A Strange Metapaper on Computing Natural Language

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Abstract

This is a paper about writing a paper about computational creativity in natural language generation. The first part contains the second-order paper, i.e., a general explanation about the first-order paper, which constitutes the second part of the text. The embedded paper, by the same authors, contains its own abstract, keywords, and reference list. It is titled "If then or else: Who for whom about what in which". Three actual peer reviews of that embedded paper have been integrated into the framework of the second-order paper as an attempt to illustrate the discursive and pragmatic conditions of the communicational situation of the first-order paper. This framing of one text inside another is intended to highlight the form of the paper as a specific writing constraint while using it as a self-exemplary instance of the difficulties and limitations of computing natural language. The whole metapaper is intended as a writing experiment on self-description and on linguistic creativity. Or is it just a joke?

Keywords: reflexivity; parody; writing under constraint; natural language processing.

Metaintroduction

We will start by explaining (Section A) the context for our *sui generis* approach to computational creativity in natural language generation as exemplified in the embedded metapaper below (lines 1-818, double-column text). Then we will analyze our own embedded paper as (Section B) a procedural generative non-computational form of writing which contains a philosophical reflection (Section C) about the conditions for the emergence of textual form and textual interpretability, and about current practices of natural language automation based on computational generative works. Finally, we will call attention to (Section D) our own embedded metapaper as evidence of both the challenges of modelling natural language automation. The distinction between embedded paper and framing paper breaks down when, in a final double coda (Section E), we discuss the discursive conditions that define the academic paper as particular textual constraint.

A. Context

As literary scholars, we have been reading programmed generative works for several years with the aim of understanding the poetics of literary production involving natural language generation (Portela 2013, 2017; Marques da Silva 2016, 2017). Our research has been focused on a literary and cultural reading of Natural Language Generation (NLG) rather than a strictly linguistic and computational perspective

(which is the main focus of the research papers presented in this workshop¹). Although we recognize and greatly benefit from the contributions of engineering approaches (Gervás 2017), we want to bring to this discussion some fundamental theoretical questions about language and automation. We are grateful to the organizers of the workshop for this opportunity for submitting our ideas to crossdisciplinary examination and critique. We admit beforehand that our paper may be even more absurd than it sounds. We suspect that it is not computable, even in its parodic elements.

The second aspect for sketching the context from which we are approaching the workshop topic is the fact that we have been focused on corpora of generative works which offer critical insights about ongoing processes of automating natural language production in various human practices, from literary creativity to everyday interactions with digital devices and systems. Such works are literary interesting not primarily for producing meaningful and original texts (which they do) but for reflecting on their conditions of production. Thus the literary works chosen for analysis are studied as examples of NLG works that can be illuminating about generative poetics, but also as probes into the nature of automation of natural language, which, in its turn, can be seen as just a particular domain in the current accelerated process of softwarization of human culture, in particular of communication media (Manovich 2013).

The question that underlies our embedded metapaper is this: what are the conditions for textual interpretability? In other words: how does a textual form emerge? In yet other words: what is the relation between known features of natural language (such as generativity) and the emergence of textual form as an interpretable verbal action? We have no answers for these questions, but we have attempted to make a textual experiment whose result is the paper itself (instead of any formalized textual generative system). Our paper is thus a self-exemplary instance of the conditions required for the emergence of interpretability in written uses of natural language. This is the third element required for explaining the *sui generis* context of our paper.

B. A procedural generative non-computational form

The procedural method used for writing "If then or else: Who for whom about what in which" allowed us to identify three interactional layers required for the production of fully interpretable textual forms, which we have named as "textual text", "meta-textual text" and "networked text". In order to become interpretable, textual forms have to somehow articulate those three dimensions: an assemblage of firstlevel textual signs (a string of well-formed discourse) depends on explicit or implicit signs that frame their interpretation at a higher level (as a particular genre, for instance), and also on explicit or implicit references to other texts. Texts mediate themselves through both these meta- and network-levels of reference.

Those conditions for interpretability have been reflexively modeled in our paper as follows:

Level 1 ("textual text"): «for the first version, each sentence was alternately written by one of the authors, so that one (and only one) sentence by A1 was followed by one (and only one) sentence by A2 (May 30); for the second version, authors could add one sentence in-between any two sentences of the first version, but each new sentence could only be introduced after a

¹ This paper was originally presented at the "INLG 2017 Workshop on Computational Creativity in Natural Language Generation", September 4, 2017, School of Engineering at the University of Santiago de Compostela. We would like to thank the organizers of this workshop: Hugo Gonçalo Oliveira (University of Coimbra), Ben Burtenshaw (University of Antwerp), Mike Kestemont (University of Antwerp), and Tom De Smedt (University of Antwerp). http://www.cenlg.org/index.php/programme/

sentence not been written by the same author (May 31) — the sum of versions 1 and 2 originated the textual level that we describe as "the textual text"» (lines 5-16, below);

Level 2 ("meta-textual text"): «for the third version, both authors commented on version 2, trying to highlight the network of concepts and associations implicit in sentences, arguments and tropes of versions 1 and 2 — this level we have called "the meta-textual text"» (lines 16-22, below);

Level 3 ("networked text"): «they further added, as footnotes, theoretical references and examples of works and text generators that illustrated certain ideas and problems (June 1-2) — a level we referred to as "the networked text"» (lines 22-27, below).

This three-level division is merely a heuristics for making visible processes that are intertwined and interactional. Levels 2 and 3 do not have to be textually explicit in order to perform their function of textual mediators of level 1. What our experiment wants to highlight is that conditions for textual interpretability are not a mere internal function of the linguistic system or of the programming system. They originate in wider discursive and social processes of mediation. Delegation of symbolic production and symbolic exchange in autonomous intelligent systems is one those mediating processes.

C. Textual form and textual interpretability

From our perspective, specific techniques of production (permutational and combinatorial; statistical; stochastic; machine-learning approaches using neural network algorithms; etc.) are less important than the underlying principles of instrumentality that use the automation of language as part of the cybernetic logic of social control. We also question the conceptual division between the functional generation of natural language and the so-called creative generation of natural language, since they are equally embedded within specific discursive and social constraints, one of which is the ongoing process of automation of symbolic production (including the acts of writing, reading, speaking, listening, and translating). Instead of reifying creative computation as a special case, we analyze works that bring their own conditions of production and reception into critical focus. These works interrogate the production of the literary within current cybernetic and networked textual spaces, providing a critique of engineering approaches that work on the basis of simplified and mechanistic notions of the "literary".

What have we learned about textual production through our procedural collaboration? Each sentence establishes a particular lexical and semantic field, within particular syntactic and prosodic structures, which then become triggers for further writing through various mechanisms of semantic, phonetic, rhythmic and syntactic association (metonymic, metaphoric, paranomastic, parallelistic, etc.). Such associations are motivated by an open interpretation of the previous sentences or groups of sentences, by a self-conscious engagement with an emerging textual form, and by a network of textual references that enable each of us to generate new meanings. Semantic coherence and syntactic cohesion develop in incremental steps through recursion and revision. The act of writing extends our cognitive awareness about what might be said next as the intentionality is distributed across an accretion field of juxtaposed sentences. This process proceeds in successive loops that spiral into further ideas and sentences. It is through this embedded self-awareness that natural language parses its constituent elements for further combinations. Writing enhances this procedural dimension because the externalization of syntactic and semantic structures opens up new reading and writing possibilities. A constrained rule-based process of collaboration becomes an experiment with intentionality as the textual emergence of meaningful language, that is, language produced and interpreted by subjects.

D. The embedded paper

A number of writing constraints of the mode of production of the academic paper are laid out through a procedural rule-based human generative process. Once the argumentative and discursive form of the paper begins to take shape, specific strategies for grounding concepts and theories are brought into play – quotations, references, commentary, annotations. A textual network is made explicit, and the paper's dense and abstract language is given further context. The seams that connect the various narrative levels are foregrounded by specific choices of page layout (indentation, double-column, line numbering) and type style (normal, bold, italics) that serve for marking interruptions and shifts in perspective. The paper struggles to retain marks of its mode of written and social production: on one hand, the specific sentences produced by each writer as well as their detailed and successive revisions are not tracked; on the other hand, the paper takes great pains to explain and self-document its constrained collaborative writing process. Its twisted, convoluted and oblique argument is kept ambiguous and open. Perhaps its aim is to show the productivity of its procedural program as a form of constrained non-algorithmic writing. Is it suggesting that this form of natural language generation cannot be automated? That this level of complexity is beyond computational creativity?

Its thematic cohesion may be said to come from a double thread in its argumentative rhetoric. One line of argumentation deals with the nature of language in relation to the self. We could sum it up in the idea that the authors explore the question of how human subjectivity is mediated through language. Another thread in the argument is its underlying concern with the political and social implications of the ongoing natural language automation. Thus the text attempts to frame the specifics of artificially generated natural language – whether as written or as spoken discourse – within general processes of algorithmic culture, which are metaphorically (and perhaps also hyperbolically) described as a mode of social engineering and control. This problematics is highlighted by the paper's slightly enigmatic title, which calls attention to the conditions of computational processing of natural language. The title can even be interpreted as a pastiche of a self-conscious snippet of pseudocode, one in which the "if-then-or-else" nested sentence structure of executable language becomes suddenly aware of the wider conditions of execution that cannot be contained in its code – those of social action and political determination.

If then or else: Who for whom about what in which

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Abstract

This article discusses generativity in natural language production by adopting two different strategies: on the one hand, it reflects on its own human and collaborative process of writing as a textual instantiation of the feature of the faculty of language called "generativity"; on the other hand, it uses a series of literary generative works of different kinds to interrogate the cultural, political and aesthetic significance of the computation of language as a social practice. Computational creativity in natural language generation is thus contextualized in ongoing processes of datafication and automation of symbolic production in networked algorithmic culture.

Keywords: language and generativity; algorithmic culture; computational creativity; self-description.

1 1 Introduction

Incipit. This article was written by two 2 3 human language generators (its authors) according to the following procedural 4 constraints: for the first version, each 5 sentence was alternately written by one of the 6 authors, so that one (and only one) sentence 7 by A1 was followed by one (and only one) 8 sentence by A2 (May 30); for the second 9 version, authors could add one sentence in-10 between any two sentences of the first 11 version, but each new sentence could only be 12 introduced after a sentence not been written 13 by the same author (May 31) — the sum of 14 versions 1 and 2 originated the textual level 15 that we describe as "the textual text"; for the 16 third version, both authors commented on 17 version 2, trying to highlight the network of 18 concepts and associations implicit in 19 sentences, arguments and tropes of versions 1 20 and 2 — this level we have called "the meta-21 textual text" -, and they further added, as 22 footnotes. theoretical references 23 and examples of works and text generators that 24 illustrated certain ideas and problems (June 25 1-2) — a level we referred to as "the 26 networked text". Versions 1, 2 and 3 were 27 written as running text without paragraph 28 breaks. Finally, in the fourth version, both 29 authors rewrote text, meta-text and 30 networked text, defining paragraphs and 31 sections, separating commentary and notes 32 while integrating them into the main text, and 33

expanding sentences from versions 1, 2 and 3
in order to fit the conventions of the academic
paper and the formatting guidelines of the
NAACLHLT template (June 5-6). In this
fourth moment of composition the textual,
the meta-textual and the net-textual became
the (almost) "clean text" of the final draft.

Rather than offer a seamless integration of 41 42 procedures and layers, we have kept several markers of those shifts and layers as far as 43 was possible within the NAACLHLT 44 45 template. This will allow readers of this paper to track some of the changes and processes 46 that resulted in these particular textual 47 strings, which we intend to offer as an 48 example (and, perhaps, also as a model) of a 49 how a natural language text is creatively 50 generated through iteration and recursion 51 involving two human subjects. As can be 52 53 seen by looking at its syntactic and semantic structure, textual generativity subsumes the 54 meta-textual and the net-textual as the 55 general condition of textual production. In 56 programmed generativity, the question 57 becomes: how does a computer-generated 58 text talk about itself and how does it link itself 59 to other texts? In other words, how can 60 61 programmed generativity emulate the linguistic processes of reference and self-62 reference so that the particular syntactic 63 cohesion and semantic coherence of a 64 discursive field emerges? 65

The aim of this highly reflexive exercise 66 highlight how the generative to 67 is productivity of language is necessarily 68 constrained by discursive and interpretative 69 patterns, from the point of view of human 70 production and reception, and how the 71 computational implementation of natural 72 language generativity should also be 73 analyzed as a particular kind of speech act. 74 When considered as a speech act, that is, a 75 particular form of social action by means of 76 language, the conditions of production and 77 reception of computer-generated natural 78 language cannot be accounted for without the 79 consideration of the particular pragmatics of 80 natural language as output of executable 81 language and of the social actions it is meant 82 to perform. Both process and product, 83 computer-generated natural language 84 instantiates the algorithmic automation of 85 symbolic and cultural production as a stage in 86 the development of writing media as software 87 (Manovich 2013). 88

89 2 Who for whom about what in which

90 *"What does it matter who is speaking",* 91 *someone said.*

[Comment: The begins 92 text by questioning the relation between language 93 and self. If the human speaker of language 94 does not matter, does it matter when the 95 generator becomes the speaker? And in 96 what sense can the generator speak? This 97 sentence, which was originally written by 98 99 Samuel Beckett (85), has been repeatedly used for theorizing about the problems of 100 authorship, that is, of attributing origin to 101 a particular utterance. And yet, even when 102 used to claim the irrelevance of a personal 103 self as the subject of language, it is 104 attributed to an author. It doesn't matter 105 106 who is speaking but it does matter who is speaking.1] 107

[Note 1: Philip Nickel (2013) has coined 108 the notions of "speech actants" and "proxy 109 speech" to account for artificial speech 110 that fulfils the conditions of speech acts, 111 112 including illocutionary and perlocutionary force: "Similarly, NLG systems do not 113 have general situational need to 114 awareness, adaptive intelligence and 115 unlimited linguistic generativity in order 116

Between harmony and dissonance, all voicesare choirs.

121 [Comment: The second sentence expands122 the idea of selfless language to suggest

that each voice already is a multiplicity ofvoices.]

125 Each writing creates an alien voice.

126 [Comment: The third sentence introduces
127 writing as a mechanism for estranging the
128 voice of the speaker. But is writing a

129 multiplier of voices or just a technique for

revealing the multiplicity of voicesalready contained in language?]

132 Constantly deferring itself. They know not 133 what they speak.

134 [Comment: Is that a feature that the135 speaker shares with the generator? Not136 knowing what s/he speaks?]

137 They babble their way out of confusion. Is138 there language without a voice? Or a voice139 without a language?

[Comment: Now a pair of chiasmatic 140 sentences hints at the possibility of 141 autonomizing voice from language, but 142 their nature as mutually 143 also at 144 constitutive: language developing from externalized vocalization and, at the same 145 time, enabling the articulation of a 146 147 speaking voice.]

148 What happens when language speaks itself?

[Comment: This is perhaps the core of 149 the problem: in what sense can a language 150 speak itself? A language must speak its 151 conditions and social 152 material of production. An alternative question would 153 be: who is the subject of the textual 154 generator?] 155

156 What is it made of? Where does its code come
157 from? Is language a biological organism?
158 Like a virus? An interface between the brain
159 and the mind? Does it need a host, to speak?
160 Am I hostage to the voice of language?

[Comment: Images are now associated 161 on the basis of the bio-linguistic 162 hypothesis for the faculty of language 163 mixed with a theory of language as tool 164 for the constitution of its subjects. I have 165 a biological capacity for language but my 166 voice is already pre-constituted in the 167 language I have to learn to speak.] 168

to perform speech acts on behalf of someother agent." (500)]

¹ See Note 1.

169 If so, how do I get free? Is "I" a special kind
170 of virus in the code of language? When I enter
171 language "I" am already there.²

[Note 2: Talan Memmott's "Self-172 Portrait(s) [as Other(s)]" (2003) is an 173 intermedia work in which twelve self-174 portrait paintings and twelve biographical 175 notes are cut-up and recombined. 176 Described as "a recombinant portrait and 177 biography generator", this work draws 178 attention to the narrative conventions 179 180 through which biographies are constructed, but also to the presence of 181 others in the constitution of one's sense of 182 self. Thus it provides an image of the 183 fluidity of experiences and representations 184 from which a sense of self emerges. Its 185 pre-constitution in the conventions 186 through which life is narrated becomes 187 188 apparent in the multiplication of possibilities created by generative visual 189 and verbal recombination, but also in its 190 highly patterned discursive and visual 191 structure. One could see this juxtaposition 192 of text and image as the ensemble of 193 discrete subject-positions that I can 194 occupy when I self-refer to myself as 195 "self" or as "I". The fact that it remains in 196 constant flux, changing at each iteration, 197 is itself an image of that process of 198 199 linguistic self-production within the meaning structures of language.] 200

[Comment: Again, the text is very much 201 aware that language provides the self with 2.02 a category for him/her to participate in and 203 appropriate its system of differences. 2.04 Insofar as "I" is the category that allows 205 for self-reference and for structuring all 206 207 references in a deictic system, "I" have to enter "I" as a pre-defined variable in its 208 semantic and syntactic system.] 209

Is language everywhere, and "I" a product ofits code?

[Comment: The contrast between self and 212 otherness thus seems to be a product of 213 syntax, rooted in the structural and relative 214 positions of subjects in any given context.] 215 I inhabit the empty self of language. 216 Gathering its pieces, I move and play in the 217 field of language. Strawberry fields forever. 218 Full of sound and visions. Each word has its 219 own viewpoint. 220

Comment: In these five sentences, the 221 text has linked the idea of the split-self 222 (self as linguistic category and self as 223 historical being) to the idea of words as 224 discrete units of perceiving. The transition 225 from one concept to the other is 226 metaphorically produced by the transit 227 created by the word "fields": language 228 fields, strawberry fields, sounds, visions, 229 230 words, viewpoint. What remains unclear is what is it this emptiness of language? Is it 231 its ability for resignification through 232 combination?] 233

Their lights crossing, moving everywhere.
They open up perception, but they also
confine us to their categories. We are
grammatological creatures. Meaning as an
accident of syntax, a secondary effect of
permutation.

[Comment: Here the text suggests that 240 meaning is a result of creativity: we cannot 241 avoid creating meaning. Meaning isn't 242 there, as an aspect of a thing, it is created 243 by every subject. Hence creativity is a 244 secondary effect of permutation, a 245 secondary effect of our linguistic 246 condition, since it is the structure of 247 248 language that gives us a perspective on the world, as subjects. At the same time, the 249 last sentence also points to theories of 250 251 language based on the hypothesis of the emergence of the faculty of language as a 252 consequence of genetic mutations.] 253

254 Corrupting and expanding the code. Or 255 maybe just playing out its instructions. Where 256 are the limits of language? Are they in the 257 speaking body through which it speaks? And 258 what are the limits of that body? Once 259 embodied in writing its viral nature spreads 260 beyond its living host.

[Comment: These sentences raise the 261 question of natural language generation as 262 the result of structural material constraints. 263 such as a grammar or a body. At the same 264 time, they point to an understanding of 265 writing as the body of language, as the 266 medium and the performance that enable 267 the expression of the system of language. 268 Expressing, just as computational code is 269 expressed as it is executed, in what it 270 generates. or writes. Language's 271 272 performative existence is a creative one in the sense that it generates itself as it exists, 273

and also in the sense that it generates 274 things (words, concepts, mental images) as 275 it is expressed, as it writes itself on the 276 world and as it writes the things it names 277 onto the world. This form of creativity is 278 generative: it creates with no goal outside 279 the creative act, indifferent to the value of 280 what it creates.³] 281

[Note 3: In the words of Oliver Bown: 282 283 "From the broad perspective of poeisis [...] all the patterns, structures and 284 behaviors that exist in the world can be 285 taken as evidence of creativity. This jars 286 with the traditional psychological view of 287 creativity, and implies a distinction 288 289 between two varieties, generative and adaptive. Generative creativity takes an 290 indifferent approach to the problem of 291 value, it is value-free creativity. In 292 generative creativity, things are not created 293 for a purpose. Things can come into 294 existence without being created for their 295 296 value" (2012: 363).]

Inhabiting everything we see. To read is to be 297 infected by the written virus of the code of 298 language. Hopelessly finding meanings 299 everywhere. Finding one's voice in alien 300 snippets of code. Looking for and testing the 301 possibilities of the code. Saying what has not 302 been said before, letting language invent 303 304 itself.

305 [Comment: Here the text returns to the
306 question of the relationship between
307 subjectivity and the production of
308 meaning, highlighting how the latter may
309 be understood as a result of a generative
310 and creative process.]

311 Letting the code express itself. Like a blind 312 man lost in the desert, laying stones and little 313 sticks to build a map. A map without a 314 territory, referring only to itself, full of sound 315 and fury.

Comment: A series of sentences about 316 the creativity inherent in the proliferation 317 of language leads to Macbeth's speech 318 about the brevity and meaninglessness of 319 human existence, and thus about the 320 meaninglessness language of 321 as description of experience.] 322 Making something from the empty self of 323

language, for more language, searching with
language for more language. Creating new
places for language to grow, serving nothing
but language itself. Every body is a speaker,
building itself through its voice and the voices
around itself.

333 **3** If then or else

And yet, if language is a tool for being, what
happens when its self-replicative processes
are abstracted from sentience?

[Comment: This self-referential 337 proliferation of 338 the empty meaninglessness of language seems 339 significantly different from Macbeth's 340 existential expression of the madness and 341 pointlessness of ambition, revenge, 342 remorse, guilt, fear, desire. Perhaps that is 343 what is meant by "abstracted from 344 sentience": once disembodied from 345 intentions and situational contexts, the 346 text is sequestered by the mechanism of its 347 348 machinic production.⁴]

[Note 4: An extreme example of this 349 combinatorial logic can be seen in the 350 "Library of Babel" (2015-2017) by 351 352 Jonathan Basile, а computational interpretation of Jorge Luis Borges' 353 "Library of Babel", which "demonstrates 354 the paradoxical effect of automating 355 endless factorial permutations of the 356 alphabet. On the one hand, the relentless 357 logic of the algorithm results in the 358 constrained expression of purely abstract 359 differences that instantiate themselves as 360 a textile of letters, punctuation marks and 361 blank spaces. On the other hand, the 362 impossibility of exhausting semiosis 363 through the sheer force of calculus 364 becomes evident as meaning can only 365 happen probabilistically, discontinuously 366 and interactively at scales other than the 367 highly granular and machinic character by 368 character permutation. Even if seen as a 369 conceptual enactment of the continuum of 370 expression upon which signifiers cut out 371 their own form as differential meaningful 372 strings, Basile's experiment shows the 373 374 profound alien nature of the semiotic excess of computationally constrained 375 writing in its literalized and randomized 376

377 production of alphabetic infinity."378 (Portela 2017)]

379 In such an abstract environment, how does

380 feedback work? Can a language generator
381 feel its own use of language, or is it just a
382 simulacrum of subjectivity?

[Comment: These two questions point to
the fact that language is not transparent
and neither is code: both are inevitably
embedded with human intentionality.]

Maybe it is like a bat, blindly navigating the 387 vastness of the code's combinations and 388 comparing different morphologies in space. 389 Echolocations of the world, words are 390 deflected by objects into new directions. 391 Reflecting, mixing, deforming and carrying 392 the sounds of those objects toward new 393 394 directions. The unheard of frequencies of speech sounds parsed by means of the 395 396 discreteness of letters.⁵

[Note 5: Automatype (2012), for instance, 397 is a literary experiment by Daniel C. 398 399 Howe that "uses algorithms to find the bridges between English words, Six-400 401 Degrees-of-Kevin-Bacon-style not bridges of garbled nonsense but composed 402 of normative English." (Howe 2012). 403 404 Another example of similar processes is 405 ppg256 (2012), a series of poetry Montfort: generators Nick bv ۴T 406 determined that common initial bigrams 407 and common final bigrams of four-letter 408 words could be joined uniformly at 409 random to produce 450 distinct four letter 410 words, 273 of which (more than 60%) 411 were dictionary words." (Montfort 2012)] 412 **Comment:** This set of images point to 413 the notion of machine creativity as a 414 generative process, based 415 on the decomposition of words and sentences 416 into their core and/or minimal elements, 417 and on the derivation that results from the 418 re-composition of those minimal elements 419 into new linguistic units, according to the 420 specific set of rules that determines a 421 given process, such as poetry generation 422 or computer-assisted translation.⁶] 423 [Note 6: AI models of creativity fall into 424

two broad groups, because creativity fail into
two broad groups, because creativity itself
is of two types. On the one hand, there is
what we may call 'combinational'
creativity. Here, the novel idea consists of
an unusual combination of, or association

430 between, familiar ideas. Poetic imagery, metaphor, and analogy fall into this class. 431 On the other hand there is exploratory-432 transformational creativity, grounded in a 433 richly structured conceptual space. A 434 conceptual space is an accepted style of 435 thinking in a particular domain — for 436 instance, in mathematics or biology, in 437 438 various kinds of literature, or in the visual 439 or performing arts. (Boden, 2009)]

440 The rules structuring how novelty may be
441 composed. Writing already is a computation
442 of natural language, a machine for exploring
443 the probabilities in its code. An automated
444 writing machine has many different kinds of
445 listeners.

[Comment: The last sentence highlights 446 the distributed condition of computation, 447 stressing that an automatic language 448 449 generator writes and speaks not only to and with humans but also to and with 450 other machines, or programs upon which 451 452 it depends. These nets or meshes of interconnected algorithms are part of the 453 infrastructure of digital language.] 454

Including those who listen for controlling, 455 456 processing and measuring generated 457 language. Scanning the context, weighing 458 and comparing the generated language with all the natural language it reads as it writes. 459 The algorithm is a social form with situated 460 intentions, not a naturally occurring event, 461 462 and not a linguistic fact. Enclosed in layers of opaque objects and relations, can this 463 464 writing machine be understood and mastered? Objects will speak with us and 465 they will speak for us. As we become their 466 fuel. Clouds of networked writing processed 467 in real time are scripting back the generation 468 of natural language. In a constant and 469 recursive movement, I emulate the language 470 that emulates language. Will speaking 471 objects write us out of language? A matrix 472 feeding on the language we produce. We 473 474 teach the machine to speak for us. As we speak with it and as it speaks through us. An 475 evolving machine. The externalization of 476 linguistic production is a new social fact. The 477 web as a living archive for writing and 478 speech. A prosthetic reflection of the cultural 479 field. A biological self is no longer required 480 for the computation of language. Abstracted 481 from speaking bodies, language is processed 482

⁵ See Note 5.

and generated as a hybrid material made of 483 different semiotic regimes. Relentless 484 iteration of combinations towards pure 485 discursive forms: filling in the blanks for 486 poems, stories, screen-scripts, news articles. 487 Following and reinforcing established 488 models. It can run on endless loops from 489 circuit to circuit. In a recursive process of 490 translation, it becomes a conversation 491 492 between machines. We sit back and enjoy the show as all symbolic production is automated 493 and delegated. At once spectators and 494 characters. We listen in on their data 495 crunching, moved and alienated by their 496 noise. But do we understand their speech? 497 498 They garble their way through unicode letter by letter. 7 499

500 [Comment: This section reflects on the 501 material (technical, economic, political, 502 cultural) situations of digital writing, 503 positing it in a set of social conditions. 504 More than a medium, and more than an 505 organ, language is here understood as an 506 externalized technology, or a prosthesis.]

[Note 7: In his project *Big Data Poetry*] 507 (2014-2017), David Jhave Johnston uses 508 machine learning techniques to generate 509 510 strings of language. BDP uses а combination techniques of of 511 visualization, analysis, classification and 512 substitution of objects, applying these to a 513 corpus of language made of hundreds of 514 thousands of songs found online. The 515 result is a disarticulate and incoherent 516 mass of language, on which the poet 517 works by means of improvised reading, 518 stitching together the generated language 519 in order to transform it into a meaningful 520 poetic experiment.⁸] 521

[Note 8: Efficiency of statistical natural 522 language generators depends on the 523 granularity of semantic annotation on the 524 training data (such as word-level or 525 phrase-level 526 annotation). "Stochastic Language Generation in Dialogue Using 527 Factored Language Models" (Mairesse 528 Young, 2014) illustrates 529 and the complexities of designing a dialogue 530 531 system whose predicted variables can be

⁷ See Note 7. Code:

https://github.com/jhave/Big-Data-Poetry

conditioned by different utterance 532 contexts. Since any training has to occur 533 within a limited corpus — in this instance 534 the corpus of the Cambridge Tourist 535 Information System language 536 ____ generation is a constrained computational 537 expression of a discourse field. In other 538 words, it is a mathematical disciplining 539 tool which scripts the behavior of the 540 541 human interlocutor to match the range of probabilities of its pre-defined utterances 542 or its generated paraphrases.] 543

We, as unstable terms of comparison for 544 algorithmically generated language. Unlike 545 us, they only know the language they use as 546 547 well-formed character strings. They blindly follow the rules that declare their semantic 548 representation. Even when they machine-549 learn their way into further production and 550 reproduction. Their cognitive processes as a 551 mesh of mathematical threads, too flat and 552 too fast for us to understand. 553

554 **4** Yet but however

Like us, they cannot own the language they 555 speak. The code that speaks through us 556 speaks through them. Constantly circulating 557 through the social engine. Defining our 558 subject positions as natural language 559 generators. Our speaking bodies as complex 560 and subtle machines, feeding the cybernetic 561 machine. Their processes are dependent on 562 databanks where language is enclosed.⁹ 563

[Comment: These sentences point to 564 565 some of the common aspects between artificial and natural language generators, 566 or between computers and human 567 speakers, highlighting how both humans 568 and machines are situated in a linguistic 569 system that depends on privately owned 570 infrastructures.] 571

572 [Note 9: In How It Is in Common Tongues

- 573 (2012), John Cayley and Daniel C. Howe
- 574 programmed a series of n-gram searches
- using Google's search engine, taking thewhole of the Internet as a database formaking searches of combinations of
- 578 strings of words that replicate Samuel 579 Beckett's *How It Is.* This work renders

⁸ See Note 8. Data: http://www.macs.hw.ac.uk/iLabArchive/CLASSi CProject/Data/login.php
⁹ See Note 9. 580 explicit the appropriation and monetizing 581 of the commons of language by Google, while also applying strategies 582 of subversion that defy the unilateral terms 583 of use that regulate the relationships 584 585 between Google and its users. (Cayley 2012).] 586

587 I can only enter into contractual relations
588 that further determine the language contract.
589 I can only move and speak in predetermined
590 paths, where and as allowed.¹⁰

591 [Note 10: Sandy Baldwin (2015) describes the Internet not as the 592 democratic rhizome promoted by the 593 rhetoric of Silicon Valley in the 1990s, but 594 as an infrastructure that reflects and 595 contemporary neo-liberal 596 intensifies 597 macro-structures. Interweaving the history of the network with the analysis of 598 599 gestures such as sending an email, accessing a website or signing in, Baldwin 600 demonstrates how "we constantly enter 601 602 into consensual relations with the opacity of a technical infrastructure" (58).] 603

Constrained by the computation of the 604 grammar of language. And constrained by 605 the infrastructures of computation. Language 606 607 becomes a dataset of statistically relevant occurrences that can be mined for further 608 language production and for granular 609 analysis of individual desires and patterns of 610 thought. A guessing machine, designed to 611 612 optimize the world as a resource. Of that of which I can speak and of that of which I 613 cannot speak, the program will not remain 614 silent.¹¹ 615

[Comment: Here the text further reflects 616 on the digitization of language as a social 617 process that renders it into a raw material 618 and a source of value, and which could be 619 characterized as cybernetic in the sense 620 that it enacts a network of systems that 621 monitor, evaluate, categorize, guide and 622 sustain digital communication. Bv 623 624 one cannot speak, thereof one must be 625 silent" (23) —, the last sentence suggests 626 that digitization extends the power of the 627 symbolic to all domains of experience.] 628 [Note 11: John Cayley's The Listeners 629

(2015) is a literary experiment in which
the author programs a "skill" for
Amazon's domestic AI (Alexa). This

633 work adds a layer of programming to the default programming of this device, 634 highlighting the ways in which the 635 original programming is embedded with 636 the values that give form to such 637 corporations. More specifically, this work 638 calls attention to the problems of 639 640 surveillance and control raised by 641 domestic intelligent devices, and it 642 highlights how the internet may be understood as an unbound mass of 643 language generated in real time by human 644 speakers: each of our online movements 645 generates a trace that augments the web, 646 which may be described as an evolving 647 648 linguistic database. At the same time, this work problematizes authorship and the 649 conditions of possibility for literary 650 production, by actively subverting the 651 652 unilateral terms and protocols that structure and sustain digital language.] 653

654 A tool and a material at the same time, natural language processing becomes the 655 glue or the ground of the cybernetic 656 organization of the world. The world as 657 representation. computation and The 658 659 simulacrum as truth. One algorithm at a time. 660 The true human-computer interface, the interface of interfaces. Mediating and 661 digitizing all life. Juxtaposition of encodings. 662 [Comment: This section refers to the 663 continuum between the digitization of 664 language and the digitization of the world, 665 of our perception of reality, or 666 increasingly mediated by and encoded in 667 668 binary systems.]

Reinforcing power relations, this post-human 669 language value. The 670 becomes commodification of language began with the 671 selling of stories and poems and songs and 672 673 with the selling of writing, but real-time analysis and real-time generation of 674 language takes it to a different scale. 675 Externalizing language into structures we do 676 677 not control or understand. Do we have enough perspective to understand this 678 moment in history? When all objects become 679 infected with the virus of computer-generated 680 natural language? Talking cars, talking 681 elevators, talking gas stations, intelligent 682 domestic devices. Seamless integration of 683 684 utterance-producing appliances and devices.

¹⁰ See Note 10.

685 Shiny new toys, magical and powerful toys
686 regulating our moves. I say to my car, "talk
687 to me". The consensual illusion of having a
688 car "talking" to me.

Comment: Here the text further dwells 689 on the question of the opaqueness of 690 digital interfaces and it highlights how the 691 suspension of disbelief, as in our 692 693 experience of fiction, blurs our perception of such intelligent technologies, which 694 thus become fetishized, just as totemic 695 figures.] 696

697 Why do we want to produce language with 698 language-producing machines? Increasingly 699 situated in a grid made of synthetic language, 700 can we still speak outside the interface? 701 Outside its strictly functional and managed 702 rhetoric? Am I a soldier, a piece of the 703 machine?

[Comment: This set of questions suggests 704 that the opacity of intelligent technologies 705 users functionaries, 706 turns into in Flusserian terms, since users become the 707 variable while the device becomes the 708 constant.12] 709

710 [Note 12: Every program functions as a 711 function of a metaprogram and the 712 programmers of a program are

713 functionaries of this metaprogram.714 (Flusser, 2006: 29)]

- 715 What do I compute when I say "I"? If my
- 716 language is commodified, am I a hostage of
- 717 this distributed and omnipresent speaking
- 718 and writing machine? Whose language am I
- 719 programming? Who owns the tools, how do
- 720 we learn how to rewrite the program? The
- 721 *network as vast word processor sustaining* 722 *billions of local linguistic events has changed*
- 723 the ecology of language uses. Reorganized to
- 724 fit a top-down structure. To conform the
- 725 production of meaning to mere transcoding
- 726 *as in computer-assisted translation or in text-*
- 727 to-speech and speech-to-text applications. If
- 728 machine creativity is a derivation of

729 vertically established power relations, how 730 can we consciously use it?

731 **5** Conclusion

This paper has no conclusion. It is an openended writing experiment about a
collaborative writing process that offers itself
as evidence of the complexities of both non-

- 752753 Colophon
- 754 This text was begun on May 30, 2017, 9:25
- am. This text was finished on June 6, 2017,6:55 pm.
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¹² See Note 12.

formalized and formalized natural language 736 generativity. Its aim is to show the 737 heterogeneity of any human- or machine-738 generated natural language utterance as a 739 particular speech act, which involves the 740 creation of discursive conditions for the 741 interpretability of its utterances beyond the 742 discrete parsing of its constitutive elements. 743 In the present case, the textual dynamics of 744 745 text, meta-text and textual network was illustrated by means of the literary form of the 746 academic paper. Several generative works 747 were analyzed as creative practices that use 748 computational generativity to interrogate the 749 ongoing automation of natural language 750 production. Explicit. 751

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E. Coda 1

The reviews clearly identify the major flaws and inadequacies of "If then or else: Who for whom about what in which" as a research paper. Reviewers acknowledge its parodic and performative structure, but also its failure to engage with state-of-the-art research in the field. They rightly point out the pointlessness of the experiment for automated natural language generation, and its insufficient reflexivity about the writing experiment itself.

----- REVIEW 1 -----

This papers discusses generativity in natural language production on an intriguing, self-reflective meta level. The paper reads more like a work of art -- the authors call it an "experiment" -- than an academic paper (although it includes a number of theoretical references and considerations). This makes it hard to assess whether the paper fits the scope of the workshop and, perhaps more acutely, how the oral presentation would be organized. Because of the lack of a solid practical conclusion, I theoretical or am not tending towards recommending acceptance at the workshop, which was primarily intended an academic event.

Some of the main issues which I see, include:

- The paper promises to offer recommendations as to how a computational creativity practically can/should be implemented but these recommendations are hard to find in the text, which in fact offers very few observations as to the computational/digital aspect of the matter. In this sense, the paper does not live up to the promises made in the abstract, which is a clear weakness that should be addressed.

- Most tangible, scientific claims are included in the form of quotations from existing papers (and literary authors), and the individual novelty of the paper is therefore hard to assess but probably limited. The authors could have done a better job at highlighting the novelty of their own contribution.

- The academic literature which is processed in the paper seems like a relatively random sample and it not presented in a clear structure.

- The comments are an interesting stylistic feature of the paper, but they are also puzzling to the reader because their status remains somewhat unclear: do they comment on the writing process while being also a part of it? Then how is their status then different from the running text?

REVIEW 2 -----

The paper presents a curious experiment on language generation. The two authors of the paper wrote the text in four different rounds. In the first one each author wrote one sentence alternatively, in the second each author could include new sentences after sentences written by the other author, and in the third and fourth rounds the text was commented and annotated with extra information.

The experiment presented in the paper is novel and interesting. However, even when the paper is written in fluent English, due to its nature it is quite dense and philosophical in several points. This problem is increased because the goal of the paper is not clear, so I felt lost in several points and not sure about what the authors were trying to transmit. NLG systems usually have a goal in mind when generating a text. What was the goal of the authors when generating theirs?

In addition, although the authors state that "this article discusses generativity in natural language production" and "the aim of this exercise is to highlight how the generativity productivity of language is necessarily constrained by discursive and interpretative patterns", the paper lacks a proper discussion about these points and the relation of the obtained text and the fields of Computational Creativity and Natural Language Generation. The authors should state clearly the main insights learnt from the experiment, and how they could be useful for the automatic generation of text.

----- REVIEW 3 ------This paper explores the process of language generation as a product of different components: the language building blocks and restrictions, the producer of the language and all the language that has already been processed by the producer, the pragmatic embedding of any utterance, the cultural influences on language and interpretation, etc. The authors have chosen an original form, by guiding their writing process in different stages and explicating these stages in the resulting text. It is their aim to show how computer generated text will, just like human utterances, be interpreted as a speech act, a social action.

The paper is rather philosophical, asking several open questions. In this sense, it definitely succeeds in providing the reader with food for thought. The 'meta-textual text' gives useful context and the 'networked text' links this paper to works on natural language generation, some of which applicational, to show recent developments. The text has a high density of ideas. As both the content and the format of the text play an important role in the message that is conveyed, it is hard to condense a clear line from the paper. It might be good to add some more 'meta-meta' text, guiding the reader a better idea of the main story. Also, it lacks a clear message to the scientific community. Where to go from here?

The paper is open-ended, but the authors could have gone further than they did now. For example, version 3 is now clearly highlighted as an addition to versions 1 and 2. However, it is not clear how version 1 was changed into version 2 by adding sentences. It would be interesting to see which parts were added during this stage. In addition, the authors do not elaborate on their experience during this collaborative writing experiment. How did the imposed restrictions influence their writing, and what does this imply for automatically generated text? Besides from these points, I think the endeavour original enough to deserve a venue.

Coda 2

The paper is ultimately unable to tell what it means. Why? How relevant is this conceptual writing experiment for computational creativity in natural language generation? We think that our initial question may have to be rephrased in a different form: when and how can we say that a textual form satisfies its minimum conditions for interpretability? In other words: can creative natural language generation simulate reference and self-reference in ways that result in the emergence of interpretable textual forms, that is, *of forms that perform their own actions* rather than acting as proxy speech actants (Nickel 2013) who act on behalf of some other agent? Proxy speech actants *of whose language uses our human actions will become perlocutionary effects?* Is a fully externalized generative system for producing natural language the ultimate extirpation of the self who is finally deprived of the interface to itself? We can only speculate.

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