

Developing Methodology and Applications for Virtual Reality in the Humanities



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Abstract: This paper summarizes the research agenda and work in progress in the project “The Humanities in Virtual Reality (HumaniVR)”. It discusses how disciplines such as linguistics, sociology and anthropology can benefit from research on Virtual Reality (VR) as a new space of social interaction, communication, and culture, particularly concerning its role as a new social medium of growing importance (Social VR). It summarizes the first research results of the experimental work in HumaniVR, and future directions.

Keywords: Virtual Reality, Social Virtual Reality, communication, methodology, linguistics, sociology, anthropology, cognitive science

1. Introduction and Working Hypotheses

Since the last decade, the consumer electronics industry has been working intensively on producing and marketing hardware and software for the immersion in Virtual Reality (VR). Since 2016, consumer-grade head-mounted displays (HMDs) are available to the broad public. As they advance technologically, become less cumbersome and more affordable over the years, the medium increases its reach beyond a – theretofore – small circle of ‘early adopters’ in the videogaming sector and IT-related businesses. One of the current trends is the development of Social Virtual Reality (SVR), i.e. applications that function at the intersection of games and social media and create opportunities for interaction and communication, work in teams, cooperative gaming and learning in virtual environments (VEs). Just as the internet developed into the lead medium once social networks provided low-threshold interactivity to lay users, SVR may develop into a widely accepted technology

when it provides opportunities for casual communication and interaction among friends and colleagues (Maloney & Freeman 2020).

SVR will have the potential to reform interactions in tele-co-present digital environments (Zhao 2003) and become a tool for intersocial and intercultural learning in digital settings, simulating social and quasi-physical closeness despite geographical distance. The research project “The Humanities in Virtual Reality” (Senkbeil 2021b) works on the basis of these observations and has formulated three working hypotheses as its research agenda. Firstly:

I. The development of Social Virtual Reality as a new space of social practice deserves the critical attention not only of computer specialists and researchers of human-computer-interactions, but needs to be accompanied by critical research and constructive feedback from the humanities and social sciences.

Research since the 1990s has shown that VR as a technology produces a unique sensation (as opposed to almost all other digital media): the *sense of presence*, i.e. the “feeling of really being there” (Lombard & Ditton 2006), in the VE. Meanwhile, developers of SVR and even users themselves can create ‘worlds’ (VEs), which obey other laws of temporal, spatial and physical interaction. Through multimodal sensors and controllers, head-, hand-, body- and face-trackers, these VEs become ‘visceral’, i.e. participating in a VE is a bodily just as it is a digital and communicative experience. The “autopoietic body” (Maturana & Varela 1992) and its physical environment are transcended and augmented by “allopoietic bodies”: avatars (Ziemke & Sharkey 2001; Zlatev 2013).

When we meet other people and their ‘quasi-bodies’ in that VE, it becomes a genuinely social space, which opens new modes of linguistic, cultural and social experiences and potentially learning. Still, all users and developers bring their real-life dispositions, perspectives and opinions with them when they enter the VE. As a result, we must regard SVR as a “hybrid space” (cf. de Souza e Silva 2006; Saker & Frith

2020), in which common social and cultural patterns are augmented by the affordances of virtuality, which may transgress back into real space and everyday life: we are currently observing a culture-VR-bias, and potentially a VR-culture-bias down the road.

To tackle these observations theoretically and empirically, we will need fresh perspectives on the established methodologies in the humanities and social sciences: developing new modes of data collection on the one hand, but also re-thinking some of the axioms that have informed our methods in the past. The second working hypothesis hence is:

II. Established methods in communication studies, linguistics, sociology, and anthropology may need to be adapted to understand social and communicative interaction in VR. For future research, theories and methodologies may need to be restructured and adapted for this new medium.

Current research in the project HumaniVR explores this hypothesis in three main strands. While they often intersect during practical research, they are divided into three chapters in this paper: developing methods (chapter 2), developing theory (ch. 3), and data collection (ch. 4). Potentials for using these ideas in practical applications, in the sense of ‘applied humanities’, will be discussed in chapter 5, in accordance with the final working hypothesis:

III. Virtual Reality is in the process of becoming a significant space for education: learning sciences, languages, and intercultural learning, to name only a few of the many possibilities. This includes situations of autonomous learning, i.e. self-directed education outside of traditional institutions. To fully exploit the opportunities of (S)VR for pedagogy and didactics, developers and teachers will need adequate methodological know-how, which needs to be systematically developed.

2 Developing Methods

Interacting in and with VR demands various skills and competencies of its users (technological, communicative, social), so an empirical program to study this multimodal interaction in depth will also need to think beyond disciplinary boundaries. With no claim to completeness, our studies have applied and are applying methodological tools from three main sources: pragmalinguistics to study verbal interactions in SVR (chapter 2.1), cognitive semantics to pay attention to the combination of verbal and non-verbal communicative cues in avatar-based embodied communication (ch. 2.2), and an anthropological/cultural-studies-based approach to discourse in the Foucauldian sense to reflect on cultural biases and mixing processes, among other things (ch. 2.3).

2.1 Adapting pragmalinguistic tools for analyses of conversations in SVR

Immersion in a VE through a state-of-the-art HMD includes built-in headphones and microphones to verbally interact, head-tracking and – in the newest products – hand- and finger-tracking, translating natural movements of the users into the avatar-based virtual situation. In other words, VEs produce an opportunity for rather classic co-present verbal conversations between people. As of today, this communication is impoverished on several levels compared to conversations in real life (IRL), e.g. concerning facial expressions, tracking and mapping the exact posture and body language etc., but it is also enriched on several other levels, e.g. status bars, text chat and ‘emotion clouds’ floating over/by the avatars. As SVR environments often include unusual spatio-temporal ground rules (e.g. the ability to teleport, to fly, to appear and disappear at will, to block/mute others), the language that users need to describe space, time, motion, identity, presence and absence (among others) must adapt, and is adapting to the circumstances. Accordingly, the analytical categories to describe such virtual co-present communication need to be adapted and re-thought as well. This includes data collection and corpus generation (see chapter 4), but also linguists’ tools to transcribe authentic

conversations. The following sub-chapters discuss these issues with an eye on the relevant linguistic sub-disciplines conversations analysis (ch. 2.2.1), functional pragmatics (ch. 2.2.2), and gesture studies (ch. 2.2.3).

2.1.1. Conversation Analysis

Since the 1970s, the so-called ethnomethodological conversation analysis (CA, see Clayman & Gill 2014, Gülich et al. 2008) is an established method to study authentic conversations, which are defined as topic-oriented linguistic interactions between at least two interlocutors, with an eye on their social relations. CA analyzes the organizational structure of conversations, the interpretational competencies of speakers and listeners, and joint meaning-making.

Generally speaking, CA should work well for conversations in SVR. Empirical work will reveal whether established modes of turn-taking, assigning social roles, and common conversation phases (Gülich et al. 2008) function similarly or differently in SVR as opposed to the default case, conversations in physical co-presence. Interestingly, classic CA postulated that communication while acting (working, handling objects, etc.) was not a ‘natural’ conversation in the default sense (Dittmann 1979) when speakers/hearers first and foremost pay attention to non-verbal issues and activities. When people meet in VR to chat with others, they necessarily act and interact with a computer interface (today mostly in the form of hand-held controllers) at the same time. This does not mean, however, that they cannot pay full attention to the conversation, and multimodally handle the many visual and textual cues that appear in tandem with their verbal exchange. Instead, we have observed how this simultaneity of human-machine-interaction and verbal ‘human-human-interaction’ can, in fact, appear very ‘natural’ indeed to experienced SVR users. In this light, dichotomies such as “natural vs. computer-mediated” or “co-present vs. telecommunicating” need to be reevaluated, not only in CA. It stands to argue that SVR produces hybrid forms of “tele-co-present” interaction (Zhao 2003), just as other digital

formats have done before (de Souza e Silva 2006, Licoppe 2015).

2.1.2 Functional Pragmatics

Approximately at the same time as CA, Functional Pragmatics (FP) developed in continental Europe as an alternative approach to the pragmalinguistic analysis of spoken discourse and written texts. As opposed to CA, FP focuses on the concrete purposes of subsequent communicative acts in authentic interactions, drawing on and extending classic Speech Act Theory. FP treats linguistic utterances as results of mentally formed necessities to act and interact interpersonally (Ehlich 1996). Per default, FP holds that interlocutors must be situated in a common space of action and meaning, which is constituted and updated in and through continued communication (Rehbein 2001). “Space” must be understood both geographically and metaphorically in that sense: in mediated contexts – also, for example, in written texts, in which the production and reception of the linguistic act are temporally, often also spatially removed from each other – the shared space for understanding is a mental product of communication itself (Ehlich 1996). This observation invites interesting thoughts and connections to be made between theory and research practice in SVR: constructing meaning in a temporarily shared, more or less ‘metaphorical’ space is, obviously, an issue in SVR.

FP draws on Bühler’s language-philosophical work (1934/2011) about the role of the speaking subject in the generation of meaning through language. He demonstrated how a small, but not insignificant number of linguistic expressions gather their meaning relative to the subject using them, a phenomenon known as *deixis*. Language users speak from a so-called *origo*, the center of any speaker’s worldview, combining personal, temporal and spatial coordinates: “I-Now-Here“. Ehlich (1978) demonstrated that deixis organizes the shared space of experience based on the *origo*, and that deictic terms help speakers direct and re-focus the attention of their listeners in that space. Interlocutors continuously – and effortlessly –

synchronize their mutual deictic coordinates to develop their shared knowledge and continue their interaction. The ‘pointing’ function of deixis (directing the listener’s attention) may, in co-present conversations, be accompanied by actual pointing gestures, while in texts without physical co-presence, embodied ‘pointing’ needs to be compensated through text-organizational routines (Kameyama 2009), leading to cohesion and coherence, among other things. For digital media before VR – i.e. various forms of multimodal telecommunication – research has shown how technology bridges geographical distance to facilitate communication, but also how it leads to new communicative problems, such as origo discrepancies, or ambivalence based on multiple addressees (Schlickau 2009). Language users are, however, rather apt and quick at solving these problems actively and creatively.

In SVR, interlocutors are co-present in a shared virtual space, and they can/must/want to solve common tasks communicatively, which mirrors the genuinely social and interactional character of conversations IRL, which FP has been analyzing so far. Moreover, VR as a medium opens unusual opportunities for action and interaction, while some of the common systems of orientation in shared spaces of meaning-making may be out of use, at least temporarily. Users need new communicative solutions to realize their communicative goals, particularly when it comes to the (apparently simple) linguistic pointing at people and objects. To name a simple example: the local deictic term *here*, uttered in VR, may relate to the physical space IRL of the speaker, or to a virtual space at or close by the speaker’s avatar. Interlocutors in SVR must cope with the problem of the ‘doubled origo’ (doubled “I-Here-Now”), and quickly. We have studied this “VR-deixis-problem” in more detail in Senkbeil et al. (2020).

In other words: both CA and FP provide methodological frameworks and analytical categories which have been proven and tested in many studies. Without intending to fully re-invent or ‘revolutionize’ these frameworks, the study of interpersonal communication in SVR

may reveal the necessity to update and reform some of them, particularly with an eye on the growing amount of highly immersive forms of digitally mediated tele-co-present interactions, which may become the norm rather than the exception at some point in the 21st century.

Moreover, well-established and globally successful systems of spoken language transcriptions (GAT, HIAT, and the relevant software *EXMARaLDA*, *FOLKER*, *Praat* etc.), which enable researches to document, code, analyze, and archive large corpora of linguistic data, may benefit from the possibility to record and embed the relevant video data rather effortlessly, embedding it into the linguistic dataset. For an extensive analysis of communicative interactions in SVR – beyond verbal utterances – these programs will need to be extended and updated (see also chapter 4 on data collection). For multimodal analyses, multi-level annotations and coding will be necessary. *HumaniVR* intends to develop the foundation for such an extended methodological toolbox.

2.1.3 Gesture Studies

Gesture Studies represent a branch of communication analysis that posits the combination of bodily and manual movements during verbal face-to-face communication at the center of attention (Müller et al. 2014). It is theoretically and methodologically situated at the intersection of pragmatics (see above, ch. 2.1.1) and the cognitive sciences (see below, ch. 2.2), and employs analytical methods from both fields (Cienki & Müller 2008). The rapid growth of technologies using body-part tracking, Augmented and Virtual Reality has spawned interesting research on multimodal human-machine-interaction with and through gestures (e.g. Bressemer 2017).

Controlling the hands, arms, and fingers of an avatar (and in the future potentially also legs, torso, and facial expressions), provides a remarkable breadth and depth of possible gestures already. Still, mediation from the autopoietic to the allopoietic body clearly limits (and will continue to limit) the possibilities of ‘natural’ body language in a VE. A full-blown

methodology to transfer the methods of gesture studies into fully virtual environments is yet to be formulated. Senkbeil (2021c) has discussed first observations on how to proceed from here.

2.2 Applying methods of cognitive semantics to VR

In the cognitive sciences, there is an extensive library on *space* as the key to human perception of and interaction with the world: space and body, space and language, space and logical thought, etc (e.g. Evans & Chilton 2010). Cognitive linguistics – as the branch most interested in communication – uses several axiomatic hypotheses with much relevance to our theorizing of VR as a social space, e.g. *embodiment*, the dynamics of *symbol* and *grounding*, and cognitive *blending*, to name only a few (Langacker 2008, Fauconnier & Turner 2003). It needs to be examined whether these foundations will retain their axiomatic character, considering the unique characteristics of virtual spaces.

Cognitive linguistics considers three-dimensional space, in combination with the laws of physics – constant unidirectional gravity, force dynamism, motion under the constraints of momentum conservation, unidirectional and unalterable time progression – as cornerstones of our cognitive and linguistic development since very early childhood. Space and “the embodied mind” (Lakoff & Johnson 2010) are hence central elements of linguistic phylo- and ontogenesis. Their impact on linguistic systems is well-documented, e.g. image schemas, primary metaphors, prepositional systems, and grammatical structures (e.g. the tenses, see Langacker 2008). Moreover, human languages conventionally blend descriptions of time and space, which strongly shapes our perception of the world (Lakoff & Johnson 2010).

These fundamentals of language development are directly dependent on bodily experiences, it is therefore often postulated that they should be independent from the cultural background of an individual. Cognitive linguistic studies on interlingual and intercultural differences of, for example, embodied metaphors and related grammatical structures exist plentifully, but they

usually argue that differences on the linguistic surface can be traced back to the same cognitive-conceptual processes in the human body and brain – which are objectively very similar around the globe. Senkbeil (2017) for example has shown that using space metaphors, even complex ones, is surprisingly unproblematic for multilingual intercultural understanding.

The term *embodiment* – a staple of cognitive linguistics, as mentioned – has acquired a key role in research beyond the cognitive sciences, e.g. in anthropological and pragmalinguistic studies (u. a. Glenberg & Kaschak 2002, Lindblom & Ziemke 2007, Senkbeil et al. 2020, Ahlers & Fink 2017, Ahlers & Siebert 2020). They have in common that they imply that people communicating IRL cannot ‘leave their bodies behind’, except in mental simulations, i.e. thinking and speaking about ‘fantastic’, fictional scenarios (Barsalou 1999, 2016), so that the human mind remains constantly and unchangeably embodied. This, of course, does not change in VR, but some of the physical laws of nature that we experience as eternal and omnipresent IRL, and which have coined much of the semantic structures in our natural languages (cf. Kuteva et al. 2019, Barsalou 2008, de Vega 2008), are not necessarily in place in a VE. Creators of VEs (and thus researchers) can ‘switch off’ some of the embodiment-based circumstances, which enables us to experimentally observe what this entails for authentic communication in such a situation. To name a practical example: what happens to the seemingly non-negotiable dualism ‘UP vs. DOWN’, which is omnipresent in primary metaphor systems (Lakoff & Johnson 2003), in a gravity-free space without a fixed frame of reference, when test subjects are asked to communicatively solve orientation tasks? Other dualisms, e.g. ‘proximity vs. distance’ – a highly significant dimension in deixis theory, as discussed in ch. 2.1.2 – may be redefined in experimental VR settings; what does this entail for our language use then? Studies on intercultural, multilingual, and lingua-franca-communication have repeatedly demonstrated how quickly, adaptively, and creatively speakers react to new communicative challenges

(Galantucci 2009; Galantucci et al. 2012; Scott-Phillips & Kirby 2010; Steels 2012; Vogt 2015). Is this valid for VR, when the experiment robs speakers of some of the conceptual, embodied basis of their semantic systems? If so, how do they communally create a new basis, a new *common ground* (Kecskes & Zhang 2009; Senkbeil 2021d)?

Research in SVR will help us explore, which opportunities and challenges this technology will have in stock for social media users, gamers, and digital workers of the future. More importantly for academic theorizing and methodologies, such experiments may help researchers in the cognitive sciences validate and re-evaluate some of the fundamental assumptions on the linguistic genesis, tapping into the field known as experimental semiotics (Galantucci 2009; Galantucci et al. 2012). A full theory on embodiment of the allopoietic (digital) social body does not exist yet. HumaniVR is working on a suggestion for an enactive-cognitive theory of bodies in VEs.

2.3 Discourse Analysis in the Foucauldian tradition

Discourse analysis in the Foucauldian tradition has transcended classic disciplinary boundaries and examines the social, political, and cultural contexts of communication. Discourse is defined as a social practice mirroring both societal and individual-situational distributions of power and resources. Power structures may be reproduced and reaffirmed as well as challenged and subversively undermined by communicative practices in any medium.

Sociocultural critique in that vein has examined and deconstructed the patterns of digital communication since the early internet of the 1990s and 2000s, and identified and problematized the so-called *digital divide*. The great benefits of digital media and the internet in particular have been and still are only accessible to some, most notably on the macroscopic global level – citizens of highly technologized first-world countries vs. developing countries – but also within societies, e.g. concerning dimensions such as class,

gender, and age (Mossberger 2009, van Deursen & van Dijk 2014).

Furthermore, critical cultural and media studies have observed how popular-cultural text increasingly differentiate between “culture-literate” and “culture-illiterate” audiences (Barker & Jane 2016), i.e. between groups of people with or without access to intertextual background knowledge and technological competencies. The producers of culture and media, but also technology and software, use and may in fact foster divides among societies, particularly along the lines of education and ‘purchasing power’, but also age.

The expected ‘virtual turn’ of social media, gaming, and pop culture will thus run the risk of producing digital divides as well, though not necessarily the same ones as those of the early internet. Researchers of media, culture, and society in the critical paradigm are usually invested in issues of social justice as well. Equal opportunity to use technological resources and acquire the necessary competencies will be a decisive question in the coming decades, if we intend to have (S)VR become a tool for community, democracy, and equality, rather than a divisive medium where access and power are reserved for only a few. A constructive-critical perspective on VR will need a methodological toolbox to identify and deconstruct patterns of *power* in Foucault’s sense (Foucault & Gordon 1980) and *hegemony* in a Gramscian sense (Gramsci 1972) in the ‘virtual universe’ that is going to develop.

Both qualitative and quantitative methods of discourse analysis – and a combination of both, see e.g. Senkbeil (2011) – will benefit from added components of research possibilities, e.g. exact vector-based digital measurements of motion in space, in situations where influence and power are negotiated. Formulating good-practice guidelines for these extensions of methodology in hands-on empirical work is one goal of HumaniVR in current research projects.

3. Developing theories of and for VR in the Humanities

3.1 Social constructivism and identity: gender, ethnicity, and dis_ability in VR

In cultural studies and communication-analytical methods, the poststructuralist concept of the general constructedness of identity(ies) is today widely accepted. The idea that people need to ‘work out’ their identity along common dimensions of similarity and difference (gender, ethnicity, etc), and that identity choices have a strong impact on communicative practice, becomes particularly obvious in avatar-based digital situations. At first glance, SVR drastically extends the degrees of freedom that individuals have when constructing and negotiating an identity for themselves and with others. In terms of current theories of *superdiversity*, a SVR environment should represent an ideal ‘playground’. We continue to observe moments in SVR, in which common binaries of identity IRL become unimportant, even temporarily dissolved. Interestingly, SVR is also immensely popular among people with physical disabilities (Maloney & Freeman 2020), who enjoy virtual emulations of social interactions (events, parties, sports) that they otherwise find difficult or impossible to participate in. This practical reason and ensuing choices may also feedback on the academic discourse about *dis_ability*. Simply put, the answer to the question who is “disabled” (vs. “able”) may have widely different answers in VR than IRL.

In critical sociological and anthropological research, we will need to observe which socially or individually chosen restrictions users obey, with or without intending to. For existing, non-immersive social digital environments of the early 21st century, e.g. massive multiplayer online games such as *World of Warcraft* or social networks such as *Second Life*, many studies exist on performances of gender and ethnicity (e.g. Corneliussen 2008, Monson 2012). They identified progressive as well as reactionary trends in developers’ and users’ choices of gendered body shapes and behavioral ideals (Rubenstein 2007). VR promises to become a significant field for the continued

development in digital gender studies and other social constructivist fields concerning identity.

3.2 Theories of hybridization and transculturality in VR

Since the 1990s, postcolonial theory and poststructuralism have inspired a turn to *hybridity* in cultural studies and neighboring disciplines, which focuses on the mixing and merging of cultural practices (Bhabha 1996; 2004). Also, theories on *transculturality* (Welsch 1999) put liminal practices, in which culture transcends traditional boundaries and binaries, at the center of attention. At the same time, critical voices object that a fair share of utopian idealism and wishful thinking has inspired parts of those theories, because authentic culture contact always occurs in contexts of institutional, economic, and sociopolitical constraints and necessities, strongly inhibiting ‘innocent’ hybridity and transcultural identities (Rathje 2009). For example, the “third space” in postcolonial theory (Bhabha 1996), defined as a newly created space in which the dynamics of hybridizing practices and identities may develop freely and creatively, remains a utopian ideal, hardly ever observable in real life.

VEs can, in principle, be designed freely and unrestrictedly. It stands to argue that VEs thus open possibilities for inter- and transcultural contact in a space that is relatively free of societal and institutional norms and constraints. As opposed to most other intercultural encounters, which take place in a cultural space that is ‘foreign’ to one interlocutor, and rather more familiar (‘home’) to another one, VEs may initially be ‘foreign’ and ‘home’ to the exact same degree for users coming from different cultural backgrounds, and invite users to communally and transculturally appropriate and ‘inhabit’ this new space together. SVR thus represents an interesting testing ground for uninhibited hybridizing processes.

Philosophers of social and cultural spaces have remarked that since the late 20th century, social and intercultural contact IRL increasingly takes place in “non-places” (Augé 1995) and “transit spaces” (Wilhelmer 2015). This includes

airports, train stations, shopping malls, and similar places of globalized consumerism, in which members of many different cultural backgrounds and social strata meet, but where nobody ever feels “at home”. VR is, at first glance, the “non-place” per se. Critics of postmodernity have been more than latently pessimistic in their analyses of “non-places”: as these spaces lack historicity and identity, they claim, they only provide the perfect environment for consumption, but allow only for very shallow human interactions (Augé 1995). They feel interchangeable, and “lonely” to those passing through them. It needs to be addressed in theory and in empirical studies, in how far this pessimism pertains to spaces in VR as well. As we – as researchers – quite consciously develop “non-spaces” for experimental intersocial and intercultural collaborations, we continue to observe how VR users co-construct meaning to (at least temporarily) appropriate and structure non-spaces for their purposes.

4. Collecting and analyzing VR data: towards a VR corpus for the Humanities

As of 2021, no VR research corpus open to the academic community exists. Organizing one will drastically increase the community’s capabilities for social, anthropological, linguistic, and interactional research, as the prior sections have shown. As communicative interactions in a VE are digitally coded per default, it will soon become possible to record full interactions in three dimensions, including audio, visuals, spatial, and avatar-physical activities in real time. Until today, studies of multimodal communication IRL have had to resort to mono-perspective recordings of audio and video, while future VR corpora will enable researchers not only to record, but also to re-simulate all interactions in VR, including spaces, objects, and motion. Analysts will also be able to retrospectively enter the space and the conversation via their HMD, and ‘re-embodiment’ the situation from any given perspective, even that of one of the test subjects. With the help of pupil-tracking hardware – available in the new generation of HMDs, e.g. by *HTC Vive* – gaze data during an interaction/conversation can be

fully recorded and reconstructed by vector analysis (Kassner et al. 2014). The data in VR rooms is by nature fully digitized from the outset, it only needs to be collected systematically, while in conventional processes of transcribing recorded IRL data from analog to digital, a reduction of data was always imminent.

The digital format extends the possibilities of quantitative, corpus-based approaches to authentic discourse, and it augments the capabilities of qualitative methods by adding new dimensions of experience – for both users and researchers. It stands to hope that empirical work in VR may feedback on theorizing and methodology in established approaches in analog settings. *HumanVR* critically explores the capabilities of the established analytical categories (see section 2) and common tools to collect, store and annotate verbal and non-verbal conversational data (Senkbeil 2021a). The path towards a (S)VR corpus is therefore lead by the guiding question:

Which features exactly will the VR corpus of the future need, to benefit linguistic, sociological and anthropological studies, and empower both qualitative and quantitative methodologies?

5. Applications of VR in the Humanities

Sound theories and methods for empirical research are the foundations of any form of progress and new directions in the humanities, and section 2 to 4 have explained how current research aims at producing workable models and abstractions. Still, the full potential of any new medium and technology lies in its practical application: when a growing population of users feels they benefit from its capabilities, make it part of their routine in work and/or leisure, and let it influence their behavior, speech, social life, and thus culture. So where will we observe SVR in practice in the future, beyond gaming?

Firstly, many researchers have commented on the pedagogical potential of VR, including IT- and science-related contents, but also confronting students with language, history and

culture, potentially also literature and politics, in new and meaningful ways through this new medium (Hamilton et al. 2021). Our own pilot studies have focused on language and intercultural learning, situated in the relatively new applied linguistic paradigm ‘digital-game-based language learning’ (DGBLL, see Hung et al. 2018, Ahlers & Siegert 2019, Senkbeil et al. 2020). We have monitored progress on both grammatical and pragmatic competences of learners of German as a foreign language in interlingual tandems in SVR (Senkbeil et al. 2020.). To name an example, the immersive character of SVR as a quasi-real three-dimensional space of interaction provokes the in-depth acquisition and application of polysemic local deictic terms such as *hier* and *da* (German for *here* and *there*), as well as vocabulary denoting directions and prepositions. As tandem partners direct each other’s attention and movement along a path (namely: through a VR maze) with the use of this terminology, they learn the semantic and pragmatic affordances of these terms in a much more direct, visceral, and motivating way than in traditional settings (ibid.), e.g. with textbooks, in which giving directions in a fictional setting is a standard – but often rather dull – exercise.

Secondly, learning with SVR entails the possibility to learn outside of traditional institutions. Once HMDs are affordable for young people to own and use them regularly, this will enable them to virtually travel to hundreds of interesting places, meet and interact multilingually and interculturally in authentic, immersive situations, while standing or seated in their living rooms. Autonomous digital learning has been a buzzword for the future of pedagogy not only during the corona pandemic. SVR may become a key tool in future developments in that matter.

Thirdly, work will be influenced by VR and SVR in ways that are difficult to fully predict yet. So far, VR has become implemented in traditionally ‘IT-friendly’ sectors of the economy. For obvious reasons, companies in which the modeling, viewing, and engineering of complex objects in 3D is a key issue have experimented with immersive technology that

can emulate an object’s three-dimensionality before it is built IRL. More importantly for social and cultural life (particularly work life) in the future, SVR may also boost a development that digital sociology has observed since the beginning of the century: “connected presence” (Licoppe 2004; 2015). Digital technology has already enabled professionals to communicate simultaneously via multiple channels and modes, with multiple interlocutors who may or may not be physically co-present, but ‘tele-co-present’. People in decision-making positions increasingly divide their attention between multiple activities and multiple communicative spaces (on- and offline). Work thus becomes a “polymorphous” and constantly changing flow of activities, multilayered communication, and instances of media use (ibid.) – as opposed to normative perception of modernity that effective work was necessarily tied to single-minded and fully focused engagement with one task or issue. SVR fosters and extends “connected presence” in decisive dimensions: it creates opportunities for the experience of co-presence in situations of geographic distance, without eliminating physical space as a frame of reference, nor opportunities for offline communication and action (Senkbeil 2021a). The work space thus becomes a “hybrid space” (de Souza e Silva 2006) of digital and analog interactions, and the “connected presence” (Licoppe 2015) of professionals becomes “hybrid presence” (Senkbeil 2021a) in more than one interactional space. Sociologists have observed how veteran users of digital “presence technology” (Zhao 2003) already exploit its capabilities with a “certain degree of virtuosity” (Licoppe 2015); now empirical work needs to examine if this will hold true for future professionals using SVR.

6. Conclusion

It is the task of the humanities to accompany the development and spread of new technologies and media – here: Social Virtual Reality – with a benevolent, yet critical eye on how it influences our life-world, social interactions, and thus culture and society. Research within the framework of HumaniVR aims at providing interdisciplinary perspectives on VR,

particularly SVR, to a) continue to develop theories of human interaction in digital spaces, to b) rethink common methodologies of academic inquiry into (digitized) communication, culture, and social interaction

and to c) develop prototypical ideas for the application of this technology in practical contexts, when people use it to work, play, learn, and socialize.

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