

# Score design for music reading: Cognitive and artistic perspectives

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The project will run from Jan 2023 to May 2026 at the Faculty of Music, University of Cambridge, and will include testing and fieldwork at the Royal College of Music in London and at the *Conservatoire royal de Bruxelles*.

The project is funded through a generous Research Project Grant by the Leverhulme Trust (UK). The Principal Investigator is Prof. I. Cross, with myself appointed as Senior Research Associate. The project also includes a Research Assistant, Dr D. Duncan, and a PhD student, Mrs K. Ness.

## The project as an expansion of ideas developed at the ULB

During my Wiener-Anspach postdoctoral fellowship at the ULB for the academic years 2020-21 and 2021-22, I was fortunate enough to work with Prof. R. Kolinsky, who has an extensive experience in research on (linguistic) literacy, its acquisition, and its cognitive and social impact. She has furthermore conducted several ambitious studies (both quantitative and qualitative) with on-site testing at academic and pedagogical institutions and active participation of relevant actors in the field. It was thanks to Prof. Kolinsky's orientation —and contacts— that I landed at the *Conservatoire royal de Bruxelles* [CrB] with the idea of doing a series of studies that could be ecologically well-calibrated, and that could be counting on the collaboration of teachers and pedagogues for qualitative evaluation of our novel music notation designs.

Following Prof. Kolinsky's guidance, I also engaged with students of the *Master en Psychologie* at the *Faculté des Sciences Psychologiques* where I was hosted, and which we included in our little team as *stagiaires*, being of great help in implementing protocols taking the forms of personality tests and tests using customised measuring scales to detect the emergence or cohesion of opinions amongst the participating musicians. The methodology developed in this way indicated positive change in the participants' views of the new features presented, from *before* performance to *after* having actually used the new pedagogical materials; it also helped us detect certain unexpected correlations between adoption of the novel materials and performance style or instrumental technique.

Thus, and for example, notational innovations that were enthusiastically adopted for certain repertoires like Baroque Music (visually emphasising the phrasing and rhetoric construction of the discourse) were considered less efficacious in other idioms such as Jazz (where visual cues supporting rhythmic continuity and precision were much more welcome). We also found that instrumentalists who articulated their experiences in ways more directly relatable to those found within the domain of linguistic pragmatics (*i. e.*, singers and wind instrumentalists) were more open to the innovations that we presented (which are ultimately imported from linguistic usages) than did other instrumentalists who, in spite of performing better with the novel materials, remained sceptical in their outlook (*e. g.*, and foremostly, string instrumentalists).

In general, the rigour and experience of Prof. Kolinsky in the not-too-far-removed field of language reading and the impact of pedagogical design on academic performance helped us approach the testing sessions at the CrB in a careful and systematic manner, and have informed the protocols that we will be using in our project at the Faculty of Music in Cambridge.

## Continuing collaboration with local musicians in Brussels

One of the premises of the project is to try to design studies and experimental conditions that are ecologically valid, as this line of research has an important applicability component.

We have been lucky to be able to count on the engagement of students and teachers of the *Conservatoire royal de Bruxelles* (amongst other renowned musical institutions, as the Royal College of Music in London), for the duration of the project. Given our objectives, having expert and committed participants in our testing provides a reassuring context, specially as much of the information we are collecting is gathered in the classrooms and rehearsal rooms of the CrB itself.

For example, one of the collaborations with the CrB entails intervening directly in their *Cours de Lecture*: the teachers of these courses give individual 30 minute instruction to their students once a month, during the *2ème Quadrimestre* (Feb - May). We do not intervene in the pedagogical method or in the general conditions for the session, and only introduce the novel materials as an observable factor: using a counterbalanced list of presentation orders, the teachers use our novel scores for 15 minutes and conventional materials for another 15 minutes. Following similar models implemented by Prof. Kolinsky and her collaborators, we gather information by recording the sessions and by having teachers and students fill in pre- and post-session questionnaires.

This line of enquiry has been maintained, with some necessary adaptations, in our new project; we are now less frequently on site at the CrB, but we are however, and thankfully, able to count on self-reflective questionnaires by the teachers.

Similarly, we are also maintaining and developing another line of reflection on notation: several students of the Master's degrees at the CrB (*Master en Musique; Master à finalité approfondie; Master à finalité spécialisée*) doing their *Travail écrit du projet artistique personnel* [TFE] have used and continue to use our novel approach to score design to create personalised editions of a chosen piece of their repertoire, which they then go on and use in their personal recitals and pedagogical activities.

All in all, the set of circumstances and interests that converged in Brussels gave us an excellent opportunity for in-field, ecologically defensible, and balanced observations, which are forming the basis of the research that we shall develop and undertake in the next few years.

Independently of the results of our studies and measurements, the validity of the research conditions constitutes a stabilizing factor in the the development and advancement of a novel pedagogical, performative, and socio-cultural vision —and ultimately, these conditions have been achieved thanks to the FW-A support.

## An example / a little challenge

Even if you don't read music, try to discern in **Figure 1** (**1A**, conventional, **1B**, modified) in which version it feels easier observe the underlying structure of the discourse (including repetitions, similarities, and predictability of information), as well as to navigate towards a specific part of the text, and detect what constitutes a unit of information. Please note that the width and size of the staves (the five-line elements on which notes are placed) is exactly the same in both versions (certainly when printed out); also, the vertical distance between text lines (staves) remains the same, although in our novel version there is extra space between sections of the piece. In general, what changes in the modified version is the delimitation, spacing, and structuring of information, which have been designed to facilitate integration of symbols, as well as the detection of iterations and visual groupings. At least

hypothetically, these should in turn facilitate the processes of prediction and abstraction that have been thoroughly proven to underpin fluent reading —though until now, only in the linguistic domain.

**SON**

TROMPETTE EN  $\text{Si}\flat$  MAURIZIO GIAMMARCO

FUSION LATIN  $\text{♩} = 120$

5 **A**  $\text{Bbm}^9$   $\text{C}^7(\text{sus}4)$   $\text{Bbm}^9$   $\text{C}^7(\text{sus}4)$   $\text{C}^7(\text{sus}4)$

9  $\text{Gm}^9$   $\text{Bm}^9$   $\text{F}^7$   $\text{Em}^9$   $\text{Cm}^{11}$   $\text{F}^{13}$

13  $\text{Bbmaj}^7$   $\text{Cm}^7$   $\text{C}\sharp\text{m}^7$   $\text{Dm}^7$   $\text{D}\sharp\text{o}^7$   $\text{Em}^9$   $\text{F}\sharp\text{m}^7$   $\text{B}^7(\text{b}^9)$

17  $\text{Gm}^9$   $\text{Bm}^9$   $\text{F}^7$   $\text{Em}^9$   $\text{Eb}^7$   $\text{D}^6$

21  $\text{G}\sharp\text{m}^7$   $\text{C}\sharp^7$   $\text{F}\sharp\text{maj}^7$   $\text{Gm}^7$   $\text{C}^7$   $\text{Fmaj}^7$

25  $\text{F}\sharp\text{m}^7$   $\text{B}^7$   $\text{Emaj}^7$   $\text{Bmaj}^7(\sharp^5)/\text{A}\sharp$   $\text{D}\sharp\text{m}^9/5$

29  $\text{Bmaj}^7(\sharp^5)/\text{A}\sharp$   $\text{D}\sharp\text{m}^9/5$   $\text{D}^7\text{alt.}$

31  $\text{Gm}^9$   $\text{Bm}^9$   $\text{F}^7$   $\text{Em}^9$   $\text{Eb}^7$   $\text{D}^6$

35 **C**  $\text{♩} = 120$   
 $\text{Bbmaj}^7/\text{C}$   $\text{Fmaj}^7/\text{C}$

37  $\text{Bbmaj}^7/\text{C}$   $\text{Fmaj}^7/\text{C}$

39 **MOLTO BALL.**  $\text{F}\sharp\text{m}/\text{E}$   $\text{Ebmaj}^9$   $\text{Dmaj}^9$

SON

Fig. 1A. Trumpet part for the piece *Son*, in its CONVENTIONAL version, as used in the *Cours de Lecture* (Year 2), Conservatoire royal de Bruxelles. Presented to students in 120 g/m printed paper (210 x 297 mm).

SON

1 Bbm<sup>9</sup> 2 C7(sus4) 3 Bbm<sup>9</sup> 4 C7(sus4)

5 Gm<sup>9</sup> 6 Bm<sup>9</sup> F7 7 Em<sup>9</sup> 8 F#m7 B7(b<sup>9</sup>)

9 Gm<sup>9</sup> 10 Bm<sup>9</sup> F7 11 Em<sup>9</sup> 12 Cm11 F13

13 Bbmaj7 Cm7 C#m7 14 Dm7 D#o7 15 Em<sup>9</sup> 16 F#m7/B B7(b<sup>9</sup>)

17 Gm<sup>9</sup> 18 Bm<sup>9</sup> F7 19 Em<sup>9</sup> Eb7 20 D6

21 G#m7 C#7 22 F#maj7 23 G#m7 C7 24 Fmaj7

25 F#m7 B7 26 Emaj7 27 gmaj7(♯5)/A# 28 D#m(♯5)

29 gmaj7(♯5)/A# 30 D#m(♯5) D7alt 31 Gm<sup>9</sup> 32 Bm<sup>9</sup> F7 33 Em<sup>9</sup> Eb7 34 D6

35 Bbmaj7/C 36 Fmaj7/C 37 Bbmaj7/C 38 Fmaj7/C

35a Bbmaj7/C 36a Fmaj7/C 37a Bbmaj7/C 38a Fmaj7/C

39 rit. F#m/E 40 Ebmaj9 Dmaj9

Fig. 1B. Trumpet part for the piece Son, in its MODIFIED version, as used in the Cours de Lecture (Year 2), Conservatoire royal de Bruxelles. Presented to students in 120 g/m printed paper (210 x 350 mm).