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Ever since the invention of movable letters and the introduction of the typewriter, technical writing tools have been considered as a means of serialization and standardization, characterized by a linear way of ordering things and thoughts. More importantly, as a cultural technique they fostered and furthered a sharp distinction between print and image. While the advent of the comic book in the industrial age was already instrumental in blurring the line between textual and visual practices, digital games now restructure this terrain to expand it further through their own specific potential. Where comic panels are used to illustrate linear progressions that proceed chronologically, digital games can also be used to diagram complex systems of relations in ways that allow for multiple points of entry or exit, and multiple directions for exploration. This essay aims to demonstrate that the cultural technique of typing is crucial in this process. It not only allows for serial intervention (as a way of navigation), it can also transform letters into objects deprived of their literary function (as a way of representation). Thus ludic seriality provides us with the means to reflect on the conditions and capacities of digital typography. As a media practice, playing with types not only relies on the logics of digital manipulation and flexibility, it also makes them formally visible.

Type Rider (2013), a game that both implements the theme of writing's transformation and, by means of its own specific medial properties, is part of its progression, serves as an example. In the following three sections, I will investigate this game as a critical space for rethinking assumptions around writing techniques as well as the historical frameworks through which they have been consistently addressed and evaluated. The first section focuses on the medial quality of writing and textuality as a formal system, the second discusses the dimension of the image as an iconic extension of the textual format, and the third brings together both lines of thought to debate the operational efficiency of digital games as a way of constituting new forms of ludic literacy.

Typography: Writing and Re-Writing

As an adventure and puzzle game, *Type Rider* discovers the history of typography to be a complex configuration. By moving along the historical lines of letters and lettering, the game not only depicts their inherent techniques and aesthetics, but also renders them as evolutionary processes of mediated communication and information. This is made evident already in the tutorial. As a guide to *Type Rider*, this introductory level invites the gamer to orientate him- or herself in the gameplay. More importantly, it also serves to demonstrate the game's potential for media reflection. While exploring *Type Rider*'s gameworld via the tutorial, the gamer moves two dots along a path depicting the origins of writing as a process of becoming media.

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Introducing text as an abstract medium, the game offers a ludic walk from cave drawings to cuneiform writings, from Egyptian hieroglyphs to Chinese symbolism, and from Greek to Latin alphabets. By doing so, it points to a significant development in the history of media: the process of fixing symbols on different materials ends the immediacy of communication. As a result, the formative progression of writing reveals two medial accomplishments: the abstracting distance from the given and the transport of the perceived into a repeatable, serialized symbolic system. Moreover, as is conveyed by the tutorial, these routes are implemented in the gameplay itself: the more the symbols are refined, the more options of operating and moving open up to the gamer.

This growing complexity is investigated progressively by playing the game, by exploring its level structure and by experiencing its dynamics. *Type Rider*'s first level marks the entrance into the Gutenberg era. Mechanization, the decisive moment of this phase, is met by the gamer throughout the level in the form of the revolving printing press, which has to be crossed by the movable dots.

Figure 1: Type Rider: Gutenberg Era

Once this scenery is left, a new challenge waits ahead: the dots get caught between the lines of a book organizing their path like bars. Hence the innovation of the printing press as an "agent of change" (Eisenstein 1979) is made visible: movable type, with its precision of form and its ability to produce and reproduce texts accurately, intensifies the drive toward mechanical repeatability. Further, this kind of conception is deeply affected by the ways in which configurations of technology, media text, and context take shape in specific arrangements and are controlled by particular apparatuses. By moving alongside various textual artefacts, the gamer realizes the extensive reorganization of knowledge's forms as it is made accessible in books and calendars, flyers and posters, newspapers and magazines. Additionally, by passing through the levels, the various dispositifs of knowledge production—such as archives, libraries, or offices—become increasingly visible. Furthermore, technologies that specifically structure and thereby vary typography are presented as movable

figures within the game: the printing press, the linotype machine, the mechanical typewriter, and the desktop computer.

However, it is not only the technical means of text production that alters how we perceive it. With the development of industrial forms and means of "graphism," i.e. telegraphy, photography, phonography, and cinematography, writing loses its monopoly on transfer and storage. Surrounded by other media, writing does not remain the same but changes its manifestations: it finds new forms and appearances. This is made visible in a level that leads the dots alongside the development of cinema.

Figure 2: Type Rider: Cinematography

Here, the dots pass before and jump on neon signs and announcements of features on movie theatre facades. Cinematographic perception corresponds to an important process of stimulation: letters and texts become mobile and movable.[1] As the level demonstrates, these dynamics facilitate aesthetic developments like rolling end titles as well as the typographic design of title sequences and animated lettering.[2] Utilizing a remarkable variety of aesthetic configurations, the cinema introduces and mediates alternate ways of managing information, in terms of both narration and viewing.

In the digital age, text and numbers, sounds and pictures all become software, hence writing as well as typing become seemingly immaterial practices. Thus a new phase in the depiction of writing and lettering, along with their attendant problems and possibilities, is instituted. The written form, coded digitally, is now data which must be made sensually perceivable to be discernable, useable, and applicable as text. Responding to these transformations, *Type Rider* highlights the introduction of the *Graphical User Interface* (GUI). In contrast to command-line control, the computer is now operated by graphic symbols: such an interface is not based on lines but on icons. Bit by bit and byte by byte, digital letters begin to emancipate themselves from the final destination of the hard copy. Offering a mise-en-abyme situation of a game within the game, *Type Rider*'s last level reveals this context.

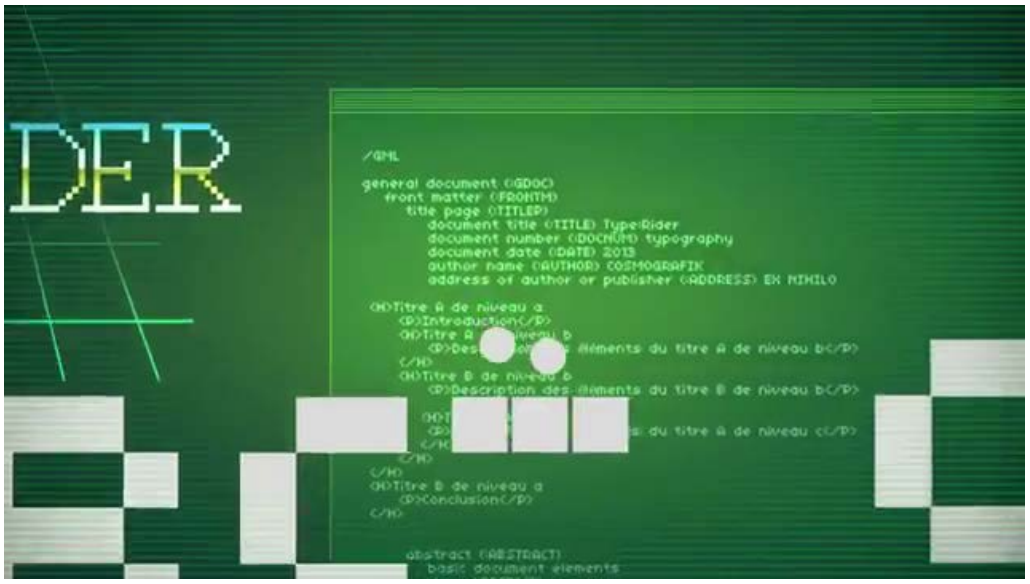

Figure 3: Type Rider: Digitalization

Here, the dots move across a game-like scenery whose bars are reminiscent of *Pong* (1972) and whose boxes allude to *Tetris* (1989), calling upon a screen culture that starts to flourish beyond established routines of lettering. The bars and boxes insinuate the square pixels of the first bitmap fonts whose rough increments are overcome by vector graphics. With the development of desktop publishing, the dependence on type foundries ends. This involves a fundamental shift from standardized to customized font design: each user can now be a designer.

The perception of text and communication about writing does not remain unaffected by the broader availability of the means of textual production. On the contrary, it sets off a cultural-technical change and, as an effect, a medially induced modification of knowledge: “An effect of digitalizing text’s design, especially its dematerialization, is, therefore, a change in thinking about writing” (Zons 2013, p. 142, *my translation*). Accordingly, it is not only the visual alteration of digital text that influences aesthetic shifts and variation, but also the medium’s changing effect on our skills in reading and writing. “Media,” according to Friedrich Kittler’s (1999, p. xxxix) famous phrase, “determine our situation.” The increased accessibility of a variety of fonts leads to an increased contingency of writing and, thereby, to a different mode of reading. Considering the proliferation of textual forms and varieties, their increased mobility and alterability, the reading skills that were suited to (and trained for) the print era are fundamentally challenged. In his text *Lesen Lernen* (i.e. Learning to Read), Niklas Luhmann (2008, p. 13, *my translation*) wonders about the conditions of new reading skills and suggests: “It could be that now, in the face of the computer’s new possibilities, we will have to return more and more to our writing skills.” This affects not only the basic opportunities for interaction, but also the interdependence of the forms of textual reception and production: in order to learn to read differently, we must know what it means to write differently. This different kind of writing is no longer oriented towards limited spaces and fixed structures of font, as it was in print culture. According to Vilém Flusser (2005, p. 63, *my translation*), the relation between creativity and processuality is deeply affected:

> Writing on paper means having to limit one's creativity. […] Writing into the electromagnetic field means that the creative text will form lines as well, but these lines will no longer be fixed. They have become "soft," graphic, manipulable. […] Text no longer serves as the result of a creative process, like it did on paper, but is itself this process. It is a processing of information into new information.

The most significant feature of new writing is its ability to mobilize the text.[3] Changes and variations are no longer exceptions but the rule. This becomes clear in the text's variability and flexibility, the increased possibilities to intervene and influence its appearance, and the results of extending and expanding formerly stable boundaries. Digital text-processing is no longer bound to a firm final condition: What is written can always be re-written.[4]

While analogue printing established the means for fixing the text as a discernible form and thereby standardizing it, digital modes of creation and expression now produce a flexible system of variation and alteration. Addressing the logics and mechanics of the industrial era, Jean Baudrillard (2001, p. 140) points to its defining feature, the series: "The industrial revolution gave rise to a whole new generation of signs and objects. […] This is the phenomenon of the series; in other words, there is the very possibility of two or of *n* identical objects." The technological rationality of industrial production fuelled serialization processes. It enabled standardization and replication, thereby motivating serial production and perception. In the digital age, these earlier modes of production have conceded dominance to the digital code: "As the order of the counterfeit was seized by serial production (viz., how art succumbed entirely to a kind of 'machinality'), so the order of production is in the process of being undermined by operational simulation" (Baudrillard 2001, p. 142). Digital operation allows for infinite alteration. Letters and signs cease to be fixed forms. Instead, they can be created like a drawing, implying the digital text's semiotic significance as an icon. In this way, digital media, and especially digital games, not only make text more agile, but also more iconic. Thus, if the digital game *Type Rider* plays with mobile typography, it will necessarily have to allude to flexible iconography. As a serial practice, then, ludic seriality is informed not only by changed modes of textual production, but also by visual aesthetics shaping what we see and how we play.

Iconography: Adapting and Converging

Text is more than a medium of language's production of meaning. The game *Type Rider* reveals this continuously by depicting textual symbols as aesthetic forms in their own right, rather than as functional parts of a coherent text. The characters by which the gamer navigates through the game's world already allude to this fact. The gamer has to guide two dots through a given level from start to finish. But what do these two dots stand for? Do they signify a colon, a division sign, a punctuation mark, a means of calculation? Or do they just represent abstract figures within the game? The dots' abstraction points to the arbitrary and associative usage of symbols and, in this way, give way to a series of possible interpretations.

Just like the dots, the letters' appearance vacillates between textual and iconic elements. This becomes apparent in the way *Type Rider* renders them as mobile characters: they tilt and twist, and turn upside down. On and on, they keep leaving

the line which they are supposed to follow. Thus, on the one hand, the letters appear as agile, separable parts and are thereby removed from their former function in text. On the other hand, the dots always slide upon and beneath them, and in doing so, play with them in a way that does not fix their position but makes it flexible. As a consequence, the letters become elements in an obstacle course: the dots climb their slant walls, roll off of them, jump a serif, and find their way out of a typographical punch. On an on, the letters resist falling into line, as they must do to generate a word and thus meaning.

Figure 4: Type Rider: Letters and Dots

By pointing to the concept of the "in-between"—those blanks and vacant spaces that are usually not recognized as such in the text structure—*Type Rider* renders them much more visible than the letters' string of meaning could. Consequently, the game presents writing as a procedure that goes beyond the serialized system of a fixed grammatical arrangement.

Addressing systems of signification eluding the confines of alphabetical literacy, Sybille Kraemer and Horst Bredekamp (2013, p. 24) claim:

> The "textualization" of culture has reached its limits. By transgressing those boundaries, the concept of culture assumes new contours. Culture is no longer a matter of monolithic immobility congealed in works, documents or monuments, but liquefies into our everyday practices with objects, symbols, instruments and machines. The right of exclusivity, which language used to claim for itself (with regard to representing culture), is no longer unchallenged. It is in the (inter)play with language, images, writing, and machines—in the reciprocity between the symbolic and the technical, between discourse and the iconic—that cultures emerge and reproduce.

This interrelation of text and icon, this interplay of words and images within everyday fluid practices, becomes even more complex when transferred from the solidity and

fixity of typeface to the dynamic mobility of digital gaming. The moving icon's temporality is crucial here. It leads to a perception of visual text not as complete, but as something that has to be completed. While the fixed typeface represents a terminated order, the moving icon's elaboration conveys digital writing as a floating process. Accordingly, there is a shift from text to texting and from product to process.

Still, it would be too simple to reduce the game's imagery to its mobile visual potential. Digital games not only enable the observation of a process but also serve as agents for action. "The meaning of iconography as a constituting characteristic for video games," writes Thomas Hensel (2012, p. 220, *my translation*), must be considered "as an active, acting mode of operation." This dimension of agency, the possibility to act in and with the digital image, places the video game in an operative and performative context. Games permit the player to regulate what he or she sees, and when. They enable an active mode of controlling serial images to create a sequence:

> In film and television, the point of view was set in motion, but it was the director who controlled the movement. Now, computer animation can function like film in this respect, for it too can present a sequence of predetermined camera shots. However, the sequence can also be placed under the viewer's control, as it is in animated computer games. (Bolter/Grusin 2000, p. 29)

Video games mobilize an active viewer, engaging him or her to participate in the process of making visual meaning out of serial pieces. Thus, digital games conform to, but also enlarge and intensify already established modes of serial practices, such as co-operation and re-creation:

> It is quite likely that this is the most important outcome of media serial products: 'mediatization' of the audience, establishing co-operation and the interdependency between producer (or 'creator') and audience (or 'recreator'). Series is not a production followed by reception, but a co-operative process of creation and recreation. (Oltean 1993, p. 12)

With respect to digital games, ludic elements allow for a specific kind of generative creativity. Ludic seriality not only makes the gamer productive and active. More importantly, ludic modes depend on activity as a necessary prerequisite. Hence, action is the determinant factor of the game's mediality. Alexander Galloway (2006, p. 2) emphasizes:

> Without action, games remain only in the pages of an abstract rule book. Without the active participation of players and machines, video games exist only as static computer code. Video games come into being when the machine is powered up and the software is executed; they exist when enacted.

Contrary to the pre-staged and thus finished action of the cinematic image, the player of video games is able to advance the plot by his actions. Moreover, contrary to the viewer's fixed position in the classical cinematic dispositif, the gamer must constantly perform physical movements – from the tiny motor performance of pushing keys and buttons to the broader physical engagement demanded by more complex motion-control mechanisms such as in exergames.[5] All these actions become perceivable through images which themselves are specifically configured in relation to those movements:

> Motoric execution is, according to the software's stipulations, translated into a specific audiovision. As a consequence, motoric execution is not solely perceived as a physical act in the here and now by the agent; it moreover manifests itself […] as a situatively abstract image object or a situatively abstract image perspective. (Venus 2012, p. 117, *my translation*)

Digital games demonstrate a significant transformation from types to bytes. While mechanic seriality relied on the factor of exact repeatability, digital seriality brings into play the concept of flexible modulation. Stretching from linear succession to multi-directed expansion, ludic modes of serialization enable the linkage of tactile, controlling movements to a visually mediated image perspective.

According to Vilém Flusser (1992), the conversion of knowledge forms and modes of perception is to be considered along the lines of the changes in the linearity of text towards nonlinearly structured codes and manners of communication. His treatise *Krise der Linearität* (i.e. *The Crisis of Linearity*) opens with the following hypothesis: "We went from icon to text. It became predominant, reached a crisis, was broken, and now we find ourselves beyond text in a new iconization, which we have to practice first" (Flusser 1992, pp. 4-5, *my translation*). This new iconization, induced and driven by the digital restructuring of the image, does not simply dismantle linear code as a predominant habit of perceiving and knowing. It also indicates that the aptitude to think might not solely be re-organized, but genuinely formed anew. Flusser (1992, p. 34, *my translation*) argues

> that the transition from one-dimensional to zero-dimensional not only implicates new categories of perception (for example, a calculus of probability instead of causal explanation, or calculation of proportion instead of logic), but new categories and values in general.

Accordingly, one should wonder which new categories begin to arise within the field of digital gaming and how they can be illuminated as non-linear rhetorical and visual strategies. This includes not only the changed constitution of text and image, but, additionally, the transformation of medial constellations as well as their implications for new categories of media historiography. The following section will focus on these phenomena.

Playability: Activating and Mobilizing

The game worlds addressed by *Type Rider* transcend the notion of a closed text. This becomes apparent in the game's interactive and transmedia experience, which is available in three different formats: as a video game, a social game, and an interactive installation.[6] Each of these dimensions transports specific medial qualities, interacting in a way that renders one dimension referential to the other. Hence this intermedial conglomerate indicates a progression which no longer emanates from discrete entities, but arises from processes.

The video game *Type Rider* itself is more than a singular game in the sense of a fixed, closed configuration; it can be installed on both the PC and on mobile platforms such as smartphones or tablets. Accordingly, there are various ways of controlling and gaming to be experienced. On the PC the two dots are controlled by typing on

the PC keyboard and observed on a stationary screen; navigation on mobile platforms demands other skills like balancing, tilting, and commanding by touch and gesture. In the first case, the gamer becomes aware of changing modes of type, that is, the performative execution of acting-by-typing. Being converted from instruments of textual production to agents within the world of the game, the PC's alphanumeric keys are deprived of their original purpose. Thus the keyboard's logic is converted from that of a *typewriter* to that of a *Type Rider*. On mobile platforms, by contrast, the gamer is sensitized to more artistic movements that bring to mind the virtuosity of a painter's brush or the manner of handwriting rather than typewriting. Offering multiple ways of perceiving and controlling text and content, tablets and smartphones demonstrate a variety of possible practices: they can be used as a game board, a space for inscription, or a screen to draw upon.

The social game version of *Type Rider* opens up yet another route for the reflexive potential of intermedia processes. Having been specially designed for Facebook, it allows users to create their own levels and share them with others.

Figure 5: Type Rider: Facebook Creation Kit

Within the system, the orientation and difficulty of each level can be determined individually by means of various design and layout components. Beginning with a basic set-up, which defines a starting point and a finish, challenges and obstacles can be added as game design elements. The positioning and direction of letters can be set up, and their size, mobility, and rotation can be changed. Moreover, the creative process of level-design is bound to a specific system of motivation: the user progresses in his or her training and is certified according to his or her improvements (for example, the user can be promoted from "stonemason" to "copyist"). Finally, these individually created parts of the game can be shared with others who can respond the levels' structure and dynamic. In this way, *Type Rider*'s level design is more than a creative task: as a social game it accentuates feedback and interaction, and by doing so, it not only facilitates experimental development of gaming

environments but also generates a broader understanding of dynamic processes of creation and cooperation.

The third format, the interactive installation of *Type Rider*, initiates a transfer of the game's rules to exhibition spaces. The installation is arranged as a movable artwork which levitates the points as projected elements in space. Moreover, the game's letters can be changed by the viewers-users themselves and thus be repeatedly rearranged and realigned. Using video projection and shape recognition, this version of *Type Rider* leaves the screen to be experienced in public spaces. Hence, it reflects our perception of everyday life as being overlaid by ludic modes which exceed the stationary medium and thereby interact with reality. On the one hand, this process promotes a sensitization to text's removal from its material substrate (since the installation addresses the virtualization of both writing tools and texts); on the other hand, it alludes to forms and systems of *augmented reality* (since it presents a real-world environment supplemented by projected information, thereby enhancing the perception of reality).

As a transmedia project continuously converting and extending its universe, *Type Rider* focuses on the media development of writing and its historically adaptable positions and procedures. Moreover, it prompts users to rethink the constitution and transfer of knowledge in its dominant forms and systems. *Type Rider* can thus exemplify a medial reflection exploring the consequences of a transformation of both cultural techniques and media historiography. This ensuing potential for changed and changing understandings of history has been addressed by Kerschbaumer and Winnerling (2014, p.14, *my translation*): "Video games dealing with historical content […] are mechanisms of dynamic production of more or less coherent processes of representation of the past." Additionally, however, video games not only deal with representations, but with the very production and modulation of historic knowledge itself. If the digital game *Type Rider* deals with the history of writing, it renders it in a specifically ludic manner: it does not simply write this history, but it writes itself into what it generates and transfers as a knowledge of writing. In this respect, it allows for a shift in perspective that focuses on its own mediality and can thus be made productive for the examination of the historicization of media culture. Lev Manovich (2001, p.161, *my translation*) underlines: "Computerizing culture not only affects the logic of currently produced cultural objects, but rather our understanding of art and media of the past." Consequently, categories that newly arise from digitalization should be applied to concepts of media history. As an example, Manovich (2001, p. 162, *my translation*) mentions the category of the interface and suggests that we develop a "new reading of media history as a history of interface-design," that we "think of the interface, a term originating from engineers' laboratories, as a broad cultural category." Defining the interface as an intersection of man and machine implying technical as well as conceptual demands, Manovich concentrates on Internet culture and the question of its function as facilitator. In this context, the interface is understood as a central cultural category that cannot be reduced to a mechanical hub. It must rather be apprehended as a configuration that implements technological modi operandi as cultural techniques. For Manovich, the web browser serves as an example for a passage through which technical information and artistic production are transferred and transported:

> As a window of a Web browser comes to replace cinema and television screen, a wall in art gallery, a library and a book, all at once, the new situation manifests itself: all culture, past and present, is being filtered through a computer, with its particular human-computer interface (Manovich 2001, p.163, *my translation*).

The concept of the window addresses a far-reaching change, concerning not only the passage of content, but also raising questions about its representation and perception. Jay David Bolter and Richard Grusin's concept of remediation concentrates on processes in which former and current medial logics are intertwined. According to this concept, digital culture's central characteristic consists of a tendency to hyper-mediatize:

> Where immediacy suggests a unified visual space, contemporary hypermediacy offers a heterogenous space, in which representation is conceived of not as a window on to the world, but rather as 'windowed' itself – with windows that open to other representations or other media. (Bolter and Grusin 2000, p. 243)

Anne Friedberg (2000, p. 243), whose history of the window as a cultural interface traces a development from multiplication to virtualization, points in a similar direction:

> The window's metaphoric boundary is no longer the singular frame of perspective—as beholders of multiple screen "windows," we now see the world in spatially and temporally fractured frames, through "virtual windows" that rely more on the multiple and simultaneous than on the singular and sequential.

Decisive for the interface as a cultural category, however, is a component that goes beyond the aesthetic tendency of virtualization and fusion: the dimension of intervention and control. Alexander R. Galloway (2012, p. vii) underlines: "Interfaces are not simply objects or boundary points. They are autonomous zones of activity. Interfaces are not things, but rather processes that effect a result of whatever kind."[7]

While in the past, the printing press served as a potent interface with the culture of knowledge regulating access, modes of perception, and forms of thought, digital games now generate new aspects of activity and exchange. A final look at *Type Rider* shall demonstrate this. Clearly the game's most significant quality is the transition from invariant knowledge forms to flexible knowledge constellations. Intra-ludically, this becomes evident in the gameplay's seriality: the process of acquisition takes place more than once, leaving the basic constellation unchanged, while gaming itself is open for variation and deviation. As a result, gaming does not concentrate on securing static knowledge repeatedly, but rather on exploring that which can be known variably. In so far, we are dealing with an experimental quest: something must be tested repeatedly in order to reach the next level of expertise. This correlates with a specific possibility—that of sharpening the gaze for dismissed opportunities of progression. Moreover, this consciousness is not solely developed inside the game's world, but expands to the phenomenon of "serial interfacing" (Denson and Jahn-Sudmann 2013, p. 11). That which is being explored and investigated is transferred to other media contexts and is made visible as knowledge of the game. Take, for example, various YouTube-videos presenting a productive processing of *Type Rider*'s facilities. In contrast to walkthrough videos, these clips transcend the game's original scenery to establish an independent form of design. For example, there is a digitally animated film in which self-made lettering moves across screenshots of the

game *Type Rider* and other pictures[8]; or a clip which presents an arrangement of paper-folding techniques while addressing *Type Rider*'s levels, playing with the relation of literacy and spatiality.[9] By combining user generated content with gaming aesthetics, these clips oscillate between artistic direction and visual gimmick, between abstract short film and medially reflexive comment.

On the one hand, these practices indicate how gamers become agents surpassing the game. On the other hand, crucial to the question of media and its historicization, it becomes evident that we are at the beginning of a transformative process that is able to change not only our present modes and forms of knowledge, but also our understanding of their origins. Ludic seriality enables the acquisition of knowledge as a flexible process. It allows for an experimental epistemology which displays and unfolds knowledge levels and maps the connectedness and entanglements between them. In this respect, digital games can be understood as catalysts for historicizing knowledge formations:

> At this profoundly transitional moment in media development, the working agenda for historians can quite productively make use of those earlier transition moments when related forms of instability threw into question media ontologies and, with them, issues of epistemology, perception, and memory. (Uricchio 2001, p.70, *my translation*)

Thus, digital games are more than archives and systems, more than apparatuses and applications. They are laboratories in which we have to move and prove ourselves.

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Notes

1 On the relation of letters and kinesis in the moving image see Scheffer and Stenzer 2009 and Arns et al. 2004.

2 The game uses the artist Saul Bass's work as an example, but it also presents the influential lettering design of *Metropolis* (Fritz Lang 1927).

3 For an extended discussion of this aspect see Bolter 2001.

4 On this development's impact on text in digital games see Garrelts 2013.

5 Ian Bogost (2005, p. 1) defines exergames as “games that combine play and exercise,” including digital technology that tracks body movement and physical reaction. For a discussion on the relation of exergaming and kinaesthetic mimicry see also Behrenshausen 2007.

6 A presentation of these formats is available at: http://typerider.arte.tv.

7 On the cultural history of the interface see also Johnson 1997 and Hookway 2014.

8 https://www.youtube.com/watch?v=qkRuK8Dt_G4.

9 https://www.youtube.com/watch?v=xcSe3Z5KdZA.