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# Critical Terms in Futures Studies

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## • Virtuality

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A search for “virtual” on Google’s N-Gram viewer shows that the use of the term is relatively stable between 1800 and 1980, after which it explodes, peaking around 2000, before slightly dipping. Virtuality presents a similar curve. These peaks correspond to the implementation of digital technology into everyday life. But as the chart shows, virtual is not a neologism; it existed before the development of computers. What did it mean then, why has it been almost monopolized by digital culture, and how can it be used in other fields?

The term virtual comes from the Latin *virtus*, derived from the root *vir* (man), and meaning strength, manliness, and eventually virtue. In scholastic Latin, *virtualis* designates the potential, “what is in the power of the force.” This sense survives in the expression “by virtue of.” The classic example of virtuality is the presence of the oak in the acorn. According to Aristotle, the oak exists *in potentia* in the acorn, in contrast to the oak in the forest, which exists *in actu*. Virtuality is thus associated with potentiality, and virtual existence contrasts with actual existence: the virtual is not that which is deprived of existence but that which possesses the force of coming into existence. In the eighteenth century, for instance, under the influence of French, the term virtual is associated with optics, more precisely with mirror images: a virtual image is made of “virtual foci,” that is, of points “from which divergent rays of light seem to emanate but do not

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actually do so" (Webster's Dictionary definition). This "seems to" open a new interpretation for the term virtual that exploits the idea of illusion inherent to the mirror image. The virtual now becomes that which passes as something other than it is. A virtual dictator, for instance, enjoys the absolute power of a real dictator while passing as democratically appointed. Mark J.P. Wolf (2017, p. 192) observes that the French theater theorist Antonin Artaud used the term "la réalité virtuelle" as early as 1938 to describe the theater experience.

The meaning of the term virtual thus developed in two different directions (Ryan 2015). On the one hand, it contrasts with real and carries negative connotations of fakeness and artificiality. On the other hand, it contrasts with actual and suggests force and productivity. The two directions are not symmetrical, because the virtual has the potential of becoming the actual, while its contrast with the real is absolute and irreconcilable.

The most famous proponent of a "fake" interpretation of the virtual is Jean Baudrillard. He sees modern culture as dominated by media such as theme parks, movies, TV, and now computers that fill the world with images; once images were regarded as a reflection of reality, but now "they have no relation to reality whatsoever; [they are] their own pure simulacrum" (1994, p. 6). The virtual takes the place of the real, and becomes the hyperreal. "With the Virtual," Baudrillard writes in *The Perfect Crime*, "we enter not only upon the era of the liquidation of the Real and the Referential, but that of the extermination of the Other. [...] The otherness [...] of the world – dispelled by Virtual Reality" (1996, p. 109).

At the other end of the philosophical spectrum is the conception of the virtual of Pierre Lévy (1998), which was inspired by Gilles Deleuze (2002), and rests on an opposition of virtual–actual. For Deleuze and Lévy, virtual and actual exist in a feed-back loop, the virtual wanting to be actualized, and the actual projecting a cloud of virtualities. This cloud can be interpreted as the affordances of an object, that is, as what this object can become and what can be done with it. For instance, if I look at an apple, I may contemplate the following potentialities: eat it, cook it in a pie, photograph it, or let it rot away until I can throw it in the trash without remorse. According to Deleuze (2002), each of these virtualities projects its own cloud, so that the generation of virtualities is an endless, recursive process. Deleuze's paper remains very abstract, but the virtual receives a much more concrete face in Lévy's (1998) *Becoming Virtual* (a questionable translation of the French title *Qu'est-ce que le virtuel*). For Lévy, the virtual "has little relationship to that which is fake, illusory, or imaginary [...]. It is a fecund and powerful mode

of being that expands the process of creation, opens up the future, injects a core of meaning beneath the platitude of immediate physical presence” (1998, p. 16). The virtual presents the following properties: it stands in a one-to-many relation to the actual, since it can be actualized in many different ways; the process of actualization is not automatic but involves a creative transformation and is therefore irreversible; the virtual is not rooted in time and space, but receives a spatiotemporal existence during the process of actualization; the virtual is an inexhaustible resource and using it does not deplete it. All these features point to the nature of the virtual as that of a creative blueprint. While it has existed since the dawn of civilization (Lévy [1998] regards tools and language as quintessential virtual entities), its productivity is brought to a higher power in digital technology. Wealth was once mostly associated with the production and possession of material objects; in today’s economy, it also arises from investment in intangible things—design, software, knowledge, branding—that embody the virtual.

The contrast between the virtual as fake and the virtual as force is epitomized by the opposition between the concepts of *simulacrum* and *simulation* (Baudrillard [1981] 1994). A simulacrum is something that passes as that which it is not, while a simulation, more particularly a computer simulation, is a dynamic model of a system that predicts its behavior under different circumstances. As different inputs lead to different outputs, the program computes the field of virtualities inherent to the simulated system.

The widespread association of virtuality with digital media has its source in the jargon of computer science. Computer scientists speak of “virtual machines,” by which they mean digital systems that can understand higher-level computer languages or even human languages, when in fact computers can only execute instructions coded in binary machine language. They also speak of “virtual memory” to refer to data that is stored in external devices but whose contents can be transferred to the computer’s central processing unit, so that from the user’s point of view, this data behaves as if it were part of the computer’s active memory. The popular association of the term “virtual” with digital technology is mostly due to the notion of virtual reality (VR), a coinage proposed by computer scientist Jaron Lanier in 1989 “as an umbrella term to describe the many simulation projects under development during the 1980s (virtual worlds, virtual cockpits, virtual workstations, virtual environments)” (Hillis 2014, p. 512).

Throughout the 1990s, starting with the First Conference on Cyberspace in 1990 (papers published in Benedikt 1991), VR was celebrated as the ultimate application of computing power, an application that would revolutionize our lives in the coming millennium by producing a new world, inhabited by a new form of humanity—the widely theorized posthuman (Heim 2014, p. 117). But as the year 2000 came and went without fulfilling these promises, however vague they were, the media presence of VR dramatically declined. Nowadays, the potentially life-changing power of digital technology is more frequently associated with social networks than with VR, despite a slight shift of interest, following the introduction of relatively cheap and lightweight HMDs (head-mounted displays), allowing three-dimensional visualization of simulated environments.

A concise way of defining VR is as an “immersive, interactive experience generated by a computer” (Pimentel and Texeira 1993, p. 11). VR has also been associated with the creation of user-friendly interfaces that replace the clumsy encoding of instructions with natural, instinctive modes of interaction that lead to “the disappearance of the computer” (Pimentel and Texeira, 1993, chapter 2). According to philosopher Michael Heim, writing in 1993, VR is characterized by the following features (my glosses). (1) Simulation: VR uses computer graphics to create an environment, or world that gives the illusion of reality. This environment may either imitate the behavior of a real-world system, or be created by the imagination. (2) Interaction: users are able to manipulate simulated objects and to change the total environment. They should do so, ideally, through the same repertoire of actions they use when dealing with the corresponding real-world situations. (3) Artificiality: the simulated world is constructed by code and not naturally given, like the real world. It has no material existence. (4) Telepresence: objects located elsewhere in the real world are made present through their images. The sense of presence of objects is intensified through three-dimensional representation. (5) Full-body participation: interaction is not restricted to the hands, as it is in the normal use of computers, and users experience the simulated world through many senses. The display surrounds them, rather than being restricted to a computer screen. (6) Networked communication: VR systems establish contact between distant users, placing them all in the same simulated environment. A successful application of these features should lead to the next. (7) Immersion: users experience themselves as physically located within the simulated world, and they are mentally caught up in the activities

afforded by this world. Some of these features support the fake interpretation of virtuality (1, 3, 4) while others illustrate the virtual as force and potential (2, 5, 6). Feature (7) represents the conjunction of both interpretations.

Applications that implement all of these conditions may be rare, but many important uses of digital technology rely on several of these subsets. For instance, using Skype for visual phone calls involves 2, 4, and 6, and may result in 7. Interactive art installations that track the movements of the user implement 1, 2, 3, 5, and 7. Among commonly used applications, the most complete realization of these features may be the online game worlds and play spaces, such as *World of Warcraft* and *Second Life*, where people interact as avatars. These virtual worlds involve 1, 2, 3, 4 (if one regards the simulated presence of other players through their avatars as a form of telepresence), 6, and 7, lacking only 5, that is, full-body participation. This last feature will perhaps be implemented when the new HMDs make it possible to create fully surrounding environments in which users will move using their legs, and grab objects using their hands rather than manipulating keyboards and joysticks.

If we associate virtuality with pretense and make-believe, that is, with that which does not count, then digital technology allows intriguing interrelations between the virtual and the real, where events do indeed count (CF. KEYWORD PLAY). Virtual environments such as flight simulators have long been used to develop skills applicable in the real world, thanks to the design principle that asks for natural interfaces. *Second Life* is used to conduct business relevant to the real world, such as education. Another phenomenon that spills out from virtual worlds into the real world is the development of virtual economies (Castronova 2005). Objects manufactured in virtual worlds, though immaterial and inseparable from their environment, can have value in the real world and be sold for real-world money. It is therefore possible to create genuine capital while working in virtual worlds, for instance by taking avatars through the levels of a game and selling them to players, who want to start with a more powerful character. While philosophy tells us that the real is one of the many potential actualizations of the virtual, digital technology demonstrates that what happens in a seemingly secluded virtual world can affect the real world.

As an example of the relevance of the concept of virtuality beyond digital culture, I propose to turn to narrative theory. This relevance encompasses both the virtual as the non-real and the virtual as the non-, or not-yet actual. The virtual/real opposition provides a basis for an approach

to the notion of fictionality (CF. KEYWORD FICTIONALITY). An informal characterization of fictional narrative, whether it takes the form of verbal narration, theater performance, film, or video game, stresses the invented, unreal character of the world being described, even though this world can overlap in many ways with the real world (for instance, by presenting characters who are based on "real" people). But a characteristic of fiction is that it implicitly denies the invented nature of its reference world (except in metafictional comments). Fiction therefore invites its audience to perform an act of make-believe, by which it is taken as that which it is not, namely as a true report of facts, just as the virtual image of the mirror is taken as the reflected object itself, even though the spectator knows that it is just a reflection.

Meanwhile, the interpretation of the virtual as potential underlies Aristotle's characterization of the task of the poet, as opposed to the task of the historian: "The function of the poet is not to say what has happened, but to say the kind of things that would happen, i.e. what is possible in accordance with probability and necessity" (1996, 16). If we interpret the possible as what could happen given the laws that govern the real world, this formula restricts poetic creativity to the construction of realistic, verisimilar worlds; but if we give a broader interpretation to possibility, then the poet is free to create any kind of world that could have existed, including the worlds of the fantastic and of science-fiction.

Another application of the virtual as potential to the study of narrative lies in the study of the directions that at some point could have been taken by the plot, but were ultimately left unactualized. A story is not just a sequence of events that happen in the storyworld, it is a path that traverses many forking points, at which different paths open themselves to the characters. Their decisions and their actions cannot be properly understood without taking into consideration the choices that have been rejected. Two types of narrative virtuality should be distinguished: the still possible, which leads from the moment under consideration into the future, and the counterfactual, which corresponds to choices that were open in the past but missed their chances of actualization. Experiencing narrative in its dynamic development means watching the possible turn into either the factual or the counterfactual, as the plot moves along its timeline, and constructing the ranges of possibilities that open themselves after every important event. This monitoring of the virtual is responsible for some of the most fundamental narrative effects, such as suspense and curiosity.

What qualifies a term as ancient as the virtual as a key term of critical futures? Throughout its long history, the empty shell of this signifier has received a bewildering diversity of contents. The ability of the word to inspire new meanings and interpretations embodies the potentiality inherent to the virtual, the force that enables it to actualize itself in multiple ways. Of the future we may expect one thing: technology will accelerate its rate of change. No concept is better suited than the virtual to capture this acceleration.

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