Musical looping of lexical chunks: An exploratory study

Kim Rockell

University of Aizu
kimusiknz@gmail.com

This paper reports on the experimental use of a recently developed musical looping app with a class of Japanese university students of English during 2014. Working in groups using shared hand-held devices, students created compositions based on lexical chunks or formulaic sequences selected freely from a fixed text. A scored example of one such group composition is included in the paper. During research, the author acted as instructor and a participant/ observer role afforded an intimate view of the educational process. Self-assessment questionnaires prior to and post working with Loopy indicate that students experienced increased confidence in their ability to produce spoken English over a three-month period. The affordances and constraints of using the musical app to learn English are examined and a significant increase in speech rate when reading from a fixed text is also noted.

Keywords: Formulaic sequences, lexical chunks, CALL, music, looping applications

Introduction

In the search for new and better ways to support language learning through technology, imagination and experimentation help to support continued progress. The recent development of an accessible looping application suggests a potential application to language learning of an app originally intended for music. In this project, the musical looping app, Loopy was trialled as a potential vehicle for incorporating music in CALL with third year Japanese university students enrolled in an advanced English acquisition elective course entitled Music and Language.

Regular Paper

While scientists continue to probe the music/language nexus (Arbib, 2013), a sub-stantial amount of evidence exists supporting the use of music as a valuable tool for second language acquisition (Ajibade & Ndububa, 2008; Butto, Holsworth, Morikawa, Wakabayashi, & Edelmen, 2014; Engh, 2013; Guglielmino, 1986; Hashim & Abd Rahman, 2010; Hidayat, 2013; Karsenti, 1996; Kristin Lems, 1996; Kristen Lems, 2001; Mashayekh & Hashemi, 2011; Medina, 1990; Mora, 2000; Rockell & Ocampo, 2014; Salcedo, 2010; Setia et al., 2012; Stansell). However, very few studies have examined music in a CALL context. Relevant work to date includes Pinkard's examination of the use of childhood songs in computer-based learning environments (Pinkard, 2001), Lems' on music-related topics in computer assignments (Kristin Lems, 2005), work in computational linguistics examining learning word meanings and descriptive parameter spaces from music (Whitman, Roy, & Vercoe, 2003) and a study of the influence of song repetition, likeability and understand-ability on EFL learner outcomes (Beasley & Chuang, 2008). Aside from these examples, little research has been conducted. Nevertheless, Computer Assisted Language Learning incorporating Music (CALLiM) is an interesting new area awaiting exploration, to which this paper makes a small contribution.

In a recent related study, the author determined that when working with texts musi-cally, careful treatment, such as extracting formulaic language or lexical chunks from the main body of song text, for reapplication to looped musical drills, is most beneficial. The ideas of American composer Steve Reich, who believed that technology such as the com-puter and sampler are already part of contemporary American folk music (Reich & Hillier, 2002, p. 159) also provided inspiration for this project. Reich's work had been stimulated by Janáček's interest in speech melody (Reich & Hillier, 2002, p. 6) and he used spoken language in musical works such as "The Cave" (1993), where "it was speaking English that dominated the rhythm and cadence of the speakers" (Reich & Hillier, 2002, p. 194). Reich believed that the "melody and meaning" of real speech sounds could be intensified through repetition and rhythm, and this process facilitated by tape looping (Reich & Hillier, 2002, p. 20).

Repetition, a feature that is fundamental to looping, is often associated with building memory, muscular conditioning, skill development, reflecting neural system's ability "to change in response to experience" (León-Carrión et al., 2010, p. 502). In the case of for-mulaic sequences, where chunks of language are thought to be stored in the memory as readily assessable units, repetitive training can enhance speakers' physiological capability to render these units of speech. The demonstrated effectiveness of working with formulaic sequences to help increase fluency also "has implications for English language programs in Japan and other EFL contexts"(Wood, 2007, p. 209). Repetition need not be tedious. By practicing with music, which by its very nature includes an element of repetition (Nettl, 1983, p. 45), the training process can be aestheticized and enlivened.[1]

Looping lexical chunks

The various word sequences such as idioms, collocations and sentence frames, which tend to be processed as single units, have been referred to as "formulaic language", "gambits" and "chunks" along with 51 other terms referring to generally similar phenomena (Hong, Yun, & Yuan, 2013; Lindstromberg & Boers, 2008; Wray, 2000). A "formulaic sequence" is defined as:

A sequence, continuous or discontinuous, of words or other meaning elements, which is, or appears to be, prefabricated: that is, stored and retrieved whole from memory at the time of use, rather than being subject to generation or analysis by the language of grammar (Wray, 2000, p. 465).

In the current paper, the terms "formulaic sequences" and "lexical chunks" are used interchangeably and can be understood to refer to the same phenomenon. Such sequences of words, which are retrieved as single lexical units (Pawley & Syder, 1983; Read & Nation, 2004; Schmitt, 2000; Weinert, 1995) have been recognized to promote greater fluency in speech production (Boers, Eyckmans, Kappel, Stengers, & Demecheleer, 2006; Jia-ying, 2006; Jie, 2001; Wan-hui, 2008). Concurrent with the discovery of Loopy, recognition of the continued importance of chunking also provided a strong motivation for the current work, which involves looping lexical chunks (LLC).

Method

As an exploratory pilot research project, this study seeks initially to examine ways in which the looping app, Loopy can be used effectively to help students improve their confidence and productive expertise in spoken English. While the benefits of enhanced confidence in promoting ongoing learning have been recognized (Tanaka & Ellis, 2003, p. 79), in the Japanese context, the kind of "extensive and routine exposure" to English that can really help students gain confidence and fluency in English is frequently lacking (Kubo, 2009, p. 36).

Group work, however, has been found to successfully promote confidence (Osboe, Fujimura, & Hirschel, 2007, p. 6). By helping students to develop social bonds through team building in group work, teachers can lower students' anxiety levels and help them reach towards greater levels of "self-perceived communicative competence", which in turn effects their overall L2 performance (Fushino, 2010, p. 718). In a study that bears some resemble to the current exploration of Loopy, Kubo's work on Pair taping was found to be effective, with open-ended questionnaire responses most frequently relating to "students' reported increase in ability to speak English for extended periods while enjoying a heightened sense of confidence"(Kubo, 2009, p. 63). Because confidence is a subjective, attitudinal experience it may be difficult to measure.

Displays of behaviour commonly associated with the idea of confidence may be misleading and only a way of masking a sense of a lack of confidence. Similarly, by adopting external physical behaviours associated with an emotional state it may be possible to engender the particular emotional state. Nevertheless, in this study stated self-perceptions of individual feelings about confidence in using English were recorded as part of a self-assessment questionnaire, administered during class time prior to and after working with the looping application. Students' experience as users of Loopy and engagement with the fixed text provided for use during the project were also probed. 40 minutes were given to complete the questionnaire, which combined sliding scale, multiple choice, yes/no and open-ended questions. Of the eight areas listed below, the first six (*a–f*) were examined in both pre and post-test, while a further two (*g, h*) were added in the post-test:

a. Perceived level of difficulty talking about sending an e-mail in English
b. Stated level of confidence in speaking English in general
c. Degree of interest in the topic "Sending an e-mail"
d. Feelings and general ideas and attitudes about the looping app, Loopy

237

e. Areas of the fixed text at a word and sentence level that students considered most difficult
f. Perception of the relative difficulty of speaking freely vs. reading from a fixed text
g. Perception of whether or not one had improved during the semester
h. Opinion as to whether any perceived improvement may be specifically due to working with Loopy

Areas *a–d* corresponded to four questions, which required students choose from one of eight options on a sliding scale ranging from positive extremes such as "very confident" to negative ones such "very un-confident". Feelings and general attitudes about Loopy were also probed further in an open-ended question.

Area e was in examined in two questions, which provided a copy of the fixed working text (see the following section) and asked students to identify areas of perceived difficulty. Area f, the perception of the relative difficulty of speaking freely vs. reading (see Figure 2), was examined using a multiple-choice question, while areas g and h were presented as yes/no questions.

The project endeavored to discover how this group of Japanese students felt about and responded to this kind of language learning activity and what kind of group compositions they would co-create. The question arises as to whether group composition projects are an effective way to use the Loopy app. One may also ask what the ramifications are of using a fixed text as a basis for such creative language projects. The study also seeks to discover if it is possible to demonstrate increased productive ability as a result of using Loopy, and if so, whether or not it is possible to pinpoint the main source of this improvement? While not the primary focus of this paper, an objective measure of change in productive ability, specifically the reading of a fixed text and free speech about this text topic was also sought. In the field of second language acquisition, such fluency is often measured in terms of speech rate (De Jong & Wempe, 2009; O'brien, Segalowitz, Freed, & Collentine, 2007; Riggenbach, 1991; Tanaka & Ellis, 2003).

Speakers were recorded reading individually from the fixed text about "Sending an e-mail" and freely describing the process of sending e-mail both before and after engaging in musical activity with Loopy. The data collected was analysed using Praat. As well as speech rate, pitch range was also examined. During the study, the researcher acted in the role of instructor and diary methods, linked to the participant/observer role in ethnomusicological studies assisted in documenting the study (Rockell, 2013, pp. 10-11).

Preparation of a fixed working text

While LLC could potentially be applied to an endless variety of texts and linguistic foci, in this initial study, a fixed text was chosen. This helped to reduce the complexity of the overall task design (which also involved practical music-making and learning to use a new app) and helped to facilitate pre and post tests in which students rendered the same language. It also made it possible to observe the different ways students treated the same text in their group compositions, since students were free to choose which vocabulary items or lexical chunks they would use during the creative group composition phase.

Regular, face-to face communication with students at the University of Aizu frequently required the use of practical language relating to computers and their use, such as the steps **238** involved in sending e-mail. Accordingly, such language seemed an appropriate and relevant

source of formulaic sequences for a fixed text. The fixed text (in the form of a reading script) was formed by assembling the following sequence of thirteen lexical chunks to create a working set of instructions that describe the process of sending e-mail.

1. Log on to my computer
2. Open my browser
3. Go to my Gmail account (Hotmail)
4. Log in to Gmail (Hotmail)
5. Click on "new e-mail"
6. Click on the "To" field
7. Type a recipient's e-mail address
8. Click on the "subject" field
9. Type the e-mail subject
10. Click in the large field
11. Type up my e-mail message
12. Click on send
13. Close the window

These chunks were drawn from terms appearing in the top ten hits from a search using Firefox for "how to send e-mail" based on frequency of appearance within individual sites and commonality across all sites. Although some researchers express concern that the relationship between the raw frequency of a word and its usefulness is not a direct one and is by itself not necessarily a sufficient condition for vocabulary selection, frequency seems a "self-evident" standard for judging a word's usefulness (Carter, 1987) and was applied in the current project. The selected target terminology was subsequently checked in three standard computer term dictionaries (Freedman, 1995; McCarthy, 1990, p. 66; McClain, 1994; McDaniel, 1994).

Finally, eight fluent English speakers were asked to freely describe how they send e-mail in recorded interviews. To a substantial degree, their responses were found to contain the same language as appears in the thirteen chunks from the Internet search, which supports the authenticity of the following reading script passage:

First I log on to my computer. Then I open my browser. Next, I go to my (Gmail /Hotmail etc.) account. I log in to my account and click on "new e-mail". Then I click on the "to" field. I type a recipient's e-mail address and click on the "subject" field. After that I click in the large field and type up my e-mail message. Finally, I click on "send" and close the window.

Loopy workflow in the classroom

This project took place over a three month period and pre and post-testing, including the online self-assessment questionnaire and recordings of both the fixed text reading script and free speech about the topic, were integrated into classroom work at the begin and end of the semester. Participants were all students in an advanced English acquisition elective called "Music and Language", which is available to third year students. From a class of 25 students, 18 were able to take part in both pre and post testing. Only two females were present within this predominately male group, the majority of whom were 20 years old. Students' compositions and effort during group work contributed to their overall grade **239**

and this provided a degree of external motivation for their musical activity. While all students were interested in music, only half claimed to have undergone some kind of previous musical training. Activity followed the workflow set out below:
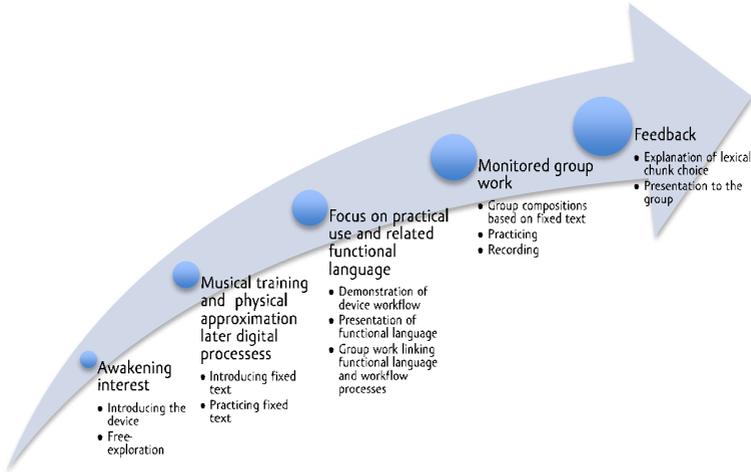
Focus on practical use and related functional language
- Demonstration of device workflow
- Presentation of functional language
- Group work linking functional language and workflow processes

Monitored group work
- Group compositions based on fixed text
- Practicing
- Recording

Feedback
- Explanation of lexical chunk choice
- Presentation to the group

Musical training and physical approximation later digital processess
- Introducing fixed text
- Practicing fixed text

Awakening interest
- Introducing the device
- Free-exploration

Figure 1. Loopy workflow in the classroom

Awakening interest

Initially, an attempt was made to awaken students' interest in the app by passing a single iPad around for small groups of students to explore freely during class time. Later, Loopy HD was used on several iPad Air 2s. The development of the Loopy app began in 2008 by Michael Tyson, an Australian designer who documents his development process through video logs and interacts with users on product-related websites. The app follows on from programs such as Ableton's Live, Apple 's Soundtrack, Propellerhead's ReCycle and Sony's ACID, which since the turn of the century have provided musicians with useful and inspiring tools for working with looped material (Freedman, 1995; McClain, 1994; McDaniel, 1994). Usually reticent when speaking English, in contrast, students appeared confident at approaching a new activity that involved technology. They also seemed highly intuitive when manipulating the app, finding their way without deliberate reference to the textual cues and English help menu explanations. When there was recognition of a shared understanding of how the app functioned, participants used simultaneous *aizuchi* (Japanese vocalized interjections), in particular, back channel grunts (Ward, 1998). Introducing Loopy in this way and explaining that the app would be used for their next group project prompted an enthusiastic reaction from the class.

Musical training and physical approximation of later digital processes

After initial exposure to Loopy as a teaser in order to awaken interest, students were introduced to the "sending an e-mail" text. Initial contact with the text occurred during individual pre-test recordings using a Zoom H2, in which students were asked to read aloud from the written text after being given three minutes to prepare. Prior to this, during the same session, students were also recorded describing how they send an e-mail freely using their own words. They also completed the online questionnaire. During the subsequent four sessions, the fixed text was practised as a class and the role of the instructor, who is musically trained, in leading musical language activities was important.

From the "sending an e-mail" text, the chunks "log on to the" and "click on the" were sung as loops as seen in the examples below:

Log on to the log on to the

Click on the click on the

Usually, during class time, students are seated at their individual computer workstations, partially obscured from the instructor's line of sight behind large computer monitors. During this phase, however, students were asked to move towards the front of the classroom, facing the instructor, and stand in a choral formation. Once looping was in process and students appeared confident in producing the chunks, the class was divided into two groups, which harmonized the passage in thirds as, shown below:

Log on to the log on to the log on to the
Log on to the log on to the

When the same melodic material is looped in this way, it resembles the form in western music that is most intimately associated with the circular; canon, a musical device began in the thirteenth century and has engaged composers and performers up to the present time (Starr & Starr, p. 7). The best known type of canon is the "round", in which the same melody is sung repeatedly by several voices that enter and exit "in succession at regularly-spaced intervals" (Reich & Hillier, 2002, p. 139). From the standpoint of the participants, rounds can be sung in many difference performance situations and are often "one of the most fun and satisfying experiences" for singers of all ages (Lavender, 2012, p. 5). Students participated

without hesitation during this phase of activity, marching on the spot and swinging their arms while they sang when encouraged to do so by the instructor.

Following this, students were asked to form a large circle, within which there were several loose sub-groups of around 3–6 students. Positioned in the centre, the instructor slowly and continuously rotated, addressing each sub-group in turn. The aim was to form a "real-human" loop and help students experience bodily and internalize what they would be doing with the Loopy on the device later on. Working through the list of thirteen lexical chunks one at a time, students were taught how to work with the text musically. Stages involved:

- Reading sections of the text and creating/clapping rhythms
- Speaking the above text aloud while simultaneously clapping the rhythm
- Singing these text rhythms at various fixed monotone pitches and building up a variety of 7th chords
- Expanding these fixed monotone pitches into simple melodies with several separate pitches

Although this activity was highly dependent on the instructor's guidance, individual students were also asked to stand in for the instructor and take over the role of central, rotating conductor. This was in order to prepare them for proactive roles later within their own groups. It was also made clear to students that they would be using these same lexical chunks when it came time for them to create their interactive group compositions.

Focus on practical use and related functional language

In the fifth session, a demonstration of device workflow was given and the functional language relating to each stage or recording with Loopy was presented. The link between functional language and related workflow processes was clearly demonstrated and the language practiced in pairs or small groups. To achieve this, Loopy tutorial material/instructions were collated in one file and projected to students via an overhead projector. The material was explained, and an actual device was displayed via the overhead projector to emphasise each stage.

Students were shown that when using Loopy, it possible to record up to six separate basic tracks and then play them pack simultaneously. They were introduced to Loopy panel's main controls, which include metronome (tempo click track), loop length control, transport and tempo or meter control. It was emphasized that the metronome function is particularly helpful in assisting students to produce stressed-timed accents in spoken English. The functional language was then chanted and sung as a class in a similar manner to the "sending an e-mail" text described in the preceding section. Finally, students in groups practiced operating Loopy in response to sequential instructions given in English by group members. It was intended that providing the specific language tools for frequently repeated stages in the Loopy recording process might lessen the prevalence of L1 use or reliance on *aizuchi* and back channel grunts as a main verbal mode during group work.

Monitored group work and feedback phase

In the next phase, students were set the task of creating a looped composition using language from the "sending an e-mail" text and they met weekly over the remaining seven **242** weeks to work on their group projects. Due to budgetary constraints, only three devices

were available for use during class. These were identified by the color of their cases along with either the number 1 or 2 (Blue 1, Blue 2 etc.), which made it possible for six small groups to share the devices during class time. Students were free to form their groups on any basis but proximity to one's habitual class time seating position tended to guide member selection. The student comment: "With Loopy you can take part in chorus and ensemble with friends and classmates" draws attention to the link between frequent physical proximity and relationship formation, something fostered by musical ensemble participation (Blandford & Duarte, 2004; Parker, 2010; Turino, 2008).

In terms of compositional structure, the only restriction in place was that students were required to work with chunks from the "sending an e-mail" text. The anonymous round "O How Sweet is Our Singing" (Preve, 2004, pp. viii, ix) was also provided as a basic melodic model or point of departure for those students wishing for more prescriptive melodic model and musical instructions.

When choosing chunks from the text for their compositions, students avoided multisyllabic words, such as "recipients" and appeared to favour short segments or text and even single words. Throughout this group composition period, the instructor monitored activity, provided musical guidance, and encouraged the use of functional language in place of L1 when students spoke about processes related to the device and app, either amongst themselves or in dialog with the instructor.

One difficulty that arose was that of having to deal with extraneous noise when working with sonic material in a shared space in close proximity to other groups. Working with headphones helped somewhat, but this meant that not all members of a group could listen to their combined musical texture during the recording process.

An example of a student composition project by the group named "Red Two Team" scored in standard western notation appears overleaf, with students' lexical chunk choices appearing as lyrics below each musical line. The following provides a brief musical analysis, which may be of less interest to readers without specific musical knowledge.

Red Two Team's project is more like a canon than a round. Students applied melodic contours drawn from the sample round "O How Sweet is Our Singing". For example, tenor two's melody is drawn from bars three and four and bass one's rising melody is drawn from the first three notes of the round. Although the tenor one melody could be viewed as a retrograde of bar one, it, and the bass two parts are original student contributions. Bar one also shows effective balance and division of sub-units of rhythm between the parts. An interesting harmonic coloration is provided by the D flat in the bass two part, which forms an augmented fourth or tri-tone with the G in the tenor one part. It should be noted that this texture was created aurally/orally and the notation is a retrospective model of the students' work. From the set text, the chunks "then I open my _____" and "I click on _____" were used. It is interesting that, although students were working from a written text, which was practised repeatedly as a group, a folk process transformed some of the lyric content. For example, "check on", which may be a substitute for "click on" in the bass part appears nowhere in the original "sending an e-mail" text. Tenor one's "I close on the **243**

How I Send E-mail

Red Two Team
Red Two Team

window" is also an unusual deviation. Since students were regularly monitored while they worked on their projects it was surprising that these textural changes were able to occur.

In the final session students were asked to introduce their group compositions to the class and explain which lexical chunks from the original text were used. They also completed post-test questionnaires and post-test recordings of the "sending an e-mail" text and free description, the results of which are presented in the following section.

Results

Post-test questionnaire responses by students showed them to be unanimous in claiming that their English had improved over the course of the project, and the majority believed that working with Loopy was responsible for helping them make this change. This written feedback also found Loopy practice characterized as "fun" and "interesting". In particular, however, students recognized that Loopy encouraged them to "consider the feeling of rhythms in English sentences" and helped them to improve aspects of pronunciation that are challenging for Japanese students of English, such as producing /r/ and /l/ sounds distinctly (Bradlow, Pisoni, Akahane-Yamada, & Tohkura, 1997; Goto, 1971; Sheldon & Strange, 1982). One student believed that Loopy could help to counteract aspects of Japanese social dynamics that are not totally conducive to spoken language practice, commenting:

> Learning English with Loopy is a good method. Because Japanese people don't tend to speak up when in large groups, it is easy to imagine a "silent" classroom. To avoid this, it is better to allow several groups to use the Loopy app at the same time. Once one group starts speaking, the others will follow suit.

The results of pre and post-tests confirmed that changes in students' attitudes and stated sense of self-confidence had taken place during the project. These tests indicated that participants felt more confident about speaking English generally and considered that talking about sending e-mail was easier after working with Loopy. Enthusiasm for the topic remained almost the same, although one student claimed to have lost interest, perhaps as a result of over-exposure. One interesting change, highlighted by these tests was the increase in the number of students who reported feeling more confident speaking freely about the topic, as opposed to reading from a fixed text, after working with Loopy. When doing so, they drew upon the specific terminology and lexical chunks that they practiced during the course of the project.

Students also expressed a number of problems and dissatisfactions during this project. Despite having displayed an intuitive confidence when initially exploring the app, and being given opportunities to practice and role-play basic operating procedures in combination with functional language, a number of students felt that the app was too difficult to use and wanted more specific guidance on its use. Variations in musical ability between individual students also meant that while some students were not satisfied working with a fixed tonic and wanted challenges such as transposing or changing key, others wanted more melodic guidance and did not feel comfortable having to create their own melodies. In both cases the instructor's support was invaluable, which serves to emphasize the significance of musical ability on the part of an instructor when attempting to replicate this kind of project.

The desire of some groups for more time to work with the device outside of the constraints of fixed classroom hours was unavoidable and arose as a result of limited resources. Others considered working with a single fixed text, such as "sending an e-mail" was limited **245**
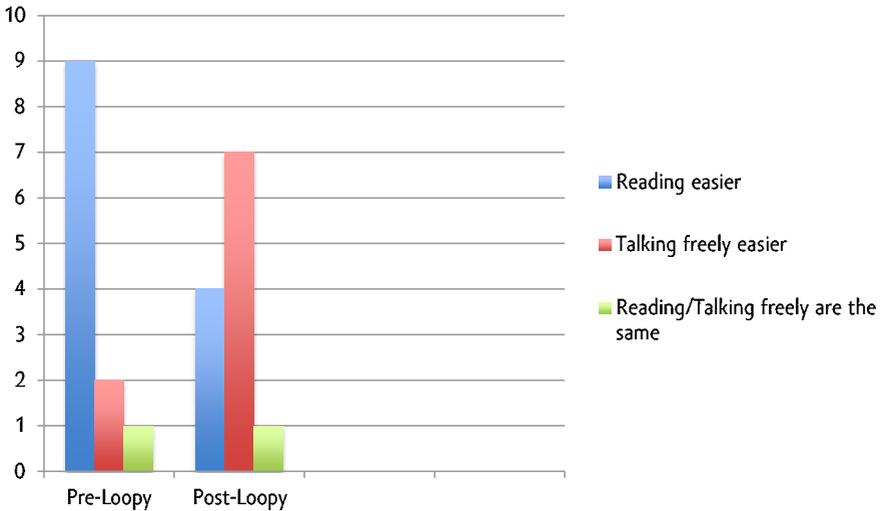
Figure 2. Feelings about the relative difficulty of reading from a text versus speaking freely

Table 1: Pre and Post speech-rate results

	Speech-rate Free speech		**Speech-rate Read speech**	
P value and statistical significance	The two-tailed P value equals 0.0443 Considered statistically significant		The two-tailed P value is less than 0.0001 Considered to be extremely statistically significant	
Confidence interval	Mean of Group One minus Group Two equals −10.506 95% confidence interval of this difference: From −20.707 to −0.305		The mean of Group One minus Group Two equals −33.371 95% confidence interval of this difference: From −42.557 to −24.185	
Intermediate values used in calculations	t = 2.1833 df = 16 Standard error of difference = 4.812		t = 7.7011 df = 16 Standard error of difference = 4.333	
Mean	33.682	44.188	97.492	130.800
SD	19.147	20.964	17.078	27.058
SEM	4.644	5.084	4.142	6.563
N	17	17	17	17

and wanted to work with more and various kinds of texts. In some cases, dissatisfaction pointed to a wish to resist the kind of socialization that was being deliberately fostered by the project. Some students claimed that they would prefer to use app one their own rather than in a group, wishing for the isolation of an individual desktop workstation rather than the intimacy of a shared hand-held device.

In addition to students' positive subjective experience of Loopy, a significant increase in speech rate in words per minute for both the Read (fixed text) and Free (describing the

topic freely) speech was observed on applying paired- t tests to data from Praat. The absence of a non-Loopy control group during this pilot study, however, reduce the immediate significance of this finding, a limitation of the study that will be addressed in future work. It is also possible that students' performance was positively affected by exposure to English external to working with Loopy. However, only speech related to the particular fixed-text "sending an e-mail", which was practiced continuously throughout the Loopy project, is being considered, so it is highly possible that Loopy practice helped to increase speech rate of spoken production of this specific sample of fixed text.

Listening to an arbitrary selection of samples gave the sense that more defined intonation curvatures were being applied to certain discrete segments of speech post-Loopy, but these where not analysed with a script during the current study. More interesting, however, was the finding that in addition to increased speech rate, pitch range was actually found to be smaller in the post-Loopy data, with a significant difference for Read-speech and Free speech not quite reaching significance. This suggests that an "improvement in speed can also have a detrimental effect on one's expressiveness in a second language."[2] Certainly, more extensive testing of a more extensive range of speech samples within a carefully crafted research design will be necessary to back up claims regarding the efficacy of Loopy.

Table 2: Pre and Post pitch range results

	Pitch-range Free speech		Pitch-range Read speech	
P value and statistical significance	The two-tailed P value equals 0.0649 Difference is considered not-quite statistically significant		The two-tailed P value equals 0.0405 This difference is considered to be statistically significant	
Confidence interval	The mean of Group One minus Group Two equals 26.40 95% confidence interval of this difference: From –1.87 to 54.67		The mean of Group One minus Group Two equals 20.76 95% confidence interval of this difference: From 1.02 to 40.51	
Intermediate values used in calculations	t = 2.0031 df = 14 Standard error of difference = 13.179		t = 2.2294 df = 16 Standard effort of difference = 9.314	
Mean	74.40	48.00	71.24	50.47
SD	45.36	39.79	23.25	33.11
SEM	11.71	10.27	5.64	8.03
N	15	15	17	17

Discussion

In this study both the CALL component, and group creation of compositions based on lexical chunks were original features, distinguishing it from previous research. In general, however, the results tend to affirm what has been stated in the literature on music and language learning. For example, the positive impact on the affective dimension of classroom activity, as occurred with Loopy, including a sense of enjoyment and increased confidence has been a commonly reported finding (Butto et al., 2014, p. 52; Guglielmino, 1986, p. 1). A reduction of the tension that can inhibit communicative activity, which in this case helped to avoid a "silent classroom", has also be reported by a number of authors as resulting **247**

from musical activity in the language classroom (Ajibade & Ndububa, 2008, p. 31; Hashim & Abd Rahman, 2010, p. 1; Mashayekh & Hashemi, 2011, pp. 2189–2190; Mora, 2000, p. 152).

Increased sociability, engagement and participation have also been claimed to result from learning language though music (Butto et al., 2014, p. 52; Engh, 2013, p. 21). In the current study, however, where participants' musical activity was deliberately mediated though a shared device, in an attempt to encourage communicative interaction, differences between personalities, and varying patterns of musical ability emerged as a challenge to some students and they negotiated the sharing of classroom resources. Issues, such as individual musicality on the part of either students or teachers, do not appear to have been emphasized in the literature, perhaps because, in general, authors themselves tend to be advocates for the use of music in the language classroom. That these concerns should arise within the current results, albeit to a small degree, suggests that they should be borne in mind, as was cautioned in another recent study on musicians in the language classroom (Rockell & Ocampo, 2014, p. 46).

Studies of music and language learning to date have also tended to emphasize the amelioration of pronunciation and enhance awareness of prosodic features of language such a rhythm, stress and intonation (Ajibade & Ndububa, 2008, p. 32; Butto et al., 2014, p. 50; Mora, 2000, p. 152). On this point, according to Lems, "Songs contextually introduce the features of supra-segmentals (how rhythm, stress and intonation affect the pronunciation of English in context" (Kristen Lems, 2001, p. 1). In general, the recognition of improvements in pronunciation as a result of group work with Loopy is in alignment with these claims. However, as indicated in the previous section, a much more sophisticated research instrument would be necessary in order to explore changes in pronunciation with more depth than that of this exploratory study.

Another theme in the literature, which is relevant to the current study, is the idea of music and enhanced vocabulary recall (Hashim & Abd Rahman, 2010, p. 4; Medina, 1990, p. 18; Mora, 2000, p. 152; Salcedo, 2010, p. 19). In the Loopy project, students succeeded in imbedding lexical chunks as a result of their looped singing and producing them with confidence in free speech at the end of the study, a positive result, which like the others mentioned above, is in keeping with research to date on music and language learning.

Unlike such studies, however, this project examines the incorporation of music in CALL specifically. Consequently, it is important to consider how the technological component, in this case a looping app on handheld devices, impacted on classroom activity and what affordances and constraints can be identified.

In traditional pedagogic settings involving music, the dynamic between teacher and students tends to be strongly focussed on the teacher, who embodies or presents musical material to the class. When an app like Loopy is used in groups, however, the locus of musical activity becomes centred on the group's device and app and the teacher adopts more of a support role, monitoring unobtrusively. On the one hand, this reduces the degree to which musical activity can be conducted or modelled. On the other hand, the device itself provides strong musical support in terms of pitch and rhythm. The built in metronome encourages a strong sense of metre and the looping of melodic material emphasizes pitch for students in a way not possible with a single instructor leading musical activity. Constructing musical textures step by step, asynchronously, an approach afforded by this app, is also less demanding musically than real time ensemble performance. In this sense the app makes language study through music more accessible to a wider range of students, and lessens the extent

to which individual musicality impacts the pedagogic process. Difficulties that arose with

regard to access to the devices outside class time were more a result of resource constraints rather than pedagogical process, but may have also influenced the result of this project.

Working with a shared device also introduced another level of language beyond the target lexical chunks, in this case functional language related to the use of the app. As pointed out, this language was taught, but its use resisted by some participants, who tended instead to use back channel grunts in combination with gestures to refer to the device and its use. Nevertheless, additional teaching of functional language emerged as a positive opportunity afforded by this and similar kinds of group work projects.

Conclusion

It is clear that the participants in this project considered learning English using the musical Looping app, Loopy, a highly engaging activity. From the students' subjective perspective, increased confidence was reported by a quarter of participants and students were almost unanimous in claiming that this method of study had helped to improve their ability to produce spoken English. The intrinsic appeal of language study incorporating music using this app affirm that in terms of engaging attention, the app has great potential.

The positive results from working with shared devices affirm the value that Osboe et al. place on group work. However, while shared hand-held devices promote an intensified locus of pre-existing proximity-based intimacy, resisted by some, they still do not ensure that English is spoken, beyond the specific lexical chunks chosen for singing or chanting. This was highlighted in the current project by the prevalence of back channel grunts and other *aizuchi*. However, that fact that students were able to call upon the chunks they had practiced and recombine them with greater fluency when freely describing the process of sending an e-mail during the post-tests was a positive result, pointing to the efficacy of looping as part of language learning practice.

In terms of student's creative choices, the study drew cautionary attention to the idea that when creative work is co-opted for education purposes, the balance between freedom and control must be carefully maintained. The ramifications of using a fixed text are a case in point. It was the observed tendency for students to avoid difficulty and choose lexical chunks that are less challenging to produce. When teaching with Loopy in the future, rather than allowing students to select freely from a fixed text, it may be more effective if the text itself is freely chosen, but for the instructor to be prescriptive about what elements of the text are practiced.

Adopting the role of instructor provided intimate access and provoked numerous insights, however, it became evident that the specifically musical demands of this role reduce the potential for reliability in similar projects, unless the researcher is similarly qualified. While it is not possible to claim university applicability, an improvement in productive ability when talking about sending an e-mail was demonstrated in the students who participated in this study. The main source of this improvement, however, was not clearly identified. It may have be due variously to musical activity, repetition, or affective drivers such as enthusiasm and "fun", or all of these factors in dynamic balance. In general, the introduction of a technological component to language learning through music made music-making more accessible to a wider range of students, created a more student-centred classroom dynamic and afforded more opportunities for incorporating a wider range of meaningful language into classroom activity.

Finally, the strongest conclusion that can be made about Loopy in the language **249**

classroom speaks in support of the power of the digital arts, in this case musical composition, to motivate and inspire students in educational endeavour, and support them in their linguistic development though CALL.

Notes

1. John Brine, conversation with the author. March 3rd, 2015.
2. Ian Wilson, personal correspondence. April 1st, 2015.

References

Ajibade, Y., & Ndububa, K. (2008). Effects of word games, culturally relevant songs, and stories on students' motivation in a Nigerian English language class. *TESL Canada Journal, 26*(1), 27–48.

Arbib, M. A. (Ed.) (2013). *Language, music, and the brain: A mysterious relationship*: MIT Press.

Beasley, R. E., & Chuang, Y. (2008). Web-Based music study: The effects of listening repetition, song likeability, and song understandability on EFL learning perceptions and outcomes. *TESL-EJ, 12*(2), 2.

Blandford, S., & Duarte, S. (2004). Inclusion in the community: a study of community music centres in England and Portugal, focusing on the development of musical and social skills within each centre. *Westminster Studies in Education, 27*(1), 7–25.

Boers, F., Eyckmans, J., Kappel, J., Stengers, H., & Demecheleer, M. (2006). Formulaic sequences and perceived oral proficiency: Putting a lexical approach to the test. *Language Teaching Research, 10*(3), 245–261.

Bradlow, A. R., Pisoni, D. B., Akahane-Yamada, R., & Tohkura, Y. I. (1997). Training Japanese listeners to identify English/r/and/l/: IV. Some effects of perceptual learning on speech production. *The Journal of the Acoustical Society of America, 101*(4), 2299–2310.

Butto, L. I., Holsworth, M., Morikawa, F., Wakabayashi, S., & Edelmen, C. (2014). Music: A motivator for underachieving EFL students? A preliminary study using karaoke. *The Journal of the College of Foreign Languages Himeji Dokkyo University, 27*, 49–54.

Carter, R. (1987). *Vocabulary: Applied linguistic perspectives*. London and New York: Routledge.

De Jong, N. H., & Wempe, T. (2009). Praat script to detect syllable nuclei and measure speech rate automatically. *Behavior Research Methods, 41*(2), 385–390.

Engh, D. (2013). Why use music in English language learning? A survey of the literature. *English Language Teaching, 6*(2).

Freedman, A. (Ed.) (1995) *The computer glossary* (7th ed.). The Computer Language Company.

Fushino, K. (2010). Causal relationships between communication confidence, beliefs about group work, and willingness to communicate in foreign language group work. *Tesol Quarterly, 44*(4), 700–724.

Goto, H. (1971). Auditory perception by normal Japanese adults of the sounds "L" and "R". *Neuropsychologia, 9*(3), 317–323.

Guglielmino, L. M. (1986). The affective edge: Using songs and music in ESL instruction. *Adult Literacy and Basic Education, 10*(1), 19–26.

Hashim, A., & Abd Rahman, S. (2010). *Using Songs To Reinforce The Learning Of Subject-Verb Agreement*. University Teknologi Malaysia, Malaysia, 1–5.

Hidayat, A. (2013). The use of songs in teaching students' listening ability. *Journal of English and Education, 1*(1), 21–29.

Hong, M., Yun, C. Z., & Yuan, P. Z. (2013). A case study of collaborative action research: lexical chunk theory and its implication on reading performance. *International Conference on Applied Social Science Research*, 33–36.

Jia-ying, L. (2006). Lexical chunks and college English teaching [J]. *Shandong Foreign Language Teaching Journal, 4*, 88–90.

Jie, L. (2001). The role of lexical phrases in second language acquisition [J]. *Foreign Language World, 4*, 29–34.

Karsenti, T. P. (1996). Bringing songs to the second-language classroom. *American Speech, 67*, 339–366.

Kubo, M. (2009). Extensive pair taping for college students in Japan: Action research in confidence and fluency building. *Accents Asia, 3*(1), 36–68.

Lavender, C. (2012). *Round the world teaching harmony with multicultural rounds and canons*. Milwaukee, WI: Hal Leonard.

Lems, K. (1996). For a song: Music across the ESL curriculum. In *Annual Meeting of TESOL*, San Francisco, CA, 2–18.

Lems, K. (2001). *Using music in the adult ESL classroom*: National Clearinghouse for ESL Literacy Education.

Lems, K. (2005). Music works: Music for adult English language learners. *New Directions for Adult and Continuing Education, 2005*(107), 13–21.

León-Carrión, J., Izzetoglu, M., Izzetoglu, K., Martín-Rodríguez, J. F., Damas-López, J., & Domínguez-Morales, M. R. (2010). Efficient learning produces spontaneous neural repetition suppression in prefrontal cortex. *Behavioural Brain Research, 208*(2), 502–508.

Lindstromberg, S., & Boers, F. (2008). The mnemonic effect of noticing alliteration in lexical chunks. *Applied Linguistics, 29*(2), 200–222. Retrieved from http://applij.oxfordjournals.org/content/29/2/200.full

Mashayekh, M., & Hashemi, M. (2011). The impact/s of music on language learners' performance. *Procedia-Social and Behavioral Sciences, 30*, 2186–2190.

McCarthy, M. (1990). *Vocabulary*: Oxford University Press.

McClain, G. (Ed.) (1994). *21st Century dictionary of computer terms*. New York: Dell.

McDaniel, G. (Ed.) (1994). IBM *dictionary of computing*. New York: McGraw-Hill.

Medina, S. L. (1990). *The effects of music upon second language vocabulary acquisition*. Paper presented at Annual Meeting of TESOL, San Francisco, CA, 1990.

Mora, C. F. (2000). Foreign language acquisition and melody singing. *ELT Journal, 54*(2), 146–152.

Nettl, B. (1983). *The study of ethnomusicology: Thirty-one issues and concepts*. Urbana and Chigago: University of Illinois Press.

O'Brien, I., Segalowitz, N., Freed, B., & Collentine, J. (2007). Phonological memory predicts second language oral fluency gains in adults. *Studies in Second Language Acquisition, 29*(04), 557–581.

Osboe, S., Fujimura, T., & Hirschel, R. (2007). *Students confidence and anxiety in L2 speaking activities.* Paper presented at the Independent Learning Association 2007 Japan Conference: Exploring theory, enhancing practice: Autonomy across the disciplines, Kanda University of International Studies, Chiba, Japan.

Parker, E. C. (2010). Exploring student experiences of belonging within an urban high school choral ensemble: an action research study. *Music Education Research, 12*(4), 339–352.

Pawley, A., & Syder, F. H. (1983). Two puzzles for linguistic theory: Nativeline selection and nativelike fluency. In J. C. Richards & R. W. Schmidt (Eds.), *Language and communication* (pp. 191–226). New York: Longman.

Pinkard, N. (2001). Rappin'reader and say say oh playmate: Using children's childhood songs as literacy scaffolds in computer-based learning environments. *Journal of Educational Computing Research, 25*(1), 17–34.

Preve, F. (2004). *Power tools for garage band: Creating music with audio recording, MIDI sequencing, and loops*: Hal Leonard Corporation.

Read, J., & Nation, P. (2004). Measurement of formulaic sequences. In N. Schmitt (Ed.), *Formulaic sequences: acquisition, processing, and use* (pp. 23–35). Amsterdam: John Benjamins.

Reich, S., & Hillier, P. (2002). *Writings on music, 1965–2000*: Oxford University Press.

Riggenbach, H. (1991). Toward an understanding of fluency: A microanalysis of nonnative speaker conversations. *Discourse Processes, 14*(4), 423–441.

Rockell, K. (2013). The Philippine rondalla: A gift of musical heritage in a migrant context. *International Journal of Asia Pacific Studies, 9*(1), 97–120.

Rockell, K., & Ocampo, M. (2014). Musicians in the language classroom: The transference of musical skills to teach "speech mode of communication". *ELTED, 16*(Spring), 34–37.

Salcedo, C. S. (2010). The effects of songs in the foreign language classroom on text recall, delayed text recall and involuntary mental rehearsal. *Journal of College Teaching & Learning (TLC), 7*(6).

Schmitt, N. (2000). Lexical chunks. *ELT journal, 54*(4), 400–401.

Setia, R., Rahim, R. A., Nair, G. K. S., Husin, N., Sabapathy, E., Mohamad, R., So'od, S. M. M., Yusoff, N. I. M., Razlan, R. M., Jalil, N. A. A. (2012). English songs as means of aiding students' proficiency development. *Asian Social Science, 8*(7), p270.

Sheldon, A., & Strange, W. (1982). The acquisition of /r/ and /l/ by Japanese learners of English: Evidence that speech production can precede speech perception. *Applied Psycholinguistics, 3*(03), 243–261.

Stansell, J. W. (2005). The use of music for learning languages: A review of the literature. *University of Illinois at Urbana-Champaign, M.Ed.*

Starr, C., & Starr, W. *Rounds and canons for reading, recreation and performance, piano ensemble, Vol 1: For piano ensemble, or with violin, viola and/or cello*: Alfred Music Publishing.

Tanaka, K., & Ellis, R. (2003). Study abroad, language proficiency, and learner beliefs about language learning. *JALT Journal, 25*(1), 63–85.

Turino, T. (2008). *Music as social life: The politics of participation*: University of Chicago Press.

Wan-hui, C. (2008). On the psychological reality of lexical chunks and their characteristics [J]. *Foreign Language Research, 6*, 017.

Ward, N. (1998). *The relationship between sound and meaning in Japanese back-channel grunts.* Paper presented at the Proceedings of the 4th Annual Meeting of the (Japanese) Association for Natural Language Processing.

Weinert, R. (1995). The role of formulaic language in second language acquisition: A review. *Applied Linguistics, 16*(2), 180–2015.

Whitman, B., Roy, D., & Vercoe, B. (2003). *Learning word meanings and descriptive parameter spaces from music.* Paper presented at the Proceedings of the HLT-NAACL 2003 workshop on Learning word meaning from non-linguistic data-Volume 6.

Wood, D. (2007). Mastering the English formula: Fluency development of Japanese learners in a study abroad context. *JALT Journal, 29*(2), 209.

Wray, A. (2000). Formulaic sequences in second language teaching: Principle and practice. *Applied Linguistics, 21*(4), 463–489.

Author biodata

Kim Rockell (PhD graduate of University of Canterbury) is presently an associate professor at Aizu University, Japan. He is an ethnomusicologist, classical guitarist and ESL educator.