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# Live Coding on Orca, the Geopolitics of the English Language and the Limits of Creative Semantic Anchoring: A Preliminary Hypothesis

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**Abstract.** *Orca is a live coding environment based on one-letter alphanumeric operators, different from the English-based commands of other coding or patching tools. Our main hypothesis is that the one-letter operators that regulate Orca’s functioning might make it a much more accessible environment, especially for those users that may benefit from an alternative to the dominant English language. In this preliminary paper, we also present our hypothesis in terms of Orca’s interactions and contradictions vis-à-vis Creative Semantic Anchoring (ASC).*

## 1. Introduction

Orca is defined in its own homepage as “an esoteric programming language, designed to create procedural sequencers in which each letter of the alphabet is an operation, where lowercase letters operate on bang, uppercase letters operate each frame” [Rek & Devine 2018]. The introducing blurb on the Orca website proceeds to clarify that “[t]he application is not a synthesizer, but a flexible livecoding environment capable of sending MIDI, OSC & UDP to your audio interface, like Ableton, Renoise, VCV Rack or SuperCollider” [Rek & Devine 2018].

Our experience with Orca so far has indeed been largely assimilable to the operation of a live coding tool, based on minimal case-sensitive, one-letter alphanumeric commands in the place of the common English language methods and operators that characterise other coding (or patching) environments. One of the main hypotheses underpinning this work is that, rather than making it an “esoteric” environment — as claimed in the app’s own homepage — the one-letter operators that regulate Orca’s functioning might make it a much more accessible environment, especially for those users that may benefit from an alternative to the dominant English language.

As suggested in the aforementioned blurb, another noteworthy characteristic of Orca has to do with its sound output: rather than working with Digital Signal Processing (DSP), the tool sends MIDI (or else OSC or UDP) data to virtual or physical devices — this might result in a series of important constraints that might nevertheless prove productive

in terms of creative decisions and excogitations.

Another important characteristic of Orca's functionality is its hybrid status as a text-based coding environment that nevertheless incorporates fundamental characteristics of Graphical User Interfaces (GUIs), such as the pertinence of NSEW cardinal directions and positions. In this sense, for instance, a specific operator like [E] moves eastward throughout the screen, using the coding environment as a patching canvas: thus, the spatial position of specific objects becomes relevant in order to predict the timing and order of specific events.

## 2. Creative Semantic Anchoring (ASC)

Creative semantic anchoring (ASC, from its original Portuguese formulation *Ancoragem Semântica Criativa*) is based on the use of verbal indicators in order to facilitate creative processes. Previous research within the g-ubimus,<sup>1</sup> and in particular by the Amazon Center for Music Research, has focussed on the interpretative study of Flausino Valle's work, based in turn on the compilation of a set of methodological tools called Interpretative Tokens (in Portuguese, "*Fichas Interpretativas*") [Keller and Feichas 2018; Keller et al 2020]. The interpretative tokens were created by Leonardo Feichas in order to help musicians perform the extended techniques called for in Valle's scores. In general, the results have shown an enhanced response to notated material thanks to the help of verbal clarifications. Abundantly drawing upon these experiences, Messina and Aliel (2019) and Messina and Mejía (2020) have proposed artistic works that use ASC as a facilitator of artistic collaboration within improvisational practices.<sup>2</sup> Another important creative experience that has been situated within the ASC sphere is Keller and Aliel's (2019) soundtrack to the film *Atravessamentos* (cf. Simurra et al. forthcoming). An issue that has been widely discussed within our research lab, and yet has never been at the forefront of any of the aforementioned publications, is the status of coding commands in view of ASC: on one hand, they can be literally described as semantic hooks that take advantage of verbal meaning (typically, in English) in order to facilitate creative musical outcomes; on the other hand, coding is such a typical activity in ubimus and other types of music creativity, that considering it part of ASC could have the side effect of weakening the very same argument about the specificity and particularity of ASC itself. In this paper, we embrace the former hypothesis. In fact, considering the practice of music coding as a form of ASC helps us reveal and reflect on some of the important specificities of Orca as a live coding environment.

### 2.1. Orca and ASC

Let us consider Orca through the theoretical and operational prism of ASC. In Orca, one-letter operators lack the semantic content that normally characterises objects and categories in other music programming languages. For instance, in Pd<sup>3</sup> the object [pipe]

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<sup>1</sup> The Ubiquitous Music Group (g-ubimus) is a network of researchers encompassing engineers and computer scientists, educators and musicians, with members and collaborators worldwide..

<sup>2</sup> "Comprovisation" can be described as a practice-led approach to research in music creation that envisages actions at a middle ground between free-improvisation practices and compositional practices [Aliel, Keller and Costa 2015].

<sup>3</sup> Pure Data (Pd) is a patching environment originally developed by Miller Puckette [cf. Puckette 1996].

delays a message for a specified number of milliseconds, evoking precisely the hydraulic functionality of an actual pipe, where one can pour a liquid that will come out from the other end with a delay that depends precisely on the length of the pipe. Although other objects in Pd might not be based on the same metaphorical thinking that characterises [pipe], many of them are still characterised by a massive reliance on verbal meaning: in this sense, objects like [noise~], [timer], [pack], etc. maintain a strong verbal proximity with the semantic content normally associated to the operations that they perform. In other words, Pd relies massively on the English language in order to orientate — and, literally, anchor — the creative actions of its users. In Orca, the semantic anchoring that characterises Pd is radically crumbled in minimal one-letter commands that often do not bear any resemblance with the verbal rendition of the operation they perform. So, for instance, [T] outputs a value from a list, while [B] outputs the difference between two values — in none of these cases there appears to be an immediate connection between the specific operations that are performed and the wordings normally used to describe them. Some operators do bear a more intelligible connection with their specific function: that is the case of the aforementioned command [E], where the E apparently stands for “eastward”, or of the command [R] that outputs aleatoric values and obviously recalls the initial R in the word “random”. Even considering these subtle analogies, however, coding on Orca is necessarily associated with mnemonic operations that cannot rely on the semantic hooks offered by other languages such as Pd, Supercollider, etc. This is, quite obviously, the main reason why Orca is described as an “esoteric” tool: in other words, it is assumed that non-reliance on semantics is likely to make the programming environment less accessible and less comprehensible. But what if this characteristic actually made the tool more accessible, especially to users who do not benefit from a strong command of English? In this paper, we preliminary explore this hypothesis, and reflect on it with an eye on ASC.

### **3. The Geopolitics of the English Language**

Various authors have commented on the disproportionate hegemony of English in the general context of thought production: in this context, Applied Linguistics and ELT (English Language Teaching) Studies have been particularly prolific in coming up with critical addresses towards this situation [Rajagopalan 1997; Lacoste & Rajagopalan 2005; Rubdy 2015; Gerald 2020]. Most of these authors criticise the disproportionate status accorded to native speakers [Rajagopalan 1997] as well as the implicit centring of whiteness [Gerald 2020] in the context of English-based educational interactions. In ubimus, Messina et al. (2019) have reflected on the varied geopolitics of power that emerge within collaborative live patching across intercontinental distances. Now, the “Geopolitics of the English Language”, as formulated by Lacoste & Rajagopalan (2005) certainly contributes to regulate the access to music programming languages, potentially impairing ubimus efforts in terms of granting universal access to creative musical practices. In this context, the aforementioned semantic hooks in English offered by tools for musical creativity might produce an implicit advantage for native speakers of English, resulting in the exacerbation of an already existing learning gap in disfavour of non-English speakers.

#### 4. Hypothesis

In light of all this, we propose a preliminary hypothesis: namely, the idea that Orca, with its mono-letter operators, might help bridge a gap that is produced precisely by the English language as an instrument of global hegemony and access control. We argue that live coding with Orca might prove equally efficient for users with different levels of access to the English language. At this preliminary stage, we propose to complement our preliminary argument with a practical live coding demonstration during *ubimus2021*. As a proof of the relevance of such an experimental presentation, we advise that 3 of the 5 authors of this paper are new to Orca. Later stages of this project will involve working with students from different universities in Brazil in order to measure the productivity of our argument. In doing this, we adhere to the methodological principles that characterised the *Live/Acc/Patch* project in 2018-2020 [Messina et al. 2020] — namely, the establishment of a schedule of training on Orca, followed by a series of collective, game-like sessions of collaborative live coding with the instructor, and finally by data collection, preferably in the form of qualitative information. As suggested above, our study attempts to identify the limits of ASC by testing it against the critical caesuras and lacerations brought about by global patterns of linguistic and ethnic inequality, which also results in situations of gender, class and race domination. Furthermore, we seek to come to a more substantial decision with regards the status of coding commands in ASC. Finally, we do not intend to invalidate our own work on ASC here — on the contrary, we seek to identify the discursive and operative limits of ASC in order to optimise and deepen our current understanding of it.

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