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Testing the influence of the group for the memorisation of repertoire in Trinidad and Tobago steelbands

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ABSTRACT

Does the collective aspect of a performance influence the memory of music in steelbands? Is the fact to see the simultaneous synchronised movements of other players performing the same part helping the musician to recall correctly a melody? Forty four panists¹ were tested in a free recall task, in solitary and collective contexts.

Three group of three melodies of growing difficulty were composed and taught to the participants through a video.

The aim of the experiment was to test the hypothesis of a positive influence of the group on individual melodic recalls, with a comparison of the mistakes rate.

Keywords

Ethnomusicology, memory, performance, mimicry, free recall task.

INTRODUCTION

Most of the panists playing for the main steelband music competition in Trinidad and Tobago are seasonal non professional players, practicing their instrument only for

the carnival season, without any formal or theoretical background. They are able to learn and perform by rote a symphonic like tune at a very fast tempo, successfully facing both written and oral traditions constraints (no variation from the composition, no score sheet). Their ability to learn quickly a constantly renewed repertoire challenges the idea that exact recall isn't possible in oral traditions (Goody 1979, Sloboda 1988).

Fieldwork observations² carried on to understand their memory skills in an ethnomusicological research led to several hypotheses (Helmlinger 2005). One of them is the help of the group mimicry, suggested by several facts: Importance of the visual observation in the encoding phase, observation of performance strategies, explicit accounts of the players. In addition, the recent researches in neurobiology tend to reinforce the hypothesis that action can be facilitated by perception (Berthoz 1997, Rizzolatti & al. 2001). An experiment tried to explore this hypothesis.

METHOD

Participants

Three groups of tenor players – the highest-ranged and most standardized pan – were tested:

- 12 regular Trinidadian players: Expert players (professionals or semi-professionals), playing all over the year.
- 10 seasonal Trinidadian players, playing only for the carnival season.
- 12 regular French players, a few of them being professional, 3 of them being professional (but originally trained on another instrument), the others

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¹ Musicians of "pan" (or "steeldrum"), main instrument of steelbands, melodic idiophone made out of an oil drum.

² 17 months fieldwork was overall spent in Trinidad and Tobago by the author, including a whole year.

playing as non professional in associations. All generally play every week.

Trinidadian participants were paid 50 TT\$ (about 7 €) for their presence, and French panists participated on a volunteer basis.

Two assistants were hired to generate the collective context in Trinidad. Both of them were semi-professional tenor pan players, recognised for their musical qualities. In France, the collective context has been created by the engagement of a skilful pan jazz player, and the participation of the author³.

All participants were precisely informed of the aim of the procedure.

Material

Melodies

Nine melodies were composed by the author in the calypso music style: The melodies were played to 25 musicians and non musicians Trinidadians (not participating in the experience), who were asked to judge the local style of the material, and a few changes were brought.

Those melodies were dispatched into three smaller groups of growing standard of difficulty, according to two criteria:

- Number of notes: Level (1) = from 32 to 34 notes, level (2) = from 54 to 57 notes, level (3) = from 79 to 88 notes,
- Number of different chords in the chord progression: Level (1) 2 = I/V/I/V, level (2) 3 = I/II/V/I, level (3) 4 = III/II/V/I.

So each participant had to learn one of the three sets of melodies (A, B and C), with one key per set (respectively A, G and F), being exposed successively to three levels of melody (1, 2, 3). An example from each set:



Figure 1. Melody C1



Figure 2. Melody B2



Figure 3. Melody A3

Encoding Video

To reproduce a encoding method as close as possible to the Trinidadian learning process (watching a demonstration from another player), a video was made from a performance of the melodies played on a tenor pan by one of the assistants.

The camera recorder was placed above the performer, showing a close up still shot on the instrument, for the participant to be able to see the hands movements. Only one shot was taped for the level (1), showing the melody played at a speed of 85 ppm. Two shots were taped for the level (2), one at a speed of 75 ppm, another at a speed of 85 ppm. Two shots were also taped for the level (3), one at a speed of 60 ppm, another at a speed of 85 ppm.

An editing was made, showing first the whole melody, then short sequences, followed by a few seconds blank to allow the participants to try it on the instrument, and the whole melody again. A recapitulation of the last sequences was made every half of melody for the levels (1) and (2), every quarter of melody for the level (3), followed by a blank to allow practice. For the level (3), all sequences were repeated twice. The video was ended by the re-exposition to the whole melody, just once for the level (1), twice for

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³ The author is also a panist.

the levels (2) and (3): first at the slower speed, then at 85 ppm (the first exposure to the melody and the sequencing of the levels (2) and (3) had been made from the slower speed shot).

The total duration of the encoding video was about 5 minutes for the level (1), 10 minutes for the level (2), 20 minutes for the level (3).

Process

Apparatus

The melodies were composed using cubase, on PC. The files were transferred on a CD and played to the 25 Trinidadians to validate the style with a standard MIDI piano sound on a sound system.

The encoding video was made with NTSC camera recorder, edited with NTSC tape recorder on VHS, and played on a NTSC television.

All the instruments used were standard tenor pans⁴.

The performances of the participants were taped with a numeric camera recorder hanged above the participants, recording a close up still shot on the instrument that showed their movements. The tempo of the recall (85 ppm) was given by a beat box plugged on little speakers.

Procedure

The participants had to learn the level (1) melody, and recall it after about two minutes twice in three different contexts: solitary context (SOC), visible collective context (VICOC, in between the two assistants playing the same thing), and non visible collective context (NONVICOC, in between the two assistants playing the same thing but hidden by a curtain). Two participants per group recalled the melodies in each of the 6 different possible orders of contexts appearance.

Then the same process was then applied for the level (2) melody, and eventually, it was only performed for the level (3) by the two Trinidadians groups, since it was too difficult for the French one.

To sum up it had four independent variables:

- Effects 1: Group (Trinidadian regular, Trinidadian seasonal, French),
- Effect 2: Context (SOC, VICOC, NONVICOC),
- Effect 3: Melodic level (1, 2, 3),
- Effect 4: Position of recall (first, second).

RESULTS

Criteria

The comparison of the different variable were made with the error rate. This was facilitated by the fact that in Trinidadian culture, the panists must play exactly –without any variation– the notes and “phrasing” (rhythmic

placement) wanted by musical director. The error rate was established on two criteria:

- **Non Retrieval of Pitch (NRP).** Number of non retrieved pitches: Substitution of an expected pitch by another, or absence of an expected pitch. A correct retrieval of pitch was coded 0, and a mistake was coded 1. The rate was calculated in percentage of the total amount of notes in the reference melody.
- **Wrong Phrasing (WP).** Number of beats in the melody including one or several rhythmic mistakes: Anticipated stroke, late stroke, absence of expected stroke, added stroke, added beat⁵, or suppression of beat. A correct retrieval of phrasing was coded 0, and a mistake was coded 1. The rate was calculated in percentage of the total amount of beats in the reference melody.

When a stroke was not visible (sometime the head of the player was hiding the hand movement), the note (for NRP) and the beat (for WP) was suppressed of the percentage calculation for all the recalls of the same melody by the same participant).

Analysis

Only the WP will be presented here since the NRP results call for further investigations because of the difference of analysis criteria.

Average WP rate are presented in table 1.

Table 1. Average error rates

	Regular Trin	Seasonal Trin	French
Soc	20.4	39.0	55.9
Nonvicoc	14.7	26.6	36.6
Vicoc	12.8	23.5	31.1

ANOVA was performed for the melodic level (1) and (2) for all the groups of participants, and for the levels (1), (2) and (3) for the Trinidadians participants.

All Groups: Level (1) and (2)

There was a main effect of group, melodic level, and especially context ($F(2,62) = 20.95$; $p < .0000001$). Players have better recalls in collective context, especially French (Effects 1 and 2: $F(4,62) = 3.13$; $p < .02$). The improvement between the first and second recall is greater in the collective situation (Effects 2 and 4: $F(2,62) = 3.18$; $p < .05$).

Trinidadian Groups: Level (1), (2) and (3)

There was also a main effect of all variables, especially context ($F(2,40) = 21.71$; $p < .0000004$). Interaction of effects 1 and 3 ($F(2,40) = 3.3$; $p < .04$) show that seasonal players are more affected by the increase of melodic difficulty. All participants were more affected by the level of the melodies in solitary context (Effect 2 and 3 : $F(4,80) = 2.79$, $p < .03$). Interaction of effects 1, 2 and 3 : show that seasonal players were even more affected by the solitary

⁴ Forth and fifth high (D) tenor pan.

⁵ When a player stopped playing, a maximum of 4 added beats were counted.

context when the melody is more difficult ($F(4,80) = 3.18$, $p < .01$). All effects interaction show that the regular players have a significant improvement of performances in the second recall of VICOC, especially in the level (3) melodies (Effect 1, 2, 3 and 4: $F(4,80) = 3.04$, $p < .02$).

CONCLUSION

The results suggest that the recall of the rhythmic placement of a melody on a tenor pan is helped by the fact to play in unison with other tenor pan players (VICOC and NONVICOC). The corrective effect of the collective situation is more important in VICOC for the regular players, which shows that they have a better –or a quicker– use of visual informations.

Interestingly, the seasonal Trinidadian players are more affected by the context when the melody is more difficult. This is showing the importance of collective playing in the very technical music style of carnival steelband competition.

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