'Investigating a rock band engaged in group composition'

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Abstract

This observational case study investigated a rock band as they group composed a song during four, two hour composition sessions. During these sessions the musicians were videotaped as they interacted with music composition software to construct musical 'loops' that were subsequently combined to provide a 'backing track'. When completed, this backing track represented the overall structure of the new song. Qualitative analysis of the videotaped data revealed six 'themes' emerging from the musician's observed behaviours that were subsequently interpreted by the researchers as group composition activities: 'playing', 'listening', 'experimenting', 'communicating', 'constructing', and 'off task'. A coding scheme also emerged during the analysis process. This coding scheme was used to time code the videotaped data, which revealed the percentages of time spent by the musicians in each of the group composition activities. Results from the combined qualitative and percentage time analyses indicated the importance of non-verbal communication for this rock band during group composition. Results also suggested differences between non-verbal communication employed by these rock musicians, when compared to non-verbal communication employed by jazz and classical musicians revealed in two prior studies. It is proposed that differences of non-verbal communication between these three groups of musicians are related to issues of group composing versus group performance of pre-composed pieces.

'Investigating a rock band engaged in group composition'

Introduction

Prior research has investigated ensemble playing by examining interaction between the musicians during rehearsal and performance of pre-composed pieces. This prior research examined issues of member's roles (Davidson & Good, 2002; King, 2006; Tovstiga, Odenthal, & Goerner, 2005), or communication (Davidson & Good, 2002; Seddon, 2005; Seddon & Biasutti, in press & 2009). The focus on rehearsal and performance of pre-composed pieces meant that group creative activities centred on interpretation and/or improvisation rather than composition. Recent research investigating collaborative music composition has mainly been conducted with young people in schools (Burnard & Younker, 2008; Gall & Breeze, 2008; Hewitt, 2008; Seddon, 2006 & 2007). The current research extends this investigation into collaborative composition by examining group composition undertaken by an experienced, adult rock band.

Two aspects were considered in the literature review: the research on communication in small music ensemble and the research into collaborative composition.

Literature review

The small music ensemble has been the focus of research in the last few years addressing issues of communication. Davidson & Good (2002) examined social and musical co-ordination between musicians in a student string quartet as they prepared for their first recital. Davidson & Good (2002) concluded that a musical work was influenced by the interpersonal dynamics of the musicians during rehearsal and performance and highlighted the importance of non-verbal communication through eye contact, gesture and musical communication. They reported how

musicians often described listening to recordings they have made and hearing themselves playing new musical phrases not previously practised, which emerged as a result of what other musicians were playing at the time. They argued that these unpractised phrases were 'spontaneous musical utterances'. This examination of musical communication between members of small musical ensembles was extended through research conducted in two separate studies, one with a jazz sextet and the other with a string quartet (Seddon, 2005; Seddon & Biasutti, in press & 2009). These studies reported similarities of communication between musicians in the jazz sextet and the string quartet based on the use of six different 'modes' of communication: verbal and non-verbal instruction, co-operation and collaboration. Relationships between the non-verbal modes of communication and sympathetic versus empathetic attunement are argued and a concept of 'empathetic creativity' is proposed. Seddon (2005) proposed that when musicians become empathetically attuned they are able to produce spontaneous musical utterances or variations, which are examples of empathetic creativity. This prior research conducted with experienced musicians provided useful insights into modes of communication and their impact on collaborative creativity during rehearsal and performance but it didn't consider modes of communication during composition nor did it attempt to quantify the distribution of time spent in the various modes of communication.

In relation to the research into collaborative composition, it has largely been conducted with young people who have little or no formal instrumental music tuition. Many researchers view prior musical experience to be unimportant when engaging in collaborative composition (Hargreaves, 2008; Hewitt, 2008).

Collaborative creativity is not a rarefied specialised activity only available to people with special gifts but something that can be part of the everyday social lives of people when they engage with others (Hargreaves, 2008). This premise forms the foundation upon which much of the research into collaborative music composition in schools has been conducted. The availability of computer software, acting as a substitute for more traditional instrumental and aural skills, has

allowed musically inexperienced individuals to compose music in ways that would otherwise have been impossible (Hewitt, 2008). The availability of this technology has facilitated the investigation of pairs of pupils engaged in collaborative computer-based music composition undertaken in the school environment. This prior research has tended to focus on the transactive nature of communication between the pupils (Hewitt, 2008) and the mediating role of computers during collaborative computer-based composition (Gall & Breeze, 2008; Hewitt, 2008; Seddon, 2006 & 2007).

Seddon (2006 & 2007) found differences between pairs of pupils' text dialogue, musical dialogue, and approaches to composition based on prior musical experience when engaged in computer-based composition in a 'virtual' environment. Results revealed prior instrumental training was associated with more extended and complex musical dialogues, critical engagement with musical ideas and produced an 'exploratory' environment. No prior instrumental training was associated with uncritical and descriptive dialogues and a 'cumulative' environment. This finding was not supported by Hewitt (2008) who found differences between composing pairs related to roles adopted by the pupils at the computer rather than their prior musical experience. Gall & Breeze (2008) also investigated collaboration between pairs of pupils as they jointly composed music. Their study considered the use of the computer as a mediational tool allowing musically inexperienced pupils to negotiate creative outcomes. Results revealed issues of control over the composition process in relation to who manipulated the computer mouse, with some pairs sharing and others where individuals kept the mouse in order to maintain control over the composition process. These prior studies provided insight into the interaction between pairs of pupils engaged in collaborative computer-based composition, with the computer acting as a mediational tool, particularly from an educational perspective. These prior studies did not however consider larger groups of musically experienced pupils, composing collaboratively without the aid of computers.

Burnard & Younker (2008) compared and contrasted actions and dialogue produced between

groups of three or four adolescents as they composed using classroom instruments. The prior

musical experience of the pupils in each composing group was mixed: some had received formal

instrumental music training and some had not. The groups were videotaped as they engaged with

the composition task and pupil actions and dialogue were coded according to 'activity theory'

(Engeström, 1998) and 'transactive communications' (Berkowitz, Gibbs & Broughton, 1980). Pupil

actions were coded for six categories: 1) *subject*; the pupil, 2) *object*; the composing task, 3) *tools*

or artefacts; language or instrumental skills, 4) *community*; the composing group, 5) *division of*

labour; participant relationships defined as either *vertical*, hierarchical or *horizontal*, democratic

and 6) *rules*; historical or place constraints on pupil actions (for more detail please see Burnard &

Younker, 2008). Pupil actions and dialogue were also coded for transactive and non-transactive

communications (Berkowitz, Gibbs & Broughton, 1980; MacDonald & Miell, 2000). In this

detailed case study, Burnard & Younker (2008) reported an exemplary case for group composition

between four adolescent pupils who had mixed prior musical training. The group's division of

labour was interpreted as *horizontal*, and composing decisions were found to be made through

discussing, describing, arguing, negotiating, explaining, playing and evaluating. Ideas proposed

during group composition were agreed or disagreed upon through cumulative and constructive

dialogue rather than disputation. Group member ideas were tried out and accepted, revised or

rejected through a process that involved all four members of the group. Although this research gave

some insight into the adolescent's actions during group composition it made no attempt to quantify

those actions.

The prior research reviewed above indicates that collaborative creative activities between

small musical ensembles has focused mainly on group member roles and communication during

rehearsal and performance of pre-composed pieces. When investigating collaborative composition,

research has involved relatively inexperienced participants composing in an educational

environment. To the authors' knowledge, no prior research has a) examined group composition with

adult, experienced rock musicians or b) attempted to reveal and quantify the distribution of composition behaviours exhibited by an experienced rock band during group composition.

Aims of the research

The current research seeks to reveal the activities of the members of the rock band 'Reeta Pawone' as they group composed a new song for their repertoire.

Method

This study employed case study methodology, with the researcher as a non-participant observer. Ecological validity was provided by observing the group in their naturalistic setting.

Participants

The participants were the three members of the rock band 'Reeta Pawone': Paolo (keyboards/computer/vocals), Matteo (bass guitar) and Marco (guitar). The group was first formed in 2001 but they disbanded after one year and didn't reform again until the end of 2005, when they began recording their improvisations as a way of generating ideas for writing their own music. Until today the group recorded 2 CDs and is working for the third one.

The group members are all Italian and are all experienced musicians. Paolo and Matteo have prior experience of formal instrumental music tuition and Marco is self taught. Marco also attended a course in composing electronic music at the conservatory of music in Ferrara from 1999-2002. The rock band group composes at their rehearsal room for two hours every Saturday. The songs are never written down in a formal way but are recorded on 'Ableton Live' multi-track music composition software. The songs are constructed with layers of sound, recorded on 'backing tracks' consisting of musical 'loops', over which the musicians play instrumental improvisations. Paolo

manipulates the backing tracks on the computer during group composition sessions. Often at home he listens to the recordings made at the group composition sessions and constructs backing tracks for the group to play with at the next session. The musicians also exchange emails, with MP3 files attached, between sessions introducing new ideas and commenting aspects of the music.

Procedure

The musicians kindly invited us to observe and videotape their group composition during the writing of a new song. Completing the construction of the backing track for this new song required four, two hour composition sessions, which took place in their rehearsal room on four consecutive Saturdays beginning on Saturday 8th March, 2008. The song being composed was called 'Distruggo Tutto' which means "I destroy everything" and evoke the revolutionary power of rock music, and the performances of Jimi Hendrix when he destroyed the guitar on the stage. Some ideas for this song had originally been 'conceived' during an improvisation at a previous session then subsequently re-improvised during a live concert performance. A positive response by the audience to the first improvised version of the song at the concert motivated the musicians to develop the improvised version of the song into a pre-composed song for their performance repertoire. This sequence of events represents a typical method of composition for this rock band. This method broadly involves an initial improvisation or 'conception' (such as a brainstorming) after which a basic 'construction' for the song is created in the form of a 'backing track', made up from several 'musical loops' with which the musicians play, improvise and sing during performance. The researchers had available all the musical material elaborated by the band: the first improvisation and the four composing sessions. For the purposes of this research they were considered the four sessions in which the members of the band worked collaboratively for shaping the piece.

Analysis

The method employed to analyse the four, two hour videotape recordings of the composition

sessions was adapted from 'Constant Comparative Method' (Glaser & Strauss, 1967; Lincoln & Guba, 1985) a method usually associated with the qualitative analysis of text based on 'Grounded Theory' (Glaser & Strauss, 1967). This adaptation of Constant Comparative Method has been successfully applied in previous studies examining individual and collaborative computer-based composition (Seddon & O'Neill, 2003; Seddon, 2006 & 2007) and musical communication (Seddon, 2005; Seddon & Biasutti, in press & 2009). This method of analysis focuses on a process where categories emerge from the data via inductive reasoning rather than coding the data according to predetermined categories (Maykut & Morehouse, 1994).

Constant Comparative Method involves five main stages: 1) immersion; 'units of analysis' are identified, 2) categorisation; 'categories' emerge from the 'units of analysis', 3) phenomenological reduction; 'themes' emerge from the 'categories' and are interpreted by the researchers, 4) triangulation; support for researcher interpretations of 'themes' is sought in additional data, 5) interpretation; overall interpretation of findings is conducted in relation to prior research and/or theoretical models (McLeod, 1994).

Analysis of the videotaped observation of the composition sessions involved researchers engaging with the five stages of Constant Comparative Method. During 'immersion', one of the researchers repeatedly viewed the videotaped material and identified 57 discernibly different behaviours displayed by the participants for example, 'listening to backing tracks', 'experimenting with musical ideas with backing', 'editing sounds on instrument', 'dealing with technology problems'. These observed behaviours were regarded as 'units of analysis'. During 'categorisation', 'units of analysis' with similar meanings were grouped together. This process resulted in 17 behaviour 'categories' emerging from the 57 'units of analysis'. A coding scheme was constructed based on these 17 behaviour categories (see Fig. 1).

(insert Fig. 1. here)

During 'phenomenological reduction', six 'themes' emerged from the 17 behaviour 'categories'. These emergent 'themes' were subsequently interpreted by the researchers as group composition activities: 'playing', 'listening', 'experimenting', 'communicating' 'constructing', and 'off task'. A diagrammatic illustration of this qualitative analysis process is provided for further clarification (see Fig.2).

(insert Fig. 2. here)

Triangulation of the data was achieved by examining transcripts of the verbal communication that took place between the members of the rock band during group composition in order to find support for researcher interpretation of the 'themes' as group composition activities (see Fig. 3.).

(insert Fig. 3. here)

Researchers returned to the video data and applied the coding scheme to conduct a time analysis, which revealed the percentage of time spent by each participant engaged in each of the coded behaviours across all four composition sessions. The parameters applied for the coding procedure were: to be coded as an observed behaviour, the behaviour must be 'sustained' for a period longer than five seconds. Validation of the coding procedure was achieved by applying a process based a procedure employed in prior studies (Seddon & O'Neill, 2003; Seddon & Biasutti, in press & 2009). In the prior study, Seddon & O'Neill, 2003) 10% of the coded data was subjected to verification by an independent researcher. In the current study, the procedure from Seddon & Biasutti (in press & 2009) was employed which involved an independent researcher separately checking the time coding of all the videotape data. The researcher and independent researcher

subsequently examined any disagreements relating to their coding and/or timing and through a process of negotiation reached 100% agreement. Results from the time analysis of the coded video data are based on this independent researcher validated analysis.

Results

Analysis of the video data revealed six 'themes' which were subsequently interpreted by the researchers as group composition activities: 'playing', 'listening', 'experimenting', 'communicating', 'constructing' and 'off task'. Researcher interpretations of these 'themes' were supported through the process of triangulation (see Fig. 3).

Results of the time analysis revealed the percentages of time spent by the rock band, in each of the 17 coded behaviours, in each of the four sessions and totals for all four sessions (see Table 1).

(insert Table 1 here)

Percentage time allocation of group composition activities was calculated by allocating the timings of the original 17 behaviour codes to their associated group composition activities (see Fig. 2). Results of this process revealed the percentages of time spent by the rock band in each of the group composition activities, in each of the four sessions and totals for all four sessions (see Table 2).

(insert Table 2 here)

Discussion

The six group composition activities: *'playing', 'listening', 'experimenting', 'communicating', 'constructing'* and *'off task'*, emerged in the current study through an inductive

analysis process, similar to that employed in prior studies investigating communication between members of small musical ensembles during rehearsal and performance (Seddon, 2005; Seddon & Biasutti, in press & 2009). It is interesting to note that in these prior studies, conducted with a jazz group and a string quartet, similar modes of communication emerged between the members of these two diverse ensembles as they rehearsed and performed. These modes of communication were: verbal and non-verbal, instruction, co-operation and collaboration. In the current study, with a rock band, although the same inductive analysis procedure was employed, similar modes of communication did not emerge. Based on this finding, we propose there are differences in communication between small groups of musicians based on whether they are rehearsing, performing and improvising or engaged in group composition. During rehearsal, performance and improvisation, small groups of musicians are realising a pre-composed piece. This enables the players to focus on performing that pre-composed piece providing them with an opportunity to communicate with each other employing non-verbal modes of communication that allow them to become 'empathetically attuned' (Seddon, 2005). In this empathetically attuned state the musicians are able to produce 'spontaneous musical utterances' (Davidson & Good, 2002; Seddon, 2005) when performing jazz music, or 'spontaneous musical variations' when performing classical music (Seddon & Biasutti, in press & 2009), which are both examples of 'empathetic creativity' (Seddon, 2005). However, when the members of this rock band were engaged in group composition, their focus was on constructing the piece. This focus on construction during group composition may have reduced the possibility for the musicians to become empathetically attuned because their attention was focussed on composing rather than performing. One could argue that improvisation is a form of composition but in jazz performance, this usually involves improvising over a pre-constructed chord sequence and would not require attention to the construction of the piece. With our rock band, once the construction of the song is completed, it is probable that the musicians would employ modes of communication during rehearsal and performance, similar to those revealed in the prior studies with the jazz sextet and string quartet (Seddon, 2005; Seddon & Biasutti, in press & 2009).

Further research would be required to investigate this proposition. Although no examples of empathetic attunement were observed during the group composition sessions in the current study, it is likely that these experienced rock musicians are familiar with this non-verbal mode of communication. Some evidence for this proposition is found in the following verbal dialogue:

Paolo: *"Then today for example, we will be able to, if we wish, to try something from which something else will be born, simply from the interaction in the rehearsal of the song."*

This extract suggests that the members of the rock band have experienced empathetic attunement which can result in empathetic creativity.

The emergence of the coding scheme in the current study enabled the researchers to extend research into group composition because results of the coded time analysis made it possible to quantify the distribution of the group composition activities. The group composition activity 'communication' consisted of two behaviour codes, verbal and non-verbal communication (see Fig. 2). As argued above, the very low coding for non-verbal communication, NVC: 0.75% (see Table 1), can be explained by the focus of the members of the rock band on constructing the composition rather than the rehearsal and performance of a pre-composed piece. Therefore, because a very low level of coded NVC was revealed, we propose that the group composing activity 'communication' may be regarded as purely verbal communication. We also propose that, when 'collectively' engaged in 'playing', 'listening' and 'experimenting', the musicians were essentially employing a form of non-verbal communication. Although it seems reasonable to propose that information related to group composition was being exchanged during 'collective' playing, listening and experimenting activities, interpretation of these activities as non-verbal communication differs from the non-verbal modes of communication revealed during rehearsal and performance in prior studies (Seddon, 2005; Seddon & Biasutti, in press & 2009) in that empathetic attunement between the composing musicians was not observed. Finally, constructing 'loops' and the 'backing track' were

'individual' technical activities undertaken by Paolo, during which the other musicians were observed to be 'off task'. Therefore, the behaviours CL, CB, DT and OT, can be regarded as either 'individual' activities engaged in by Paolo or 'other' collective activities, undertaken by Marco and Matteo, not specifically related to the group composition process. Based on this interpretation of the time analysis data, we propose group composition in this case study, relied on a combination of verbal and non-verbal communication.

The percentage time analysis revealed that verbal communication occupied 23.75% and non-verbal communication occupied 33.25% of the total time spent during the group composition of this song. The 33.25% of non-verbal communication, consisted of the following 'collective' activities: 'playing': 24.75%, 'listening': 6.5% and 'experimenting': 2%. Based on this result, we propose that although the musicians were not empathetically attuned, non-verbal communication played an important role during the group composition of this song. The 'individual' activities: 'playing': 3%, 'listening': 2.25% and 'experimenting': 6.75% (total 12%) and 'other' activities, 'constructing': 8% and 'off task': 23% (total 31%) occupied the remaining 43% of the total time spent group composing. This is an interesting finding because it reveals that only 57% of this time specifically allocated to group composition was actually spent in 'collective' activities.

The composition developed over the course of four rehearsals and percentage time allocation across all four sessions makes it possible to trace changes in the distribution of the group composition activities across the sessions (see Table 2). This demonstrates that verbal communication increased from Rh1-4 as the song was developed and overall non-verbal communication fluctuated during the same period. Time allocated to non-verbal communication revealed interesting trends for 'playing' and 'experimenting'. 'Playing' increased from Rh1-3 and 'experimenting' decreased over the same period suggesting changes in approaches to group composition between early and later stages of the composition process. Based on this percentage time distribution of the group composition activities, we propose that during the group composition

of this song the rock band focussed initially on 'experimenting' individually and collectively in order to provide initial ideas. These initial ideas were then developed in later sessions employing increasing levels of verbal communication. Some support for researcher interpretation of the group composition process can be found in the participant dialogue.

The following is an extract of a conversation between two of the musicians and one of the researchers that took place during the setting up of equipment before the start of Rh3 and gives a participant perspective on their group composition process:

Paolo: *"We have created this thing, it came from an idea. We like it or we don't like it for the song but in any case we don't throw it away. The second time, we develop it: Matteo has taken the bass line. He says 'I reflected about this at home about what we have done in the rehearsal room and I was thinking about a certain type of atmosphere, a certain type of sound and I composed this bass line'. We have listened to it, we have tried it and we have developed it in some way. We must find something interesting to put over it. I didn't like it and so we tried a new development so we shift, add and cut. Then, I keep the recordings that we have done here, I listened to them, some parts convinced me some parts didn't convince me, I developed something. I add something that in my opinion feels good. We will do this today. It always happens more or less in this way. Now there are two things: they say its bad and we throw it away or they say it is interesting and we go forward with it. Other times the idea is born and developed together. But substantially the time available* [in the rehearsal room] *is short, the equipment ...many times the two things in combination; in the sense, first we develop an idea together then individually we elaborate it, we add, cut and then we return to work on the first idea but everyone adds what he has done at home."*

Matteo: *"Then if we wish to change something during the week we email. If we have an idea we record it in a MP3 file and we send it to the others. So at times it happens that we listen to the song at home, we like a short passage, we isolate it and we send it to the others. Perhaps, we take it, we*

develop it like a new song."

The above explanation reveals how the members of the rock band make decisions based on the group composition activities playing, listening, experimenting, communicating and constructing and adds further support to researcher interpretations of the group composition activities and composition process. Individual member's ideas are tried out, accepted, revised or rejected through a democratic process that involved all the members of the band. This finding supports the findings of a prior study (Burnard & Younker, 2008), which reported a similar democratic process that the researchers interpreted as *horizontal* division of labour.

I would have a brief summary here with the major point reached in this research. Like:

Summarising the results of this research, the following group composition activities emerged: 'playing', 'listening', 'experimenting', 'communicating', 'constructing' and 'off task'. Concerning the distribution during the four rehearsals:
- The experimentation activity decreased from the first till the last rehearsal.
- The 'Playing' activity consists of the performance of the linked ideas and increased from the first to the last rehearsal.
- The listening and communication were increasing during the four rehearsals: more staff to listen more staff to evaluate and to modify.
- The individual behaviour of making the loops engaged the participants especially at the beginning.

Some final remarks for future research. In order to focus on group composition processes, data analysis concentrated exclusively on the time the group spent composing together in the rehearsal room. This meant individual work, conducted in between rehearsals, and prior group improvisations did not form part of the current study. Although audio recordings of the initial improvisations at the prior rehearsal and performance were made and copies of the emails and attached MP3 files were collected, analysis of this data revealed little about the group composition process. Audio recordings did not provide an opportunity to observe communication between the musicians and the emails did not discuss composition process. Future research should record any prior group improvisations on videotape rather than audiotape as this could facilitate analysis of the communication employed during this phase of the group composition process. Also, data should

include information about what occurs when the musicians are working individually on ideas for the song at home because, as the current study reveals, these activities are important to the overall group composition process. In future studies, musicians could keep 'working diaries' when they work at home explaining what they did and why. In spite of these minor limitations, the current research does take a tentative first step in demonstrating and explaining group composition processes. It does this by interpreting group composition 'behaviours' in order to reveal group composition 'activities' that emerged through the inductive qualitative analysis of the videotaped data. The consideration of these group composition activities in relation to their percentage time distribution across the group composition sessions, provides some insight into the importance placed on those group composition activities by the members of the rock band during group composition.

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Fig. 1. Behaviour Codes

PL Wi (ind)	Playing with backing individually
PL Wi (coll)	Playing with backing collectively
PL Wo (ind)	Playing without backing individually
PL Wo (coll)	Playing without backing collectively
PL Lo (ind)	Playing the backing individually
PL Lo (coll)	Playing the backing collectively
LI (ind)	Listening individually
LI (coll)	Listening collectively
EXS	Experimenting with sounds (individual only)
EXI (ind)	Experimenting with ideas individually
EXI (coll)	Experimenting with ideas collectively
VC	Verbal communication
NVC	Non-verbal communication
CL	Constructing a 'loop'
CB	Constructing the 'backing track'
DT	Dealing with the technological problems
OT	'Off task'

(N.B. The codes: PL Lo (ind), PL Lo (coll) apply only to Paolo (the keyboard player) as he initiates and stops the 'loops' and 'backing tracks' on the computer. This applies also to CL & CB as he manipulates the computer while constructing 'loops' and the 'backing track'. Paolo is not coded for PL Wo (ind), or PL Wo (coll), except at the beginning of Rh1 before any 'loops' or 'backing tracks' have been constructed, because for him these behaviours are coded as PL Lo (ind), PL Lo (coll). Also, Paolo was found not to display any EXS behaviour. DT applies to dealing with technological problems. OT is mainly used to code time spent by Matteo and Marco chatting about topics, not related to the composing task, while Paolo is constructing 'loops' and the 'backing track'.)

Fig 2. Diagram of Phases of Analysis

1: Immersion

2: Categorisation

3: Phenomenological Reduction

'Units of
Analysis' (57)

'Behaviour Categories'
A-Q (17)

'Coding Scheme' (17 Behaviour codes)

'Themes' (6 Activities)

57 Discernibly different behaviours: 'Units of Analysis'.	17 Categories: containing 'Unit of Analysis' of similar meaning.	PL Wi (ind) playing with the loop individually PL Wi (coll) playing with the loop collectively PL Wo (ind) playing without the loop individually PL Wo (coll) playing without the loop collectively PL Lo (ind) playing the loop individually PL Lo (coll) playing the loop collectively

Playing

LI (ind) Listening individually
LI (coll) Listening collectively

Listening

EXS experimenting with sounds (individual only)
EXI (ind) experimenting with ideas (individually)
EXI (coll) experimenting with ideas (collectively)

Experimenting

Communicating

VC verbal communication
NVC non-verbal communication

CL creating a loop
CB creating a backing track

onstructing

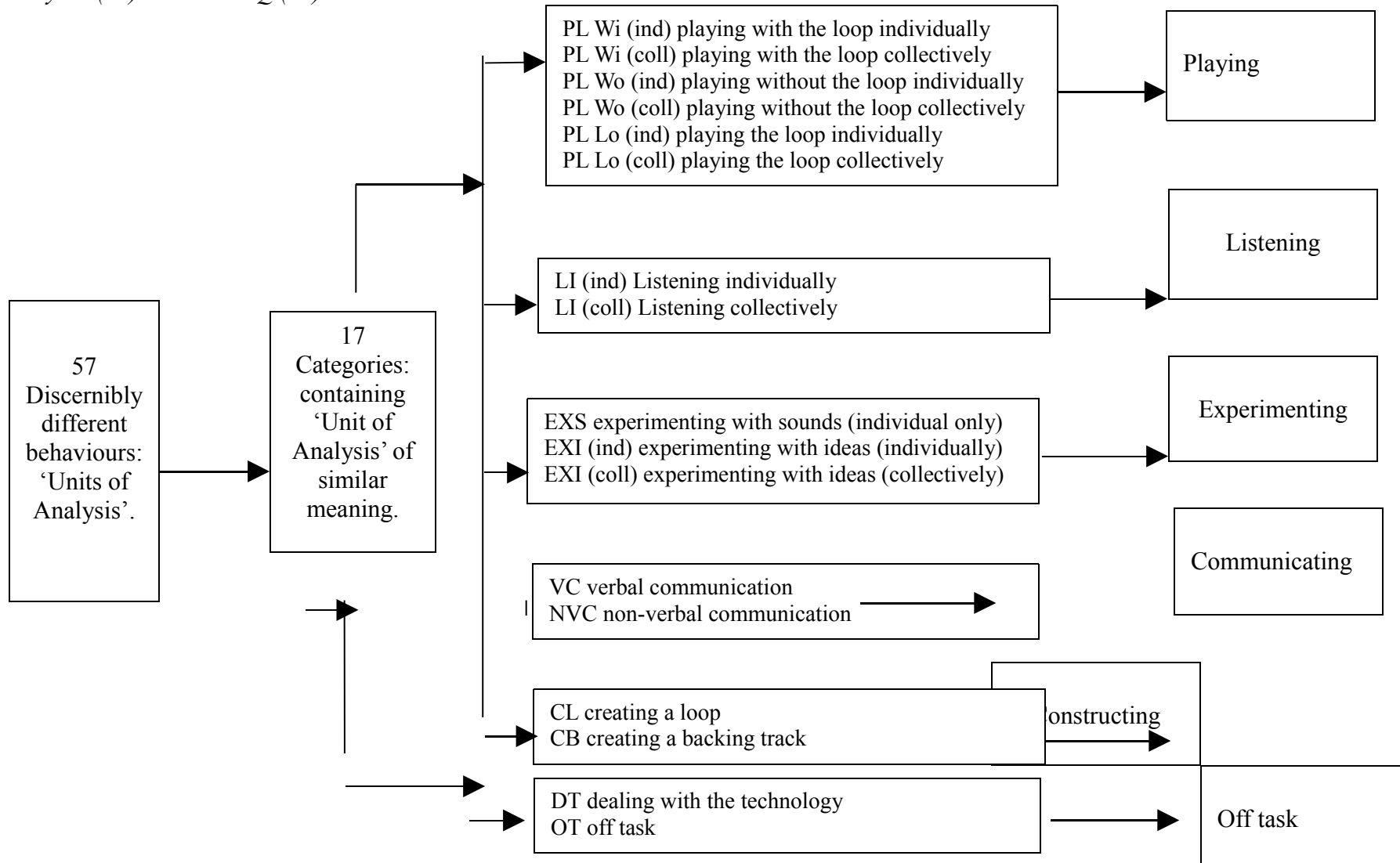DT dealing with the technology
OT off task

Off task

Fig. 3: Triangulation: Support for researcher interpretations of activity themes from the transcript of verbal communication that took place during the composition sessions.

Activity themes	Supporting quotation	Interpretation
Playing	MC: "We play with the tracks another time." MT: "No, no.. forget it. Try to put the backing track and I will try this over it.." PO: "Wait a minute… we will try something.. start playing the bass." MC: "It was interesting this time, this time with all the tracks together."	These quotations exemplify and support interpretations of 'playing' activities involving individual and collective playing with and without the loop/backing tracks.
Listening	PO: "At a certain point you have made an interesting turn on the guitar but you stopped it suddenly." MT: " We will try to listen to the loops without fixing on them and see if they were good ideas. We must find a convincing bass for the backing track."	These quotations exemplify and support interpretations of 'listening' activities both individual and collective.
Experimenting	PO: "We have created this thing, it came from an idea. We like it or we don't like it for the song but in any case we don't throw it away." MC: "I can try to re-enter with the previous sound…" MT: "Yes, yes good we need to find the end of the passage and the entry of the jazz part."	These quotations exemplify and support interpretations of 'experimenting' activities where musicians experiment either individually with sounds and ideas or collectively with ideas.
Communicating	PO: "So the first part is good." MT: "In the jazz part we need something like (Plays something)." MC: "in C right?"	These quotations exemplify and support interpretations of 'communicating' activities via verbal and non-verbal communication
Constructing	PO: "Yes this loop. This guitar?" MT: "This isolates this fragment of the riff…..." PO: "This can eventually be re-recorded…..Wait a minute and I will re-record it." PO: "Yes, yes then I would like to join all the	These quotations exemplify and support interpretations of 'constructing' activities where PO is constructing a loop or backing track.

	parts with the backing track, with the rhythm guitar, with the percussion…."	
Off-task	MT: "You must take the bass out of the amplifier…." PO: "But.. you must.. aren't you on 3?" MT: "Alternatively, I can turn it down." PO: "But wait……here it is." MT: "But I turn it off because it is buzzing badly…This out is not for computer but for headphones.." MT: "I have always dreamed of doing a 'Reeta' (Rita Pavone – an Italian singer and actress from the 60's) version of a Vasco (Italian male rock/pop singer from the 60's) song." MC: "What a citation!.."	These quotations exemplify and support interpretations of 'off-task' activities where the musicians deal with technological problems as they arise and MT & MC have conversations while they wait for PO to finish work on loops or backing tracks.

Table 1. Percentages (%) of time spent in each of the 17 coded behaviours in each of the four composition sessions (CS) and totals.

THEMES	CODES	CS1	CS2	CS3	CS4	Total
Playing	PL Wi (ind)	2	3	2	0	1.75

	PL Wi (coll)	13	9	22	20	16
	PL Wo (ind)	1	1	0	0	0.5
	PL Wo (coll)	0	1	0	0	0.25
	PL Lo (ind)	0	2	1	0	0.75
	PL Lo (coll)	6	5	13	10	8.5
Listening	LI (ind)	5	3	0	1	2.25
	LI (coll)	7	3	7	9	6.5
Experimenting	EXS	3	2	7	1	3.25
	EXI (ind)	11	1	1	1	3.5
	EXI (coll)	3	4	1	0	2
Communicating	VC	17	22	22	31	23
	NVC	1	1	1	0	0.75
Constructing	CL	6	3	1	1	2.75
	CB	5	7	4	5	5.25
Off task	DT	4	9	4	3	5
	OT	16	24	14	18	18

Table 2. Percentages (%) of time spent in each of the six activity themes in each of the four composition sessions (CS) and totals.

THEMES	CS1	CS2	CS3	CS4	Total
Playing	22	21	38	30	27.75
Listening	12	6	7	10	8.75
Experimenting	17	7	9	2	8.75
Communicating	18	23	23	31	23.75
Constructing	11	10	5	6	8
Off task	20	33	18	21	23