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como se constrói uma casa: Moving and Interactive Typography in Digital and Audio-visual Environments

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Abstract: This study aims to briefly analyze the semantic and aesthetic role of the written word and typography between the end of the 19th century and the present, paying particular attention to its perception and use in audiovisual and digital systems. Analyzing a wide range of periods, works, and artists, we aim to understand the potential of typography in the contemporary artistic discourse and explore the visual, dynamic, and interactive components in modern and contemporary typography. This study also aims to find new possibilities for using typography as an artistic component in a computational and videographic system. We will show one of our first experimental works in this field, a short stop-motion film we developed to assess original ways of converging text, image, and movement in an audio-visual and digital environment.

Keywords: typography, text, moving image, digital media-arts.

como se constrói uma casa: Tipografia Dinâmica e Interativa em Ambientes Digitais e Audiovisuais

Resumo: Este artigo pretende realizar uma breve abordagem analítica sobre o papel semântico e estético da palavra escrita e da tipografia entre o final do século XIX e a atualidade, prestando especial atenção à sua percepção e utilização em sistemas audiovisuais e digitais. Analisando uma ampla gama de períodos, obras e artistas, o objetivo é compreender o potencial da tipografia no discurso artístico contemporâneo, explorando principalmente as componentes visual, dinâmica e interativa da tipografia moderna e contemporânea. Paralelamente, procura-se encontrar novas possibilidades de uso da tipografia como componente artístico num sistema computacional e videográfico. Neste artigo, apresentaremos um dos nossos primeiros trabalhos experimentais neste campo, um curta-metragem em *stop-motion*, desenvolvido com o propósito de avaliar formas originais de convergir texto, imagem e movimento num ambiente audiovisual e digital.

Palavras-chave: tipografia, texto, imagem em movimento, média-arte digital.

como se constrói uma casa: Tipografía Dinámica e Interactiva en Entornos Digitales y Audiovisuales

Resumen: Este trabajo pretende realizar un breve análisis sobre el papel semántico y estético de la palabra escrita y la tipografía entre finales del siglo XIX y el momento actual, prestando especial atención a su percepción y uso en los medios audiovisuales y digitales. Desde el análisis de una amplia gama de períodos, obras y artistas, su objetivo es comprender el potencial de la tipografía en el discurso artístico contemporáneo, explorando principalmente los componentes visual, dinámico e interactivo de la tipografía moderna y contemporánea. Paralelamente, el objetivo de este estudio es encontrar nuevas posibilidades de utilizar la tipografía como componente artístico en un sistema computacional y videográfico. En este artículo presentamos uno de nuestros primeros trabajos experimentales en este campo, un cortometraje en *stop motion*, desarrollado para evaluar formas originales de converger texto, imagen y movimiento en un entorno audiovisual y digital.

Palabras clave: tipografía, texto, imagen en movimiento, media arte digital.

A fundamental characteristic of writing is its ability to crystallize oral speech and to transmit memories, information, and ideas across time and space (Bachfischer & Robertson, 2005; Uyan Dur, 2021). As the physical manifestation of a language and a crucial medium for gathering, storing, manipulating, communicating and disseminating information, writing first emerged in Ancient Sumer between 3200 and 3000 BC. (Gelb, 1963; Kramer, 1963; Mietkiewicz, 2017). But even though the invention of writing can be attributed to the Sumerians, the first variant of an alphabet appeared in present-day Lebanon. It later reached the Greeks, who would improve it, adding a set of vowels to it. After this transition – which would end in a better transcription of speech via 27 letters, alphabets would undergo no future substantial modifications (Schmandt-Besserat, 2014).

An important change in the evolution of writing would occur millennia later. Rather than manifesting itself in its *causa formalis* (Heidegger, 2002), it would do so in its methods of production. In the 15th century, Johannes Gutenberg, using his knowledge of metallurgy and a wine press, created a modular composition and printing method (McCarthy, 2020). With this invention a new discipline was born: typography, i.e., the composition of letters, words, and lines of text in a certain rule, order, and harmony. It consists of a repeatable system that can be combined in infinite ways, means through which it is possible to transform a written idea into a visual shape. This is a field linked to aesthetics, style, culture, history, industry, technology, communication, and entrepreneurship (McCarthy, 2020; Uyan Dur, 2021). By introducing a system of movable characters, Gutenberg unleashed one of the most significant technological and social advances of humanity.

Knowledge quickly spread and literacy increased exponentially, thus changing how people communicate (Rebelo et al., 2018). In just a few decades, European societies went from a system based on scribes (in which a few men manually copied each letter from one text to another in a very time-consuming process) to a mass production one in which a single instrument could mechanically reproduce thousands of pages per day. Although this technological transformation altered the speed and scope of communication, the main function of the written text fundamentally resided in its core value of preserving speech. Beatrice Warde emphasizes this notion in her collection of essays entitled *The Crystal Goblet, or Printing Should Be Invisible* (1955), which asserts that typography is, above all, an "invisible craft." Unlike calligraphy (Harris, 2003), a form of writing that maintains a close relation with the visual arts and in which communicative and aesthetic dimensions coexist – even receiving the title of "the art of beautiful writing" (Uyan Dur, 2021, p. 224), the primary objective of typography should be legibility: the author's ideas must be clearly conveyed to the reader, who, in turn, should have no difficulty in understanding them. Since the reader – when truly immersed in the content of a literary work – is unable to simultaneously concentrate on reading and viewing the text, i.e., "the mental eye focus through type and not upon it" (Warde, 1955, p. 16), typography should be unintrusive, avoiding interfering with our inner voice – which continually produces meaning as it traverses the lines of the page and interprets the narrative of a text. "The type which, through any arbitrary warping of design or excess of "colour," gets in the way of the mental picture to be conveyed, is a bad type" (Warde, 1955, p. 16). The author goes even further by excluding the hypothesis that typography can have any intrinsic visual and artistic value:

> . . . it is mischievous to call any printed piece a work of art, especially fine art: because that would imply that its first purpose was to exist as an expression of beauty for its own sake and for the delectation of the senses. (Warde, 1955, p. 13)

The pretext underlying the notions portrayed by Warde, according to Bachfischer and Robertson (2005), may have arisen as a response to the different cultural and artistic currents that emerged in the early 20th century, specifically in the 1920s and 1930s with the Dada and Futurist movements, fueled, in part, by the Bauhaus school and its philosophy of The New Typography (Tschichold, 1995). These new schools of thought contributed substantially to reforming print styles, thus unleashing new methods of conceiving typographic design.

The Moving Word

Poets and writers have long explored typographic qualities in order to incorporate expressiveness into their work. In the 2nd and 3rd centuries BC, Greek poets, such as Simmias of Rhodes and Theocritus, constructed texts that formed patterns depicting eggs and pan flutes. Millennia later other examples appeared that intended to endow writing with new textual meanings by visually composing text. Throughout the 20th century, we can find examples of this practice, such as concrete poetry or typewriter art, trends that attribute pictorial elements to text (Rebelo et al., 2018).

> A letra deixa de ser unidimensional, de poder expressar apenas um som, de estar submetida a um conjunto rígido de regras. Pode tornar-se veículo de significados múltiplos, universalmente reconhecidos, ou código secreto, cuja chave é exclusiva do seu autor. (Bacelar, 1998)

The rescue of text from the rigid norms derived from traditional Western typography and its convergence with movement gained new meanings with the arrival of film. After the emergence of the seventh art, text would claim a central place in silent movies, used mainly to aid images to express meaning – when the latter was unable to do by itself –, communicating concepts such as time, place, or dialogues between characters. But text was not just an accessory to image, it was occasionally the focus of creative works. Such is the case of Marcel Duchamp's short film, *Anémic Cinéma,* from 1926: "The first film within the tradition of the avant-garde to claim equality of title and image . . ." (Sitney, 1979, p. 102). At the beginning of the film, one immediately perceives a subversive attitude toward the prevailing praxis as Duchamp deconstructs words to create new aesthetic and semantic possibilities. Here, he rearranges the two terms making up the title of the film to form an anagram (see Figure 1). This was only possible by changing the spelling of *anémique* – the standard spelling of "anemic" in French –, to *anémic*, an anagram of *cinéma*. This intentional flaw enabled him to play with the composition of the opening sequence, giving the illusion of textual and visual symmetry.

Figure 1: Sequence with the title of the movie, Anémic Cinéma*, Marcel Duchamp, 1926*
Note. Duchamp (1926).

Duchamp's cinematographic work was in line with the new theories that emerged in the early 1900s, namely the notions brought by the artistic avant-gardes, such as the Cubists (Marcus, 1972) for example, regarding the treatment of letters, words, and texts, elements which were previously foreign to a large part of the artistic field, "especially fine art," as Warde calls it, which then occupied the center of

artists' attention, breaking down the barriers dividing the forms of literary and visual expression. Artists such as Pablo Picasso, George Braque, and Fernand Léger sometimes used typographic elements and words as pictorial elements by inserting newspaper clippings or letter designs with the use of stencils. For the Cubists, letters had a fundamental plastic function in their creations, especially in their collage phase.

In *Anémic Cinéma*, a six-minute short black-and-white film, Duchamp offers different possibilities for interpreting language components, transforming them into the protagonists of the narrative. As mentioned before, quasi-symmetrical visual and textual compositions are key elements in forming the sequence on which the title of the film is superimposed. One of the words begins as the other ends. The lower end of the image (Y axis) and each of its corners (X axis) contain the letter A, converging at the top (Y axis) and in the middle of the frame (X axis) with the letter C, creating a virtual vertex and giving the general illusion of a triangle. Duchamp, by orthographically manipulating words and their positions thus creates geometric patterns on the screen, resulting in an experience in which spectators can read and see the word. This playful act, seen at the beginning of the film, prepares the viewer for its 19 subsequent compositions, which are reproduced in a rhythmic and hypnotic way. These segments depict a series of Rotoreliefs, discs created by Duchamp which produce optical illusions via centripetal and centrifugal movements on a black background (see Figure 2). Some of these creations contain circular and elliptical geometric patterns, whereas others show spiralling lines of text. Both create an immersive experience via their swirling movements, a kind of ballet that manifests itself by multiple pirouettes which slowly pull us into their mesmerizing orbits. This graphic and kinetic act also contain lines of text which create a kind of wordplay; nine discs are complemented by different phrases in French, impossible to perfectly translate into other languages due to their absurd nature, which, according to Geiger (2020, p. 110), are like spoonerisms: ". . . single interplays of homophone words making up nonsense sentences that convey alliterations and rhyme, within the dada and surrealist tradition poetry." These stylistic devices provoke an intermittent semantic confusion in the spectator, broken only by the introduction of entirely graphic discs – the scenes that make up the film are constantly jumping between discs made of circular/elliptical patterns and others made of text. The rhythmic alternation between the text and image panels pays homage to the cinematic experience of silent films:

> . . . Anémic Cinéma derives from the recognition that by and large the cinematic experience during the silent period was one of an alternation of reading and looking at images in an illusionistic depth . . . for every image there is a verbal passage or between every two images, a title. (Geiger, 2020, p. 110)
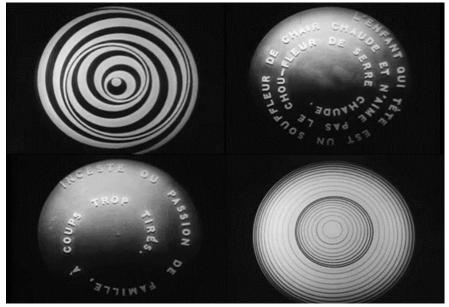

Figure 2: Collage of different Rotoreliefs, Anémic Cinéma*, Marcel Duchamp, 1926*
Note. MoMA (2020).

In a general sense, the experience of *Anémic Cinéma* is like a procedure in which the semiotic systems of reading a text and visualizing images merge to create a hybrid experience. It is important to mention that, like *Anemic Cinema*, other works tried to merge text and movement, namely the constructivist films of the 1960s, 1970s, and 1980s, including *T,O,U,C,H,I,N,G* (1968) by Paul Sharits; *Zorn's Lemma* (1970) by Hollis Frampton (see Figure 3); and *So Is This* (1982) by Michael Snow, titles in which text and moving image materialize as a "perfect double mirror or reciprocal *mise en abyme* for the two media" (Pethö, 2011, as cited in Geiger, 2020, p. 110).

Figure 3: Collage of multiple frames, Zorn's Lemma*, Hollis Frampton, 1970*
Note. Enns (2016).

The Interactive Word

"The use of motion on the computer screen changes how we design, how we read and how we interact with typography." (Small, 1999). New supports emerged at the end of the 20th century, with the launch and democratization of personal computers and the consolidation and proliferation of digital platforms, making the use of typography as a visual form even more noticeable (Palos et al., 2019; Rebelo et al., 2018). According to Betancourt (2019), contemporary digital animation software allows for a wide spectrum of animations using typography, such as configuring letters in *animorphs* (a portmanteau of *animation* and *morphemes*) or superimposing typographic visual effects on live images. He adds that, due to the progressive reduction of production costs, kinetic typography has grown on computer screens, televisions, billboards, and e-books. "As advances in technology introduce more complex creative challenges, screen-based typography must be reconsidered as [sic] new language with its own grammar, its own syntax, and its own rules." (Helfand, 2001, as cited in Quelhas, 2012, p. 21). Computer systems make it possible to represent the word in new ways, in an ecosystem which enhances the creation of artistic works exploring the dynamism and interactivity of typography.

In *Interactive Poetic Garden*, Tom White and David Small created an artifact that converges digital systems and text. According to its authors, *Interactive Poetic Garden* "is literally a fountain of words" (White & Small, 1998, p. 335). This work consists of a physical and immersive installation in which water descends from several waterfalls into a small pool (see Figure 4). Words are projected onto its surface, giving the impression of floating leaves. A person sitting beside the pool can interact with the words by a specially designed interface enabling users to stop the flow of words by pushing, pulling, and manipulating their order. Participants treated the work mainly as a space for contemplation: some passively observed the constant flow of words, whereas others imprisoned them in small groups and then released them. Speaking about the installation, Bachfischer and Robertson (2005, pp. 7-8) explain that:

The true beauty of this project lies in the rich and open-ended interaction with type in an unusual form, which goes far beyond the passive reception of expressive typographic performance. If text in expressive typography is interpreted by the designer, text in an interactive environment is interpreted by audiences in new, non-content related ways within a set of possibilities constructed by the designer.

Their work creates an experience in which users choose their own path and story, producing personal and original meanings along the way.
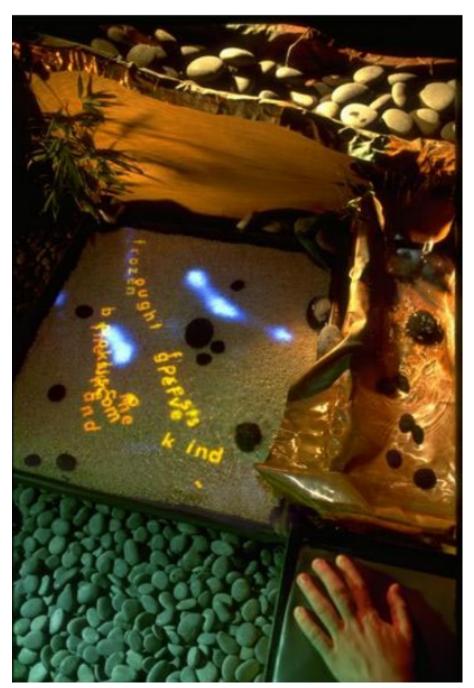

Figure 4: Interactive Poetic Garden*, Tom White and David Small, 1997-98*
Note. White & Small (1998).

Like *Interactive Poetic Garden*, other works and artists from different areas, such as holography, video art, computer art, and net art, have been exploring the potential of new technologies which emerged at the end of the 20th century to extract new ways of interpreting text, including Jeffrey Shaw's *Legible City* (1989); Gary Hill's *Beacon* (1990); Eduardo Kac's *Accident* (1994); John Maeda's *Tap Type Write* (1998); and Teresa Pimentel's TIPO (2005). Some of these works focus on the interactive dimension of consuming the written word, taking their experience one step further: from an experience of reading and viewing, we have now reached one of interaction.

The Case of Digital Poetry

The poetic text finds new paths in visual poetry, which unite the word with the exploration of space via non-linearity and syntactic inversion and disorder, giving rise to a new aesthetic which culminates in the creation of digital poetry (Neitzel & Bridon, 2013; Palos et al., 2019). In turn, digital poetry fosters discussions on concepts related to the interaction between readers and poems. As Palos et al. (2019, p. 213) highlighted:

> The typographic form influences its visuality and the way we interpret poems, and that is also acts as a graphic element that allows the reader to establish different poem interpretations by inserting his/her own gestural subjectivities as he/she interacts with the poem.

Note that it would be inappropriate to view these works as a mere transposition from the printed medium to the digital one. They rather constitute specific artistic creations which emerged in digital environments. Its production is, therefore: "entranhada no digital, nas técnicas digitais, e não podem ser entendidas como uma versão digital de uma arte anterior" (Tavares, 2010, p. 17). Digital poetry has a categorical element in typography since, as previously mentioned, it incorporates graphic and visual components into text and enables the materialization of the poem in a way which favours the interaction between words. Regarding the interactivity digital poetry provides, the reader-poem interaction can materialize, for example, via the former's gestures, establishing a kind of dialogue in which their movements can give rise to different interpretations (Palos et al., 2019). This direct agency readers can have in these works by manipulating their typographic elements constitutes a new way of interpreting poems and makes these creations: "um convite a leituras diversas, a significações variadas, cabendo ao leitor construir significados" (Neitzel & Bridon, 2013, p. 131). In this dynamic, readers assume the role of readers-actors who maintain a gestural relationship with typography and imprint their gaze on these works:

> . . . this interaction is a differentiated form of language that allows us to add movement and include the reader's participation in the work, enabling new meanings for the millennial art of poetry. (Palos et al., 2019, p. 226)

Alckmar Luiz Dos Santos and Gilbertto Prado's digital poem *Memória* (2002) (see Figure 5) shows this range of interactivity. In it, nine initially imperceptible images become legible words when readers-actors move a cursor over them. In doing so, we also hear the narration of the word corresponding to each image. Thus, we can navigate the poem in different ways as users' movements have the power to activate and deactivate its elements.
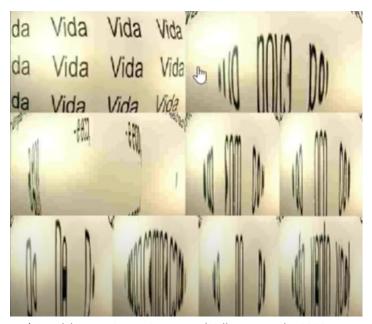

Figure 5: Memória*, Alckmar Luiz Dos Santos and Gilbertto Prado, 2002*
Note. Dos Santos & Prado (2002).

Interactivity is not, however, a necessary condition within the scope of digital poetry as some works ignore this dimension. Some creations explore the plurality of readings and approaches the digital medium enables as sound and movement offer greater freedom for intertextual relationships (Neitzel & Bridon, 2013). In *Scalpoema* (2001), by Joesér Alvarez, the author builds his poem from a passage from the novel *Memórias Póstumas de Brás Cubas* (1881), by Machado de Assis. Starting from this verse the words mix with each other, an amalgam which gives rise to the poem, an intertextual creation born from another text (see Figure 6). *Sweet Old Etcetera* (2006), by Alison Clifford (see Figure 7), is an example of a work that operates in this intertextual aspect and is allied to interactivity. In it, readers-actors walks through it and unveil it. This digital project attributes movement, shapes, and sounds to the poetry of E. E. Cummings, originating new readings and relations between the different elements making up the represented poems.

Figure 6: Scalpoema*, Joesér Alvarez, 2001*
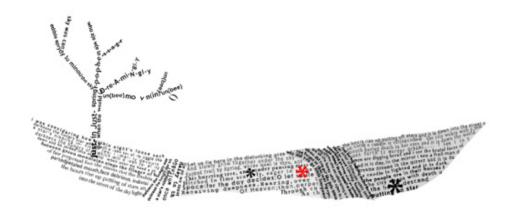Note. Joesér Alvarez, 2001.

Figure 7: Sweet Old Etcetera*, Alison Clifford, 2006*
Note. Clifford (2006).

Como se Constrói uma Casa

This is an important moment to note that the theory previously analysed belongs, in fact, to a bigger study framed in a PHD investigation about moving and interactive typography which will result in the creation of multiple audiovisual and digital artifacts. Now, an effort has been made to test some tools, methods, and languages around the potential of words/letters in an audiovisual and computational ecosystem. One of these experiences originated *como se constrói uma casa* (in English: *how to*

build a house), a short stop-motion film created using a word processor, in this case Google Docs. Its concept arose based on two premises: a) the title *como se constrói uma casa* stems from *Como se desenha uma casa* (2011), a collection of poems by Manuel António Pina, and b) a diagram illustrating a theory about the evolution of the Greco-Latin alphabet (see Figure 8).
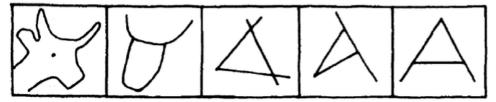

Figure 8: Different stages in the evolution of the letter "A"
Note. Pimentel and Branco (2005).

Based on these two notions, we formed the following scheme:

Letter	Greek name	Ancient name	Possible meaning
C	Gama	Gimel	Camel
A	Alfa	Ãleph	Bull
S	Sigma	Shin	Tooth
A	Alfa	Ãleph	Bull

Table 1: Scheme with the letters "A," "C," and "S" and their possible evolution and archaic meanings
Note. Adapted from Pimentel and Branco (2005).

The connection between the letters "C," "A," and "S," which enables us to form the word "casa" (in English "house"), and their former meanings give origin to the characters. They also offer a suggestion of what could unfold in the narrative.

> *A camel rests in the desert, two bulls clash, a tooth explodes in the air. That's how a house is built.*

After we briefly outlined this premise and characters, we had to understand how we could realize this idea using audiovisual and digital tools. We briefly describe the conceptualization and production process of this short film below.

The first pre-production stage was based on appropriating images for the chosen characters: a camel, two bulls, a tooth, and a house. For this, different silhouettes of these figures were retrieved from image banks. Then, each illustration was subjected to an online program which converted these image files into HTML, thus giving us a figure cemented with letters (see Figure 9).
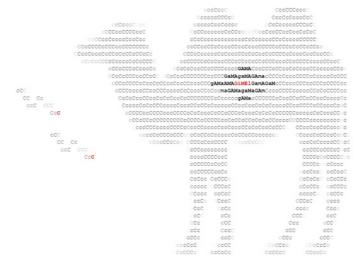

Figure 9: Result of converting an illustration into typographical symbols
Note. Martins (2022).

This series of events enabled the transfer of each text image into a word processor, a system which offered us the possibility of manipulating each of these symbols. We were then able to modify the colour, sHApE, Size, and po^siti^on of all letters making both the shape of the animal/object and its background/surroundings. In the case of the image above, the background largely consists of white letters, giving the illusion of a void since it shares the same colour of the page on which it rests (a white-on-white situation). But we can see from the lines zigzagging the left area of the frame, these (former) white letters can also be changed, giving us the ability to manipulate the environment surrounding the characters. Thus, we have great freedom to build multiple and different animation scenarios. We can both reshape the characters and change what happens all around them.

After changing one (or more) of these parameters, the images were crystallized by screen capture, resulting in a triple click: a "Command-Shift-4." Different instances were gradually glued together during our post-production montage. This is how the effect of movement was produced to replicate the stop motion style. The result can be seen in the link below (see Figure 10). This short film reflects a work in progress around the discovery of materials, methods, and languages in digital and audiovisual systems which focus on the potential of building works in which letter, image, and movement merge to create new forms of meaning.

Figure 10: como se constrói uma casa*, 2022 (video)*
Note. Martins (2022).

Conclusion

"The most effective use of writing in both a linguistic context and as a visual expression has been within the scope of conceptual art and this has brought new discourses and perspectives to the art." (Uyan Dur, 2021, p. 219). This text started from an ongoing study around conceptual, aesthetic, and technical notions which will form the preliminary bases for the creation of multiple video installations and digital artifacts aiming to use the word as an artistic expression. *Como se constrói uma casa* is one of the first steps in this journey to find original ways of (de)constructing text in audiovisual and digital systems.

Rather than lying in characters or in the conventional use of the alphabet, the essence of typography consists of materializing writing in graphic configurations. Thus, typography operates on the "margins" of writing and determines aspects such as shape, size, and font, the spaces between letters/words, and their positioning on the page (Betancourt, 2019). The addressed themes and fields of creation enable us to understand the potential of typography in contemporary artistic discourse and explore the dynamism and multiple interactivities which digital typography entails and that give rise to innovative forms of visual expression regarding the written word. The concern with contemporary typography is a concern with the "margins" of text and language, in which the visual aspect of the text itself becomes a generator of meaning.

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