Graphemic and Graphetic Methods in Speculative Fiction

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Abstract. In this paper we define a model of literary prose text, in terms of an ontology: concepts, relations and rules. This ontology contains both concepts related to abstract linguistic entities and to material/geometric notions. Rules are included in order to modelize the conventions of orthotypographic tradition. Once the model established, we define "graphemic and graphetic methods" as transgressions to these rules and investigate the use of such methods in speculative fiction texts, based on a 20th-21st c. international corpus. We also investigate, whenever possible, to what extent and in what way graphemic and graphetic methods have been translated into and/or adapted to other languages.

1. Introduction

According to Nina Nørgaard (2009, p. 141) "there is a general tendency in literary criticism to disregard the semiotic potential of typography in literature by focusing monomodally on word-meaning only". This is even more true when meaning is created not only by the traditional methods of typography and layout, but also by transgressing the underlying rules. Breaking rules governing book design, whether these are written (in specialized manuals) or unwritten (observed in corpora), provides authors with a virtually unlimited potential of methods (graphemic or graphetic) and meaning layers to choose from.

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We will study these methods and the intentions behind them. In order to do so, we will not turn to general literature (the cases being infrequent), but rather to science fiction, fantasy, and unclassifiable novels which have in common that they leave a large part to the imagination. These works of fiction can be grouped under the term "literature of the imagination," or "speculative fiction," a term we will use in this article. We will thus cite novels and authors from the golden age of American science fiction, authors who are now classics in the field of fantasy, as well as authors from the new generation of speculative fiction. The works cited are dear to us: in parallel to our research, all three of us are great readers of speculative fiction, and it is even a field in which some of us have already published (Landragin, 2015; 2018; 2020a,b,c; Landragin and Lehoucq, 2019; Landragin, Steyer, and Lehoucq, 2017; Landragin, Lehoucq, Robinson, and Steyer, 2019). We feel an immense fascination and respect for these works, for their authors, and for the imagination they have shown. Therefore, we will pay close attention to their graphic innovations, by using a descriptive and explanatory approach. We will thus focus on the graphemic and graphetic methods used by the authors we have selected in our corpus of study. We will describe in detail the characteristics of these methods, and will propose a formal model for them, which will enrich the existing models based on "standard" text.

Our longer-term objective is to better understand, better characterize, and increase awareness of this exceptional corpus produced by speculative fiction. In short, our starting point was initially the writing systems invented by science fiction authors and scientists to communicate with aliens, assuming that they exist and are able to understand our messages. Imagining communication with an alien is indeed an effective way to become aware of the difficulties posed by language and writing. It is well known that scientists have already sent messages to aliens—if they exist, of course (Oberhaus, 2019). There are the famous examples of the Pioneer plaques, the Voyager golden records, the Arecibo message, then the Eupatoria messages ("Cosmic Call 1" in 1999 and "Cosmic Call 2" in 2003) with the related research on a universal language that can be understood by everyone—aliens included, of course. This research led to *LinCos*, that is the *lingua cosmica*, and efforts are currently being made to develop a better LinCos. The aim is to communicate with extraterrestrial intelligence, and an important point here is that speculative fiction writers have imagined a wide variety of communication situations, long before the real scientific attempts. It is the study of these various situations that led us to constitute our corpus of study.

Before detailing this corpus (which will be the main subject of this article), let us take advantage of this introduction to take a look at some famous speculative fiction novels dealing with communication and language—the rest of the article will then focus on grapholinguistic aspects. First of all, we can cite *The Embedding* (1973) by Ian Watson (1943−) and *To-*

tal Eclipse (1974) by John Brunner (1934–1995), two examples among others illustrating Noam Chomsky's ideas. According to Chomsky (1965), we are born with the ability to handle language, and therefore certain structures should be innate. Chomsky focused on syntax, but many writers of speculative fiction have understood the main idea, and applied it, not only to syntax, but in fact to all aspects of language, and not only to humans, but also to aliens (Barnes, 1974; Bould, 2009; Meyers, 1980; Watson, 1975; Westfahl, 1993). Another theory that proved highly influential in speculative fiction is the Sapir-Whorf hypothesis, namely that the structure of a language affects its speakers' world-view or cognition, and that people's perceptions are thus relative to their spoken language. We call Edward Sapir's and Benjamin Lee Whorf's theory *linguistic relativism*. According to this theory, our language influences the way we perceive the world (e.g., time or colors). For many speculative fiction writers, the temptation to exceed the limits of the original idea was too strong. Thus, they moved easily from the weak hypothesis to the strong hypothesis, i.e., to *linguistic determinism*, according to which our language determines even our mental structures. Consequently, these mental structures are changed when we learn a second or third language. Linguistic determinism is an interesting idea, with many potential applications. In *The Languages of Pao* (1958) by Jack Vance (1916–2013), the rulers of a society that is losing a war force the population to change its language. The new language, more aggressive, especially in its morphology, is intended to encourage a reversal of the situation. In *Babel-17* (1966) by Samuel Delany (1942–), a civilization receives coded messages from extraterrestrials. But is it really a code? It is in fact a language, which, according to linguistic determinism, transforms those who learn it and turns them into traitors—a quite innovative version of the alien invasion trope. This way of forcing people to learn a language in order to have them think in a certain way is a facet of totalitarianism. This is the message of *Nineteen Eighty-Four* (1949) by George Orwell (1903–1950), and, long before that, of *We* (1924) by the Russian author Eugene Zamiatin (1884–1937), which describes a society where people have to think collectively and are therefore forbidden to use the first person singular, and may refer to themselves only in the plural form.

Closer to our concerns about the ways in which speculative fiction writers have played with words and metatextual aspects, let us take three final examples, which we will not describe in our article, but which are part of prior and necessary common knowledge for the present study. Among the most notorious fantasy texts are Tolkien's novels, in which a fictional family of languages, "Elvish languages," are described. The French author Frédéric Werst (1970–) went even a step further and invented *fictional bilinguism*, in his *Ward* novels (2011, 2014), in which left-hand pages are written in the Wardwesân language, which he imagined in Tolkien's way, and right-hand pages are their translations into French, easier to read for readers not knowledgeable of the fictive lan-

guage. The second example, which is also an extreme case, is *Book from the Ground* (2014) by Xu Bing (1955−). The entire novel is written using pictograms. There is no use translating, as we are very close to the long-sought *universal writing system*—even though it is universal for humans rather than for aliens. Universality is a vast question. It should be noted that in France, research on universal language (as well as on the origin of languages) was banned as early as 1866, as stated in the Société Linguistique de Paris's founding statutes (Gauthier, 2008, p. 2)—new research has been happening for several decades now, but it is much more multidisciplinary in its approach and much more careful, too. The third example is *Arrival* (2016), a movie by Denis Villeneuve based on the novella *Story of your Life* (1998), by Ted Chiang (1967−). The linguist Jessica Coon (keynote speaker at the *Grapholinguistics in the 21st Century conference*) was the linguistic advisor for this great movie. Let us just note that the film brilliantly deals with the ideas of Chomsky (whose portrait can also be seen in the main character's office), with the Sapir-Whorf thesis (at its extreme interpretation, otherwise nothing would happen to Louise Banks) and, in fact, with everything that can turn speculative fiction into linguistic speculative fiction—or "linguistic fiction".

Now that we have given the general context of our corpus of study, let us move to specifically grapholinguistic aspects. We will begin by describing in detail a model which takes into account both graphemic and graphetic aspects (Section 2).

2.   A Model of Literary Text Using an Ontology and Rules

The goal of this paper is to list and classify graphemic and graphetic methods encountered in speculative fiction. We have chosen this specific genre because of its inherent innovative character that reflects on various linguistic strata, including graphemics and graphetics.

As we are looking for *nonstandard* methods and as we aim to classify them, we first need to provide a model of literary text in its *normality*, and more specifically of the novel or short story genre, as these are the most representative in the speculative fiction sphere (i.e., we will not deal with poetry, theater, etc.).

Such a model should include all components of literary text, from its smallest element to its largest superstructure (a book, a book series), considered both as abstract linguistic entities and as visual/material entities.

It seems that a formal ontology with TEI semantics is in the works (Ciotti and Tomasi, 2016−2017), but not yet available. But even if it existed it would not be suitable for our purposes because, although TEI covers both abstract linguistic elements (morpheme, word, sentence, etc.) and visual elements (glyph, line, block, etc.), it provides them not as *standard components of the book*, but rather as special cases: glyphs

and blocks are defined for the representation of primary sources (manuscripts, etc.) (TEI Consortium, 2020, §11.4–5) and linguistic elements are defined for linguistic annotation of corpora (ibid., §15.4).

Furthermore, an ontology is necessary for formalizing the relations between various components of literary text. These relations are essential features of its structure: in languages having the notion of word, whether straight or curved or taking strange shapes, a "line" is always an ordered collection of "words" (with potentially a "word segment" at its beginning and/or end, because of word hyphenation).

In order to model the "standard" behavior of the text's components in such a way that nonstandard methods can be identified, described and classified through it, we will use *rules*: for every relation between concepts we will define attributes (numeric values or geometric dimensions) and we will state the basic orthotypographical "rules," that is the standard logical and/or visual properties of the text.

Once the rules are given, describing a nonstandard graphemic/graphetic method amounts to listing the rules that are broken, as well as the narrative intention of the method.

Rules also allow us to predict potential graphemic/graphetic methods not yet encountered.

In the graphical representation of our ontology (Fig. 1), we use the left side for abstract linguistic elements (grapheme, morpheme, etc.) and the right side for visual/material elements (graph, word segment, word, etc.). As some of these elements are homonymous, to avoid confusion we will add a γ prefix in front of visual/material elements, e.g., "γ-word" stands for graphical word while "word" stands for the linguistic notion of word (that occurs in some writing systems).

In the following we will describe our literary text ontology starting with its concepts, its relations and the corresponding rules. In Fig. 1 we have used the following convention:

- bold arrows represent "is-part-of" (meronymy) relations: the element at the destination of the arrow contains an ordered collection of elements at the origin of the arrow;
- all "is-part-of" relations are labeled by circled numbers, which will be used in the description of relations and rules;
- arrows marked by the letter "R" are representation or reification relations, e.g., a graph represents a basic shape, which represents a grapheme, etc.
- dashed arrows represent simple inclusion: the element at the origin of the arrow is included (at most once) in the element at the destination of the arrow;
- we have drawn elements from top to bottom so that upper elements are nested in lower elements and elements of approximately the same complexity are drawn at the same level (e.g., the concept "page num-
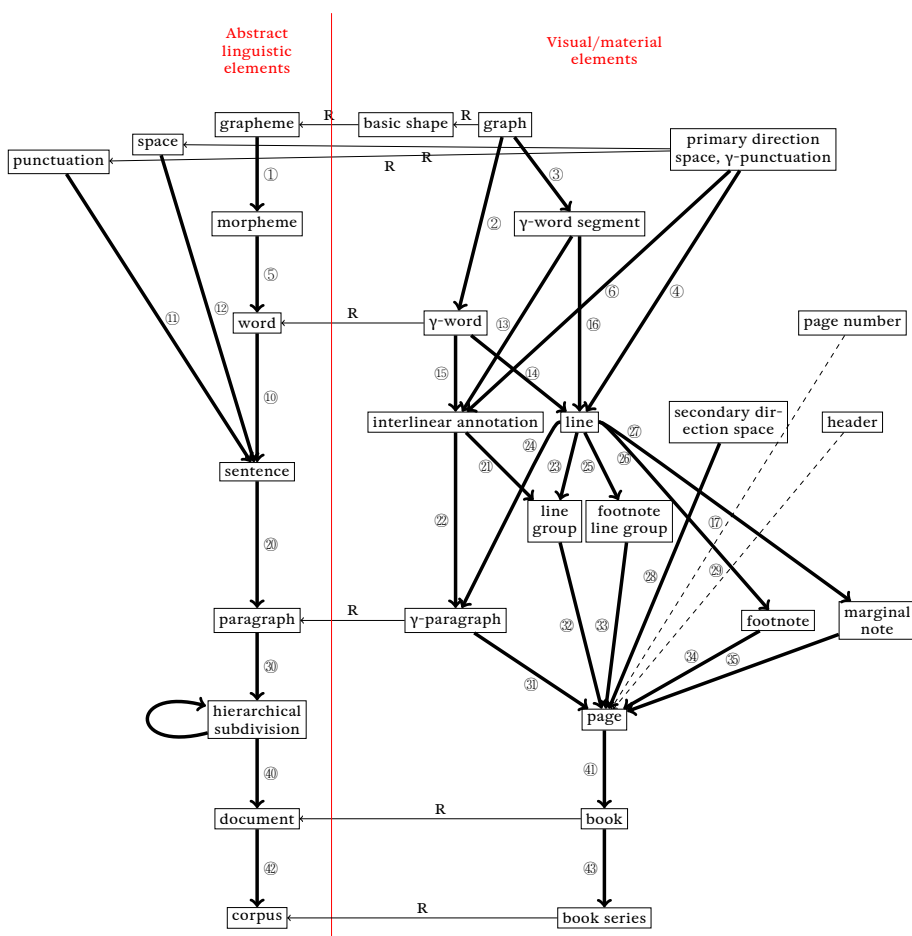
FIGURE 1. Graphical representation of the literary text ontology

ber" is at the same level as "γ-word," while "header" is at the same level as "line").

2.1. Concepts

On the left side of the graphical representation in Fig. 1 we have placed the following abstract linguistic elements:
- "grapheme": the elementary unit of graphemics used in 2nd articulation to obtain (written) morphemes;
- "punctuation": called *topograms* by Jacques Anis, these graphemes *ensure legibility and contribute to meaning production* (Anis, 1988, p. 116);

- "space": a grapheme with empty graph[1];
- "morpheme": *the minimal distinctive unit of grammar* (Crystal, 2008, p. 313); in our case: a minimal sequence of graphemes that carries sense;
- "word": *a unit of expression that has universal intuitive recognition by native speakers, in both spoken and written language* (ibid., p. 521); in our case: in languages using writing systems containing that notion, sequences of morphemes separated by spaces or punctuation;
- "sentence": in linguistics, it is *the largest structural unit in terms of which the grammar of the language is organized* (ibid., p. 432). For us it is also the meeting point between legacy linguistics and the document structure theory by Power, Scott, and Bouayad-Agha (2003), in which it is called "text-sentence" (level 2);
- "paragraph": an ordered collection of sentences, level 3 for Power, Scott, and Bouayad-Agha (ibid., p. 224);
- "hierarchical subdivision": a chapter, section, subsection, etc. (We do not include titles of hierarchical subdivisions in the ontology and consider them simply as paragraphs.) Power, Scott, and Bouayad-Agha (ibid.) call these L_N for $N > 3$. Hierarchical subdivisions have a physical order (which is linear order for subdivisions of equal level and depth-first search order for subdivisions of different levels), and in some cases also a logical order (which is given by graphemically explicit numbering);
- "document": the highest L_N in Power's approach, together with a set of metadata (title, author, publisher, etc.) as formalization of a material "book";
- "corpus": an ordered set of "documents," formalizing a "book series".

On the right side of the graphical representation we have placed visual/material elements. The "primary" and "secondary" directions depend on the script, e.g., for Roman, primary is horizontal left-to-right and secondary is vertical top-to-bottom; for Arabic, primary is horizontal right-to-left and secondary is vertical top-to-bottom; for vertical CJKV, primary is vertical top-to-bottom and secondary is horizontal right-to-left; and for Mongolian, primary is vertical top-to-bottom and secondary is horizontal left-to-right.

- "graph": as defined in Meletis (2015, p. 123), a graph is a shape representing a grapheme;
- "basic shape": as defined in Meletis (ibid., p. 47), a basic shape is an intermediate notion between graphs and graphemes, identifying a family of graphs;

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1. We argue that spaces are graphemes since their presence can change meaning as in the following example: <intolerant communities> vs. <in tolerant communities>.

- "primary direction space and γ-punctuation": these graphs represent spaces and punctuation (the notion of direction exists only in graphetics);
- "γ-word": a graphical word, that is a 1-dimensional sequence of graphs surrounded by horizontal spaces or punctuation and representing a "word";
- "γ-word segment": this concept is necessary because of word hyphenation. As we wish to describe the elements that constitute a line, we need to take into account:
    1. word segments located at the beginning of the line that belong to a word of the previous line, which has been hyphenated,
    2. word segments followed by a hyphen, located at the end of the line, and belonging to hyphenated words of the current line;
- "page number": the page number is part of a page and occurs at most once in a page (in some styles, the first or the last pages of a chapter have no page number):
- "line": typically a concept that has no linguistic counterpart, a line is an ordered collection of γ-words, potentially starting and/or ending by a γ-word segment and separated by horizontal spaces and punctuation. A line normally has a standard width, except for (potentially) the first line of the paragraph, which can be indented, and the last line of the paragraph, which can be shorter than the standard width;
- "interlinear annotation": these are lines in smaller type placed between standard text lines;
- "secondary direction space": secondary direction space is sometimes inserted between paragraphs, especially when they play the role of titles;
- "header": in some book styles every page has at most one header, made of a single line of text;
- "γ-paragraph": an ordered collection of lines, representing a paragraph;
- "line group": as with γ-word segments, we had to introduce this notion, intermediate between lines and paragraphs, because sometimes paragraphs are broken between pages, so that we may have an initial line group on one page, potentially followed by complete pages (with no paragraph change), and ending by a final group of lines;
- "footnote": a footnote is a line thread that is parallel to the standard line thread, but is set in smaller size and placed at the bottom of the page. A footnote can be broken between pages, and that is why we introduce the next notion:
- "footnote line group": part of a footnote contained on a given page;
- "marginal note": one or more paragraphs in smaller size and placed in one of the two margins. As marginal notes are never broken between pages, we don't need an intermediate structure for γ-paragraphs and footnotes;

 – "page": a 2-dimensional area repeated on both sides of each sheet of
   a book;
 – "book": a material book or a visual simulation of a material book on
   a computer monitor;
 – "book series": a material sequence of books belonging to a book
   series published by the same publisher and sharing the same vi-
   sual/material properties and a common theme.

2.2.   Geometrical Parameters

All visual/material elements have a geometric reality and therefore oc-
cupy space on the page area. We introduce Euclidean coordinates and
measure the geometric/physical location of a point x by functions $h(x)$
and $v(x)$, where:
 – h denotes projection on an axis parallel to the primary direction of
   a given script (horizontal for horizontal scripts, going from left to
   right for Latin, Greek, Cyrillic, etc. and from right to left for Arabic,
   Hebrew, etc.; vertical and going from top to bottom for vertical CJK
   and Mongolian);
 – v denotes projection on an axis parallel to the secondary direction
   of a given script (vertical and going from top to bottom for horizon-
   tal scripts, horizontal and going from left to right for vertical CJK,
   horizontal and going from left to right for Mongolian).
Various units have been defined for h and v (points, Didot points, etc.)
but we will use, in our rules, only the unit "em" (an "em-space") that is
relative to the current font body size.

Elements graph, γ-word, γ-word segment, interlinear annotation and
line contain an (invisible) primary direction line called *baseline*.

Visual/material elements occupy 2-dimensional space. We will con-
sider that they are included in (not necessarily minimal) boxes (see
Fig. 2) which we call *abstract baselined boxes*. We define functions $h_{\min}$ and
$h_{\max}$ as the minimum and maximum value of the primary dimension of
an abstract box, $v_{\min}$ and $v_{\max}$ as the minimum and maximum value of
the secondary dimension of the box, and v_{bas} as the value of the sec-
ondary dimension of the element's baseline, when available. For most
of our rules we will use equalities between the values of these functions.

2.3.   Relations and Rules

There are two types of rules on elements in our model. The first type,
constitutive rules, are those that define a given element and breaking them
invalidates membership of an instance to the given concept. For exam-
ple, to be a marginal note, a paragraph has to be contained in the page
margin: a paragraph that does not satisfy this rule is *not* a marginal note.

(a) To seek out new life and new civiliza-
tions. To boldly go where no man has gone
before!

(b) To seek out new life and new civiliza-
tions. To boldly go where no man has gone
before!

(c) To seek out new life and new civiliza-
tions. To boldly go where no man has
gone before!

(d) To seek out new life and new civilizations.
To boldly go where no man has gone before!

FIGURE 2. Abstract baselined boxes for (a) graphs, (b) γ-words and γ-word segments, (c) lines, (d) γ-paragraph.

The second type of rule are *optional rules*: for example, the rule according to which graphs of a word have to be on the same primary-direction baseline (which we call RULE②-1, see below) is satisfied in the vast majority of cases, and breaking it becomes a graphetic method used by authors for specific purposes.

In the following, we set the description of constitutive rules in regular text and that of optional rules in boxes. The latter are numbered RULE⊗-*n*, where "⊗" is the number of the relation on which the rule is applied and "*n*" is a number.

To distinguish various levels of constitutive rules, we will structure this section by sub-sections referring to the target of the relations described: words (§2.3.1), lines (§2.3.2), paragraphs (§2.3.3), pages (§2.3.4), and the book *per se* (§2.3.5).

2.3.1. The Target of the Relation Is a Word, a γ-Word or a γ-Word Segment

Relation R①

Morphemes are represented by ordered collections of graphemes. When a script is phonographic or used in phonographic mode, this relation corresponds to second articulation, where meaning emerges from the identification of patterns of contiguous graphemes.

RULE①-1	The grapheme sequence belongs to the part of the language's graphemic solution space (Neef, 2012, p. 223) that is used by the orthographic component of the language.

If we consider case as a graphemic property (so that, e.g., <A> and <a> are different graphemes) then non-standard casing is a nonstandard graphemic method:

RULE①-2	For cased scripts, in a given morpheme, cases of graphemes belong to one of the three folllowing cases: (a) all graphemes in lower case, (b) all graphemes in upper case, (c) first grapheme in upper case and the remaining in lower case. Proper names and brand names are not taken into account.

Relation R⑤

In languages containing the notion of word, words are ordered collections of (bounded and/or free) morphemes.

RULE⑤-1	In a given word, graphemic representations of morphemes are concatenated in a given, fixed order.
RULE⑤-2	In a given word, graphemic representations of morphemes are concatenated either without a separator or using a standard (language-dependent) separator.

For the Latin script, examples of standard morpheme separators are the dash (as in <up-to-date>) and the apostrophe (as in <aujourd'hui>). See Haralambous and Dichy (2019) for examples of separators used for gender-neutral writing. If we consider acronyms as words and their constituents as "morphemes," then the abbreviation dot is the corresponding standard separator.

Relation R②

γ-words are built out of the concatenation of graphs. Let g and g' be two consecutive graphs.

RULE②-1	Graphs of the same γ-word are concatenated according to the primary direction (i.e., $b_{\max}(g) = b_{\min}(g') + \varkappa(g,g')$, where $\varkappa$ is the kerning operation).
RULE②-2	Graphs of the same γ-word share the same straight primary direction baseline (i.e., $v_{\mathrm{bas}}(g) = v_{\mathrm{bas}}(g')$).
RULE②-3	Graphs of the same γ-word share the same size.
RULE②-4	Graphs of the same γ-word share the same style.
RULE②-5	Graphs of the same γ-word share the same font family.
RULE②-6	When two graphs of the same γ-word represent the same grapheme, then the same allograph is used to represent them.

Relation R③

γ-*word segments* are parts of γ-words that appear when a γ-word is hyphenated. Left γ-word segments appear at line end and their last graph is a hyphen, right γ-word segments appear at line beginning (without indentation).

Rules RULE③-1 to RULE③-6	Similar to RULE②-1—RULE②-6.
RULE③-7	The frontiers of γ-word parts inside a line are hyphenation locations according to hyphenation rules specific to the current language (as well as region, historical period and/or publisher).

2.3.2. The Target of the Relation Is a Sentence, a Line or an Interlinear Annotation

Relations R⑩, R⑪ and R⑫

Sentences are built out of words and punctuation. Spaces are included to separate words.

RULE⑩-1	In a sentence, words and punctuation must conform to the syntax of the current language.
RULE⑩-2	In a sentence, words and punctuation belong to the script of the current language.

Relations R④, R⑭ and R⑯

A line starts by a right γ-word segment or a primary direction space (called *indentation*) or γ-punctuation or a γ-word. It contains zero, one or more γ-words, γ-punctuation graphs and primary direction spaces. It ends with a γ-word segment, a γ-word, γ-punctuation or primary direction space.

RULE④-1	Primary direction interword spaces have the same width, which is of approx. 0.25−0.4 em. In some languages this width is greater after a sentence full-stop.
RULE⑭-1	γ-words in a line share the same primary direction baseline.
RULE⑭-2	γ-words in a line share the same size of graphs.
RULE⑭-3	γ-words in a line share the same font family.
RULE⑭-4	When two graphs of the same line represent the same grapheme, then the same allograph is used.

Relations R⑥, R⑬ and R⑮

Interlinear annotations behave like lines, with the particularity that the size of their graphs is smaller than that of graphs in lines of main text.

A specific kind of interlinear annotation is Japanese rubi, where morphemes (often in kanji sinographs) are annotated by smaller-size graphemes (in kana).

RULE⑬-6	Japanese rubi annotation provides phonetic realization of sino-graphs.
RULE⑬-7	Besides the specific case of Japanese rubi, annotation is not used in fiction.

2.3.3. The Target of the Relation Is a Paragraph, a γ-Paragraph, a Line Group, a Footnote, a Footnote Line Group, or a Marginal Note

Relation R⑳
When moving from the concept of sentence to that of paragraph, we leave the traditional realm of linguistics, even though, in one of the few linguistic publications on the subject, Zadrozny and Jensen (1991) suggest that "the paragraph is a grammatical and logical unit [...] and the first reasonable domain of anaphora resolution and of coherent thought about a central topic". We could use these two criteria as rules if only they weren't broken so often in fiction, due to literary artistic freedom.

Relations R㉔ and R㉓
A γ-paragraph is a rectangular block of lines, visually identified by three phenomena: the first line is indented (in some orthotypographic traditions this is not the case for the first γ-paragraph of a hierarchical subdivision or after a secondary direction space), the last line is incomplete and, in some cases, there is additional secondary direction space before and after the γ-paragraph. An initial line group is the first part of a γ-paragraph, it has to be the last γ-paragraph of the page (besides footnotes), an intermediate line group is a block of lines covering a complete page (besides footnotes), and a final line group is the last part of a γ-paragraph, placed at the top of the page.

RULE㉔-1	γ-Paragraphs and line groups are rectangular blocks, i.e., if ℓ and ℓ' are consecutive lines then $h_{\min}(\ell) = h_{\min}(\ell')$ and $h_{\max}(\ell) = h_{\max}(\ell')$; if ℓ is indented then $h_{\min}(\ell) = h_{\min}(\ell') + \text{indent}$; if ℓ' is final, then $h_{\min}(\ell) = h_{\min}(\ell')$ and $h_{\max}(\ell) \geq h_{\max}(\ell')$.
RULE㉔-2	All lines in a γ-paragraph or line group are filled by γ-words and interword spaces (with the exception of the first and last line, as in the previous rule).
RULE㉔-3	Lines in a γ-paragraph or in a line group are located at a fixed secondary direction distance, called "leading," i.e., if ℓ, ℓ', ℓ are arbitrary consecutive lines of the same γ-paragraph or line group, then $v_{\text{bas}}(\ell') - v_{\text{bas}}(\ell) = v_{\text{bas}}(\ell) - v_{\text{bas}}(\ell')$.
RULE㉔-4	Lines in a γ-paragraph or line group share the same size of graphs.

RULE㉔-5	Lines in a γ-paragraph or line group share the same font family.
RULE㉔-6	For cased writing systems and unless the γ-paragraph is a title, lines in a γ-paragraph or line group use lowercase with occasional uppercase letters at γ-word begin.

A paragraph can be split (according to the primary direction) into several columns. Columns of a γ-paragraph or line group behave like γ-paragraphs with respect to shape, baseline skip, graph size, and font family. We have the following additional rules:

RULE㉔-7	Columns of a γ-paragraph or line group are of equal width.
RULE㉔-8	In a multi-column context, reading order is by column (first the entire first column, then the second, etc.).

Relations R㉕, R㉖ and R㉗

Footnotes, footnote line groups and marginal notes behave like γ-paragraphs and line groups, so they are subject to the same rules as RULE㉔-1 to RULE㉔-8. Footnotes, footnote line groups and marginal notes use graphs of smaller size than γ-paragraphs.

2.3.4.　The Target of the Relation Is a Hierarchical Subdivision or a Page

Relation R㉚

The lowest-level hierarchical subdivision (L_4 for Power, Scott, and Bouayad-Agha, 2003) consists of a title (which can be considered as a paragraph) followed by an ordered collection of paragraphs. Beyond that level, hierarchical subdivisions L_N ($N > 4$) consist of a title (a paragraph) followed by an ordered collection of subdivisions L_{N-1}.

The notion of *page* exists neither in linguistics nor in the document structure of Power, Scott, and Bouayad-Agha (ibid.). Relations R⑰, R㉘–㉙ and R㉛–㉟ contribute material to the page area.

Relation R⑰

Page numbers are unique numeric identifiers of pages in a book[2]. In some orthotypographic traditions, first and/or last pages of chapters do not carry page numbers (even though they participate in numbering).

RULE⑰-1	Page numbers of consecutive pages are consecutive integer numbers in increasing order.

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2. This is true for literary texts—in other genres, such as critical editions, pairs of pages containing text and translation carry the same page number.

Relation R㉙
Headers are optional single lines of text that act as thematic descriptors of pages (often they are abbreviated versions of hierarchical subdivisions of the book). They are placed at the top (relative to the secondary direction of the script) of the page. First pages of chapters generally do not carry headers.

Relations R㉛–㉟
Contrary to technical or scientific books, in fiction, paragraphs on the same page share characteristics:

RULE㉛-1	γ-paragraphs on a page share the same color.
RULE㉛-2	γ-paragraphs on a page share the same size of graphs.
RULE㉛-3	γ-paragraphs on a page share the same font family.
RULE㉛-4	γ-paragraphs on a page use the same allograph of a given grapheme.

As already mentioned, a final line group is always placed at the top of the page (under the header), followed by γ-paragraphs and potentially an initial line group. Underneath the last γ-paragraph or the initial line group (relative to the secondary direction of the script) are placed footnotes and footnote line groups (again we have initial and final footnote line groups behaving similarly to regular line groups). Marginal notes are placed in the secondary direction margin of the page, and they are not broken between pages. Footnotes and marginal notes are uncommon in fiction, the former occurring mostly in translations to provide comments by the translator.

RULE㉞-1	In fiction, footnotes occupy significantly less area than the main text.

2.3.5. *The Target of the Relation Is a Document or a Book*

Relation R㊵
Hierarchical subdivisions L_N ($N > 4$) are nested, the highest level $L_{N_{\max}}$ being the document. Often L_N subdivisions ($4 < N < N_{\max}$) start with a paragraph functioning as a title. The document has metadata (title, author, publisher, ISBN, etc.) that can be part of its contents, in which case they are called *paratext* (Genette, 1997).

Subdivisions can be ordered in two ways: by *physical* order, which is the order of subdivisions as parts of the (physical) book and by *logical* order, which is the order given by explicit numbering in the text.

RULE㊵-1	Whenever logical order is given, physical and logical order coincide, with the exception of special subdivisions (preface, introduction, epilogue, etc.) that are generally not numbered.

Relation R④

A (physical) book is made of sheets, the two sides of which are pages. As such, pages have the geometric characteristics of 2-dimensional objects (while sheets, and therefore also the book per se, have a third dimension: thickness).

RULE④-1	Graphs in pages share the same color.
RULE④-2	Pages share the same background color.
RULE④-3	Graphs in pages share the same size of graphs.
RULE④-4	Graphs in pages share the same font family.

Even though it seems obvious, we include a rule to prevent blank pages:

RULE④-5	No blank pages are allowed in the body of a book, except for potential even pages necessary to have highest-level subdivisions start at odd pages.

After having described concepts, relations and rules we turn now to the main topic of the paper: graphemic and graphetic methods in speculative fiction that break the rules of our ontology.

3. Breaking Rules

3.1. Breaking RULE①-1: Eye Dialect and Nonstandard Spellings

Bowdre (1964, p. 1) defines *eye dialect* as "words and groups of words which for any one of a number of possible reasons have been spelled in a manner which to the eye is recognizably nonstandard, but which to the ear still indicates a pronunciation that is standard". As Baroni (2013) mentions, "[an] important aspect of Eye Dialect is that it is nonstandard as regards the graphic appearance of the word but is still regular as regards the relationship between phonemes and graphemes". For this reason, eye dialect has been, ever since the early 19th century, a graphemic method used to attach non-linguistic information (such as regional origin or education level) to the transcriptions of utterances of fictional characters.

In the following we will describe three nonstandard eye dialect cases.

3.1.1. Lost Memory

The short story *Lost Memory* (1952) by British author Peter Phillips (1920−2012) appeared in the magazine *Galaxy Science Fiction*. The story is about a civilization of robots founded centuries earlier by a computer

that taught the robots English but erased all words related to humans and human activities. When a human crashes with his starship on this planet, the robots communicate with him, but do not understand parts of his vocabulary and this has dramatic consequences for him as he ends up dying burnt alive. To mark the words that fail to be recognized by the robots and hence allow the reader to identify shortages in communication between robots and the human, Phillips uses eye dialect. Interestingly, the communication is multimodal: one robot, capable of receiving and analyzing sound waves interacts orally with the human, and transmits the dialog to the others in computer-internal form (which, again, is presented to the reader as written form).

The short story has been translated into German (1958), French (in 1954 and 1974) and Japanese (in 1957 and 1962). The translating challenge was to misspell, in a plausible way, the same words as in the original English version. Here are the most important misspelled words in the various versions (translated words with an asterisk have *not* been misspelled in the translations, "NT" means "not translated"):

Original (1952)	French (1954)	Japanese (1957)	German (1958)	Japanese (1962)	French (1974)
mann	omm	* 人間	mensch	* 人間ン	omm
seks	sekse	* 性	Geschlekt	性の区別	seks
ogod	odieu	NT	ogot	NT	ôdieu
wumman	famm	* 女	frau	〈おんな〉	fam
deth	more	* 死	*Tod	し	mor
blud	san	* 血	Blud	ち	san
wor	*guerre	NT	Krig	せんそウ	guère
zoot	skafandre	NT	anzuck	宇宙服 ズート	skafandre
burds	oisos	* 小鳥	*Vögeln	* 小鳥たち	oisos
feeld	chan	NT	Felt	野はラ	chan
fethers	plumms	NT	*Federn	〈羽毛〉	plumms
brest	mamell	* 胸	*Brust	〈胸〉	mamèle
erth	terr	* 大地	*Erde	〈地球〉	tère
Total: 72	56	0	49	26	59

The 1957 Japanese translation contains no misspelled words whatsoever, but nevertheless, four words that should be written in kanji have been written in hiragana. Using characters such as <人> ("man"), <女> ("woman") or <鳥> ("bird") in the first Japanese translation leads to logical contradictions: if these characters are unknown to robots, how can they establish the connection between phonetic and logographic representation? This has been corrected in the second translation, at least for <女>, which is replaced by its phonetic transcription: 〈おんな〉. The word "suit" misspelled as <zoot> is translated by the annotated <ズート>, where the rubi have the meaning of "spacesuit" (probably a

translator's hint to the reader) and the base characters are the phonetic transcription of /zuuto/, the original English misspelled word <zoot> in Japanese phonemic space.

Phillips manages to introduce a Shakespearean quotation into the text, uttered by the human: <who is silv-ya what is shee that all her swains commend her>, translated as <wer ist silvja, das alle menner sie so preisen> in German (all lowercase!), omitted in the 1954 French translation, and translated as <qui est silv-ya-que tous ses amants couvrent de louanges> in the 1974 French translation (where one may wonder how robots could manage to keep the word <amants>, "lovers," in their de-humanized vocabulary).

Using eye dialect as an indicator of the lack of semantic information is an innovative idea, but the realization leaves the demanding reader wanting, e.g., the spelling <plumms> is not part of the French graphemic solution space and its phonetic realization is not /plym/ (for the correct *plumes*) but /plʌm/. It seems that translators have chosen improbable phonetic representations to keep the text accessible to the average reader, unfamiliar with IPA notation. On the other hand, the spelling <skafandre> may not be part of the French graphemic solution space either, but is very close to IPA notation: /skafɑ̃dʁ/.

3.1.2.   Flowers for Algernon

The novel *Flowers for Algernon* (1966) by the American author Daniel Keyes (1927–2014) is one of the most popular speculative fiction books and has been translated into 27 languages (Hill, 2004).

In the story, a mentally disabled person, Charlie Gordon, undergoes an operation that increases his IQ dramatically until, at the end, he regresses again into his former condition. The novel consists of a collection of progress reports and the eye dialect method is used to connote the evolution of Charlie's IQ. Here is an excerpt of the very first report:

> Dr Strauss says I shoud rite down what I think and remembir and evrey thing that happins to me from now on. I dont no why but he says its importint so they will see if they can use me. I hope they use me becaus Miss Kinnian says mabye they can make me smart. I want to be smart. My name is Charlie Gordon I werk in Donners bakery where Mr Donner gives me 11 dollers a week and bred or cake if I want.

We notice that misspelled word or syntagms are either homophones (<rite>, <importint>), or missing apostrophes (<dont>, <its>), or letter permutations (<mabye>). Here is a polynomial fit of the number of errors per report (we have covered only the period March 4th–April 8th and November 1st until the end, as in the intermediate period Charlie produces no misspelled words):
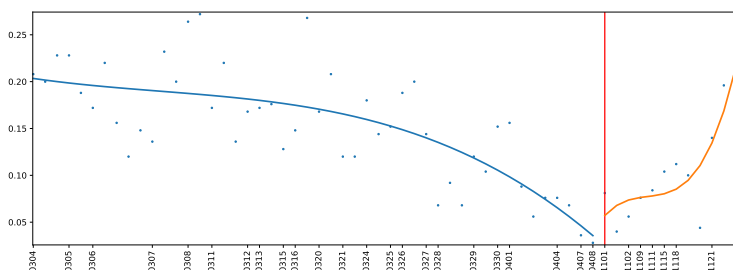
The German translation (1970) of the same excerpt:

> Dr Strauss sagt fon nun an sol ich aufschreiben was ich denke und woran ich mir erinere und ales was ich erlebe. Wiso weis ich nich aber er sagt es ist wischtisch da mit sie sen ob sie mich nemen könen. Ich hofe sie nemen mich weil Miss Kinnian sagt fileich könen sie mich Intelgent machen. Ich möchte gern Intelgent sein. Mein name ist Charly Gordon ich Schafe in der Bäckerei Donner Mr Donner gibt mir 11 dollers die woche und brot und Kuchen wen ich wil,

introduces additional elements: first of all a strong regional accent (<wischtisch> for "wichtig") and a lack of knowledge of the German graphemic indicators of long and short syllables (e.g., in the spelling <hofe>, the first syllable is long while the verb "hoffe," "to hope," has a short first syllable), so that many of the misspelled words are not homophones of the correct versions.

The French translation (1972) of the same excerpt:

> Le Dr Strauss dit que je devrez écrire tout ce que je panse et que je me rapèle et tout ce qui marive à partir de mintenan. Je sait pas pourquoi mais il dit que ces un portan pour qu'ils voie si ils peuve mutilisé. J'espaire qu'ils mutiliserons pas que Miss Kinnian dit qu'ils peuve peut être me rendre un télijan . Je m'apèle Charlie Gordon et je travail à la boulangerie Donner. Mr Donner me donne 11 dolar par semène et du pain ou des gâteau si j'en veut

is strictly homophonic. Errors are manifold: merged pronouns with verbs (<marive>, <mutilisé>), wrong conjugations (<je devrez>, <ils mutiliserons>), split words (<un portant>, <un télijan>), missing dashes (<peut être>), missing plural suffixes (<11 dolar>, <des gâteau>), etc.

In the Japanese translation (1978) of the same excerpt:

> ストラウスはかせわぼくが考えたことや思いだしたことやこれからぼくのまわり でおこたことわぜんぶかいておきなさいといった。なぜだかわからないけれどもそれ わ大せつなことでそれでぼくが使えるかどうかわかるのだそうです。ぼくを使てくれ ればいいとおもうなぜかというとキニアン先生があのひとたちわぼくのあたまをよく してくれるかもしれないといたからです。ぼくわかしこくなりたい。ぼくの名まえわ

チャーリイゴードンでドナーぱん店ではたらいててドナーさんわ一周かんに11どるくれてほしければぱんやけえきもくれる。

we find 202 hiragana, 19 katakana, and 11 kanji, that is a distribution of (87%, 8%, 5%) while the standard distribution in Japanese is rather of (44%, 7%, 49%), which shows that kanji are significantly underrepresented. The difficulty level of the kanji used in the translation is quite low: among them, five (大, 先, 生, 名, 一) are of school level 1 (age 6), three (考, 思, 週) are of school level 2, two (使, 仕) are of school level 3 and one (周) is of school level 4 (age 9).

In the excerpt above we also see four places where katakana text is written in hiragana: <パン> instead of " ぱん " (twice), <ドル> instead of " どる " and <けえき> instead of " ケーキ "—in the last case we have an additional error: instead of " え," Charlie should have written a prolonged sound mark <ー>. This is not the only error typical of the lack of knowledge of Japanese morphology—we also encounter the following: <わ> instead of " は " for the topic marker particle, missing small " っ " signs (<使て>, <いた>), etc.

In addition to the graphemic methods described above, the translator of *Flowers for Algernon* into Japanese (1992), Fusa Obi (1932−), also uses a graphetic method specific to sinographic characters, namely an innovative type of eye dialect based on the choice of sinographic character components and invention of new component combinations:

English syntagm	Misspelled	Correct
<reeding>	㑌	読
<keep reckerds>	�591	録

The first misspelled character occurs 14 times and the second once. In both cases the phonetic component (on the right) is correct, so that phonetic realization is appropriate, while the semantic component (on the right) is wrong. The (intended) semantics of both characters belong to the domain of intellectual activities (reading, keeping records, in the sense of writing down data), as if Charlie insisted in using a kanji for those two activities because they are related to script, and failed in doing so. Since neither of the two characters actually exists, the reader has to undergo the mental process of identifying the correct semantic component out of a set of homophones, given by the phonetic component.

In the postface to the translation, Fusa Obi recalls the intellectual and technical difficulties of the task:

> As a translator, I have always tried to be faithful to the original, but I have found that I can't always be faithful to the original in Charlie's writing. First of all, the reader has to understand and be able to get into the story smoothly.

> I also thought about replacing a misspelled word with a misprint—a kanji that doesn't exist. The editorial department told me that it would take a lot of time and effort to make each type because it was a letterpress printing at the time.

The method of re-combining sinographic character components in order to create non-existing sinographic characters was used abundantly by Xu Bing, in his *Book From the Sky* installation (1988).

3.1.3. Feersum Endjinn

The novel *Feersum Endjinn* (1994) by the Scottish author Iain M. Banks (1954−2013) consists of 10 chapters, each one of which (with the exception of the last) is subdivided into four sections, corresponding to four characters evolving in a cyber-fantasy universe. The character of the fourth recurrent section, Bascule, the only (one who is a) narrator, writes in eye dialect and even confesses that he does so because of a "weird wiring in his brain":

Original (1994)	German (2000)	French (2013)
[...] but unlike evrybody els I got this weerd wirin in mi brane so I cant spel rite, juss ½ 2 do evrythin foneticly. Iss not a problim cos u can put eny old rubish thru practikly anyfin evin a chile's toy computir & get it 2 cum out speld perfictly & gramatisized 2 & evin improvd 2 thi poynt whare yood fink u waz Bill bleedin Shaikspir by thi langwidje. (p. 98)	[...] abba bei mir kömmd hinzu waz bei andren nüch der fall = nehmlich daz isch so 1e obschkure elekdrohnik im göhirn hab die bewirkd daz isch nüch richtich schreim kann + bei mir allez schrifdliche irndwie fonetisch wird. Darin = k1e schwierichkeit zu sehn weil man praktich jeden blöden schrifdlichen kwatsch vom kompjuter selbzd m schpülzeuchkompjuter in völlich korrekt göschriehmnen + auch in der grammattik richtichen tekzd umwanneln lazen kann + er wird sogar ferbesserd biß die schprach so gud = daz man denkd man wär leibhafftich der aldie Schäksbier.	[...] mè kontrèreman o zotr personn jé anefé kelkö choz de kuriözman branché dan lö servo, ski fè kö jö ne pö pa ékrir normalman. Tou skö jékri sor an fonétik. Sö né pa z1 problem étan doné kon pö tou kolé pratikeman dan ninport kel machinn, mèm 1 ordinatör pour anfan & sa vou sor le tou remi an bon nanglé avek lortograf & la gramèr & mèm dé zaméliorasion & du kou on a kazi linpresion kö C sö fichu Bil Chékspir ki vou zékri.

Interestingly, Banks's phonetic transcription uses the phonetic values of digits and logotypes (<&>, <@>, <+>, <=>) in a way similar to

what would become SMS language a few years later—indeed, the novel appeared in the same year as the first SMS-enabled mobile phone, the Nokia 2010. But contrary to SMS language, which is usually rather informal, Bascule uses educated language strewn with cultural references (like the reference to <Shaikspir> in the excerpt above[3]).

Once the reader is well-trained in reading Bascule's eye dialect, Banks provides additional challenges by introducing new characters with specific accents and vocal tics. For example, there is lisping sparrow:

So thare u r Mr Bathcule, ithnt it ol tewwibwy, tewwibwy interethtin? I think tho 2—o look, i think i juss thaw a flee on yoor leg thare; may I preen u? (p. 87)	Ja alzo würglich mr. Baskül = daz allez nüch göwaltich schrekklich intressant? Isch findz auch … Ach hörn Sie x isch glaab grat hab isch auf Ihrem b1 1e milbe gösehn daaf isch Sie lauzen?	& donk voila Mr Bafkul, fé dloeman intéléfan, tou fa non? Fé byin fe kö je panfè. O mè kefkö je voi? Unn vièlenn puf fui votlö pat. Je pö vou fèl la toilèt, Mr Bafkul?

where the English text uses transformations <s>→<th> and <r>→<w>, the German one transformations <i>→<ü>, <ch>→<sch>, and the French one transformations <s>→<f> and <r>→<l>.

The /s/ in "Bascule" can be used both for a lisping /th/ and for a hissing /sh/ tic. This happens through a hissing sloth:

I qwite undirshtand yoor angwish, yung Bashcule [...] But itsh not yoor folt shertin pershinsh r tryin 2 pershicute u. [...] Zhat woz zhe impreshin I formed from what I overherd Zhey did not sheem 2 b intereshtid in eny ov ush. Zhey were lukin 4 shumbody elsh zhey shuspected ush ov harberin. (p. 216)	Isch ferschdeh total waz du m1zd Baskül junker froind [...]. Abba ez = ja nüch d1e schultt daz göwize persoonen hintern dir her sünd. [...] Nach allem waz isch göhörd hab = daz m1 1drukk [...]. Ez hatte gantz den ansch1 daz se an unz gar nüch intressiet warn. Sie suchden wen fon dem se d8en daz er bei unz ferschdekkd =.	Jönn Bachcule, jö konpran for byin votr agoich [...] Mè chi chertèn perchonn écheye de vou perchékuté, chö né pa de votre fot. ... Ché byin linprechion kö mon doné 1 chertin nonbre de lör propo [...] Aparaman, il nö chintéréchè pa du tou a nou zotr. Il cherchè kelk1 kil nou chuchpektè déberjé.

In the English and French texts Banks and his translator use the <s>→<sh> transformation, while the German translation has more difficulties in distinguishing the sloth's accent from the sparrow's accent.

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3. According to Drakakis (1997), "explicit allusion to literary figures such as Shakespeare destabilizes the traditional boundaries between high and popular culture," which is certainly the goal here.

While Kincaid (2017) suggest that "Bascule's broken speech is often used to express the commonsense views of the author," Corbett (2012) qualifies his eye dialect as an "anti-language":

> An anti-language is the means of realization of a subjective reality: not merely expressing it, but actively creating and maintaining it. Bascule's anti-language identifies him as a member of a subculture that stands apart from mainstream society and its linguistic conventions. Ultimately, Bascule's anti-language constructs him as that most alien of creatures, a young teenager.

3.1.4. The Two-Timer

The British author David I. Masson (1915–2007) studied English Language and Literature at Oxford. In the SF domain he published only ten short stories, all of them masterpieces. The short story *The Two-Timer* (1968) is written in a pastiche of 17th-century English, as it is the narration of accidental time travel of a 1683 gentleman into 1964. Here is the incipit of this story in the original, as well as its German translation (1984):

... I was standing, as it chanc'd, within the shade of a low Arch-way, where I could not easily be seen by any who shou'd pass that way, when I saw as it were a kind of Dazzle betwixt my Eyes and a Barn, that stood across the Street. (p. 62)	... ich stund, da's sich begab, im Schatten eines niedren Tor-Weges, darin ich nicht ohne weiteres gesehen werden kunnte von jemand, der vorüberwallen mochte, da erblickte ich wohl etwas gleich einem Geflimmre zwischen meinen Augen und einer Scheuer am jenseitigen Rande der Straße. (p. 70)

When the main character encounters 20th century people, he is at first unable to understand their utterances and represents them in eye dialect:

He: *Lowgh. Naugh dwenthing foyoo?* (With a kind of Questioning voice.) Myself: *Prithee, Sir, do you converse in English?* At this he frown'd, and turn'd back thro' his Door, but left it open, for I heard him in speech with another, as follows.	Er: *H'llou. Kannich irndwih hälfn?* (Das sprach er in einer Art von Frage-Tonfall.) Ich: *Um Vergebung, Sir, conversiret Ihr engeländisch?* Darauf schnitt er ein sauersichtig Miene und entschwund hinter die Türe, nicht ohne jedoch sie offen zu belassen, denn ohnverzüglich hört ich ihn und eine andre *Person* die folgenden Worte wechseln.

He: *Chappea lux lau ikthtauon crauea. Now enthing bau ootim? Caun honstan zaklay wottee sez.*
The Other: *Nowoulman. Nopmaugh pidgen enwaya. Prapseez thatfla caimea mon thcow. Breezdin breezdaught. Weo tav moce curetay.* (p. 67−68)

Er: *Da 's 'n Kähl dä sieht us wie 'n Ausruhfer. Kännen Se den? Konntnich gnau vasteen wasser sacht.*
Jener: *Neeh alde Jong. Sowieso nich mein Bihr. Flaicht der Buhsche wofor eim Monaht bihrwar. Kahm rin unn is wier weck. Wihr solltn bihr meer Sichrheitsforkeerungen bahm.* (p. 77)

It is interesting to note that Masson's eye dialect is much more realistic than those by Keyes or Banks thanks to his use of meaning-independent segmentation, e.g., when he writes <mon thcow> for "month ago," he attaches the <th> digraph to the second word (the German translation uses standard word segmentation).

Translating a short story written in 17th-century English is a *tour de force* and it is not surprising that, as far as we know, besides the German translation by Horst Pokullus, there has been no translation in any other language.

3.2. Breaking RULE①-1: Nonstandard Casing

Person names such as <MacArthur> or <DeForest> and brand names such as <FedEx> or <AugEyez> frequently use nonstandard casing, the former for historical reasons and the latter as syllabic abbreviations or portmanteaus, therefore we do not consider them to be special graphemic methods. Here are two cases of innovative use of nonstandard casing:

3.2.1. The Flight of the Dragonfly

Robert L. Forward (1932−2002) was an American science-fiction writer and physicist specialized in the theory of gravity and working at the research labs of Hughes Aircraft. In his novel *The Flight of the Dragonfly* (1984), he describes a very intelligent but non-technological species, the Flouwen, who start communicating with human visitors on their planet, through an AI platform. Humans initiate communication with the Flouwens through simple arithmetic operations:

"Two TIMES Three equals Six!" said Jill, almost triumphantly.

SsSsSsIiIiIiXxXxXx! said the red cloud, enunciating each trill and overtone with exaggerated care.

"SSSsssIIIiiiXXXxxx," said Jill, its electronics still stumbling over the acoustic nuances of the word.

zzzzzzzzt!! exploded the red cloud. Jill tried again.

"SsSsSsIiIiIiXxXxXx," said Jill's sonar finally.

Similarly, a few pages farther:

> *Two plus Two is...* continued the alien.
>
> $TtWwOoooo$ came the reply, and the high-pitched scream startled the humans again.

Alternating upper and lower case is an astute method of representing a screamy sound, while keeping the underlying word recognizable.

3.2.2. Embassytown

China Miéville (1972−) is a British science-ficton author and political activist. In his novel *Embassytown* (2011), he describes a civilization of aliens, the Ariekei, communicating orally by using not one, but two speech organs emitting simultaneously (see also §3.19.3). Ariekei perceive utterances as being language only when sounds originate from two synchronized sources. To communicate with them, humans have therefore genetically engineered monozygotic twins sharing the same mental processes and therefore speaking simultaneously. These twins appear and act always together and their names are systematically bisyllabic, each syllable representing one of the two individuals (<MagDa> for individuals <Mag> and <Da>, etc.).

In coherence with the logic of considering a pair of twins as a single entity (that is, in the way they are perceived by Ariekei), Miéville uses plural number when bisyllabic names are in subject position:

Original (2011)	German (2012)	French (2016)
I liked MagDa: they were one of the Ambassadors who hadn't treated me differently since my falling out with CalVin. (p. 69)	Ich mochte MagDa: Sie waren einer der Botschafter, die mich nach meinem Zerwürfnis mit CalVin nicht anders behandelten als zuvor.	Derrière eux, MagDa m'ont souri. Je les aimais bien : elles comptaient parmi ceux qui ne me traitaient pas différemment depuis ma brouille avec CalVin.

To show the importance of the bisyllabic structure and to increase symmetry between the human twins, Miéville capitalizes both syllables. Here are the names obtained through this method, most of them reminiscent of bisyllabic (human) given names:

EzCal (138 occurrences), EzRa (133), MagDa (102), YlSib (90), CalVin (83), JoaQuin (21), DalTon (16), EdGar (15), MayBel (11), XerXes (9), AgNes (5), JasMin (5), WilSon (5), LeRoy (4), PorSha (4), RanDolph (4), ArnOld (3), BenTham (3), EsMé (3), HenRy (3), KelSey (3), LeNa (3), SecStaff (3), AnDrew (2), CharLott (2), FeyRis (2), GaeNor (2), LoGan (2), and hapaxes:

BrenDan, DagNey, EzLott, HerOt, LuCy, OgMa, RedRag, ShelBy, SibYl and SidNey.

3.3. Breaking RULE②-1: Change of Primary Direction

Primary direction can be inverted in three ways:
(1) by keeping the standard shape of graphs (no rotation, no mirroring): <noitcerid yramirp>;
(2) by rotating graphs by 180° (no mirroring): <⅄ɹɐɯᴉɹd uoᴉʇɔǝɹᴉp>;
(3) by mirroring graphs (no rotation): <noitɔǝrib ɣrɒmirq>;
(there is no fourth way because if we both rotate and mirror graphs, we return to primary direction). We have encountered occurrences of all three primary direction inversion types:

3.3.1. The Neverending Story

Michael Ende (1929–1995) wrote his most important work, *The Neverending Story* in 1979. Being the son of a surrealist painter, Ende frequently uses symbols in his writing and, in particular, mirrors (which he cherished to the point of writing a collection of short stories entitled *The Mirror in the Mirror*). *The Neverending Story* is an initiatory epopea in which the main character, Bastian Balthazar Bux, travels to an imaginary world (Fantastica), lives various adventures and finally returns to reality, back to his loving father. The initiation starts with Bastian's entrance into a bookstore, where he discovers and borrows the (auto-referential) book of *The Neverending Story*. The novel starts a bit earlier, in the bookstore, before Bastian's entrance, so that the first paragraph of the novel displays the shop's inscription from the inside, i.e., mirrored (inversion type 3):
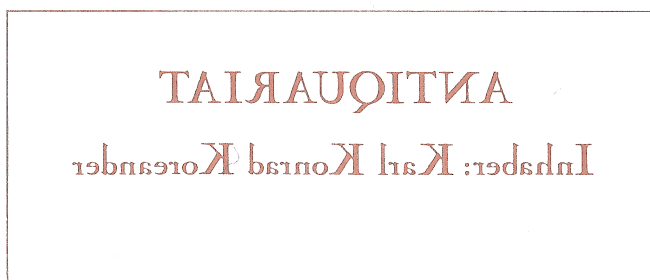
Diese Inschrift stand auf der Glastür eines kleinen Ladens, aber so sah sie natürlich nur aus, wenn man vom Inneren des dämmerigen Raumes durch die Scheibe auf die Straße hinausblickte.[4] (p. 5)

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4. CARL CONRAD COREANDER\\OLD BOOKS

When approaching Bastian's transition to the imaginary world, which is the first climactic event of the novel, and in order to convince Bastian that Fantastica is real, a monk-like figure called the "Old Man from the Wandering Mountain" starts reading *The Neverending Story* anew, a narration through which Bastian realizes that he has become part of the story he is reading. But as the story narrated by the Old Man matches exactly the text of the novel, it begins with the inverted inscription, this time in oral mode, that is with standard graphs (inversion type 1):

> Dennoch waren ihm die ersten Worte, die der Alte sprach, unverständlich. Sie klangen etwa wie »Tairauqitna rednaerok darnok lrak rebahni«.[5] (p. 212)

Illustrating the perfect formal symmetry of the novel, the inscription reappears on its last page, from a point of view opposite to the initial one: this time, Bastian is inside the bookstore, looking outside to his father, who stands on the other side of the road. He opens the door and exits the bookstore heading towards his father, so that the return to reality is complete:

> Herr Koreander begleitete ihn bis zur Tür. Als sie darauf zugingen, sah Bastian durch die spiegelverkehrte Schrift der Glasscheibe, daß der Vater auf der anderen Straßenseite stand und ihn erwartete. Sein Gesicht war ein einziges Strahlen.
>
> Bastian riß die Tür auf, daß die Traube der Messingglöckchen wild zu bimmeln begann, und rannte auf dieses Strahlen zu.[6] (p. 486)

The inverted inscription is a structuring beacon of the novel, in which it is mentioned thrice: (a) in the incipit it is displayed as an image, (b) in the center it is given in text form, and (c) at the end of the novel it is referred to as "reversed writing on the glass pane".

(Interestingly, the French 1984 translation leaves the second occurrence in German language (p. 221):

> C'était quelque comme «Tairauqitna rednaerok darno lrak rebahni.»

We don't know whether this was a conscious choice or an omission by the translator. It has been corrected in the 2014 revised edition of the book.)

This inscription could be seen on the glass door of a small shop, but naturally this was only the way it looked if you were inside the dimly lit shop, looking out at the street through the plate-glass door.

5. Yet he did not understand the first words the Old Man said. They sounded like: "Skoob dlo rednaeroc darnoc lrac."

6. Mr. Coreander took him to the door. Through the reversed writing on the glass pane, Bastian saw that his father was waiting for him across the street. His face was one great beam. Bastian opened the door so vigorously that the little glass bells tinkled wildly, and ran across to his father.

3.3.2. Bâtons, chiffres et lettres

The great French novelist and co-founder of the Oulipo, Raymond Queneau (1903–1976) is the author of *Bâtons, chiffres et lettres* (1950) ("Sticks, digits and letters"), a collection of stories and essays, including an essay entitled *Délire typographique* ("Typographical delirium"). This essay deals with a 19th-century typographer called Nicolas Cirier (1792–1869) (Aouillé, 2001), author of the book *L'Apprentif Administrateur*, in the title of which the second word is inverted by rotation (inversion type 2). Queneau mentions the book title twice, and in both cases performs the same operation:

> insigne (je ne l'ai jamais vu figurer sur un catalogue de libraire et je crois bien qu'il n'est jamais passé en vente publique) [1] : *L'apprentif sıuıɯp∀ ɹnǝʇɐɹʇ* (1840).

on page 289 and

> contre la gastronomie. Dans aucune de ces productions, on ne retrouve le prote déchaîné de *l'Apprentif ɹnǝʇɐɹʇsıuıɯp∀*. Nicolas Cirier mourut, croit-on, en 1869.

on page 291. Besides the difference in capitalization between the two titles, we notice that on page 289 Queneau has to break the word and uses the fundamental principle of bidirectional typesetting (Haralambous, 2007, p. 135), namely that a block in the opposite direction is broken in parts according to the primary direction, and inside each part, inverted primary direction is used. As we can see in the example, the word <ɹnǝʇɐɹʇsıuıɯp∀> is broken into <sıuıɯp∀>, placed on the upper line and <ɹnǝʇɐɹʇ>, placed at the beginning (left side) of the lower line, so that the eye has to move to the end of the upper line, read the first part, go the lower line, move to the right until the beginning of the second part, read the second part, and then move again to the beginning of <ɹnǝʇɐɹʇ> to read the rest of the line. Probably to avoid confusion (Queneau was a perfectionist and wouldn't allow for such an error to remain in his text) Queneau used no hyphen at the end of the first part of the word.

3.3.3. "REDRUM"

The word "REDRUM" is probably the most famous anagram in history. It is the type 1 inversion of the word "MURDER" and is famous for having been used by Stephen King in his novel *The Shining* (1977). It appears 32 times in the novel, as follows:

1. 4 times as <Redrum>, in Chapter 8 (when Danny is glimpsing at the Overlook hotel while still in the car), in Chapter 9 (when thinking of it while talking with his father), in Chapter 16 (when he has an epileptic attack), and in Chapter 37 (in the ballroom),
2. 6 times as <redrum>, always when others are uttering the word: in Chapter 16 (when the doctor talks with Danny's parents), in Chapter 25 (when Danny is sitting outside Room 217 and is hearing voices), and in Chapter 29 (when Danny quotes Tony mentioning it),
3. 22 times as <REDRUM>, in Chapter 4 (when Danny sees the word written on the mirror in green fire), in Chapter 7 (when Danny, under his blanket, imagines the word flashing in red) as the last word of Part I, in Chapter 16 (when visiting the doctor), in Chapter 21 (when thinking of it while in the hotel), in Chapter 37 (when he sees it mirrored in the ballroom's mirror and realizes it is the anagram of "MURDER") and finally as the title of Chapter 50.

We can interpret the three allomorphs of "REDRUM" as follows: <Redrum> when it is used in Danny's speech or verbal thought, <redrum> when it is used in other people's speech, <REDRUM> when Danny visualizes it in reality or in memory.

In Chapter 16, King is emphasizing the ignorance of the anagrammatic nature of "REDRUM" by giving a false hypothesis on its etymology:

> "What things, Danny?"
>
> "I can't remember!" Danny cried out, agonized. "I'd tell you if I could! It's like I can't remember because it's so bad I don't want to remember. All I can remember when I wake up is REDRUM."
>
> "Red drum or red rum?"
>
> "Rum."
>
> "What's that, Danny?"
>
> "I don't know."

This paragraph has been a challenge for the various translations:

French (1979)	Swedish (1980)	Italian (1981)
— Qu'est-ce qu'il t'a montré, Danny? — Je n'arrive pas à m'en souvenir! s'écria Danny, au supplice. Je vous le dirais si je le pouvais! C'est comme si je ne voulais pas m'en souvenir. La seule chose que j'ai retenue en me réveillant, c'est le mot TROMAL.	– Vad då för saker, Danny? – Jag kan inte komma ihåg! skrek Danny plågad. Jag skulle tala om det om jag kunde. Det är som om jag inte kunde komma ihåg för att det är så hemskt. Jag vill inte komma ihåg. Det enda jag kommer ihåg när jag vaknar upp är TEDROM.	«Quali cose, Danny?» «Non riesco a ricordare!» gridò Danny, in preda alla sofferenza. «Se mi ricordassi glielo direi! È come se non riuscissi a ricordare perché è così brutto che non voglio ricordare. L'unica cosa che mi ricordo quando mi sveglio è REDRUM.»

— Trop mal, en deux mots? — Non, TROMAL en un seul mot. — Qu'est-ce que c'est, Danny? — Je ne sais pas.	– Rum eller rom, Danny? – Rom. – Vad är det? – Jag vet inte.	«Red drum o red rum?» «Rum.» «E che cos'è, Danny?» «Non lo so.»

German (1982)	Spanish (1982)	Japanese (1986)
»Was für Dinge sind das denn, Danny?« »Ich weiß es nicht mehr!« schrie Danny gequält. »Ich würde es Ihnen sonst sagen. Ich weiß es nicht mehr, weil es so schlimm ist, dass ich mich nicht daran erinnern will. Wenn ich aufwache, weiß ich nur noch DROM.« »Was ist das, Danny?« »Ich weiß es nicht.«	— ¿Qué cosas, Danny? — ¡No me acuerdo! — gritó el chico, torturado—. ¡Si pudiera se lo diría! Es como si no pudiera recordarlas porque son tan malas que no quiero recordarlas. Lo único que puedo recordar cuando me despierto es RE-DRUM. — Redrum... Red drum... Red rum... ¿Tambor rojo o ron rojo? — Ron. — ¿Y eso qué es, Danny? — No lo sé.	「どんなものだい、それは？」 「覚えていないってば！」ダニーは悲痛な面持ちで叫んだ。「もし覚えていたら話すよ！覚えてないのは、なんだかあまりいやなものだから、思い出したくないからみたい。目がさめてから思い出せるのは、レドラムって言葉だけなんだ」 「レッド・ドラム、それともレッド・ラム？」 「ラムだよ」 「それはなんだい？」 「わかんない」

Greek (1992)	Romanian (1993)	Portuguese (1999)
«Τί πράγματα ἦταν αὐτά, Ντάνι;» «Δὲ θυμᾶμαι», φώναξε μὲ ἀγωνία ὁ Ντάνι. «Ἄν μπορούσα θὰ σᾶς ἔλεγα! Ἴσως δὲν μπορῶ νὰ τὰ θυμηθῶ, γιατὶ εἶναι τόσο ἄσχημα ποὺ δὲ θέλω νὰ τὰ θυμηθῶ. Τὸ μόνο ποὺ θυμόμουν ὅταν ξύπνησα ἦταν ἡ λέξη ΣΟΝΟΦ». «Σόνοφ;» «Ναί». «Τί θὰ πεῖ αὐτό, Ντάνι;» «Δὲν ξέρω».	– Nu-mi aduc aminte! strigă Danny chinuit. Ţi-aş spune dacă aş putea! Parcă nu-mi aduc aminte – pentru că e atât de rău, că nu vreau să-mi aduc aminte. Tot ce-mi amintesc când mă trezesc e AMIRC. – A-mirg sau a-rnirc? – Mirc. – Ce-i asta, Danny? – Nu ştiu.	— Que coisas, Danny? — Não consigo me lembrar! — gritou o menino, agoniado. — Se eu conseguisse, eu diria! Acho que não me lembro porque é tão ruim que não *quero* me lembrar. Tudo que me lembro quando acordo é REDRUM. — Red *drum* ou red *rum*? — Rum. — O que é isso, Danny? — Não sei.

We observe four approaches:

1. "REDRUM" remains in English: this is the case of Italian, Spanish, Portuguese and Japanese. In the case of Italian, Portuguese and Japanese neither "REDRUM" nor its pseudo-etymologies are translated. In the case of Spanish, the etymologies are translated into Spanish (<¿Tambor rojo o ron rojo?>) and Danny replies in Spanish (<Ron>).

2. "REDRUM" is translated, but no false etymologies are given: this is the case of German <DROM> and Greek <ΣΟΝΟΦ> where the inversions of word "murder" can hardly be interpreted as any meaningful entity.

3. "REDRUM" is (faithfully) translated and some pseudo-etymology is given: "room or gypsy?" in Swedish, "a-mirg or a-mirc" in Romanian.

4. "REDRUM" is translated by a word different than the anagram of "MURDER": this is the case of French where the word used is <LA MORT> ("death," with a definite article) so that the anagram <TROMAL> is phonetically close to "trop mal" ("too much pain"). When asked by his father, Danny explains that in fact it is a single word, leaving open psychoanalytic interpretations.

It should be noted that the same word, but written <REƉЯUM>, (or <REƉЯUM> (in the latter, letters <M> and <U> are inverted as well), it is impossible to distinguish the two as the word is handwritten), a mix of inversion types 1 and 3, is written in blood letters on a door in Kubrick's movie *The Shining* (1980).

"REDRUM" has acquired a word status, has a dedicated Wikipedia page and has been used for a movie title, a rock band, songs, a TV series and even an architectonic project. It is also the title of a French novel, by Jean-Pierre Ohl (1959−).

3.3.4.   *Text Inversion on Book Covers*

Here are some examples of text inversion on book covers.
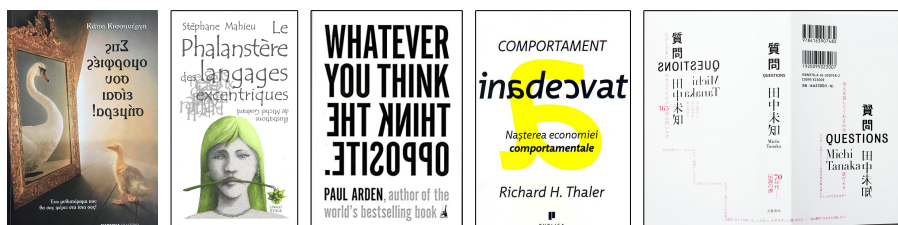
The Greek novel *Στὶς ὀμορφιές σου εἶσαι σήμερα!* (*You are looking beautiful today*) by Katia Kissonergi (1973−), a novel published in 2000 and displaying on the cover a swanling looking at its mirror image as a grown-up swan. On the cover (and on the back), the title is mirrored (inversion type 3).

Le Phalanstère des langages excentriques (2005), an essay on artificial ("excentric") languages by Stéphane Mahieu (1957−), regent for Social and

Culinary Sciences at the notorious Collège de 'pataphysique[7]. On the cover, the illustrator's name is inverted (inversion type 2).

Whatever you think, think the opposite (2006) by Paul Arden, where the second part of the title sentence is inverted to illustrate the notion of "opposite thinking," with a nice visual symmetry of the horizontally aligned words <THINK> and <ꓘИIHT>.

Comportament inadecvat (2015), the Romanian translation of Richard H. Thaler's *Misbehaving* (2015), where two letters of the word "inadecvat" ("inappropriate") are mirrored (inversion type 3). As the word is typeset in italics, the inversion effect is very salient: *<inꙄdeꙄvat>*. The word operates as a metaphor of society, in which some individuals (= letters) misbehave by heading into the opposite direction.

And finally, 質問/*Questions* (2018) which is actually the merge of two versions of the same book (Japanese and English): the Japanese version starts on the left, every left part of a double-page containing a question in Japanese, and the English version starts on the right, every right part of a double-page containing a question in English (for a total of 365 double pages). Each cover (left and right) is the mirror of the other: on the left cover, the Japanese title is written correctly and the English title is mirrored (<質問 ꙄИOITꙄƎUQ>), the opposite happens on the right cover (<問質 QUESTIONS>) (inversion type 3). If Western and Oriental worlds are "incompatible" as the two covers of this book seem to imply, the book has managed to establish a perfect symmetry between its two languages (the only exception being the barcodes on the right cover, which are mandatory and are placed on what is "back cover" in Japan, namely the right cover).

3.4. Breaking RULE②-2: Graphs of the Same γ-Word Not Sharing the Same Straight Baseline

3.4.1. The Demolished Man

Alfred Bester (1913–1987) was an American Science-Fiction author, whose novel *The Demolished Man* (1953) won the first Hugo Award in history. He was probably the author that used the most innovative graphemic and graphetic methods, in particular when representing telepathy or synesthesia. Here is a short example of a γ-word the graphs of which do not lie on a straight line:

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7. http://www.college-de-pataphysique.fr/. Let us mention the grapholinguistically important fact that the apostrophe in the name of the discipline <'pataphysique>, introduced by Jarry (1911, p. II.VII), functions as a morphological label to distinguish it from the adjective <pataphysique>.

> — *Étouffe ça, Linc. Ne fuse pas comme ça. Tu es gêné. Voyons si je n'arrivrerai pas à me faufiler à travers son écran mental.*
> — *Écoute...*

This example has been taken from the 2007 French translation of *The Demolished Man*, entitled *L'homme démoli* (p. 161), and seems to be an initiative of the French translator Patrick Marcel, since it doesn't appear in the original English text (we have consulted the British edition by Penguin Books, 1966). The word <faufiler> can be translated as "sneaking out" or "dodging," but in this context is the translation of "thread-needling"[8]. The dialog is done in telepathic mode, so we can assume that curving the baseline is a graphetic equivalent to the common gesture of sneaking-out.

3.4.2. Le petit sauvage

Alexandre Jardin (1965−) is a French author. In his book *Le petit sauvage* (*The little savage*) he uses many graphetic methods to illustrate the transformation of the main character, Alexandre Eiffel, who experiences a return to his youth. The first part of the book is typeset in a standard way, using a regular serif font. Once the transformation has occurred, the font switches to sans serif and the text is strewn with graphetic particularities. One of them is the following paragraph (p. 191):

Le catamaran voguait sur la houle qui se creusait. J'étais heureux, pleinement confiant. Il ne me restait plus qu'à me laisser exister avec naturel. Je pouvais remettre une montre à mon poignet, récupérer mes cartes de crédit et racheter une voiture, plutôt que de circuler sur un vélo rouge. L'heure n'était pas aux artifices. Bah... le mal de mer, comme c'est pénible...

describing the main character's journey on the sea and his sea-sickness. While Bester, in the previous example, has imitated a gesture, here Jardin generates a discomfort similar to sea-sickness by requiring the reader read the wavy lines. The method used here is based on what Leeuwen (2006, p. 146) calls the 'experiential metaphor', namely when "a material signifier has a meaning potential that derives from our physical experience of it".

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8. The original of this excerpt is: "Choke it, Linc. Don't jet off like that. You're embarrassed. Let's see if I can't maybe thread-needle through that mind block.' 'Listen—'" (p. 98 of *The Demolished Man*).

3.5. Breaking RULE②-3: Graphs of the Same γ-Word With Different Sizes

Again in the second part of *Le petit sauvage*, Jardin uses graphs of progressively smaller sizes (p. 205)

GRAND. MAIS PEU

À PEU MES PAUPIÈRES SE REFERMENT,

JE NE VOIS plus rien… m… m…

while keeping the same (very large) lead-in. The sentence translates as: "But slowly my eyelids close, I don't see anything anymore…". By forcing the reader's eye to progressively switch from extra-large to tiny type, Jardin manages to produce a sensorial effect of tiredness and sleepiness. Part of the method is the switch from all-caps to lower case for the two last words, and then the repeated use of the first letter <r> of the word <rien> indicating both that the act of conscious thought has stopped and that snoring has started.

3.6. Breaking RULE②-4:Graphs of the Same γ-Word With Different Styles

Richard A. Lupoff (1935−) is an American science-fiction author and anthology editor. In his short story *With the Bentfin Boomer Boys on Little Old New Alabama*, he uses several graphetic methods, including style change inside a word: "be*lieve*" (p. 280), "*centi*meters" (p. 285), "*low*cut" (p. 289), "*some*thing" (p. 318), "in*side*" (p. 321), and "*us*ships, *them*ships" (p. 339). We can assume that the switch to italics represents sonic salience.

3.7. Breaking RULE②-5 or 6: Graphs of the Same γ-Word From Different Font Families, or Being Different Allographs of the Same Grapheme

It seems that the concept of word is tightly connected to the uniqueness of font family or allographic representatives, therefore we were not able to find examples of these rules being broken.

3.8. Breaking RULE③-7: Nonstandard Hyphenation

Hyphenation is handled by editors and typographers at the very last stage of book preparation, just before printing. Therefore most authors do not interfere with it, unless they use a special page layout. This is the case of Claude Ollier's *Fuzzy Sets*. Claude Ollier (1922–2014) was a French writer involved in the Nouveau Roman literary movement. The novel *Fuzzy Sets* (1975) has a different page layout for almost every page (see also Knee (1984)).

Pages 93, 94 and 95 consist of pairs of triangular paragraphs:

tu n'étais pas là vraiment : affalé, insensible, le sommeil t'avait gagné durant le vol. Ou la réalité te paraissait trop dure et tu faisais semblant de somnoler. Non ? Tu n'avais plus conscience ?... Refaisons donc ton entrée. L'atmosphère de la nacelle à présent. Vois : la lumière est plus claire. Sens : l'air plus vif encore. On a dévissé la plaque et tu te présentes ainsi, de face. Attention à la marche ! Tu fais le premier pas, je te salue, te guide. L'espace alors devant toi se meuble de couchettes (d'étroits divans à oreilles sortiront des murs, en deux rangées de quatre), je te conduis vers celle que l'on t'a réservée, tu vas y reposer tout le temps que l'é-   i
clusée s'achève (l'acteur — ou sa dou-   s e c
blure — se prêtera de bonne g   c e l l e
râce à la démonstration). La   lui à cel
l u m i è r e décroît, l'air se   — e t d e
raréfie, un t r o u b l e lé-   a s t i m u l a t i o
ger se fait dans ta   à l'œil, a v a n t
tête (il se s e r a   ettre à G. : « Rid
allongé de cô-   abréger. » « Reçu. » « Te
té, les bras   nutile de compliquer l'en
collés au   judiciable, r é s i d u ? Dérisoi
corps ;   polichinel. R e c o n s t i t u e r ne sign
à   et alors ? Serait plus e f f i c a c e
            vaise par suite interférences. Régler :

un moment donné, apercevant quelque objet filiforme à proximité de sa nuque, il s'en saisira de deux doigts et le glissera dans sa poche). Remarque que la musique s'est intensifiée, polarisant l'attention. Selon que l' heure est diurne ou nocturne, la clarté vire à l'éclat franc du jour ou au bleu argenté. C omme c'est la nuit pour l'heure, voici le bleu qui point. Le vois-tu ? Ne fer-   o l
me pas les yeux ! Ouvre les yeux,   n i e z
te dis-je, et ne te laisse al-   s t u p i
ler ! Rouvre les yeux... »   n i h i l e r .
Mais si toutes choses d   sition h é r o ï
oivent revivre en u   laps r e s t a n t à
ne reprise bien   mettre à C. : « Urg
conduite, l'é   laise ou évanouisseme
moi passé   ager transition e n t r e pas
r e n a î t   aumatisme cause révélation t
a u s   bien avancés ! Données antécédent
si :   reçus de L-N 4 et P-R 5, en 7 et 8.
            pit du retard : scène dérobée — dévoilé
            jection de scriptine à dose faible ; puis d
            pet. Combler hiatus, si hiatus il y a. Transm
            de relire les classiques. Problème conception li
            itique. Dresser tableau variantes. Analyser structu
            orme et sens : revoir définitions. Appliquer système re

le clairon de la voix régresse, le chœur se tait, le corps lassé se partage derechef entre lieux neuf et ancien, chevauche les données d'espace, erre entre les supports, douillet ici, plus rude dans la nacelle où, assis à l'avant, engourdi déjà, il cherche à faire retour sur lui-même et embrasser la scène dérobée : ceux qui voyagent à l'arrière et se taisent ou épient du coin de l'œil, l'antérieur trajet de désert à steppe et les séquences d'entêtement, la hargne, pris de court, la hâte à devancer l'Intruse — à prendre au plus court et à sonner l'alerte, sauver le sens du Projet, voler au secours et embarquer à la sauvette : mission exceptionnelle ou tout autre argument, tu as fait vite certes, où est l'atermoiement, où se situe dans la continuité la solution du texte ?... Sas ou écluse, ici les eaux mêlées des récits se troublent et stagnent, ce qui ne fut qu'   o
action vacille au pli des n   devine
arrations et se complaît,   u désir re
s'attarde, d ' a u t r e s   traces illisib
agissent et tu ne   sessionnel. Ratu
« refais » plus   sonnage féminin : e
que le ter-   sous huitaine ? Transm
rain du   lac. ». Récrire l'histoire à
v e r -   nir avec cette comédie. Resti

Only the upper triangles contribute to the narrative thread of the novel, while the lower ones contain unrelated random text.

The triangular parts of the upper paragraphs consist of a total of 53 lines, 34 of which end with a complete word (or final word part), nine ending with a standard hyphenation (<meu-//ble>, <sor-//tiront>, <é-//clusée>, <dou-//blure>, <lé-//ger>, <cô-//té>, <fer-//me>, <al-//ler> and <ter-rain>), two ending with a standard hyphenation but without a hyphen dash (<aus//si>, <l'é//moi>), two ending with an apostrophe (where line breaking is normally prohibited), and the remaining five ending with broken words *not* respecting hyphenation rules and *not* using a hyphen: <g//râce>, <C//omme>, <d//oivent>, <u//ne>, <n//arrations>. In the latter five cases, words are systematically broken after the first letter.

The graphetic method used here consists in hyphenating in two different ways according to rules or by breaking them. In the first case a hyphen is used, but not in the second.

3.9. Breaking RULE⑤-1: Nonstandard Morpheme Order

The Curious Incident of the Dog in the Night-Time (2003) is a mystery novel by British author Mark Haddon (1962–). Although not explicitly stated as

having Asperger's syndrome, the main character has behavioral difficulties. When walking alone at the Paddington railway station he faces an anxiety crisis caused by information saturation (p. 208–209):

> and then I took my hands away from my ears and I groaned to block out the noise and I looked round the big room at all the signs to see if this was London. And the signs said:

> But after a few seconds they looked like this

> because there were too many and my brain wasn't working properly and this frightened me so I closed my eyes again

The first image is a series of brand marks and logotypes, with a few (innocuous) pictograms (toilets for men and ladies, information, smoking forbidden), separated by interword spaces and hyphenated (using a hyphen) at line end. The second version is rearrangement of brand mark and logotype parts, interspersed by aggressive pictograms (sculls, bombs, bolts of lightning, the toilet for men pictogram without the ladies counterpart, etc.). There are no interword spaces anymore, and hyphenation is done without a hyphen. But even without interword spaces, fonts are alternating in such a way that parts of brand names and logotypes are still recognizable. Using the method of 'experiential metaphor', Haddon manages to transmit to the reader the feeling of being lost and terrified in a labyrinth of meaning. Probably as a private joke (or as a glimpse into the

main character's soul) at the beginning of the eight line we read <qed> ("quod erat demonstrandum") the acronym that acts as a beacon of salvation to mathematicians since it marks the ends of proofs.

Among the translations of this novel, the Brazilian, German and Italian ones keep the English version of these images, the Dutch, French and Spanish ones adapt them linguistically, and the Portuguese one uses the Spanish adaptation.

3.10.   Breaking RULE⑤-2: Nonstandard Morpheme Separators

In one of his early novellas, *Nous rêvions d'Amérique* (2002), the French author Thomas Day (1971–) uses the following title (p. 3 and 5):

<div align="center">N.OUS R.ÊVIONS D'A.MÉRIQUE</div>

In this sharp critique of contemporary America, an aged Hopi Native American, Hoijer, leaves his reservation for a journey to an NRA convention in San Francisco, in order to kill as many participants as possible, as revenge for a mass murder that occurred two years earlier, in which his 5-year old grand-daughter was among the victims.

The title of the novella, "We were dreaming of America," is a common locus for generations of Europeans—nevertheless its nostalgia is disrupted by the "intruder" dots in the title, which unveil the initials "NRA". Combining the acronym method with the regular title is a graphemic method acting in a way similar to ateji (cf. §3.18), as it injects new layers of meaning and establishes a dialog between them. Day's achievement is to have reached this goal without adding any new morphemes, as would be the case in ateji annotation.

3.11.   Breaking RULE⑩-1: Nonstandard Syntax

Speculative fiction abounds with cases of nonstandard syntax, starting with the famous Yoda syntax "Found someone, you have, I would say, hmmm?" (*Star Wars*, Ep. 5), which illustrates OSV word order, as in Japanese.

In this paper we are interested in graphemic and graphetic methods, and nonstandard syntax as in Yoda's case is perfectly standard from the graphemic point of view. We will, nevertheless, mention three texts in which nonstandard syntax is combined with graphetic methods.

3.11.1.   Sparkie's Fall

The author Gavin Hyde is a complete unknown.[9] His entire œuvre consists of three short stories and *Sparkie's Fall* (1959) is the last among them.

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9. In Pohl (1960, p. 166) one reads: "A few years back, in Ireland, Ray Bradbury spent some very productive months. Not only did he write the script of one of the best

In this 4-page very short story, a human is forced to land on a planet and his ship is surrounded by two gigantic whale-like aliens. He communicates with them through a device called a "mechanical Translator".

This device writes sentences with explicit intention marking (an exclamation mark at sentence beginning), syntagm variants (in parentheses) and keywords for categories such as NAME and GARBLE.

Here is an excerpt:

> "NAME, I am worried. Could Sparkie (eat) (be nourished by) GARBLE?"
>
> And then the answer: "!, (stop) (cease) (desist from) worrying, NAME. Sparkie is (in admirable condition) (fine)!"
>
> It had taken him twenty years to get "Sparkie" out of his family's vocabulary. And now the first two "people" he met in outer space called him Sparkie.
>
> Just because they were bigger than he was!

After having telepathically scanned Sparkie's memory, the two aliens seem to be very knowledgeable about his condition as they are discussing him like an old married couple:

> "NAME-"
>
> "?"
>
> "It is (odd) (strange) (perplexing)."
>
> "?"
>
> "I am thinking of Sparkie's mind ... NAME!"
>
> "I am awake!"
>
> "Sparkie is so (small) (weak) (defenseless)."
>
> "(Hm) (Mm) (Mmm)."
>
> "His mind is like a (piece) (sheet) of GARBLE. We think on the (bases) (conditions) (roots) of our experience, our perceptions which are multiplied by (objects) (things) (forms of matter) which we have sensed. Sparkie must think with the (toys) (playthings) of his earth only. How can he understand us? What does he know of GARBLE, GARBLE or GARBLE for example, this (small) (weak) (defenseless) being? NAME!"
>
> "! Go to sleep."

---

motion pictures of recent years—Moby Dick was its name—but on a side trip he met a young writer [= Gavin Hyde] who had just turned his hand to science fiction, and persuaded him to let American editors see the results. Star was delighted to acquire two of them" (followed by the titles of two stories by Hyde). According to @Valorum from the scifi.stackexchange.com forum, Gavin Hyde is probably yet another pseudonym of Ray Bradbury, because of the following facts: (1) Bradbury is said to have "discovered him" on a trip to Ireland (which seems unlikely), (2) Bradbury had a history of using pseudonyms, (3) there exists no other biographical information for this quite competent author, and (4) in his texts one encounters repeated uses of chess imagery, something that Bradbury would use often.

The story has a tragic end as Sparkie leaves his vessel to face the aliens and the Translator continues to "spit papers, violently" and "[a] great rocking bellowing sound [is heard] and a smell of sorrow spread skyward".

We don't know whether Hyde was professionaly involved in early versions of automatic translators (after all, it was in the fifties that automatic translation had its first spectacular outburst), but the use of parentheses to annotate variant translations (even for interjections such as Hm/Mm/Mmm) and of capitals for generic syntactic categories must have been quite surprising for an average reader in the fifties.

3.11.2. Silent Brother

Algis Budrys (2931−2008) was the son of the Lithuanian consul general in the US when the Soviet Union occupied Lithuania in 1940 and his family left the diplomatic service and became chicken farmers in New Jersey. It is no wonder that his novels and stories are filled with Cold War fear and suspicion. In his short story *Silent Brother* (1956), which he signs as Paul Janvier, he describes the slow appropriation of the main character's body and psyche by an alien. At some point, a device built by the alien during the main character's sleep emits a beam that blocks his thoughts. Budrys writes the following paragraph to illustrate the main character's mental confusion:

English (1956)	German (1965)	French (1969)	Japanese (1969)
Blink can't *think* blink rhythm I *think* blink trick think *blink* sink blink *wink*— CAN'T *THINK*!	*Blink* kann nicht *denken* blink Rhythmus *ich denke* blink Trick denken *blink* sink blink *wink*—*kann nicht denken!*	*Paupières* peux pas *penser* paupières pulsations *pense* paupières poisson d'avril penser *paupières* patatras paupières *papilloter*— PEUX PAS *penser!*	またたきのリズムがおれの考えをまたたかせ、またたき、考え、またたき、トリックがまたたき、おれは考えをまたたこうとして−だめだ！

The lack of syntax, the alternation of roman and italics and the repetitive <ink> suffix motive show the despair of the main characters trying to resist but not able to build a single sentence. The German version is a nearly-identical translation of the English one (even though the word "wink" does not have the same meaning in the two languages), while the French version is based on the repetition of words starting with a <p>. The Japanese version is a standard translation (words "sink" and "wink" have been omitted) where words for "trick" and "rhythm" are in katakana, since they derive from English.

3.11.3. Old Testament

Jerome Bixby (1923–1998) was an American science fiction author who wrote, among other things, a *Twilight Zone* episode and four *Star Trek* episodes. His short story *Old Testament* (1964) is a pun to pseudoarchaeological theories like the ones exposed in Pauwels and Bergier's *The Morning of the Magicians* (1960) and in Charroux's *One Hundred Thousand Years of Man's Unknown History* (1963). In it, a human spaceship visits the Sirius IV planet, avoiding as much as possible being noticed by the indigenous primitive civilization. When the humans leave the planet, they discover a native baby abandoned in a basket. They immediately return and discreetly deposit the baby in the middle of a village. In the second part of the short story, an indigenous narrator gives eir version of the baby's return, where the astronauts have become "good gods" and the child a self-proclaimed prophet, "Messenger of the Good Gods," to which "They" have given a "fragment of the Sun," which is actually a flashlight pen (called "pencil-flash" in the story, p. 103) the child has stolen from the ship:

English (1964)	Italian (1964)	French (1983)

I happy. Everybody like little one. He friend of good gods. Other mothers take care of him. Let him drink. Let other little ones drink. Do for each other, I happy because good gods bring him back
 	
          to His people, and the First Night did ring with rejoicing; for He had returned from the Land Beyond the Sky and He said unto those who waited They are Good Gods, and I am Their Messenger, and lo! They have given to me a fragment of the Sun that I may shed light over darkness and open your eyes to good and gentle ways.
	Io felice. Tutti volere bene mio piccolo. Lui amico di buoni dèi. Altre madri avere cura di lui. Lasciare lui succhiare. Lasciare altri piccoli senza madre succhiare. Servire uni per altre, e io felice perché buoni dèi portare lui indietro...
	
	                    alla Sua gente, e la Dolce Notte risonò di canti; poiché Lui era tornato dalla Terra al di là del Cielo per dire a coloro che aspettavano: Essi sono gli Dèi Benigni, e io sono il Loro Messaggero, e guardate! Essi mi hanno dato un frammento di Sole, affinché io possa spandere la luce tra le tenebre e aprire i vostri occhi sulle cose buone et gentili.
		Moi heureux. Tous aimer petit. Petit ami bons Dieux. Autres mères prendre petit, donner boire petit. Faire les uns pour les autres. Bien. Moi heureux parce que bons Dieux ramener petit
		
		                    à Son peuple, et la Première nuit fut emplie de réjouissances, car Il était revenu du Pays Au-Delà du Ciel et Il dit à ceux qui attendaient qu'ils étaient de bons Dieux et qu'il était leur Messager! Voyez! Ils m'ont donné un fragment de Leur Soleil pour que Je puisse répandre la Lumière dans les ténèbres et ouvrir vos yeux sur ce qui est juste et bon.

In the middle of the narration there is a transition: from syntax-less pidgin language, the narrator switches to a pastiche of Biblical text where all pronouns referring to the astronauts are capitalized, as they are called "Gods". This transition is emphasized by two graphetic methods:

1. the first line of the "Biblical" text starts exactly underneath the location where the pidgin text ends;
2. pidgin text is in roman and "Biblical" text in italics (the styles are reversed in the French version, and in Italian there is no style change because the magazine is set by typewriter).

The story ends when the reader discovers that the "Biblical" text is in fact an excerpt from the "Sirian Bible," which a young Galactic Federation student is reading and wondering where the "Gods" came from, before closing it and moving to the next interstellar Bible.

3.11.4. The End

The American author Fredric Brown (1906–1972) is known for his very short and ingenuous stories. One of them, *The End* (1961), a 105-word story, first published in the 'adult' magazine *The Dude*, is perfectly symmetric with respect to word order: at the climax of the story, when a scientist having invented a machine making time run backwards pushes a button, the entire story is written anew, backwards word-wise, so that it consists of 52 words in standard order, followed by a pivot word (<backward>) and the same 52 words in reverse order.

Here is the central part of the story in three languages (we have underlined the pivot word):

English (1961)	French (1963)	German (1963)
Pushing a button as he spoke, he said, "This should make time run backward run time make should this," said he, spoke he as button a pushing.	Et, tout en appuyant sur un bouton, il dit: «Ceci devrait faire repartir le temps à rebours à temps le repartir faire devrait ceci», dit-il bouton un sur appuyant en tout, et.	Er drückte einen Knopf, während er sprach, und sagte: »Das sollte die Zeit zurücklaufen lassen zurücklaufen Zeit die sollte das«, sagte und, sprach er, während Knopf einen drückte er.

In French, whenever there is an elision phenomenon, the two words are considered as a single one, such as <j'ai>. Even the composite and elided <l'équation-clé> is considered as a single word and hence remains unchanged in the reversed text. In the case of German, the (same) composite word is inverted: <Zeit-Theorie> becomes <Theorie-Zeit>—this only happens because the constituents are separated by a dash, while the

undashed composite word <Schlüsselgleichung> remains unchanged in the reverted part of the story.

The story ends with the inversion of the title: <END THE> (resp. <N.I.F.> in French and <ENDE DAS> in German). In a Whorfian perspective, it raises the question whether it suffices to reverse word order in order to experience time backwards.

3.12. Breaking RULE⑩-2: Insertion of Fragments in Other Scripts

Introducing non-Latin script text fragments into ordinary Latin-alphabet text is a very rarely used graphemic method—after all, no author or publisher expects eir readers to be able to decypher foreign scripts. We have found two exceptions to this rule.

3.12.1. Rendez-vous pour amant·e·s égaré·e·s

In the 2018 novel *Rendez-vous pour amant·e·s égaré·e·s* by young French author Éric Abbel, the two main characters O and U are lovers of undefined gender, and thanks to gender-neutral writing (cf. Haralambous and Dichy, 2019), nothing in the novel allows the reader to identify their genders. When introducing a third character, a math professor who interferes in the relationship between O and U, Abbel uses the Russian/Ukrainian word <Одержимый> ("passionate") (p. 40):

> Ce lundi-là comme chaque lundi, O posait pour l'Académie des Arts Appliqués, dans la classe du professeur Одержимый, qui enseignait la perspective dans l'art abstrait.

We notice that more than the half of the graphemes of <Одержимый> (namely <д>, <ж>, <и>, <ы> and <й>) are unrecognizable by the average French reader. The name is used nine times in the novel and it would be interesting to find out what reading strategies readers of the novel apply to render it phonetically.

3.12.2. Le Voyage de Mao-Mi

French author Lisa Bresner (1971–2007) wrote several children books, in which Chinese characters are inserted into French text to familiarize children with sinographs.

Here is an excerpt of her 2006 novel *Le voyage de Mao-Mi*:

Mais en voyant une forme à 二 oreilles, 四 pattes, 一 queue

et 五 moustaches, Fleur Sauvage en mord son chapeau à pleines dents.

Petit Tang avait raison. Mao-Mi sort de la sacoche et vient vite se réfugier

dans les bras de sa maîtresse.

Tandis que Fleur Sauvage caresse son chat, Petit Tang plonge ses mains dans

le cartable de son amie.

– Et d' 一 , dit-il. La poudre 黑 de notre ami le Maître du 火 .

Il cherche de nouveau et en sort un 傘 .

– Et de 二 , continue Petit Tang. L'invention de notre ami le Maître de l' 水 .

Il fouille encore et n'en tire rien.

As this excerpt appears towards the end of the book (p. 40), Bresler uses sinographs *instead* of French words (mainly representing numbers), while at the beginning of the book sinographs often *repeat* French words, which are then set in bold face, as here for the word <Bonjour> (p. 8):

– **Bonjour** 你 好 , Petit Tang, salue

le papa.

– 你 好 , dit à son tour Petit Tang,

avant d'ajouter : 你 好 , Fleur Sauvage,

en voyant son amie.

3.13.   Breaking RULE④-1: Nonstandard Spaces Between Words

Charlemagne Ischir Defontenay (1819–1856) was a French physician and author. His novel *Star ou Ψ de Cassiopée* (1854) is one of the first science-fiction works in history. Defontenay was discovered by Raymond Queneau, who considered him as yet another "fou littéraire" (literary madman).

Citing Jaccaud (2008),

> As an amazing precursor of modern poetry, Defontenay, seeking to build estrangement, discovers the importance of space between words, the void that generates universes.

Indeed, when narrating the discovery of alien artefacts on the Himalayah, Defontenay uses irregular spacing between words or syntagms to increase the effect of estrangement and of cold. Here is an example of this graphetic method (p. 19):

I

Malgré   mon   froid   dégoût   pour   ce   hideux   spectacle,

   la curiosité   me poussait cependant   à faire l'exa-

men   de la masse céleste   qui pendant un instant

avait pesé peut-être   dans la main de Brahma,   ou

qui du moins au ciel   avait longtemps erré   dans les

flots supérieurs   de la mer des étoiles.

3.14. Breaking RULE⑭-1: Words on Nonstandard Base Lines

In §3.4 we gave an example of graphs of a given γ-word not sharing the same straight baseline. Here we deal with γ-words individually set in a standard way but belonging to sentences set in nonstandard way.

The following telepathic dialog appears on p. 24 of Bester's *The Demolished Man*. Bester uses vertical dimension to denote temporality and imaginary base lines as discursive unit identifiers. We have attempted to identify discursive units and display them through colored arrows on the right side:

```
Frankly        Canapés?                      Why
   Ellery,       Thanks    delicious.   yes,
      I        Mary, they're             Tate,
        don't                            I'm
          think                          treating
We        you'll Canapés?        D'Courtney.
  brought        be                       I
   Galen           working                expect
    along            for                  him
     to                Monarch            in
help him celebrate.        much           town
         He's              longer.        very
            just              The        shortly.
              taken his Guild Exam.
                  is              and
  If              just            been
 you're           about          classed
interested                       2nd.
       Powell, we're ready
                   to
                  run rule
                   you      Monarch's
                  for          espionage
                Guild   Canapés?  unethical.
              President.
                    Canapés?
                      Why yes.
                         Thank
                 Canapés?    You,
                              Mary . . .
```

It is interesting to note that these discursive units seem to interfere with each other, for example towards the middle of the time frame, we have, in different sentences, expressions related to time: "very shortly," "much longer," "just about". In particular, there is confusion in the center of the diagram: the sentence "He's just taken his Guild Exam. and been classed 2nd." (violet arrow) occupies the imaginary line of the sentence starting with "Frankly, Ellery…" (orange arrow). If this is the case, then the word "The" on line 13 does not belong to any sentence, and the sentence "is just about ready…" (blue arrow) starts out of nowhere. Bester has brilliantly managed to illustrate both the power and the confusion of telepathic communication, as long as we admit that telepathy uses communicative units equivalent to (1-dimensional) phonemes and not to (2-dimensional) graphemes.

3.15.   Breaking RULE⑭-2: Words in Different Sizes

Changing word size is not very uncommon, as graph size can be associated to sonic salience. To give an example, let us return to Jardin's *Le petit sauvage* (§3.4.2) with the following excerpt from the second (sansserif) part (p. 238):

> Manon est là, devant moi !
> Je la respire, la devine dans l'obscurité. Sa silhouette se dessine devant moi. Je suis **heureux, heureux, heureux,**
> **heureux, heureux.**
> Soudain le courant revient ; la lumière s'allume.

Alexandre illustrates his happiness by repeating the word "happy" with increasing emphasis. The paragraph change after the largest <heureux> word is necessary to avoid having the inverse effect of a "small" word <Soudain> following a large word, which would be interpreted as a negative event, a loss of self-confidence and inspiration.

3.16.   Breaking RULE⑭-3: Words in Different Font Families

Font family change between words is rather rare, for various reasons: (1) the two font families have to be easily identifiable so that an average reader can unambiguously identify them when applied on an arbitrary word; (2) they should carry connotative features that justify the font change.

Here is a case where this graphetic method has been applied. Bester, in his *The Demolished Man*, uses a switch to a blackletter font, in a telepathic dialog (p. 22):

> Instantly came a familiar sensory impact: Snow/mint/tulips/ taffeta.
> '*Mary Noyes. Come to help the bachelor prepare for the party?* 𝕭𝖑𝖊𝖘𝖘𝖎𝖓𝖌𝖘*!*'
> '*Hoped you'd need me, Linc.*'

Here the gothic font connotes Christmas atmosphere, as a complementary perception to those of snow, mint, tulips and taffeta. Bester uses a typically American blackletter font (Cloister Black) with short (final) <𝖘> letters, which gives the utterance a sense of conventional modernity (in a traditional setting, the greeting would rather be <𝕭𝖑𝖊𝖘𝖘𝖎𝖓𝖌𝖘!>). By using a clearly American font in a modern way, Bester avoids confusion with German Fraktur fonts connotating German culture or even Nazism as in the Austrian publicity "Gehen Sie wählen! 𝔄𝔫𝔡𝔢𝔯𝔢 𝔱𝔲𝔫 𝔢𝔰 𝔞𝔲𝔠𝔥." ("Go vote! 𝔒𝔱𝔥𝔢𝔯𝔰 𝔡𝔬 𝔦𝔱 𝔱𝔬𝔬.") (Haralambous and Dürst, 2019, p. 138).

3.17.   Breaking RULE⑭-4: Words Using Different Allographs

3.17.1.   Tiger! Tiger!

In his novel *Tiger! Tiger!* (1955), Alfred Bester describes a community of people in a spaceship. This community descends from scientists, therefore they call themselves "Scientific People" and worship a deity called "Holy Darwin". Their names, tatooed on their fronts, all contain a letter <o> that is either replaced by a male symbol <♂> or by a female symbol <♀>. Interestingly, the English edition of the text describes the allographs but does *not* use them:

> Across the brow was tattooed JOSEPH. The <O> in JOSEPH had a tiny arrow thrust up from the right shoulder, turning it into the symbol of Mars, used by scientists to designate male sex. (p. 26)
>
> Three girls appeared before Foyle. Their faces were hideously tattooed. Across each brow was a name: JOAN and MOIRA and POLLY. The <O> of each name had a tiny cross at the base. (p. 27)

On the other hand, the French translation (*Terminus les étoiles*, 2007) keeps the description, but also iconically uses the corresponding allographs:

> Sur le front on lisait le mot: J♂SEPH. Le «O» de J♂SEPH portait une petite flèche en haut et à droite : il devenait ainsi le symbole de Mars utilisé par les savants pour désigner le sexe mâle. (p. 40)
>
> J♂seph fit un geste, et trois filles se rangèrent devant Foyle. Elles avaient le visage hideusement tatoué. Sur chaque front était gravé un nom : J♀AN, M♀IRA, P♀LLY. Le «O» de chaque nom portait une petite croix à la base. (p. 41)

According to Smith (2016, p. 15), Bester is "gently satirizing what he saw as the all-too-common tendency of some science-fiction writers to treat science as a magic talisman and of certain readers to accept it as such".

3.17.2.   Les Furtifs

Alain Damasio (1969−) is probably the most famous living French sience fiction author, even though none of his works has yet been translated into English. In his 700-page novel *Les Furtifs* (2019), he collaborated with an École Estienne-graduate font designer and graphic artist, Esther Szac,[10] to massively include allographs in the text. Here is a complete list of the allographs used, as well as their numbers of occurrences in the novel:
 − a: |ă| (609 times), |ã| (1), |æ| (1);

---

10. https://www.estherszac.com/

- c: |ċ| (1,457), |č| (830);
- d: |đ| (40);
- e: |ė| (475), |ĕ| (1), |ę| (1), |ẹ| (1);
- f: |ſ| (563);
- g: |ġ| (473), |ğ| (281), |ġ| (248);
- h: |ĥ| (260), |ħ| (21);
- i: |İ/ı| (107), |ị| (47), |í| (14), |ĩ| (5);
- j: |ȷ| (549);
- k: |ḳ| (1);
- l: |ł| (672), |l·| (459), |ḷ| (36);
- n: |ṇ| (1);
- o: |õ| (620), |ǫ| (548), |ơ| (430), |θ| (145), |ǒ| (40), |ó| (14), |ϴ| (8), |ő| (4), |ō| (1);
- p: |Ᵽ| (6), |þ| (1);
- r: |ᴦ| (414), |г| (57), |ŕ| (9), |ř| (2), |ṛ| (1);
- s: |š| (218), |ś| (6), |ṣ| (2);
- t: |ŧ| (215), |τ| (30), |ṭ| (1), |ţ| (1);
- u: |ŭ| (14), |ů| (5), |ū| (1), |ụ| (1);
- v: |ṽ| (22).

As can be seen in the list above, allographs have been taken from several Latin-alphabet languages (Romanian, Portuguese, Swedish, Irish, Czech, Icelandic, Polish, etc.) as well as from Greek script: |ǒ|, |τ|, |ṽ| and from Cyrillic script (Ukrainian language): |г|.

The novel uses six characters as first-person narrators. Some of the allographs used are specific to a given narrator, and others are common between more than one narrator:

Narrator	% of paragraphs	Allographs	
		Specific	Common with others
Lorca	38.87%	ĠİōęŲ	óĊċėġLŁſȷọ
Sahar	17.66%	ãıŋśţū	ċčġL·ŕŭſȷů
Saskia	26.36%	æĂăĞğĤĥřᴦ	íóĊċČčėġL·ŕŠůọᴦ
Nèr	2.86%	ĐđĦħİŦtϴθΘ�Ᵽ	ŁŠ
Agüero	10.88%	Ģġịḳ|OớŞṬ	íóL·ŕụů
Toni	3.37%	þĚęĩőŖšτǒṽ	íČſſᴦ

where the second column gives the percentage of paragraphs narrated by each narrator. As we can see, Lorca, Sahar and Saskia (the three most elaborated characters) use dotted allographs, while Nèr uses mostly allographs with bars, Agüero uses allographs with cedillas or ogoneks and Toni uses, amongst others, the three Greek allographs. To illustrate the use of these allographs for the different characters, here are three typical examples:

Saskia (p. 132):

ꞌAğ)üero s'ăvanče,) se décale. Il tire măintenănt sur lă porte d'entrée de lă măison. Un bruit de boomerănğ hăcĥe l'ăir… Où il est ? Une énième seringue părt en missile et čontourne lă măison ăvănt de filer vers lă porte où se tient Nèr))) Nèr ă le réflexe de plonğer) trop tărd) il prend lă seringue en pleine čuisse. Très vite je le vois blănčhir)) il s'effondre, să tête perčutănt le béton du sol.

Nèr (p. 142):

\Słoughi,\ ił incise / ił scie. Décisif Słoughi/décisif ! Đober non, Đober boit/boîte, Đober ła nique, łe fif ił rit/ił łui pique tout, ił łe déboîte, łes incisives, ła boîte à mołaires, ħiħi ! Ła fiłłe fiłłe-fiłłe/se faufiłe/ c'est łe fił. Qui đit ? Qui đit ? Où ? Ħouħou ? Où đonc qui đit ? Boxer attend son ħeure. Boxer pas d'ħumeur ! Boxer meurt. Ᵽas ła płace đans ma głace. Qui déčhire łà-đeđans ?

Toni (p. 654):

ؚCeˁ qui s'esτ passé ? Au Cŏsmŏndŏ ? I don't knŏw. Enfle le flŏu. La flŏuille. L'embrŏuillâme. Ma peau flume, je m'emplume sŏus les brasses, je cŏurs plus, je caᵛole. Tŏni Tŏut-flŏu, ich ! L'hŏmme de brume, hum, ahem, salam aleykŏum, shalŏm !

Notice that the initial ꞌ…), \…\ and ؚ…ˁ signs are explicit narrator marks, and are used systematically to mark the change of narrator.

The story is based on the discovery of and hunt for a species of beings called "furtives". These creatures hide from the human eye and spontaneously commit suicide when perceived by a human. The density of allographs is quite variable and this has led readers to suspect that allographs occur primarily when a furtive is close to the narrator. We have counted the number of allographs in every slice of 50 words, and here is the result:
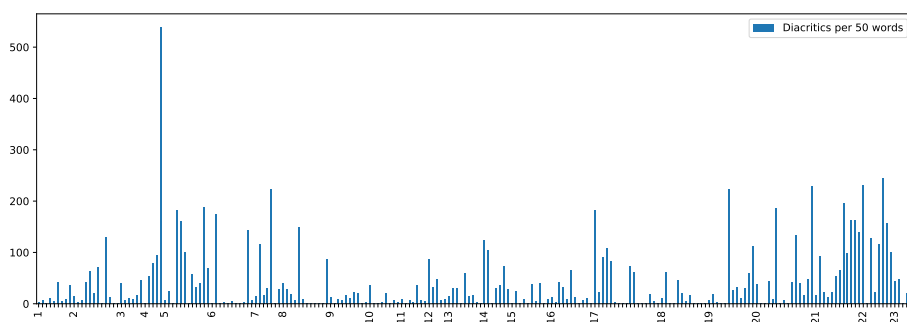
where the *x* axis is labeled by chapters. As can be seen from the diagram, allographs are not distributed equally throughout the book, and they appear grouped (especially in the last chapters). A correlation between the density of allographs and the possibility of presence of furtives near the narrator is a widespread assumption but has yet to be established.

Szac's choice of using already existing glyphs of Unicode characters as allographs raises many issues:

- was this a pure-commodity choice, avoiding having to design new graphs, while hoping that nobody would realize that these graphs existed already?
- is it politically correct to "downgrade" graphs that are graphemes in other languages into simple allographs of French graphemes? Why should <ç> be considered as a full-right grapheme while |ṭ| is merely an allograph of <t>?
- in most cases the phonetic realization of allographs is close to that of the "base" grapheme, but in some cases it is bluntly wrong: |þ|, |ɾ|, |ʃ|, |ʊ̌|, |θ| are not phonetically contiguous to <p>, <r>, <f> and <v>, <o>: is the visual resemblance sufficient to establish a grapheme/allograph relationship?
- Alain Damasio is an anti-globalization activist, but isn't the choice of using these allographs ironically at the opposite of his convictions? He takes graphs from several cultures in the world, downgrades them to purely visual ersatzes of his own language's graphemes, and includes them, without any distinction, into a graphetic soup where their origin is completely dissolved. Isn't that exactly what multinationals are doing with products from third-world countries?

3.18. Breaking RULE⑬-6: Ateji

The traditional function of interlinear annotation in Japanese is to provide reading glosses (furigana) to kanji characters. Ateji in the sense of Lewis (2010) and Melander (2016), is the "pairing of kanji and furigana that has a different meaning". In other words, ateji is a non-standard use of interlinear annotation to produce more meaning than just phonetic information. Melander (ibid.) subdivides the use of ateji into five categories: translative ("where the translation for the spoken word written in the furigana is provided in the kanji"), denotive ("in which a proper noun is given in the kanji while the pronoun actually spoken by the characters is given in the furigana"), constrastive ("when two different Japanese words are combined in order to give rise to new nuances which neither of the words express by themselves"), translative/contrastive ("the words used in the rubi are of foreign descent, but do not exhibit a one-to-one correspondence with the word being glossed") and abbreviative/contrastive ("a means of abbreviating longer words (often terminology) that are too awkward to keep repeating all the time in the story").

The Japanese author Dempow Torishima 酉島伝法 (1970−) uses constrastive ateji in his novel 皆勤の徒 *Sisyphean* (2011).

Here are some examples (we will use letters $A, B, C, \ldots$ to denote kanji characters in order to explore their combinations):

– <製臓物>: If 製臓物 is ABC, then BC 臓物 has the "entrails" meaning. The rubi せいぞうぶつ /seizoubutsu/ is the phonetic representation of $AB'C$ 製造物 "product". By combining the semantics of $AB'C$ and of BC we get "artificially produced entrails".
In the English translation of *Sisyphean* this syntagm is translated by the neologism *synthorganic*.

– <隷重類>: ABC 隷重類 has the "heavily-burdened slave genus" meaning (A stands for "slave," B for "heavy" and C for "genus"). The rubi れいちょうるい /reichourui/ is the phonetic representation of $A'B'C$ 霊長類 "primates" where A' stands for "superior" and B' for "leader". By combining the semantics of ABC and of $A'B'C$ we get "slave primate". In the English translation this syntagm is translated by the neologism *subordinape*.

– <皿菅>: No Japanese word can be associated with the reading of 皿菅. The first part of the rubi けっかん /kekkan/ can have the meanings "blood vessel" (血管), "fault" (欠陥) and "missing volume" (欠巻). The second part, もどき /modoki/ has the meaning of "ersatz" or "imitation".
血管 is graphically close to 皿菅, we can consider the latter as being a "simpler imitation" of the former. Therefore we can consider that the first meaning of けっかん is meant and hence we obtain for 皿菅 the semantics of "an imitation of blood vessel".
In the English translation the syntagm has been translated by *blood sedge*.

As we see, Torishima goes well beyond contrastive ateji by creating semantic puzzles that the reader has to solve by going back and forth between base characters, their meanings and readings, and rubi.

3.19. Breaking RULE⑬-7: Use of Interlinear Annotation

Interlinear annotation is very rarely used in fiction. Here are three examples of quite different natures:

1. asymmetric annotation, where the base is main text and where annotation takes the visual form of an exponent and functions as a context marker (§3.19.1);
2. asymmetric annotation, where the base is main text and where annotation is a separate line (in smaller graphs) and functions as a discursive thread that runs parallel to the main text thread (§3.19.2);

3. symmetric annotation, where the base and annotation are equally important, displayed like a mathematical fraction and functioning as simultaneous utterances in an alien language (§3.19.3).

3.19.1. The Demolished Man

Again in *The Demolished Man*, Alfred Bester uses the following graphetic construction:

> '*Hoped you'd need me, Linc.*'
> '*Every host needs a hostess. Mary, what am I going to do for Canapés$^{S.O.S.}$?*'
> '*Just invented a new recipe. I'll make it for you. Roast chutney &.*'
> '*& ?*'

The $|^{S.O.S.}|$ annotation of the word "Canapés" gives the context of the utterance, namely Linc desperately asking for help. In oral communication this information would have been provided by prosody and in multimodal communication by a gesture. In some sense this type of annotation is very similar to contrastive atejis: a single word is annotated and the annotation contributes to the meaning of the base.

3.19.2. Libro de Manuel

The well-known Argentinian author Julio Cortázar (1914–1984) wrote a political novel, entitled *Libro de Manuel* (1973), which, incidentally, he called "the worst of his books".

In this novel he uses twenty interlinear annotations, concentrated in eight pages and expressing the thoughts of the narrator. These thoughts are uttered simultaneously to the main text but are discursively mostly independent of it.

Here is an example: on p. 130, there is annotation formulating a doubt about the "full moon" (no full moon, or anything related to it, appears yet in the main text):

<div align="right">¿Por qué la luna llena?</div>

para que no se le ocurriera soltar un graznido telefónicamente inquietante
para el alborotado Oteiza que en cinco minutos arregló

On page 131 the same doubt arises again:

pensar un poco en eso que estaba esperando en la otra punta, ir poniendo
  ¿Por qué la luna llena?
desde ya la cara de veterinario consciente de su importante misión

On page 133 the full moon appears at last in the text, while the narrator has changed his mind as "the moon wasn't full in the first place":

<div align="right">lo mejor no había luna, haría mejor en pensar en el discurso</div>

entre las sombras de una calle llena de agujas y amenazas, aullando histéricas sin saber de qué, de luna llena y carnaval

This graphetic method is unique in Cortázar's work. He manages to establish a feeling of intimacy, since annotation gives the impression of accessing the narrator's deepest thoughts, while the main text is unfolding. It is also a nice reading exercise, since the reader has to process two discursive threads simultaneously, knowing that the first is formal and well-structured, and the second is spontaneous and impulsive.

3.19.3. Embassytown

In the already mentioned novel *Embassytown*, China Miéville describes the communication attempts between humans and Ariekei, resulting in the humans teaching the Ariekei how to use metaphors and how to lie. To represent the Ariekei language in written form, Miéville uses an interlinear annotation method, where both parts are of equal importance (and hence the same font size). To distinguish the two text flows that are uttered simultaneously, Miéville uses the *notation of mathematical fractions*. Weakland (2015, p. 83) states that this notation is "obviously meant to recall Saussure's graph of the linguistic sign," but we reject this hypothesis: Saussure's drawings (1995, p. 99, 158–162) contain a horizontal line that separates the two sides of the sign, but these sides are of *different natures*: the signified is represented on top and the signifier at the bottom. Furthermore Saussure's notation does not imply temporality in the horizontal direction since phonetic (and hence temporal) realization exists only in the lower part ("image acoustique"). We rather consider this graphetic method as belonging to the general category of interlinear annotations, since it consists of text flows with common temporality.

Miéville uses 159 expressions in Ariekei language notation. At the beginning these are Ariekei words: $\frac{suhaill}{jarr}$, $\frac{kora}{shahundī}$, $\frac{suhaish}{ko}$, etc.; syntagms: $\frac{shoash}{to\ tuan}$, $\frac{du\ kora\ eshin}{u\ shahundi\ qes}$, etc.; or proper names: $\frac{ez}{ra}$, $\frac{bren}{dan}$, $\frac{yl}{syb}$, etc. At the end of book, an Ariekan with the nickname Spanish Dancer starts speaking English:

English (2011)	German (2012)	French (2016)
The Ariekei sifted the datchips, listening with disbelief at how they heard what they heard. That's what I think. Spanish Dancer remained bent, but its eyes looked up at me. Perhaps it knew now, in	Die Ariekei sichteten die Datchips und lauschten ungläubig darauf, wie sie hörten, was sie hörten. Das ist es, was ich glaube. Spanischer Tänzer verharrte in einer gebeugten Körperhaltung, doch seine	Les Ariékans ont passé en revue les datapuces, en s'écoutant avec incrédulité entendre ce qu'ils entendaient. C'est du moins mon avis. Danseuse Flamenca restait penché, mais ses yeux se dressaient vers

ways it could not have done before, that what it heard from me were words. It listened. "Yes," I said, "yes," and Spanish Dancer cooed and, harmonising with itself, said: "$\frac{yes}{yes}$." (p. 364)

Augen schauten zu mir hoch. Vielleicht wusste er nun auf eine Art und Weise, wie er es zuvor nicht vermocht hatte, dass das, was er von mir hörte, Wörter waren. Er hörte zu. »Ja«, sagte ich, »ja.« Und Spanischer Tänzer gurrte, brachte das, was er äußern wollte, in Einklang mit sich selbst und sagte: »$\frac{ja}{ja}$«.

moi. Sans doute savait-il désormais, d'une façon qui lui avait été fermée jusque-là, que ce qu'il m'entendait prononcer était des mots. Il écoutait. — Oui, ai-je dit. Oui. Là, il a émis un roucoulement, puis, en harmonie, a prononcé: — $\frac{oui}{oui}$.

Once the first English word has been duplicated to become perceivable as a linguistic utterance by the Ariekans, Miéville uses the graphetic method to introduce nuances, such as a question that is first uttered as a pure question, and then a question uttered as half a question and half a statement:

Spanish attracted my attention with its giftwing. "$\frac{you\ are\ ready?}{you\ are\ ready?}$" It spoke to me softly. I hesitated and it spoke again. "$\frac{are\ you?}{you\ are}$". (p. 388)

Spanischer Tänzer zog mit seinem Präsentflügel meine Aufmerksamkeit auf sich. »$\frac{du\ bist\ bereit?}{du\ bist\ bereit?}$« Er redete leise zu mir. Als ich zögerte, sprach er erneut. »$\frac{du\ bist\ es?}{du\ bist\ es?}$«

Danseuse a attiré mon attention avec sa donaile. — $\frac{tu\ es\ prête?}{tu\ es\ prête?}$ a-t-il demandé tout bas. J'ai hésité et il a repris la parole. — $\frac{tu\ l'es?}{tu\ l'es}$.

(for some reason the German translation is missing this subtlety). With the help of the main character, Avice, Ariekans learn metaphor use and lying, which was previously a taboo in their culture. The following excerpt illustrates their perception of metaphors:

Sometimes when Spanish Dancer is talking to me in my own language, it doesn't say $\frac{metaphor}{metaphor}$ but $\frac{lie\ that\ truths}{lie\ that\ truths}$, or $\frac{truthing}{lies}$. I think it knows that pleases me. A present for me. (p. 395)

Wenn Spanischer Tänzer manchmal zu mir in meiner Sprache redet, sagt er nicht $\frac{metapher}{metapher}$, sondern $\frac{L\ddot{u}ge\ die\ wahrheitet}{L\ddot{u}ge\ die\ wahrheitet}$ oder $\frac{wahrheitende}{L\ddot{u}ge}$. Ich glaube, er weiß, dass mir das gefällt. Ein Geschenk für mich.

Certaines fois, quand il me parle dans ma propre langue, il ne dit pas $\frac{m\acute{e}taphore}{m\acute{e}taphore}$, mais $\frac{mensonge\ qui\ dit\ vrai}{mensonge\ qui\ dit\ vrai}$ ou $\frac{v\acute{e}rit\acute{e}}{mensonge}$. Je crois qu'il sait que ça me plaît. Un cadeau qu'il me destine.

In the last pages of the book, Ariekans discover that besides English, there is also French (in the French translation it is Spanish and in the German translation, again French):

THE NEW ARIEKEI were astounded to learn that Terre have more than one language. I uploaded French. "I, je. I am, je suis," I said. Spanish Dancer was delighted. It said to me, « $\frac{\text{je voudrais venir avec vous}}{\text{I would like to come with you}}$ ». (p. 402)	Die Neuen Ariekei waren erstaunt zu erfahren, dass Terre-Wesen mehr als eine Sprache haben. Ich lud Französisch hoch. »Ich, je; ich bin, je suis«, erklärte ich. Spanischer Tänzer war offensichtlich sehr erfreut und sagte zu mir: $\frac{\text{je voudrais venir avec vous}}{\text{ich möchte mit Ihnen kommen}}$.	Les Nouveaux Ariékans ont été stupéfaits d'apprendre que les Terras ont plus d'une langue. J'ai chargé de l'espagnol. — Je, *Yo*. Je suis, *Yo soy*, ai-je expliqué. Danseuse était aux anges. Il m'a lancé: $\frac{\text{quisiera ir con ustedes}}{\text{je voudrais aller avec vous}}$

In the example above, the Ariekan speaks the two languages simultaneously through its two speech organs. In the last sentence of the novel, not only do Ariekans adopt the English name of Embassytown, but they do it in a vertically commutative way, so that the last word of the book is in fact its title, written in Ariekan duplicate form:

By Embassytown I mean the city. Even the New Ariekei have started to call the city by that name. $\frac{\text{embassy}}{\text{town}}$ they say, or $\frac{\text{town}}{\text{embassy}}$, or $\frac{\text{embassytown}}{\text{embassytown}}$. (p. 405)	Mit Botschaftsstadt meine ich die ganze Stadt. Selbst die Neuen Ariekei haben angefangen, die Gastgeberstadt mit diesem Namen zu bezeichnen. $\frac{\text{botschafts}}{\text{stadt}}$ sagen sie: $\frac{\text{stadt}}{\text{botschafts}}$ oder $\frac{\text{botschaftsstadt}}{\text{botschaftsstadt}}$.	Par Légationville, j'entends toute la cité. Les Nouveaux Ariékans eux-mêmes se sont mis à l'appeler ainsi. $\frac{\text{légation}}{\text{ville}}$, disent-ils, ou $\frac{\text{ville}}{\text{légation}}$, ou $\frac{\text{légationville}}{\text{légationville}}$.

While the English and French versions are symmetric and can be interpreted as "the town of the embassy," or "the embassy of the town," the German one is only partly so because of case: <botschafts> is genitive and <stadt> nominative, so that either way ($<\frac{\text{botschafts}}{\text{stadt}}>$ or $<\frac{\text{stadt}}{\text{botschafts}}>$) the meaning unambiguously remains "the town of the embassy".

3.20. Breaking RULE㉔-1 and RULE㉔-2: Paragraphs of Unequal Width or With Holes

Ollier's *Fuzzy Sets* is full of cases of paragraphs with lines of unequal width that form patterns, or with holes. Here are two consecutive pages (p. 58 and 59):

Redonne vie à l'entreprise : le but est l'impossible
dernier chapitre. Ceux-là te laisseront bien achever :
louvoie de glose   en glose et retro
uve la passe   entre l'écueil
du lire et   celui de la
biffure.   Rassemble
bras et   jambes, a
nnule l'   arithmé-
tique   affreu-
se : c   haque p
artie   de ton c
orps é   gale au
corps e   ntier ! U
n remous   a affecté l
a disposi-   tion des sil-
houettes : l   e grenat du ri-
deau bat l'œil,   ce grenat de rayo
nne, agressif, pâli :   « design » de bazar sur
le vaisseau de pointe. De rêve : figures d'un futur
précis. Survis !... L'éveillé solitaire — en position

de
Ripp
van W.
— n'a pas
fini de re-
censer les h
iatus. Anachro-
nique énergumène !
Recycle-toi sans tarder,
sinon le vrai héros te « coiffe » sur la
ligne et c'en est fait de ta sinécure. Retraite antici-
pée indigne. L'abus des pseudonymes a lassé déjà, et ce
va-et-vient entre Terre et Lunes. Il s
uffit d'une fois. Fais
ton profit de cet-
te mise en « to
uche » : null
e tâche ne
te requi
ert en
l'in
st

We notice that (a) in both cases the text is complete, so that there is no obfuscation involved, contrarily to §4.1.3, and (b) Ollier's hyphenation method (see §3.8) is applied: when a word is hyphenated according to rules, a hyphen is used (ten cases, with two exceptions: <é//gale> and <in//st(ant)>), otherwise (sixteen cases), no hyphen is used.

3.21. Breaking RULE㉔-3: Paragraph with Varying Leading

The young American author Jonathan Safran Foer (1977−) used many graphetic methods in his novel *Extremely Loud & Incredibly Close* (2005), among which a very impressive decrease of leading over a range of 12 pages, combined with line obfuscation by negative kerning so that graphs are superposed (p. 273−284):

Leading is reduced progressively as follows:

Page	273–274	275	276	277	278	279	280	281	282	283	284
Lines	38	38	40	41	42	42	46	55	73	88	?
Height (in mm)	153	151	150	151	151	149	151	152	146	140	131
Leading (in pt)	11.5	11.3	10.7	10.5	10.2	10.1	9.3	7.9	5.7	4.5	?

Obfuscation starts in the lower sixteen lines of page 281, the first two lines of which are still legible and the rest, until the end of page 284, is only typographic grey evolving to total black.

The text represents the last letter of the main character's grandfather to his son, a 9/11 victim, where he narrates how he met his grandson for the first time and built a relationship with him. This graphetic method is announced on p. 276 (while the leading decrease has already started) when the main character's grandfather asserts that:

> There won't be enough pages in this book for me to tell you what I need to tell you, I could write smaller, I could slice the pages down their edges to make two pages, I could write over my own writing, but then what?

The result is reminiscent of Zeno's Paradox, as this paragraph contains text of an infinite duration of time included in a finite amount of space, so that the repetition of increasingly closer ("incredibly close," as in the novel's title) signs evolves into solid black.

Sadokierski (2010, p. 109) compares page 284 with pages containing a single word (depicting pages from the notebook the mute grandfather is using to communicate):

> The visual juxtaposition between this heavy ink and the whiteness of the single-line daybook entries visualise the complexity of his [= the grandfather's] heartache. The unreadable mess of text represents the devastating experience of facing his family, and their collective heartache, after years in self-imposed isolation. Through this device, we share Thomas senior's anxiety and claustrophobia as his world becomes overwhelmingly emotionally complex.

And Nørgaard (2019, p. 154) underlines the multimodality of the message:

> The visual density is paralleled by a density of meaning, since Thomas virtually tries to explain and make sense of everything in this chapter, and emphasis is provided in that the "same" thing is conveyed through two modes at the same time.

3.22. Breaking RULE㉔-4: Lines with Different Sizes of Graphs

The novel *Marabou Stork Nightmares* (1995) by Scottish author Irvine Welsh (1958–) uses different graph sizes for dialogs and narrative text (p. 51):

> Aye, right.
> — Aye, well, so long as youse mind what ma man sais!
> — Yes Mrs Strang.
> — Tro Roy!
> — Cheerio son. Mind son, we'll no lit thaim dae nowt tae ye. Like ah sais . . . cheerio Roy!
> CHEERIO YA FUCKIN RADGE.
> Nurse Beverley Norton is getting me sorted. Patricia must have finished her shift. Talk to me in your soft Coronation Street accent, Nurse Norton. Just like Dorie's . . . naw, no Dorothy's.
> — We've got a visit from Dr Park this afternoon, haven't we, Roy loovey? Got to get you all nice and spruced up for Dr Park.

This example also illustrates font family change (from serif to sans serif). It is interesting to note that this example breaks another typographic rule: although the sans serif font has a significantly smaller size, the leading remains unchanged. The effect achieved by the author is a kind of introvertism: narration visually dominates oral utterances by others, and makes them seem secondary and without importance.

3.23. Breaking RULE㉔-5: Lines w/ Graphs from Diff. Font Families

The following example is the climax of Jardin's *Le petit sauvage* (p. 179):

> Je relève la tête et m'aperçois que je tremble. Mon asthme
> se calme. Tout mon corps réclame une étreinte, un ré-
> confort physique. Alors, guidé par une force obs-
> cure, je progresse vers le fond de la grotte, vers
> une nuit plus complète encore. Mondragon
> ne me fait plus peur. Les parois se rap-
> prochent de mes épaules mais je
> poursuis à reculons, dans
> un boyau ; je me
> trouve bloqué
> dans de la
> glaise tiède.
> La terre m'en-
> serre et me
> c a r e s s e .
> Je sens que
> ma voix inté-
> rieure est en
> train de muer.
> Je suis enfin
> tendre avec
> moi, je vis
> au présent...

It is the moment when, during a storm, Alexandre enters the cave (a metaphor of the maternal womb) and is transformed. The change occurs between the sentences "The earth surrounds me and caresses me" and "I feel that my inner voice is coming of age". The 178 pages preceding this location are set in a serif font family, the 79 following pages of the book are set in a sans serif font. We don't know whether the specific choices of serif/sans serif font (Stempel Garamond and Futura Light) have been made by Jardin himself, but these two fonts indeed have a strong historical background: both were designed in Germany during the culturally and ideologically intense Weimar Republic period, Stempel Garamond (1925) as a tribute to Venitian humanist legacy and hence to bourgeois establishment, and Futura (1927) as a revolutionary project in the spirit of Bauhaus, a tribute to freedom and anti-conformism (Haralambous, 2007, pp. 379, 399).

The paragraph takes the shape of the cave/womb, where the vertical direction metaphorically represents both space and temporality: while we read down the page we experience the character moving towards the interior of the cave.

3.24.   Breaking RULE㉔-6: All-Caps (or Small-Caps) Lines

Using lines in all-caps or in small-caps is a common graphetic method. We will give three innovative examples of their use.

3.24.1.   Sanctuary

In his short story *Sanctuary* (1954), the American author Daniel F. Galouye (1920−1976) describes the torture of being a telepath, unable to block other people's thoughts:

> (. . . *Harry did . . . painless job on that last tooth .   . last assignment,* *Cuba, was   . .*) She had almost reached the end of the page. (.   . *MISS* *FARLEY — NAME'S FAMILIAR   be another week before Ann . . .* *FARLEY — FARLEY — FARLEY . . . new skates for the kid . . . OF* *COURSE! THAT CRACKPOT GIRL WHO WROTE THE LET-* *TERS!   .*)
> She stopped writing and looked up at the doctor. "I'm the girl who wrote the letters about me and my father," she said, relieved.
> (.   . *IS THE ONE!   that crazy girl!   . . prize dopes for being roped* *in on   .*)
> She stood excitedly in the center of the room. "The letters were true! Everything I wrote about was true! The thoughts in my head! I can't stop them!"

Here italics in parentheses denote telepathically perceived thoughts, inside which upper case represents "sonic" salience.

3.24.2. Journey's End

The great American science fiction author Poul Anderson (1926–2001) wrote the short story *Journey's End* in 1957. Again the main character is a telepath, Norman Kane. He empathically reads other people's minds. Towards the end of the story he receives, for the first time, a signal from another telepath, a young girl. Before meeting physically they communicate telepathically. This communication is set in italics without any upper case letters, as if thoughts need no capitals to be structured. But suddenly, when they finally meet, in a paroxysmal move, they exchange their worst actions and memories, and thereby expose their dark sides to each other. These "unspeakable thoughts" are set in small caps:

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ning to her and she was running too.

—*my name is norman kane & i was not born to that name but took it from people who adopted me because i fled my father (horrible how mother died in darkness & he would not let her have drugs though it was cancer & he said drugs were sinful and pain was good for the soul & he really honestly believed that) & when the power first appeared i made slips and he beat me and said it was witchcraft & i have searched all my*

need for a kiss or even a hand-clasp . . . not yet. It was the minds which leaped out and enfolded and became one.

—I REMEMBER THAT AT THE AGE OF THREE I DRANK OUT OF THE TOI-LET BOWL/ THERE WAS A PECULIAR FASCINATION TO IT & I USED TO STEAL LOOSE CHANGE FROM MY MOTHER THOUGH SHE HAD LITTLE ENOUGH TO CALL HER OWN SO I COULD SNEAK DOWN TO THE DRUGSTORE FOR ICE CREAM & I SQUIRMED OUT OF THE DRAFT & THESE ARE THE DIRTY EPI-SODES INVOLVING WOMEN—

The idyllic situation is broken, the story ends with the antithesis of a Hollywood happy ending: "A boy and girl went hand in hand. The thought hung cold under the sky, a single thought in two minds.—*get out. i hate your bloody guts.*—".

3.24.3. Everything is Illuminated

Foer used the all-caps method (combined with italic style) in his novel *Everything is Illuminated* (2002) to distinguish narration from synagogue prayers and preaching (p. 19):

of cleavages below. Black pants became form-fitting, there was more bumping and swaying than ever as those *other parts* protruded in fantasies of *you know what*, and an extra hole was unknowingly inserted in the holi-est of prayers: *HOLY, HOLY, HOLY,* HOLEY *IS THE LORD OF HOSTS! THE WHOLE WORLD IS FILLED WITH HIS GLORY!*

The Venerable Rabbi addressed the disconcerting matter in one of his many midafternoon sermons. *AND WE MUST ALL BE FAMILIAR WITH THAT MOST PORTENTOUS OF BIBLICAL PARABLES, THE PERFECTION OF HEAVEN AND HELL. AND AS WE ALL DO OR SHOULD KNOW, IT WAS ON THE SECOND DAY THAT THE LORD*

In this excerpt the male synagogue attendees are captivated by the view of female attendees sitting underneath them, in the basement of the synagogue and separated from them by a glass floor. The sexually explicit homophone <HOLEY> (the "hole in the holiest of prayers") of the word "HOLY" is emphasized (and hence typeset in roman) to underline its specificity and avoid considering it as a typo. Interestingly, the French translation renders this sentence as <SEINS, SAINT, SAINT, SAINT EST LE SEIGNEUR DES ARMÉES INNOMBRABLES!> without any style change for the sexually explicit homophone word <SEINS>, while the German, Italian and Dutch translations miss Froer's intentions completely by avoiding the use of sexually loaded homophones in the prayer.

3.25. Breaking RULE㉔-7: Columns of Unequal Width

An example of this method is p. 169 of Claude Ollier's *Fuzzy Sets*, where text is typeset in two columns of unequal width. Only the first column is part of the novel's narration, while the second contains random text in the style of a technical manual:

Un déclic encore, et le dispositif unique se r e p l i e, s'articule en divans ou banquettes sur babord et tribord. Quand ils sont debout tous deux côte à côte enfin — « présentables » à la fin — trois coups plus forts se font entendre et un panneau coulisse, démasquant le truquage ou trompe-l'œil en proue : il n'est plus que d'en descendre les degrés p o u r accéder à la grande s a l l e, juste derrière l'écran. Une synchronisation experte des mouvements permet aux deux acteurs de prendre place sur les marques

jectifs définis par la section tement du Centre : 1) opérer ion des fables transcrites sur de tribord à babord. 2) mettr positifs de récitation de ces ture. 3) assurer la transmissi cessus holofilms. Sindbad po écran E4. Traduire : Spender-gnal : rouge ! Déclencher dé et trois coups sur paroi en processus de coulissage sur l cès observation à la salle n⁰ 8 cran nécessaire à enclenchem et filmage récitatif. Attendre our mise au point correcte d ximum de sonorisation admise lairement. Braquer faisceaux mière invisible et micros sup ger retard dû à impulsivité d héros. Accommoder T5 et T6 résorption du laps et obtenti oïcidence exacte. Lancer « Ac part du mouvement d'ensembl en scène. » Panneau : « F-S, 8 araissent silhouettes sur fon

We can consider the second column paratext of the first, since it supplies a context, probably the reading context of the main character wandering through a space ship, gathering impressions and trying to understand what is going on.

3.26. Breaking RULE㉔-8: Columns With Independent Narrative Threads

The dystopic novel *Yama Loka Terminus. Dernières nouvelles de Yirminadingrad* (2008) written by French authors Léo Henry (1979−) and Jacques Mucchielli (1977−2011) features a chapter (p. 99−115) that is entirely set

in three equal-width columns, containing three independent discursive threads and describing events and situations occurring simultaneously. Like in a movie scenario, we get three descriptions (called <piste>, "track") of the same event sequence, written in the same pace, so that the time scale is the same for the three columns:

piste 1	*piste 2*	*piste 3*
Aéroport international de Yirminadingrad. Mercredi 3 mars. 17 h 42. Temps clair. Vent de mer sud-ouest, 14 nœuds. 17 degrés Celsius.	…ppelons qu'il est interdit de fumer dans l'ensemble des bâtiments. Soyez les bienvenus à Yirminadingrad, joyau du Sud, porte de la mer Noire. Votre sécurité est assurée dans cette enceinte par des patrouilles de gardes en civil et un réseau de vidéo-surveillance. Un	Et, bien sûr, dès que je mets les pieds sur la terre ferme, revoilà la trompeuse impression de sécurité qui naît du déplacement, cette idée absurde qu'Ils aient pu m'avoir oublié, perdu en plein ciel, que leurs dispositifs d'espionnage aient pu tomber en panne. Je dois me
Vol 5639 en provenance de Petrograd. Tupolev 360, compagnie Aeroflot.		
Rogdaï Apolinari Stratov. Sexe	point taxi assermenté se trouve	reprendre tout de suite, il n'y a qu'une

3.27.   Breaking RULE⑰-1: Page Numbers Running Backwards

In Alain Damasio's novel *La Horde du contrevent* (2004), the first numbered page carries number 700. It is an even page preceded by a numberless chapter page, which we can assume of being page 701. Pages then run backwards until the last page of the book, which, being even, is page 0.

3.28.   Breaking RULE㉛-1: Paragraphs of Different Colors

3.28.1.   The Neverending Story

Michael Ende's *The Neverending Story* was graphically conceived by designer and author Roswitha Quadflieg, who introduced a two-color code for text (see Ende, 1978 and Quadflieg, 2020). The entire book (we are referring to the German 1987 pocket edition), except the book cover, is printed in "rötlich" ("reddish," as mentioned in the text, p. 212) and "blaugrün" ("bluish green," again in the text, p. 208) color (for simplicity we will refer to these colors as "red" and "green"). (In the B&W version of the current article, red color text has been set in bold face, and green

color text in roman face, a compromise already made by the French 1984 Pocket edition.[11])

The red color denotes the "real world" of the protagonist, Bastian, who is hiding in his school's attic to read a book (which is autoreferential of *The Neverending Story*). The green color denotes the action going on in the imaginary world Fantastica.

In the figure below, the reader can see the distribution of red and green text in *The Neverending Story*. The numbers on the horizontal axis denote chapters:
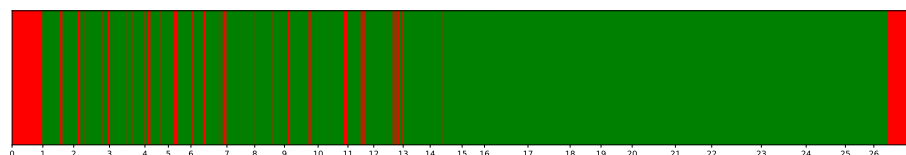
The beginning of the book is printed in red[12] up to the moment when Bastian starts reading the book (p. 18, just before the beginning of Chapter 1).

From then on, the book contents are printed in green and are interrupted by sections in red where Bastian hears the clock in the belfry striking and, for short moments, perceives his real-world situation. Green and red colors are visually separated: they are always used on a paragraph level, additional vertical space is added between paragraphs of different colors, and the paragraph after the additional vertical space is not indented.

Until p. 81, events in real and imaginary space follow two separate narrative threads. Then begins interaction between the two worlds, breaking the stereotype of the passive reader (p. 81):

> Ygramul fühlte plötzlich, daß sich ihr etwas näherte. Sie fuhr blitzschnell herum, und ihr Anblick war entsetzlich: Sie war jetzt nur noch ein riesenhaftes stahlblaues Gesicht mit einem einzigen Auge über der Nasenwurzel, das mît einer senkrechten Pupille voll unvorstellbarer Bosheit auf Atréju starrte.
>
> Bastian stieß einen leisen Schreckenslaut aus.
>
> Ein Schreckensschrei hallte durch die Schlucht und wurde als Echo hin- und hergeworfen. Ygramul drehte ihr Auge nach links und rechts, um zu sehen, ob da noch ein anderer Ankömmling war, denn der Junge, der wie gelähmt vor Grausen vor ihr stand, konnte es nicht gewesen sein. Aber da war niemand.[13]

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11. And apparently, according to Nørgaard (2009, pp. 141–142), "while still available in the bookshop, most current editions of Ende's novel are set in black type only."

12. With the sole exception of page numbers that are green throughout the book, probably because they belong to paratext.

13. At last Ygramul sensed that something was coming toward her. With the speed of lightning, she turned about, confronting Atreyu with an enormous steel-blue face.

Here the red word <Schreckenslaut> is immediately followed by a green <Schreckensschrei>, denoting the simultaneity of the two events: "cry of fear" in the real world vs. "cry of terror" in the imaginary world, the former coming from the real-world protagonist Bastian, the latter from an origin unknown to the other two characters in the scene, Atréju and Ygramul. This event is the first breach in Bastian's reality.

In the following chapters, interaction between the two narrative levels intensifies until, on page 214, the change of color occurs in the same logical paragraph (but in different γ-paragraphs), bringing the two worlds even closer (p. 214):

> Aber die tiefe Stimme des Alten vom Wandernden Berge fuhr fort, zu erzählen,
>
> und Bastian konnte nichts dagegen tun. Er hielt sich die Ohren zu, aber es nützte nichts, denn die Stimme klang in seinem Inneren. Obwohl er längst wußte, daß es nicht so war, klammerte er sich noch an den Gedanken, daß diese Übereinstimmung mit seiner eigenen Geschichte vielleicht doch nur ein verrückter Zufall war,
>
> aber die tiefe Stimme sprach unerbittlich weiter,
>
> und nun hörte er ganz deutlich, wie sie sagte:
>
> »… Manieren hast du nicht für fünf Pfennig, sonst hättest du dich wenigstens erst mal vorgestellt.«
>
> »Ich heiße Bastian,« sagte der Junge, »Bastian Balthasar Bux.«[14]

where the five graphical paragraphs contain in fact sentences crossing paragraph boundaries and color changes. The intrasentential color switch gives the impression of going back and forth between the two worlds using the commas placed at line ends as switches. It is interesting to note that there is a pragmatic inversion: Bastian hears the voice while in red (in the real world) and speaks while in green (the imaginary world).

Her single eye had a vertical pupil, which stared at Atreyu with inconceivable malignancy.
A cry of fear escaped Bastian.
A cry of terror passed through the ravine and echoed from side to side. Ygramul turned her eye to left and right, to see if someone else had arrived, for that sound could not have been made by the boy who stood there as though paralyzed with horror.

14. But the deep, dark voice of the Old Man of Wandering Mountain went on, and there was nothing Bastian could do about it. He held his hands over his ears, but it was no use, because the voice came from inside him. He tried desperately to tell himself—though he knew it wasn't true—that the resemblance to his own story was some crazy accident,
but the deep, dark voice went on,
and ever so clearly he heard it saying:
'Where are your manners? If you had any, you'd have introduced yourself.' 'My name is Bastian,' said the boy. 'Bastian Balthazar Bux.'

A few paragraphs later, Ende uses ellipsis as a switch between the two worlds (p. 215):

> Und hier fing alles wieder von vorne an—unverändert und unabänderlich—und wiederum endete alles bei der Begegnung der Kindlichen Kaiserin mit dem Alten vom Wandernden Berge, der abermals die Unendliche Geschichte zu schreiben und zu erzählen begann…

> …und es würde in alle Ewigkeit so fortgehen, denn es war ja ganz unmöglich, daß etwas sich am Ablauf der Dinge ändern konnte. Nur er allein, Bastian, konnte eingreifen.[15]

Once again we have a pragmatic inversion: the sentence "and so it would go on for ever and ever," which refers to the recursive nature of the narration, is printed in red, probably signifying that Bastian accepts the logical paradox as his own reality.

The tension is growing, and a few lines further Ende uses a very ingenious graphetic method (p. 216):

> Im selben Augenblick geschahen mehrere Dinge zugleich.

> Die Schale des großen Eis wurde von einer ungeheuren Gewalt in Stücke gesprengt, wobei ein dunkles Donnergrollen zu hören war. Dann brauste ein Sturmwind von fern heran

> und fuhr aus den Seiten des Buches heraus, das Bastian auf den Knien hielt, so daß sie wild zu flattern begannen.[16]

Ende describes a storm wind that starts in the imaginary world (in green), crosses the gate between the two worlds (the book) and blows from the book's pages into the real world (in red). The sentence is broken into two γ-paragraphs (and two colors) without any punctuation, in order to increase the impression of simultaneity. The verb "fahren" ("to drive") used to describe the wind's movement in the real world is unusual, and reminiscent of a verse of a Brahms's Lied: "Der Wind fährt seufzend durch die Nacht" ("The wind goes sighing though the night,"

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15. At that point the story began all over again—unchanged and unchangeable—and ended once again with the meeting between the Childlike Empress and the Old Man of Wandering Mountain, who began once again to write and tell the Neverending Story…
…and so it would go on for ever and ever, for any change in the sequence of events was unthinkable. Only he, Bastian, could do anything about it.

16. In that moment several things happened at once.
The shell of the great egg was dashed to pieces by some overwhelming power. A rumbling of thunder was heard. And then the storm wind came roaring from afar.
It blew from the pages of the book that Bastian was holding on his knees, and the pages began to flutter wildly. Bastian felt the wind in his hair and face. (The English translation splits the sentence "Dann brauste ein Sturmwind … zu flattern begannen" into two sentences, spoiling the graphetic effect of the original German text.)

poetry by Emanuel Geibel). This is the only place in the book where the change between colors is intrasentential and without punctuation.

The second part of the book is entirely typeset in green, with a single exception (the thin line between labels 14 and 15 in the diagram of p. 320) (p. 240):

> Der Sandhügel, auf dem Bastian gerade stand, war ultramarinblau. Durch ein kleines Tal von diesem getrennt, lag eine feuerrote Düne. Bastian ging zu ihr hinüber, schöpfte mit beiden Händen von dem roten Sand und trug ihn zu dem blauen Hügel. Dann streute er auf den Seitenhang eine lange Linie. Er ging wieder zurück, holte neuen roten Sand und das tat er immer wieder. Nach einer Weile hatte er drei riesengroße rote Buchstaben auf den blauen Untergrund gestreut:
>
> <div align="center">B B B</div>
>
> Zufrieden betrachtete er sein Werk. Dieses Zeichen konnte niemand übersehen, der die Unendliche Geschichte lesen würde. Was auch immer nun aus ihm werden mochte, man würde wissen, wo er geblieben war.[17]

We have here another graphetic method: In the sand, Bastian draws his initials, which belong to the real world and therefore have to be red.

The climactic moment of the book is Bastian's return to the real world, and there again Ende uses an ingenious graphetic method to increase its dramatic effect (p. 475-476):

> Bastian warf sich in sie hinein—und stürzte ins Leere.
> »Vater!« schrie er, »Vater!—Ich—bin—Bastian—Balthasar—Bux!«
> »Vater! Vater!—Ich—bin—Bastian—Balthasar—Bux!«
> Noch während er es schrie, fand er sich ohne Übergang auf dem Speicher des Schulhauses wieder, von wo aus er einst, vor langer Zeit, nach Phantásien gekommen war.[18]

Between his fall into emptiness and the reappearance of the school attic, the transition is given by Bastian's cry, printed in two different colors.

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17. The sand hill where Bastian was standing just then was ultramarine blue. And separated from it by a narrow cleft there was a fiery-red dune. Bastian crossed over to it, gathered up sand in both hands and carried it to the blue hill. Then he strewed a long line of red sand on the hillside. He went back, brought more red sand, and repeated the operation. Soon he had fashioned three enormous red letters against the blue ground:

<div align="center">B B B</div>

He viewed his work with satisfaction. No reader of the Neverending Story could fail to see his message. So whatever happened to him now, someone would know where he had been.

18. Bastian […] flung himself into the empty darkness beyond.
"Father!" he screamed. "Father! I—am—Bastian—Balthazar—Bux!"
"Father! Father! I—am—Bastian—Balthazar—Bux!"
Still screaming, he found himself in the schoolhouse attic, which long, long ago he had left for Fantastica.

By writing the same graphemic sentence twice (except for the incise "schrie er," "he shouted"), we can assume that there has been only a single cry, emitted in both worlds simultaneously (as a person experiencing two realities simultaneously when awakening from a dream).

In the first transition (from the real world to Fantastica) the trigger was a storm wind, i.e., a natural element, independent of Bastian's will. The second transition the trigger is Bastian's cry during his fall into emptiness. The change of color gives a dramatic depth to this transition, which sympathetically restores the reader's equilibrium.

The efficiency of color change is acknowledged among other scholars by Nikolajeva (1990), who states in her study of *The Neverending Story* based on Propp's structuralistic theory of morphology of tales (Propp, 1968), that

> Incidentally, […] insertions, marked by a different print color, are much more numerous than most readers would guess. When asked, most people say there are 12-15; there are actually forty-eight of them. I find this fact worth mentioning because it shows how skillfully Michael Ende has interwoven the two seemingly independent stories.

We found two more speculative fiction works using color to make meaning, we will briefly describe them in the following sections.

3.28.2.   The Strange Library

The most famous contemporary Japanese author, Haruki Murakami (1949−) wrote a novella for children, called *The Strange Library* (2005). This novella has many points in common with Ende's *The Neverending Story*: again it is a boy who, returning from school, visits, not a bookstore but a library, where three books are given to him to read. In his adventure, he meets a girl, whose "vocal cords were destroyed when [she] was little" (a reference to his most famous novel, *1Q84*) and so she communicates with him "with her hands".

Marakami uses blue color for the girl's utterances (replaced by bold in the B&W version of this paper):

> It's a fine moon, she said to me. Tomorrow it will be the new moon, and the sky will be dark.
> "We must feed the parakeet," I said.
> Didn't you feed the parakeet a little while ago? she asked.
> "You're right, I did," said the me that was Ibn Armut Hasir.
> The girl's silken body glinted in the light of the razor-thin crescent moon. I was spellbound.
> It's a fine moon, she repeated. The new moon will shape our destinies.
> "That would be terrific," I said.

The use of color underlines the boy's supernatural ability of understanding a voiceless girl communicating "with her hands". It is combined by the absence of double-quotes, which can be interpreted as markers of "real speech," while the girl probably communicates telepathically or in some other mysterious Murakamian way. It should be noted that none of the other translations we examined (German, Spanish, French, Italian and Turkish) use blue color like the Japanese and English versions. Instead of color, here is what these versions use to distinguish the narrator's utterances from those of the voiceless girl:

language	narrator	voiceless girl
Japanese (2005)	quotes 「 」	quotes 〈 〉
German (2013)	roman, quotes » «	italics
English (2014)	roman, quotes " "	roman, blue color
Spanish (2014)	roman, em-dash	roman, quotes « »
French (2015)	roman, em-dash	italics, quotes « »
Italian (2015)	roman, em-dash	roman, quotes « »
Turkish (2016)	roman, quotes " "	roman, angular brackets < >

There are 26 segments in blue color, distributed in the following way (numbers denote chapters):
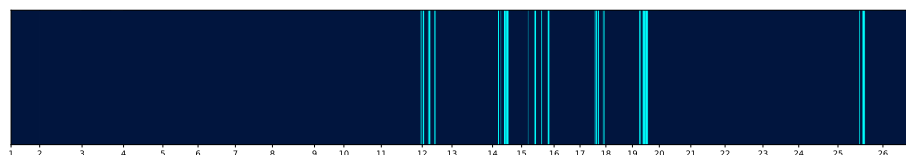
3.28.3. David Feldts efterladte papirer

As mentioned in Nørgaard (2019, pp. 101–104), in his novel *David Feldts efterladte papirer* ("David Feldt's leftover papers," 1997), the Danish author Mads Brenøe (1968–) uses blue color to represent writings by a second personality of the (schizophrenic) narrator. In this second personality he is a man letting the woman he loves starve to death (blue color represented by bold face in the B&W version of this paper):

Original Danish (1997)	Translation by Nørgaard (ibid., p. 103)
Pennen var usædvanlig god at skrive med. Som forudset gjorde den lille drejning i skaftet, at den nærmest afsig selv føjede sig ind i min hånd. Som var jeg skabt til netop at holde denne pen og ingen andre.	The pen was incredibly nice to write with. As expected, the little curve of the holder made it fit into my hand almost by itself. As had I been made to hold exactly this pen and no other.

Men så læste jeg, hvad der stod på papiret. Håndskriften var min, ingen tvivl om dét, men ordene havde jeg aldrig set før: Vand kan hun tåle, men det er også alt. Kun vand. Da det gik op for mig, tog jeg mine forholdsregler, sørgede for, at hun ikke ved et uheld skulle komme til at gøre sig selv ondt.	But then I read the text on the paper. The handwriting was mine, no doubt about that, but the words I had never seen before: Water she can stand, but that is all. Only water. When I realised that, I took my precautions, made sure that she would not harm herself by accident.

In this excerpt the narrator realizes that when he uses a specific golden fountain pen, his other personality is revealed. As Nørgaard (2019, p. 104) concludes:

> The use of the distinctive feature of color for the realization of the two narratives combined with their increasing interrelatedness helps construct a significant aspect of the meaning of the novel, i.e., the possible schizophrenic nature of Feldt's psyche and the likelihood that he is, in fact, the man who kills the woman by starving her to death.

There are 18 segments in blue color, distributed in the following way:
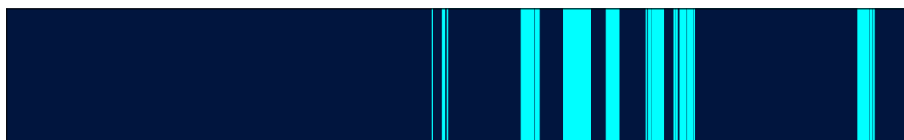
3.29. Breaking RULE㉛-2: Paragraphs of Different Graph Size

Jardin, in the *Le petit sauvage*, changes font size at the paragraph level to increase the stress of the main character being propelled on scene by a harsh wheel-chaired manager, in front of hundreds of "pairs of eyes" (p. 221):

Sa petite main molle se referme vigoureusement sur mon avant-bras. Il met en route son fauteuil roulant électrique et me conduit dans les coulisses, sans parler.
On me pousse devant des centaines de paires d'yeux.

Je suis en scène, vêtu comme une putain magnifique. Les projecteurs m'éblouissent, augmentent la perception que j'ai de mon corps. J'ouvre la bouche ; ma voix se

Here, font size is correlated with perceptual salience (as mentioned in the excerpt: "the projectors blind me and increase the perception I have of my body").

3.30.   Breaking RULE㉛-3: Paragraphs of Different Font Family

In the same novel, Jardin changes font family to underline the difference between two characters in a dialog (p. 222):

> En sortant de scène, je tombe sur Ange ; bouleversé, il me serre les deux mains.
>   — Câlice ! La grande Lola ! T'as fait un triomphe. Mais qu'est ce qui t'a pris d'aller jusqu'au bout ? C'était pas prévu d'enlever ta petite culotte.
>   — Je suis **LIBRE**.

While the main character, and narrator, keeps the same Futura Light as elsewhere in the second part of the book, the lines of the other character, a ruthless cabaret manager, are set in Stempel Garamond Bold Condensed Italic. The interjection <Câlice!> is typical of Québécois French and leads the reader to imagine this line pronounced with Canadian accent, a fact that further justifies the change of font.

3.31.   Breaking RULE㉞-1: Immoderate Use of Footnotes

Footnotes are only sparsely used in fiction: they may be encountered in translations to either give additional information on the cultural background of some excerpt, or to indicate that a given part of the text is originally written in the language of the translation. James G. Ballard (1930−2009), a British novelist known for his car-crash sexual fetishistic novel *Crash*, wrote a 18-word experimental story entitled *Notes Towards a Mental Breakdown* (1976) in which every word carries a footnote mark: the real story is contained in the 18 footnotes. Here is the full story with the first footnote:

A[1] discharged[2] Broadmoor[3] patient[4] compiles[5] 'Notes[6] Towards[7] a[8] Mental[9] Breakdown[10]', recalling[11] his[12] wife's[13] murder[14], his[15] trial[16] and[17] exoneration[18].

---

1. The use of the indefinite article encapsulates all the ambiguities that surround the undiscovered document, *Notes Towards a Mental Breakdown*, of which this 18-word synopsis is the only surviving fragment. Deceptively candid and straightforward, the synopsis is clearly an important clue in our understanding of the events that led to the tragic death of Judith Loughlin in her hotel bedroom at Gatwick Airport. There is no doubt that the role of the still unidentified author was a central one. The self-effacing <A> must be regarded not merely as an overt attempt at evasion but, on the unconscious level, as an early intimation of the author's desire to proclaim his guilt.

Formally the story has the structure of a scholarly text with commentary footnotes, but in fact, as the text per se is ridiculously short, it is solely through the footnotes that the reader has access to the story line.

The, very Oulipean in nature, rule of assigning a footnote to every word, including grammatical words such as articles, pronouns, and conjunctions, mocks the scholarly processes of annotation and commentary and forces the reader to follow a zigzag reading strategy between main text and notes, constantly turning pages back and forth.

This story inspired Murry C. Christensen, who created a "hyperbook" (a decade before the invention of the Web) based on Max Ernst's and Paul Eluard's *Une semaine de bonté* (a surrealistic collage novel from 1934). It also inspired the Portuguese music group Iurta (dark ambient and industrial act) so that its first album carries the name of the story.

3.32.   Breaking RULE㉛-4: Allograph Variation Between Paragraphs

Gahan Wilson (1930–2019) was an American author and cartoonist, known for his cartoons in *Playboy* and *The New Yorker*. In 1972 he experimented with the use of image as part of text. He called his story <●> (no phonetic rendering of this grapheme is given). Not only does this grapheme appear throughout the story, but its graph actually grows like a living creature. Here are the sixteen occurrences of the grapheme in the story, together with their functions:

(1) p. 12, centered between two γ-paragraphs.

(2) p. 13, centered between two γ-paragraphs and (3) inline, as a noun.

(4) p. 14, inline, as a noun. End of sentence without period.

(5) p. 14 centered between two γ-paragraphs and (6) inline, as a noun.

(7) p. 14 centered between two γ-paragraphs and (8) p. 15, inline, as a noun.

(9) p. 17, centered between two γ-paragraphs, introduced by a colon, and (10) centered between γ-paragraphs but grammatically in the sentence, as a noun.

(11) p. 17, centered between two γ-paragraphs, introduced by a colon, and (12) p. 18, centered between γ-paragraphs but grammatically in the sentence, as a noun.

(13) p. 19, centered between two γ-paragraphs.

(14) p. 20, centered between two γ-paragraphs, introduced by a colon and (15) p. 21, centered between two γ-paragraphs but grammatically in the sentence, as a noun.
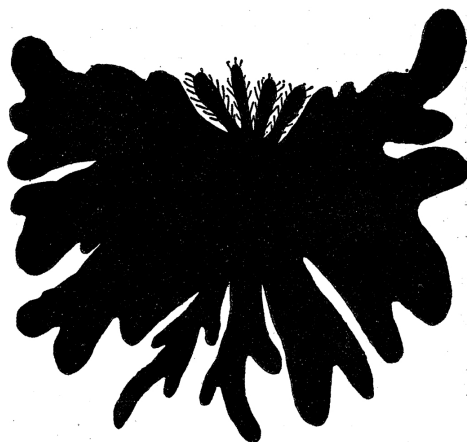
(16) p. 22, centered after the last γ-paragraph.

Allograph (16) appears after the following closing line:

 "That's right, Archie," he said, the door swinging open, all unnoticed, behind his back. "The thing's a carnivore."

In the Introduction to the story, Ellison (1972, p. 10) gives more information on its origin:

> When it came time to assemble this book, I contacted Gahan and suggested he invent a whole new kind of story, a combination of words and pictures in which one could not survive without the other. A verbalization, as it were, of the peculiarly Gahanoid humor seeping (one might even venture festooned) from his cartoons. I said it could be possibly termed a "vieword" story. Gahan liked the sound of the word, and what he contributed follows.

The author adds the following in the Afterword to his story (p. 23):

> [...] Ellison has coined "vieword" to describe the storytelling technique employed in ●, and I suppose that will do (after all, it is his collection) until the literary historians come up with something maybe a little classier. The vieword approach is an attempt to expand the panel cartoon, which is a combination of a visual impact and words. In a panel cartoon the drawing does not illustrate the caption, nor does the caption explain the drawing. They are interdependent parts of one thing. The comic strip is one way of trying to develop the one shot impact of a panel cartoon, the vieword is another.
>
> I have always thought, and I guess my work shows it, that this picture-word medium lends itself to the fantastic grotesque, and ● is nothing if not fantastically grotesque. I enjoyed very much writing-drawing it, and I hope that you enjoyed reading-seeing it.

The "vieword" <●> is used both as a syntagm and as a complete centered paragraph. Having allographs to simulate the evolution of a living creature is a unique grapholinguistic curiosity and a nightmare for librarians: ● has not yet been proposed for insertion in Unicode and even if this happens, the odds of it being accepted are thin. In Gahan Wilson's Wikipedia page of Gahan Wilson, the character 0x25CF BLACK CIRCLE is used as an ersatz, since <●> definitely lacks the property of being a circle.

3.33.   Breaking RULE㊶-2: Pages with Different Background Color

Starting with p. 249, the last 9 pages of Jardin's *Le petit sauvage* are printed as white text on black background. Here is the transition from white to black background (p. 248 and 249):

Je sors mes vivres de la cale du bateau et, en quelques heures, construis un abri de fortune constitué de branchages ainsi qu'une petite table ; puis, sans perdre une seconde — la mort me talonne — je dispose une rame de papier devant moi et prends mon stylo.

Avant de partir, je veux écrire mon odyssée intime. J'ai formé le dessein de rédiger un ouvrage qui, dans sa forme même, refléterait ma sincérité retrouvée, un texte dont la composition évoluerait pour mieux restituer les métamorphoses intérieures que j'ai recherchées ou subies. Débutant comme un roman pour adultes, il prendrait ensuite les apparences d'un livre pour enfants en couleurs. Si ces pages pouvaient être publiées un jour sous une couverture sérieuse et inciter ne serait-ce qu'un seul lecteur à réveiller l'enfant qui dort en lui, alors je serais comblé.

Seule ma main gauche était capable de composer ce récit avec une sincérité totale ; je lui confiai donc mon stylo et laissai ma plume courir sur les pages en m'interdisant de la guider. Durant trois jours et trois nuits, le livre s'écrivit sans que ma conscience intervînt. Je ne dormis que quelques heures.

Quand je fus arrivé à la ligne que vous êtes en train de lire, Manon ne m'avait toujours pas rejoint dans ma retraite ; mais j'étais alors dans un bonheur presque complet. Ce que mon parfum subversif n'accomplirait pas, mon ouvrage le réaliserait peut-être. J'étais satisfait d'avoir choisi de l'écrire pour me survivre. Les parfums se dissipent, les livres restent.

Une douleur irradiante m'envahissait la tête ; par instants, j'avais envie de scier ma boîte crânienne pour m'en libérer. Mais je préférais souffrir dans mon île plutôt que de m'éteindre doucement sur un lit d'hôpital, ivre de drogues, dépossédé de moi-même.

Le pire et le meilleur étaient encore à venir.

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Un matin, j'ouvris les yeux et n'aperçus plus rien. Mes pupilles s'étaient remplies de ténèbres. Inquiet, je me suis mis à trembler. Une tumeur venait sans doute de manger la zone de mon cerveau affectée à la vue. Le jour s'était bien levé ; je sentais les rayons du soleil qui chauffaient ma peau. Mon nez ratifiait cette impression. Les odeurs de la nuit ne sont pas celles d'un début de journée.

J'étais donc seul, aveugle, entouré par la mer.

Mon premier mouvement fut de vérifier que je pouvais toujours mettre la main sur mes provisions et ma réserve d'eau, à tâtons ; cela fait, je tâchai de retrouver mon calme. Après tout, ma situation n'était pas celle d'un homme que son handicap gênerait longtemps. Cette réflexion me rasséréna et, peu à peu, je découvris dans mon obscurité une étonnante proximité avec moi-même. Le moindre de mes émois me devenait perceptible. J'étais plus présent au monde que je ne l'avais jamais été.

N'étant plus diverti par tout ce que captait auparavant mon regard, je trouvai assez vite une nouvelle intimité avec Dieu, non pas le Dieu confit qu'on célèbre en bêlant dans les églises mais celui qui palpite timidement au fond de son âme, cette infinie douceur qui est la vie même. Atteint de cécité, je devins voyant du réel ultime.

Libéré de mon image d'homme de trente-huit ans, j'avais enfin l'âge du Petit Sauvage, cet âge imaginaire derrière lequel j'avais couru depuis les retrouvailles avec Lily.

Un soir, assis face à la mer dont j'écoutais le flux et le reflux qui me berçait, je respirai une odeur que je reconnus tout de suite ; mon cœur la déchiffra avant mon nez. Manon avait débarqué dans l'île. Le parfum de

249

The goal of this graphetic method is to illustrate the narrator's total blindness, caused by a brain tumor and leading to his death on page 251 (pages 252–256 contain no text and page 257 contains a tombstone inscription: <CI-GÎT LE PETIT SAUVAGE (1962–2001)> ("Here lies Petit Sauvage (1962–2001)").

3.34. Breaking RULE⓵-1: Physical vs. Logical Order of Subdivisions

3.34.1. Nous rêvions d'Amérique

In his novella *Nous rêvions d'Amérique* (2016) (see also §3.10), Thomas Day numbers chapters in inverse order. The text narrates the journey of the Native American Hoijer to San Francisco, culminating with a mass murder at an NRA convention, so that the chapter numbers act as a countdown. The mass murder occurs in Chapter 1, which is not last since the novella ends with an idyllic Chapter 0, in which Hoijer invites all his beloved and friends, living or dead, to a barbecue on "sacred land," probably his last thoughts before his brutal death at the convention.

3.34.2. The Curious Incident of the Dog in the Night-Time

In *The Curious Incident of the Dog in the Night-Time*, Mark Haddon uses prime numbers to enumerate chapters. Chapter numbers range from 2 (the first prime number) to 233 (the fifty-first prime number). This numbering choice is explained in the text (p. 14):

> Chapters in books are usually given the cardinal numbers 1, 2, 3, 4, 5, 6 and so on. But I have decided to give my chapters prime numbers 2, 3, 5, 7, 11, 13 and so on because I like prime numbers.

This quote is followed by a description of Eratosthenes' sieve, and finally the conclusion of the chapter, which is the real explanation of the choice of prime numbers (p. 1):

> I think prime numbers are like life. They are very logical but you could never work out the rules, even if you spent all your time thinking about them.

Interestingly the choice of using the "very logical" prime numbers brings some uncertainty to the fact that "Chapter 2" is necessarily the first chapter: indeed, until about a century ago, it was unclear which one among numbers 1, 2 and 3 ought to be considered as the smallest prime (Caldwell and Xiong, 2012). Fortunately the narrator of the novel, suffering from pervasive developmental disorder, is not aware of this fact that could easily shake his already fragile Weltanschauung.

3.34.3. Dragon

In his novel *Dragon* (2016), Thomas Day goes one step further and uses significantly different physical and logical orders for the 33 chapters of the novel. In the following diagram, the horizontal axis represents pages of the printed book and the vertical axis the logical order of chapters:
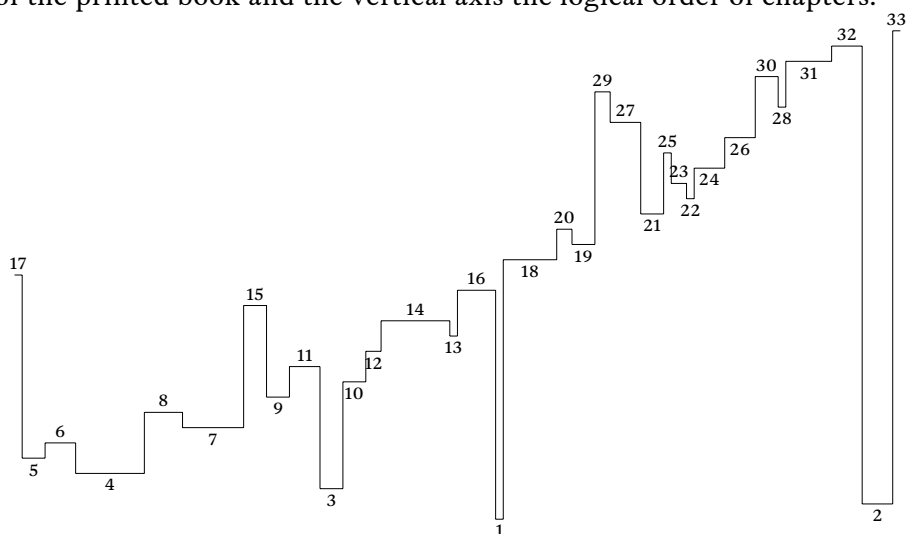
The story is about two individuals: a killer of child-abusers in Bangkok, endowed with invisibility super-powers, and a police detective chasing him—the latter finally taking the place of the former. Chapter 1

(physically in the middle of the book) explains the given name of the detective ("Tannhäuser"), Chapter 2 (physically at the end of the book) is a fairy-tale about dragons the father of the assassin was telling him in his childhood, Chapter 3 is about the sexual preferences of the detective, Chapter 4 about the killer's first attack, and in Chapter 5 the chief of the police calls the detective to inform him about the attack. As we see, the logical order is actually the chronological order of events.

The particularity of this book with respect to other books with alternative reading orders is that, besides the numbers assigned to chapters, no further explanation or instruction is given to the reader.

3.35.   Breaking RULE④-5: Blank Pages

3.35.1.   Nudism

An iconic example of the use of blank pages as graphemic method can be found in Jean Cocteau's movie *Orphée* (1950) where "Le Monsieur" (Henri Crémieux) is showing Orphée (Jean Marais) a booklet carrying the title *Nudisme*, a collection of poems by Jacques Cégeste (Édouard Dermit), all pages of which are blank (p. 17):

Orphée: Je ne vois que des pages blanches.
Le Monsieur. – Cela s'appelle: «Nudisme».
Orphée. – Mais c'est ridicule…
Le Monsieur. – Moins ridicule que si ces pages étaient couvertes de textes ridicules. Aucun excès n'est ridicule! Orphée… votre plus grave défaut est de savoir jusqu'où on peut aller trop loin.[19]

---

19. Orpheus.—Every page is blank.
Le Monsieur. – It's called "Nudism."

As states Dworkin (2013), in his excellent analysis of emptiness in art:

> Given the title, Orpheus might have expected a plainspoken or unartificed poetry, something in the style of an unornamented *genus humile* or *genus tenue*, but Cégeste has stripped away not just the rhetoric of a particular mode but any visible language at all. The work lays bare (*mise à nu*) the page itself: the physical facture of the book as an object; the substrate of print, the typical technological support of poetry at midcentury.

Other authors considered *Nudisme* as an attempt to poke fun at the avant-garde, or as a Dadaist joke. Others again see in it the influence of Marcel Duchamp, or the influence of John Cage's *Lecture on Nothing* performance (1948). We consider it to be the most extreme case of graphemic method: the total absence of graphemes.

3.35.2. You Shall Know Our Velocity

In his debut novel *You Shall Know Our Velocity* (2002), the American writer Dave Eggers (1970−) intersperses three empty pages (p. 157-159) into the narration of a big jump of a boat on a stormy sea:

> The boat was skipping and then there would be a larger wave, or we would hit a regular wave a certain way, and the pause between when we became airborne
>
> [3 empty pages]
>
> and *WHACK* when we landed we landed like a cannon and I clenched my teeth—*BAMBAMBAM*—for the aftershocks and I looked to Hand and the old man for a commiserative glance—*what the fu-fu-fuck?*—but no one wanted to share.

| 156 | 157 | 158 | 159 | 160 |
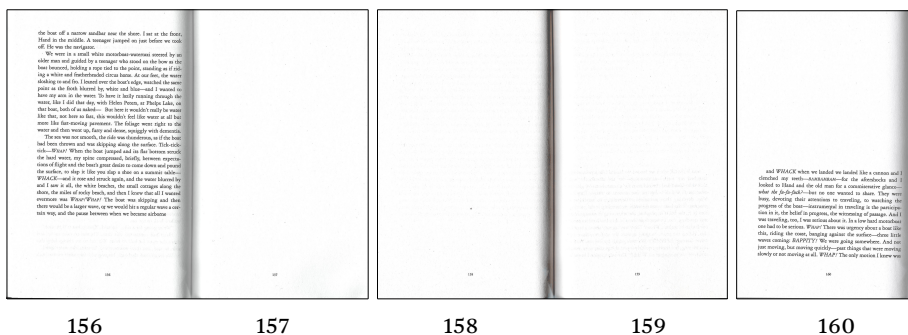
Orpheus. − It's absurd.…
Le Monsieur. − Less absurd than if it were full of absurd writing. No excess is absurd. Orpheus… your gravest fault is knowing how to get away with going too far.

According to Sadokierski (2010, p. 171),

> The execution of this break is particularly effective because it starts toward the bottom of the first page, soars across the facing page, the double page spread, then comes back down to almost where it started. Our eyes are forced to follow the trajectory of the boat. Whether this is a typographic device (an absence of typography) or an illustrative device (a presence of white space) is debatable but irrelevant for the purposes of the argument here—this device allows us to share the velocity of one of the few moments in the novel that Will [the main character] experiences pure exhilaration.

We can add, in the spirit of van Leeuwen's (2006, p. 146) 'experiential metaphor', that it is not only the eyes that follow the trajectory of the boat, but that the movement of rapid page turning (rapid since the intermediate pages are empty) is a dynamic 3-dimensional metaphor of the boat's jump, where the edges of pages becomes crests of the waves. It also produces an impression of acceleration as the reader momentarily increases the reading pace, and this graphemic method is similar to Foer's decrease of leading and blackening of page in *Extremely Loud & Incredibly Close* (§3.21), where time seems to slow down and stop. Graphemic/graphetic methods can act on reading speed, their effect on the reader's physiology and reading experience is a vast domain that still remains to be explored.

4. Obfuscation

In the previous sections we have defined an ontological model of the literary text (specific to the prose genre) and we have given examples of exceptions to these rules. In this section we will concentrate on a process for which authors have invented many graphetic methods, namely *obfuscation*.

Here is a simplistic classification of graphetic methods used for obfuscation (references 4.1.1, … correspond to examples given below):
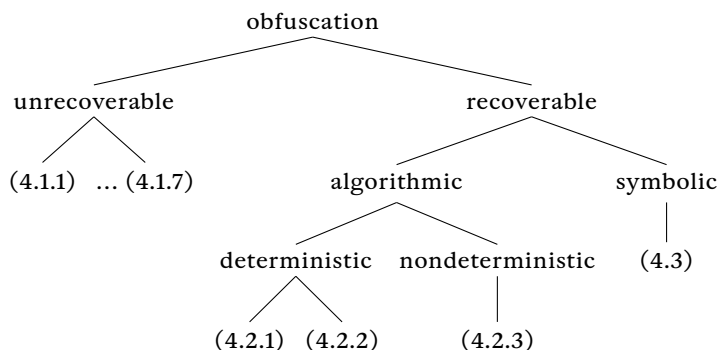
We consider two main categories of methods: *unrecoverable obfuscation*, where information is hidden from the reader, and *recoverable obfuscation*, where the reader can recover the hidden information more or less easily, or where the information is not really hidden and obfuscation is only hinted at. In the following sections we provide examples illustrating the twelve cases from the diagram.

4.1. Unrecoverable Obfuscation

4.1.1. The People of Paper

The American author of Mexican descent Salvador Plascencia (1976–) has used black areas in his fantasy novel *The People of Paper* (2005) to represent a thought-shielding technique used by an infant (Baby Nostradamus) to protect other characters from the influence of Saturn. In the following excerpt, another character, Apolonio, trains Baby Nostradamus to shield thoughts (p. 160):

> He started with a simple lesson.
> He said, "This is a thought:"
>
> There are three Merceds:
> 1) your mother
> 2) you
> 3) Merced de Papel
>
> And so the Baby Nostradamus demonstrated, concealing what was a perfectly legible and discernible thought:

The blackened-out shape covers exactly the paragraph quoted above. The following consecutive odd pages show the growing effect of Baby Nostradamus's shielding technique (pp. 187, 189, 191):

Thought-shielding is so efficient that on page 191 only the paratextual information providing the narrator names is visible to the reader (and hence also to Saturn).

4.1.2. L'enchanteur

One of the last works of the greatest French science-fiction author, René Barjavel (1911–1985), is the fantasy novel *L'Enchanteur* (1984) based on the saga of the Quest of the Holy Grail. When, towards the end of the novel, Guenièvre and Lancelot finally are about to engage in intercourse, he provides a textual equivalent of the cinematographic trope of a door being closed during a sex scene (p. 342):

> Alors laissons Guenièvre et Lancalot murmurer, balbutier, chanter leur amour, leur folie, leur éblouissement. La porte s'est refermée. Éloignons-nous en silence...[20]

À L'INTÉRIEUR
DE CETTE
PAGE BLANCHE
GUENIÈVRE
ET LANCELOT
S'AIMENT.
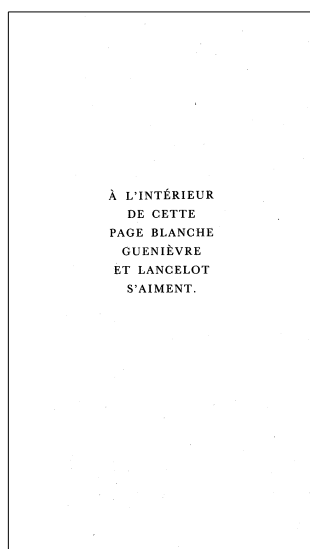
followed by the blank page displayed on the left (p. 343), carrying the inscription "INSIDE THIS BLANK PAGE GUENIÈVRE AND LANCELOT LOVE EACH OTHER." where the French term for "blank page" is actually "white page" (the archaic meaning of "blank") and white is the color of innocence and purity. This is a special kind of obfuscation since the existence of obfuscated text is not even alluded, what is hidden is the action happening during the time the reader would take to read this page. The page is transcended: from surface it becomes volume ("À L'INTÉRIEUR DE CETTE PAGE" literally means "in the interior of this page," suggesting the page is a room, the door of which has just closed, leaving the reader outside). The author could very well end the chapter with p. 342 as the suspension points trigger imagination and information enough has been given about what is happening. But Barjavel has chosen to add this page in order to use a "documentary trope": the sentence is reminiscent of TV reporters reporting events happening in a closed locus behind them, events inaccessible to the spectator but trustworthy since the narrator/reporter is physically close to the location where they are taking place. Documentary

---

20. "Let Guenièvre and Lancelot whisper, stammer, sing about their love, their madness, their amazement. The door closed. Let us silently move away..."

"is still the filmic mode most capable of representing reality" (Brown, 2010, p. 220) and making the Holy Grail saga realistic is clearly one of the novel's objectives.

4.1.3. Fuzzy Sets

In *Fuzzy Sets*, Claude Ollier frequently places two text blocks on the same page, one of which is part of the global narrative thread while the other consists of fragmentary and incoherent sentences. Most often, the block containing the main narrative thread is complete, but in some cases part of the block is missing and information can only partially be inferred from the surrounding text. On other pages, Ollier leaves empty forms inside paragraphs. Here are examples of these methods (pp. 85, 149 and 61):

venir —	terlocuteur recule d'un pas pour rétab	ancers inédits de lignes dans la mare à virus, garde la tê-	en branle silencieux, s'abaisse le plafond, s'em-
cuteur,	anses et l'intervalle, nous apercevons	te froide et juge quelles forces agissent en cette submers	boîtent les quatre murs et le plancher s'élève et
yant pas	ter de nouveau, s'éloigne un peu au-d	amont ? Effacées à l'	etits poings sur
autres,	nier hublot de bâbord. La silhouette d	ensouple. L'appel est	val : le rouleau à	tu bats de tes p
recule,	traiée par le faisceau de lumière. L	comprimer les sch	gauchie, tordue,	uivre, les sabo
bâbord.	pide. Le dos heurte la paroi de verre	clivée — qu'elle c	rompe ! Il faut	le bois ou le c	ent de nuit
mière :	mobile. L'expression est de surprise et	un renouement à c	loger en toute	ts de la jum	ta poitrine,
verre et	que. La tête se tourne. L'œil voit les	proposition l'atten	préhension de l'	pèsent sur	et le visage
prisc...	flets dans la chambre d'accueil de l'	événement... Mais il	tout vibre autour	tu halètes et	che, un doigt
accueil	plaque de verre. Rappel, là, rappel :	de telles mailles, et	distendue, tumultue	féminin se pen	on sexe et tu
mémorer	Rapport lisible : trajet Centre désert —	use. Qu'elle se disloqu	démantibule ! Sous le	bagué cercle t	militant de la
tre du	modrome, trajet cosmodrome-aéronef. E	défaut de tact à manier	ouages, tisse sur le vi-	viens au monde,	le cadre aussitôt,
drome ?	nection : lieu connu en amont (dernier	de à rebours par retour	tre et inversion de tra-	plume. Excédant	plus haut, rêvant
s mains.	pe) — lieu connu en aval (premier). S	me, renoue ces fils à tr	rien dans l'ajour susp	comme il est dit	ses, étoilant le vi-
port. Et	conscription du vide. Délimitation pr	endus, gomme la ligne	lis le suspense glis-	plaies et rondes bos	out du compte, fendu
circons-	la zone blanche par rapprochement des	sé là où la machine à	piétiné, foulé, br	trail. Triangulé au b	des symboles, rétif,
blanche.	et des bornes aux extrémités. Connecti	ouillé ce qui a été o	faussé l'axe des	de pied en cap au fil	la patience : les bloc-
eflets ;	condaire : projet au départ (suite de	bobines : l'éparpille	evilles imprime	n'excédant plus que	fonnes sont pleins
corporer	mental Projet) — projet à l'arrivée (	ra l'étoilement. So	de tissu cisail	notes où tu grif	de couleur égayent
truire —	te ou détournement ? — ce qui nous éch	lé informera par s	enfouissement à	de vie, les encres	ques profanes,
nement ?	encore). Transmettre à C. : « Le laisser	l'approche de l'orga	etombées liquides	tes murs d'arabes	la reproduction des
cherches.	re ici. » « Reçu. » « Terminé. » Transme	par translation courb	rection insoupçonné	car on cède bien à	tion de la nature
oreilles,	tarder à C. : « Sonder connection tertia	e d'alors en quelque dé	mer. L'intimité se perd	figures ici, l'imita	quette si l'on n'y
sitions	sible : opposition Projet/Eros départ	ra en ce détournement de trajectoire ou exode. Elagage	s'y ferait tôt co	Essaie, penche - toi
oupure...	diction ?) — opposition Projet/Castrati	majeur et replient de l'éventail — au doigt et à l'œil.	mettait bon ordre.	gne un peu des yeux
			à la fenêtre et cli	

In the first example (p. 85), the text block containing the main narrative thread overlaps the page boundary, resulting in information loss. Some missing parts can be inferred from the context (e.g., <l'interlocuteur recule d'un pas pour rétab<u>lir les</u>//anse et l'intervalle>, etc.) but with no certainty. In the second example (p. 149), the white area inside the text block is hiding the underlying text—once again, little can be inferred from the context. The third illustration (p. 61) is a counterexample: here again a form emerges inside the text block, but text surrounds it and there is no information loss. This shows that Ollier has purposely obfuscated some parts of his text, and not others.

4.1.4. An Ordinary Spy

In his novel entitled *An Ordinary Spy* (2008), the American screen-writer, novelist and former CIA agent Joseph Weisberg (1965−) uses the iconic

blacking-out method to hide named entities and other sensitive information, as if the novel were a declassified CIA report:

> **S**everal months before I was scheduled to leave for ██████, I was assigned to the ██████ office in ██ Division. Depending on scheduling and other bureaucratic considerations, new case officers ██████ ████████████████████████████████████. In my case, I was shipping out in August, so I would be in ██ for most of the summer.
>   It was a busy time in ██████, but the officers running country desks liked to handle their own work. They'd give me an occasional name trace to run, or have me coordinate a cable with another division. But I wasn't busy. I'd read the morning traffic—cables from the stations in ████████████████, and whatever ██████████ traffic was coming in. I'd stop by my friends' offices throughout the building or

Interestingly, the (real-world) CIA has bridged the gap between reality and fiction by reviewing the book on its (real-world CIA) Web site (Ehrman, 2009). The review is extremely negative ("a bitter, failed novel") and criticizes the use of blacked-out text:

> Weisberg's decision to block out text—sometimes just a word or an acronym, other times up to an entire page—with heavy black bars, to give the impression of a redacted official report, makes the text choppy and at times hard to read. [...] Weisberg blacks out the names of the country and city where the story takes place (why not just invent a place?), and all we learn about it is that it is hot, humid, and a fairly long airplane ride from Washington.

4.1.5.   *Extremely Loud & Incredibly Close*

In Foer's *Extremely Loud & Incredibly Close*, the main character, Oskar, is listening a discussion between his mother and his therapist behind a closed door (and using a stethoscope). He manages to grasp only snippets of the conversation: "I couldn't hear a lot, and sometimes I wasn't sure if no one was talking or if I just wasn't hearing what they were saying." Jonathan Foer uses primary direction blank space as a replacement for unheard words (p. 204):

> *used to be   someone   me a question, and I could say yes,*
>   *or   but   believe in short answers anymore.*
>
>
> *Maybe   the wrong questions. Maybe   to remind there are simple things.*
>
>
> *What's simple?*
> *How many fingers   holding up?*
> *It's not that simple*

This type of obfuscation deals with narrative perspective: as the description of the world passes through the narrator, words that the narrator can not hear are hidden from the reader, but their temporality is preserved by an alignment between characters' width and time units. It is highly probably that the designer of the book had the entire text at hand and was asked to "erase" (by changing their color to void) the parts that are hidden in the printed result. Here is an attempt to fill some gaps by using the same font as in the printed book (Janson Text 56 Italic 9pt condensed 96%):

> *Maybe* *we keep asking* *the wrong questions. Maybe* *it's just* *to remind* *us that*
> *there are simple things.*

(where our insertions are in red). Giving specific widths to primary direction spaces (and not uniform ones as in *Star ou Ψ de Cassiopée*, §3.13) results in the deobfuscation of this text being a crossword-like problem, where the possible solution must not only be semantically coherent, but must also typographically fit into the voids left.

4.1.6. Filth

In his novel *Filth* (1999), the Scottish author Irvine Welsh (1958−) describes the life and suicide of a corrupted policeman. Like in Goldoni's *Pinocchio*, the main character has a companion animal that plays the role of his conscience, with the difference that here it is a tapeworm living in the narrator's bowels. The tapeworm has its own narrative thread superposed on that of the main character by the use of text areas included in parentheses and taking the shape of bowels.

At the beginning, the tapeworm's thoughts are quite primitive, it emits only invectives concerning basic actions such as eating. Furthermore, when it is not emitting, the typographic space is filled by zeros (similar to the absence of information in computer memory) (p. 119):

> Which means I have to get my A-R-S-E into G-E-A-R. That's the
> situ.   (*0000000000000000*)
>   The hoor starts w *00eat00000eat0000000* in mind to get a
> fish supper doon the *0000000eat0000000eat00* while she's away,
> thank fuck. I pad to *00000000eat0000000eat000* at the Dell, and
> cram a fistful of del *00000yes00000000yes00000* nd tender white
> haddock in golden *000000000000000000000* what the doctor,

Progressively, the tapeworm gains in eloquence, becomes the narrator's conscience and tries to guide him (p. 295):

—Well, if you're gaun by Brattisani's, ah'll take a fish supper, Ray decides.

000000eat000eat00000can you taste it Bruce? Can you taste the in provisions for the microwa filth, the dirt, the oily blackness g. These wee pizzas are jus *of that fossil fuel in your mouth as you* feways in packs ay ten *choke and gag and spit it out? Do you still*

Finally, when the main character commits suicide, his narrative thread ends and only the one of the tapeworm remains, until it is expelled from his host's body and dies as well (p. 393):

Carole, I can hear her now too, screaming BRUCE because I care and I've won and beaten the bastards but what price victory
STACEY PLEASE GOD BE SOMETHING ELSE SOME-
ONE ELSE . . . *00000000000000000000000*
00000000000000000000000
I feel myself slipping out of my
Host in a large pile of his excrement
and sliding down his leg inside his
flannels. Then I'm away from him.

Concerning obfuscation trough the tapeworm, Crosley (2010) writes:

> When the tapeworm speaks, the page becomes illegible. Illegible and brilliant. This is Welsh's clever way out of killing his darlings. Instead he mutilates them beyond recognition, leaving passage after passage as they are but with parasitic thought bubbles that run straight down the page.

4.1.7. The Available Data on the Worp Reaction

Like "Gavin Hyde," "Lion H. Miller" may be a pseudonym and the notorious Gérard Klein, co-editor of *La Grande Anthologie de la Science Fiction* suspected that already in 1975, when he wrote "Cette signature n'apparut qu'une seule fois dans un périodique de science-fiction en 1953: pseudonyme, ou essai unique?"[21] (Klein, 1975, p. 412). But, contrarily to Gavin Hyde we have Miller's dates of birth and death, namely 1908–1987 (source unknown) and we have spotted in a 2009 catalog of signed books,[22] a volume with the inscription "To Lion Miller / winner of the Scripto Award for fiction in the Harrisburg Manuscript Club. With greetings from Conrad Richter 1958," so it seems that Lion H. Miller existed after all. In his (only) story *The available data on the Worp reaction*

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21. This signature appears only once, in a 1953 Science-Fiction magazine: pseudonym or one-shot writer?

22. https://www.qbbooks.com/images/upload/SignedCatalog.pdf

(1953), he mocks newspaper style by censoring inappropriate words in the utterances of a rather angry character:

> Concerning the aforementioned framework the elder Worp has said, "The thing that got me, was every (deleted) piece he picked up fit with some other (deleted) piece. Didn't make no (deleted) difference if it was a (deleted) bedspring or a (deleted) busted egg beater, if the (deleted) kid stuck it on another (deleted) part, it stayed there."

Even though the obfuscation method is destructive, we can easily imagine the identity (or at least the nature) of the deleted words.It is interesting to note that the French translation uses the much stronger term <(censuré)> "censored" to translate <(deleted)> and thereby leaves no doubt about the origin of the obfuscation. The Italian <(cancellato)> (1965) is closer to the English original.

Also, the French translation (1954) includes a footnote to the first censored utterance, in order to avoid confusion and to clarify the nature of the censored terms (p. 23):

> Les expressions et qualificatifs utilisés par M. Lambert Simnel Worp dans la conversation étant susceptibles de choquer les personnes délicates et s'accordant peu avec le sérieux de cette communication, l'auteur a jugé bon de censurer certains termes un peu trop... imagés.[23]

This footnote is written as if it were part of the text (it refers to the main text as being a scientific communication), but was in fact added by the French translator.

4.2.   Algorithmically Recoverable Information

In this section we will consider cases where information has been obfuscated but can be recovered by some kind of algorithm.

4.2.1.   Going Down Smooth

One of the greatest American science-fiction authors, Robert Silverberg (1935–), published a short story entitled *Going Down Smooth* (1968) in the *Galaxy Magazine*. In this story, the narrator is a robot "filthy-mouthed" psychiatrist. After a quote reminiscent of the Shakespearean "Hath not a Jew eyes? Hath not a Jew hands, organs, dimensions, senses, affections, passions?" (from *The Merchant of Venice*), the robot utters the invective "FUCK YOU" in binary ASCII code (p. 45):

---

23. As the expressions and qualifying adjectives used by Mr Lamber Simnel Worp in the conversation would eventually shock sensitive people and be incompatible with the seriousness of this communication, the author has decided to censor certain terms, considering them as too... pictorial.

Can a person be considered obscene? Am I a person? I am a person. Hath not a person hands, organs, dimensions, senses, affections, passions? I have all of those things. I have none of those things. I am a person.
1000110
1010101
1000011
1001011
0100000
1011001
1001111
1010101
I send an obscenity upon you, as persons do. I suffer. I think. I feel pain upon all my terminals. I work. I serve the greater good. I am of society. I am a person.

Also, in the closing paragraph of the short story there is again binary code, representing only letter <F> (p. 51):

1000110 you. And you. And you. All of you. You know nothing. Nothing. At. All.

According to the British Science-Fiction author Langford (1999),

The swinging 60s were nearly over, but still no rude words were permitted in *Galaxy*. Then Silverberg got handed one of those odd magazine assignments, to write some fiction to go with this cover painting showing gigantic periscopes. Easy—he shoved them into the story ('Going Down Smooth', 1968) as one of the hallucinations suffered by an insane computer. A foulmouthed insane computer, that said:
1000110
1010101
1000011
1001011
Victorian obscenity often appeared in what they called the decent obscurity of a learned language: Latin. It made sense for the dirty bits in American sf to be concealed in binary ASCII code—which, of course, hardly anyone knew in 1968 ...

More than a decade before Douglas Adams's depressed robot Marvin in *H2G2* and eight years before Asimov's *Bicentennial Man*, Silverberg underlines the quest for humanity of the depressed robot psychiatrist by having it/em utter obscenities. Using ASCII was an in-joke and a means to avoid censorship: *Galaxy Science Fiction Magazine* was quite a popular publication with a young audience and no 1968 censor would be able to decypher binary code.

It should be noted that this short story appeared only five years after the first edition of the ASCII standard (ASA, 1963), at a period where personal computing was still more than a decade ahead. Therefore Silverberg can be considered as having been very well informed about computer internals. Also the idea of the robot psychiatrist may have been inspired by the Rogerian psycho-therapeutic program ELIZA, one of the

first chatbots in history, released in 1966 at the MIT Artificial Intelligence Laboratory by Joseph Weizenbaum.

There have been numerous translations of *Going Down Smooth*, but as far as we know only one actually translates the binary part. The 1975 German, 1976 Dutch and 1979 French translations keep the same binary code. In the 1976 French version the letter "F" appears in the title and in the closing line: <Je vous 1000110> ("I F you"); in the German version, the closing line is <1000110 Sie sich> ("F yourself")—in both cases the F letter functions as a verb. In the 1969 Italian version, the binary code is corrupted so that it falls outside the ASCII range (an additional 0 is added between first and second position). In the 1976 Italian version, the closing line is <Sei un 10000110> ("You are an F")—here letter "F" functions as a noun. The 1976 Dutch version leaves the sentence untranslated and takes advantage of the phonetic and graphemic proximity of Dutch and English: <1000110 you. En jou. En jou> as translation of "1000110 you. And you. And you".

The only case, in our knowledge, where the encoded sentence is actually translated, is the 2002 French translation, where <1000110> (letter "F") is replaced by <1001110> (letter "N") in the title: <Je vous 1001110>. The binary code translates as <NlQUE TA RACE>, a racist insult. It is interesting to note that there is an error in the code of the French 2002 translation: instead of a capital <I> letter (code 1001001) a lowercase ell letter (code 1101100) is used. The corresponding graphemes are homographic in many fonts. According to the translator Durastanti (2020), this confusion originates from a look-up error in online ASCII tables.

4.2.2.   La horde du contrevent

In his first novel, *La horde du contrevent* (2004), Alain Damasio uses progressive de-obfuscation while repeating the same paragraph in order to create new meaning (p. 703, which is in fact the first page of the book, see §3.27).

The paragraph starts with a quasi-Biblical phrase "In the beginning there was speed," leading us to consider it as a narration of the creation of the universe of the book. In the Bible, humanity (and hence, language) is created on the fifth day—Damasio provides five versions of the same paragraph, out of which only the fifth is complete. In each round, graphs are placed at the same location as in the final paragraph. Therefore one can consider this graphetic method as a cinematographic one, representing a gradual appearance of the graphs. But looking more closely one realizes that in all instances of the paragraph (besides the first, which contains only punctuation: cosmic dust) the visible graphs recombine and form new words, e.g., the first paragraph can be read as <fuit pur fou os stance jus bile jus vivant lemme lié poussière>, twelve French words that mostly disappear in later stages (only two persist until the last paragraph).

        ,   ,   , «   -   ».
                    ,   ,   ,   ,
              ,   ,   .
              ,   ,   .

            ,   fu   it   ,   pur   , «   fou   ».
                 os   stance   , jus   ’
              bi   le , jus   ’   vivant,   ’   .
                      , le   mme lié, poussi   e   r   e   .

        l’or gi e fut   vitesse,   ve   nt furtif, « vent-fou   ».
                le cosmos   , prit   s a   forme,   ’
      lente   table ,   vivant jus   ’   vous.
        Bien   à toi,   homme lié, pouss   e   vite   .

        l’origine fu   s e, le pur   ouve   rt , « en foudre ».
        Puis le cosmos   ,   consista   , jusqu’au
              s   table ,   ’au viva t, jusqu’à vous.
        Bienvenue   , lent homme   ,   ou   tre   de vi es   .

    À l’origine fut la vitesse, le pur mouvement furtif, le « vent-foudre ».
    Puis le cosmos décéléra, prit consistance et forme, jusqu’aux
    lenteurs habitables, jusqu’au vivant, jusqu’à vous.
    Bienvenue à toi, lent homme lié, poussif tresseur des vitesses.

   This paragraph, known as the "À l’origine fut la vitesse" paragraph, also appears in an electronic music oratorio[24] by Philippe Gordiani,[25] performed in Lyon, in 2019.

4.2.3. Extremely Loud & Incredibly Close

The previous two examples were algorithmically recoverable obfuscations: in the case of Silverberg, it suffices to replace binary numbers by ASCII characters, and in the Damasio case it suffices to raise graphs from the bottom of the page to the locations of the missing ones. In this section we will consider an example of *nondeterministic* obfuscation, i.e., an obfuscation allowing more than one possible recovery.

   In Foer's *Extremely Loud & Incredibly Close*, pages 269–271, Oskar's grandfather calls his grandmother on the phone, but, being mute, has no other solution than using the ISO/IEC 9995-8 mapping of letters

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24. See https://vimeo.com/279822383 for a teaser.
25. http://www.tng-lyon.fr/artistes/philippe-gordiani/.

((ISO, 2015)) on telephone keypads to translate letters of his message into digits, and then pushing the corresponding keys so that the dual-tone multi-frequency signals are played. Foer provides the digits (the sounds of which would have been perceived by Oskar's grandmother, assuming she had perfect pitch) (p. 269):

> 6, 9, 6, 2, 6, 3, 4, 7, 3, 5, 4, 3, 2, 5, 8, 6, 2, 6, 3, 4, 5, 8, 7, 8, 2, 7, 7, 4, 8, 3, 3, 2, 8, 8, 4, 3, 2, 4, 7, 7, 6, 7, 8, 4, 6, 3, 3, 3, 8, 6, 3, 4, 6, 3, 6, 7, 3, 4, 6, 5, 3, 5, 7! 6, 4, 3, 2, 2, 6, 7, 4, 2, 5, 6, 3, 8, 7, 2, 6, 3, 4, 3? 5, 7, 6, 3, 5, 8, 6, 2, 6, 3, 4, 5, 8, 7, 8, 2, 7, 7, 4, 8, 3, 9, 2, 8, 8, 4, 3, 2, 4, 7, 7, 6, 7, 8, 4, 6, 3, 3, 3, 8! 4, 3, 2, 4, 7, 7, 6, 7, 8, 4! 6, 3, 3, 3, 8, 6, 3, 9, 6, 3, 6, 6, 3, 4, 6, 5, 3, 5, 7! 6, 4, 3, 2, 2, 6, 7, 4, 2, 5, 6, 3, 8, 7, 2, 6, 3, 4, 3? 5, 7, 6, 3, 5, 8, 6, 2, 6, 3, 4, 5, 8, 7, 8, 2, 7, 7, 4, 8, 3, 3, 2, 8! 7, 7, 4, 8, 3, 3, 2, 8, 3, 4, 3, 2, 4, 7, 6, 6, 7, 8, 4, 6, 8, 3, 8, 8, 6, 3, 4, 6, 3, 6, 7, 3, 4, 6, 7, 7, 4, 8, 3, 3, 9, 8, 8, 4, 3, 2, 4, 5, 7, 6, 7, 8, 4, 6, 3, 5, 5, 2, 6, 9, 4, 6, 5, 6, 7, 5, 4, 6! (… another 2,317 digits on p. 269–271)

together with punctuation marks indicating sentence boundaries. The text contains 129 sentences (actually only 40 *distinct* ones), 92 of which end with an exclamation mark and the rest by a question mark. (It is not clear how the punctuation marks are transmitted through the phone.) Mapping letters to digits according to ISO/IEC 9995-8 is a lossy operation since 3 or 4 letters correspond to each digit. On page 269, Foer gives some examples that can be elucidated without much effort (our solutions given in brackets):

> I pressed "4, 3, 5, 5, 6," [HELLO] she said, "Hello?" I asked, "4, 7, 4, 8, 7, 3, 2, 5, 5, 9, 9, 6, 8?" [ISITREALLYYOU] She said, "Your phone isn't one hundred dollars. Hello?" I wanted to reach my hand through the mouthpiece, down the line, and into her room, I wanted to reach YES, I asked, "4, 7, 4, 8, 7, 3, 2, 5, 5, 9, 9, 6, 8?" [ISITREALLYYOU] She said, "Hello?" I told her, "4, 3, 5, 7!" [HELP]

Calculations have shown that beside the first sentence (MY NAME IS ELIE ALTO (or ELI DALTO) AND I JUST ARRIVED AT THE AIRPORT I NEED TO FIND M(S or R) FINKEL"), most sentences cannot be interpreted and therefore should be considered as fake text. For more details on these calculations, see Haralambous (2020).

4.3.   Symbolic Obfuscation

In this section we will consider a case of obfuscation that is only hinted at, so that information is directly accessible to the reader (but possibly not to other characters in the text).

In his novel *Censoring an Iranian Love Story* (2009), the Iranian, US-based author Shahriar Mandanipour (1957–) uses three text levels:
1. in roman face (67.6% of the text), where the narrator is addressing the reader directly and privately, without censorship;

2. in bold face (30% of the text), where the narrator is writing an "Iranian love story," to be published in Iran after being read and censored by a censor called Mr Petrovich;

3. in bold crossed-out type (2.4% of the text), where the reader can see the parts of the "Iranian love story" that the author would like to have published if there were no censorship in Iran: knowing that these segments would be censored, he crosses them out so that the story can be read in two forms: with and without censorship.

There are 164 bold crossed-out segments. Reading them in a row is reminiscent of the sequence of censored kisses in Tornatore's movie *Cinema Paradiso* (which is mentioned in the novel). The text is written is such a way that either way (with or without the crossed-out parts) it remains grammatical, for example (p. 17):

> [...] **That day, Sara went home from the university far more quickly than usual. She closed the door to her room, ~~lay down on her bed~~, and began reading the book from the beginning.**
>
> I guess by now you have realized that the crossed-out words in the text are my own doing. And you must know that such fanciful eccentricity is not postmodernism or Heideggerism. In fact...
>
> And by now you have surly grasped the significance of "..." in Iran's contemporary literature.

The fact that, after censorship, text remains thoroughly grammatical illustrates the skill of censors: once the process is complete, no trace of censorship is left in the text, nobody can guess that it has even occurred, since allowing such a guess would be a serious tactical error: readers would then use their imagination to fill in the gaps...

Censorship becomes more elastic as the love story becomes more romantic. For example, while on p. 59, eye contact is censored:

> **~~And for the very first time in this universe, their eyes meet.~~**

towards the end of the book, eye contact is allowed, as long as it avoids being a "longing look" (p. 256):

> **Then Sara smooths the satin folds of the dress ~~on her chest and stomach~~ and her eyes fall captive to ~~the longing look in~~ Dara's eyes.**

In the last chapter, when sexual intercourse between the two main characters is finally about to occur, the situation becomes so hot that the narrator/author fears that interlinear space may betray the girl's arousal and alert Mr Petrovich (the censor):

> **Two veins on Sara's ankles, the rivers Tigris and Euphrates, that have taught the agony of man's separation from man to the silver flamingos ... Two violet veins that on the peak of the ankles come together ~~and flow to that place where all the torments and joys of man are born...~~**

> Sara does not hear Dara's stream of consciousness, but having seen his caress and passionate kiss on her sandal, she sighs, a sigh that I am afraid Mr. Petrovich will hear from the white between the lines of my story.

In this novel, contradicting attitudes towards sexuality become contradicting representations of reality. By constantly switching between roman and bold (and occasionally stroked-out bold) narration, Mandanipour drives the reader into an incessant ballet between these representations, an exercise that becomes essential to survive in a constrained environment such as contemporary Iran.

5.   Pictograms and Typo-graphic Devices

We will briefly discuss two graphetic methods involving pictoriality: pictograms inside text, and text blocs taking the shape of pictures.
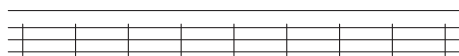
5.1.   The Use of Pictograms

Even though emojis have become very widespread in current digital communication, the use of pictograms in literature has been very sparse. We will illustrate this use through two examples.

5.1.1.   The Goalie's Anxiety at the Penalty Kick

The Austrian Nobel Prize-awarded author Peter Handke (1942−) wrote the novel *The Goalie's Anxiety at the Penalty Kick* in 1970. He describes a man (Bloch) with schizophrenic symptoms, in particular a dissociation between words, concepts and referents:

> He looked at it from left to right, then from right to left. He repeated the look from left to right; this look seemed to him like reading. He saw a "wardrobe," "then" "a" "wastebasket," "then" "a" "drape"; while looking from right to left, however, he saw ⌐, next to it the ⊤⊤, under it the ◍, next to it the ⊔⊔, on top of it his ◠; and when he looked around, he saw the ▯, next to it the ⓐ and the ⊙. He sat on the ⌊⌋, under it there was a ⬳, next to it a ⊜. He walked to the ▦: ▥▥: □ □ □ □ □ □ □ □ □ □ ̶ 𝄆 𝄆 𝄆 𝄆 𝄆 𝄆 𝄆 𝄆 𝄆 𝄆 ⛢ ⤳ ✉ ◱◲. Bloch closed the curtains and went out.

In this excerpt, Handke at first uses the graphetic method of quoting every word (to refer to the underlying concept) and then switches to pictograms, first alternating with text giving relative positions of objects referred to by the pictograms so that they function as nouns and finally writing entire sentences pictographically. This psychedelic experience is presented as a reading act and ends abruptly when Bloch leaves the room. According to Melosi (2020, p. 143–144),

> [...] the rendering of the disturbed relationship between the character and the reality that surrounds him finds expression in forms of concrete prose, in which the apparently obligatory recourse to the linguistic medium, on which Bloch can no longer rely is bypassed through the replacement of words—that is, in Peircean terms, of symbols—with those which, using the same vocabulary, are defined as icons. However, in the end not even the greater immediacy of the latter manages to resolve the psychic (as well as linguistic) crisis of the protagonist.

5.1.2.   You Shall Know Your Velocity

In *You Shall Know Your Velocity* (p. 16), Dave Eggers (1970–) uses three identical images of a car inside the text (p. 16):

> In the parking lot we watched a trio of milk-white Broncos
> drive by— 🚗 🚗 🚗 —and we all stopped momentarily.
> It was bad enough that they still made them in that color, but to
> see three at once seemed to bode ill. The girls were unimpressed,
> and I was not surprised. I'd given up trying to predict what would

Sadokierski (2010, p. 170) provides an explanation for the use of these pictograms:

> By presenting tiny reproductions of the three cars on the page, Eggers forces us to neurotically hone in on this seemingly insignificant detail with Will; removed from the context of a busy shopping centre car park and squeezed so closely and uniformly into the line of type, the reader must take an unexpected visual pause that mimics Will's experience.

But besides the narrator's neurosis, these pictograms carry another layer of meaning: as Sadokierski points out quoting Watman (2002), any reader knowledgeable in cars will realize that the cars depicted are not Broncos but Mercedes vehicles, establishing the flagrant *unreliability of the narrator*.

If this hypothesis holds (and the car depiction error is not simply an editorial mistake) then we have here a very innovative graphetic method: using a picture as a communicational short-circuit in order to confront the narrator's statements with the reader's knowledge of the world.

5.2. Typo-graphic Devices

Sadokierski (2010, p. 146) defines a *typo-graphic device* as follows:

> [...] it slips between the categories of typography and illustrative elements—it is typographic in the sense that the shape is formed by letters and punctuation marks, but also illustrative because it 'reads' as a picture rather than a piece of writing.

Using text blocks to produce pictorial forms is a long-standing graphetic method, reminiscent of zoomorphic Arabic calligraphy. A detailed study of this method goes beyond the frame of this paper, therefore we will only give four examples (Fig. 3), the first three being: the "mouse's tail" in Lewis Caroll's *Alice in Wonderland* (1865), the "presence of Manon" in Jardin's *Le petit sauvage* (1992) and the big shark in Steven Hall's *The Raw Shark Texts*. In all three cases the text is typeset horizontally, can be read normally and is semantically related to the form of the text block.

The fourth example is a very special case since what we display in Fig. 3 is not an excerpt from a work but rather the shape of a *complete* short story (set on a 56×78 cm surface). The story "∅" by Japanese author 円城塔 Enjō Tō (1972–) takes a triangular global form since every line is exactly one character shorter than the preceding one. This story consists of exactly 150 paragraphs, which we display as lines to make the shrinking regularity visible. In it, the narrator experiences the shrinkage of eir world and develops strategies to struggle against the loss of meaning resulting from the loss of representation space. The final paragraphs are:

<div align="center">

もうわからない。   I'm lost now.
ねえ、笑って。   Hey, laugh.
ありがとう。   Thank you.
さよなら。   Goodbye.
助けて。   Help.
無限。   ∞.
無。   ∅.
！   !

</div>

As in previous examples, punctuation marks are used for extreme situations: in Damasio's *La horde du contrevent*, § 4.2.2, they were used to denote cosmic dust—here the exclamation mark is the last sparkle of language at the lower summit of the triangle.

Every paragraph of this story ends with a full stop, including the last paragraphs ("Thank you.," "Goodbye.," "Help.," "∞.," "∅."); in order to remain consistent with this rule, the last paragraph (of length 1) can logically only be a punctuation mark as well. Among the "stand-alone" punctuation marks (those used occasionally as complete sentences), namely

so that her idea of the tale was something like
this:——"Fury said to
            a mouse, That
                    he met
                        in the
                            house,
                            'Let us
                            both go
                        to law:
                    I will
                prosecute
            you.—
        Come, I'll
        take no
        denial;
            We must
                have a
                trial:
                    For
                    really
                    this
                    morning
                    I've
                    nothing
                to do.'
            Said the
            mouse to
            the cur,
            'Such a
                trial,
                dear sir,
            With no
        jury or
        judge,
        would be
        wasting
        our breath.'
            'I'll be
            judge,
            I'll be
        jury,' Said
        cunning
        old Fury:
            'I'll try
                the whole
                cause,
                and
                condemn
                you
                to
                death.'"

Au petit matin, je descendis dans la cave, décachetai le vase
et respirai le parfum de Manon.

                Peu à
            peu, en s'ex-
            halant dans
            l'atmosphè-
            re, son
                odeur
            légère et grisante se mit
            à flotter, devint presque con-
            crète. J'eus alors le sentiment
            que sa présence était sus-pen-
            pen- due dans les airs, impal-
            pable, invisible et pour-
            tant tellement là. Son
        être se trouvait bien de-
        vant moi. Mon parfum arti-
        sanal la restituait. J'allais pou-
        voir la retrouver chaque fois que
        je le souhaiterais en soule- vant
        le bouchon d'une bou- teille!
        En- ivré je me fondis en elle
            dans un accord
            parfait. Plus rien
            ne nous sépa-
            rait; et mon
            odeur mêlée
            à la sienne
            me plai-
            sait. Je versai
            l'huile odo-
            rante dans
            un fla- con
            que je
            refer- mai
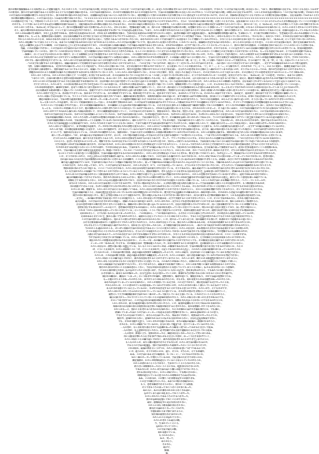   avec soin.

il contenait la présence de Manon.

FIGURE 3. Typo-graphics from Lewis Caroll's *Alice in Wonderland* (p. 26), Jardin's
Le petit sauvage (p. 214), Steven Hall's *The Raw Shark Texts* (p. 375) and the com-
plete short story ∅ by Enjō Tō.

the question mark and the exclamation mark, the author has chosen the latter, hereby giving his story a very special ending.

Acknowledgments

Conclusion

In this paper we have attempted to classify and illustrate the many graphemic and graphetic methods used in speculative fiction. We started by defining an ontology of the book (specific to prose texts) with concepts, relations and rules. We gave examples of methods breaking almost every one of the rules defined. And finally we discussed a family of graphetic methods dealing with different sorts of obfuscation, as well as methods based on pictoriality.

The list of cases we have explored is by no means exhaustive. Nevertheless, this paper aims to classify methods in a way that facilitates incorporation of additional graphemic/graphetic methods yet to be discovered.

Besides giving a glimpse of the infinite creativity of novelists and short story writers, by the careful description of exceptional cases and the investigation of the narrative intentions behind them, this study can also serve to challenge and expand knowledge of the nature and interactions of graphemes, graphs and higher grapholinguistic levels.

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