Musical statements and responses were described as oriented towards either the self or other and in this study the children oriented most musical responses to or through the workshop leader.

There are some key differences to consider. In Miell and MacDonald (2000), pairs rather than groups of children were observed, and those children were aged 11 to 12 rather than being pre-school. At least one of each pair had experience of instrumental lessons (ranging from 6 to 72 months). Therefore, the older children have a greater range of musical possibilities due to the type of instruments and level of sophistication in musical skills and knowledge. The task in the study was specific (even though it was open-ended) which contrasts with the range of workshop activities in this study. Finally, the coding structure is developed from theory of communications between two people rather than among a group.

The constructs add to existing literature in conceptualising musical development and specific capacities that developed through preschool children's improvising. The children developed CMA and S-MA in a varied range of musical parameters. This represents an observable outcome. However, as the raters did not substantially replicate the original coding scheme, more research could include a 'teacher mediated' option for CMA and S-MA. A study could also be designed where the workshop leader steps away from the group to investigate what

musical interactions occur without an adult present. Results from this study should not be viewed in the same light as models showing a linear progression through increasing skill in manipulating musical parameters (e.g., Ilari *et al*., 2017). The order in which the children progressed through parameters in this study, although interesting, is not as important as appreciating that the children showed CMA and S-MA in a range of different parameters of their own choosing.

Limitations

One limitation of the study was the relative lack of experience in improvisation pedagogy of the raters. However, this is an emerging field of both practise and research; finding raters with more extensive expertise in a third area (improvisation as well as music education, and early years) would have been highly challenging.. A larger future study might address this by having a mixed panel of raters, including nursery teachers and improvising musicians as well as music educationalists, to rate and be interviewed about the videos. Each discipline brings different experience and understanding of children's actions, and the combination of their contributions would extend understanding of how the constructs might be applied. Another limitation was that both nurseries were in a similar urban and socio-economic area. A future study could investigate whether this is likely to have shaped findings by recruiting in a wider diversity and number of settings.

Implications

Conceptualising processes in improvisation is a relatively new and growing area of research. It is moreover one that has made few inroads into the surprisingly rich world of very young children's improvisation. To gain benefits of improvisation and to fulfil the potential of curricula which emphasise creativity and open-ended tasks, it is important that these processes be fully understood and that they can be recognisably enacted by different groups of children. CMA and S-MA offer unprecedented flexibility in capturing the spontaneous, real-time, creative and responsive aspects of improvisation.

This study challenges research in music education based on the position that creativity is only possible when the individual has internalised contextual rules (or processes) of the relevant domain (Csikszentmihalyi, 1997). Viewing the children's improvisation through constructs of CMA and S-MA revealed that young children created, responded to and combined a wide range of musical parameters in a group. Children at this age are not just making noise randomly, there are complex mental processes involved in their improvising – through creating and responding but also in ways that are mediated by more than one factor.

Another important contribution of this work is the insight offered by the contstructs into how two groups progressed through a workshop programme. Most research into children's creativity is focused on the individual, and ratings of children's creativity are often measured in a test at certain time points. Improvisation has been used in this way as a tool to advance discrete musical skills and not for its own sake (Siljamäki & Kanellopoulos, 2019). However, through a holistic consideration of what different groups of children are doing together, this research identifies the benefits in basing early music education on improvisation. This idea has been promoted by authors such as Sawyer (2007) who propose improvisation should be at the core of music education to because it uniquely prioritises skills

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such as creativity, collaboration and adaptability, as well as the

integration of those aptitudes in real time.

CMA and S-MA are important as they demonstrate young children's ability to collaborate in

a creative endeavour. As well as this, that individual development can happen in a group;

children can decide what influences their musical expression, therefore they have agency in

their learning. Having others respond to one's creative musical actions is a powerful way for

children to feel included in a personally meaningful way which can build confidence and

strengthen their personal rationale for what and how they create through music.

REFERENCES

Addessi, A. R., Anelli, F., Benghi, D. & Friberg, A. (2017). Child-computer interaction at the beginner stage of music learning: effects of reflexive interaction on children's musical improvisation, *Frontiers in Psychology, 8*, 65.

Born, G. (2017). After relational aesthetics: Improvised musics, the social, and (re)theorising the aesthetic. In Born, G., Lewis, E. & Straw, W. (Eds.), *Improvisation and Social Aesthetics*, Duke University Press.

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology, *Qualitative Research in Psychology*, *3*(2), 77-101.

Brophy, T. S. (2002). The melodic improvisation of children aged 6-12: A developmental perspective. *Music Education Research*, *4*, 73-92. doi: 10.1080/14613800220119787

Brophy, T. S. (2005). A longitudinal study of selected characteristics of children's melodic improvisations. *Journal of Research in Music Education*, *53*(2), 120-133.

Burnard, P. (2002). Investigating children's meaning-making and the emergence of musical interaction in group improvisation, *British Journal of Music Education*, *19*(2), 157-172.

Coghlan, D. (2001) *Doing action research in your own organization*. London: SAGE.

Cohen, J. (1960) 'A Coefficient of Agreement for Nominal Scales', *Educational and Psychological Measurement*, *20*(1), 37-46.

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Csikszentmihalyi, M. (1997) *Creativity: flow and the psychology of discovery and invention*. HarperPerennial

Drost, E. A. (2011). Validity and reliability in social science research. *Education Research and Perspectives, 38*(1), 105-123.

Green, L. (2002). *How popular musicians learn: A way ahead for music education*. Ashgate Publishing, Ltd.

Gale, N. K., Heath, G., Cameron, E., Rashid, S. & Redwood, S. (2013). Using the framework method for the analysis of qualitative data in multi-disciplinary health research, *BMC medical research methodology*, *13*(1), 11.

Guilbault, D. M. (2009). The Effects of Harmonic Accompaniment on the Tonal Improvisations of Students in First through Sixth Grade. *Journal of Research in Music Education*, *57*(2), 81-91.

Hickey, M. (2009). Can improvisation be 'taught'?: A call for free improvisation in our schools. *International Journal of Music Education*, *27*(4), 285-299.

Holdhus, K., Høisæter, S., Mæland, K.,Vangsnes, V., Engelsen, K. S., Espeland, M. & Espeland, Å. (2016) Improvisation in teaching and education—roots and applications. *Cogent Education*, *3*(1). doi:10.1080/2331186X.2016.1204142

Ilari, B., Fesjian, C., Ficek, B. & Habibi, A. (2017). Improvised song endings in a developmental perspective: A mixed-methods study, *Psychology of Music*, *46*(4), 500-520.

Ivankova, N., & Wingo, N. (2018). Applying mixed methods in action research: Methodological potentials and advantages. *American Behavioral Scientist*, *62*(7), 978-997.

Johansen, G. G. (2019). Seven steps to heaven?: An epistemological exploration of learning in jazz improvisation, from the perspective of expansive learning and horizontal development. In Johansen, G. G., Holdhus, K., Larsson, C. & MacGlone, U.M. (Eds.), *Expanding the Space for Improvisation Pedagogy in Music: A Transdisciplinary Approach*. (pp. 245-260). Routledge.

Kanellopoulos, P. A. (2007). Children's Early Reflection on Improvised Music- Making as the Wellspring of Musico-Philosophical Thinking. *Philosophy of Music Education Review*, 119-141.

Kendig, C. (2016). What is Proof of Concept Research and how does it Generate Epistemic and Ethical Categories for Future Scientific Practice? *Science and Engineering Ethics, 22*(3), 735-753.

Korkiakangas, T., Weldon, S. M., Bezemer, J. & Kneebone, R. (2014) 'Nurse– surgeon object transfer: Video analysis of communication and situation awareness in the operating theatre', *International Journal of Nursing Studies*, *51*(9), 1195-1206.

Kratus, J. (1995). A developmental approach to teaching music improvisation, *International Journal of Music Education Original Series*, *26*(1), 27-38.

Landis, J. R. & Koch, G. G.(1977). The Measurement of Observer Agreement for Categorical Data, *Biometrics*, *33*(1), 159-174.

Lewis, G. E. (2014) 'Collaborative Improvisation as Critical Pedagogy. *Nka Journal of Contemporary African Art*, (34), 40-47.

Miell, D., & MacDonald, R. (2000). Children's creative collaborations: The importance of friendship when working together on a musical composition. *Social Development*, *9*(3), 348-369.

MacDonald, R. A. R., Wilson, G.B & Miell, D. (2012). Improvisation as a creative process within contemporary music. In D. J. Hargreaves, D. Miell, & R. A. R. MacDonald, (Eds.), *Musical Imaginations: Multidisciplinary Perspectives on Creativity, Performance and Perception* (pp. 242-255). Oxford University Press.

MacGlone, U., & MacDonald, R. A. (2017). Learning to improvise, improvising to learn: A qualitative study of learning processes in improvising musicians. In E. F. Clarke & M. Doffman (Eds.), *Distributed creativity: Collaboration and improvisation in contemporary music*. (pp. 278-294). Oxford University Press.

MacGlone, U.M. (2019). Young children's talk about improvisation: How *conceptual tools* and *workshop roles* are formed through musical improvisation workshops. In G. G. Johansen, K. Holdhus, C. Larsson & U. M. MacGlone (Eds.), *Expanding the space for improvisation pedagogy in music: A Transdisciplinary Approach* (pp. 115-132). Routledge.

MacGlone, U.M. (in press). Frames for improvising. In Gault, B. & Abril, C. (Eds.), *Teaching General Music: Dimensions of Practice*. Oxford University Press.

Paananen, P.A. (2006). The development of rhythm at the age of 6-11 years: non-pitch rhythmic improvisation. *Music Education Research*, *8*(3), 349-368.

Paananen, P.A. (2007). Melodic improvisation at the age of 6-11 years: Development of pitch and rhythm. *Musicae Scientiae*, *11*(1), 89-119.

Peng, K. L., Lin, M. C., & Baum, T. (2013). The constructing model of culinary creativity: an approach of mixed methods. *Quality & Quantity*, *47*(5), 2687-2707.

Sawyer, R. K. (2003) *Group creativity: music, theater, collaboration*. Mahwah, NJ: Lawrence Erlbaum Associates

Sawyer, K. (2007). Improvisation and teaching. *Critical Studies in Improvisation/Études critiques en improvisation*, *3*(2).

Siegel, S. & Castellan, N. J. (1988). *Nonparametric statistics for the behavioral sciences*, McGraw-Hill.

Siljamäki, E. & Kanellopoulos, P. A. (2019). Mapping visions of improvisation pedagogy in improvisation research. *Research Studies in Music Education, 42*(1), 113-139.

Swanwick, K., & Tillman, J. (1986). The sequence of musical development: a study of children's composition. *British journal of music education*, *3*(3), 305-339.

Thorpe, V. E. (2015). *Assessing Complexity: Group Composing and New Zealand's National Certificates of Educational Achievement.* Unpublished PhD Thesis, Victoria University of Wellington.

Townsend, A. (2013). Action research. [electronic resource] : the challenges of understanding and changing practice. Open University Press, McGraw-Hill Education.

Voyajolu, A. & Ockelford, A. (2016). Sounds of Intent in the Early Years: A proposed framework of young children's musical development, *Research Studies in Music Education*, *38*(1), 93-113.

Wassrin, M. (2019) 'A broadened approach towards musical improvisation as a foundation for very young children's agency', in Johansen, G. G., Holdhus, K., Larsson, C. & MacGlone, U.M. (eds.), *Expanding the Space for Improvisation Pedagogy in Music: A Transdisciplinary Approach*. (pp. 33-50). Routledge.

Welch, G. (1999) 'Education and musical improvisation: In response to Keith Sawyer', *Psychology of music*, *27*(2), 211-214.

Woolley, C. M. (2009) 'Meeting the Mixed Methods Challenge of Integration in a Sociological Study of Structure and Agency', *Journal of Mixed Methods Research*, 3(1), 7-25.

Whitcomb, R. (2010). Rhythmic characteristics of improvisational drumming among preschool children, *Research and Issues in Music Education*, *8*(1), 3.

Wilson, G. B. & MacDonald, R. A. R. (2016). Musical choices during group free improvisation: A qualitative psychological investigation, *Psychology of Music*, *44*(5), 1029-1043.