The role of expectations in the believability of mediated interactions
Abstract

Elena Pasquinelli
Institut Nicod – EHESS
Elena.Pasquinelli@ehess.fr

The notion of believability in mediated conditions can be characterized as *a judgment regarding the plausibility of a certain mediated experience, the judgment being positive when the experience respects the expectations of the subject which are activated by the contents and context of the experience itself*. When we consider a certain experience as believable in fact we do not necessarily consider the experience as being true, in the sense of being an experience with real, existing objects. Neither we consider that experience as being susceptible of becoming true, for instance in the future.

Since no problem of existence is at stake, then the adherence of the experience with the experienced reality cannot be a criterion for believability: when we consider a certain experience as believable we just accept it as *plausible under certain conditions*. Since the subject cannot compare his experience with reality, then he might compare his experience with his *expectations*. Expectations are in fact always present when we have an experience at the cognitive, perceptual or motor level. The fact that we normally hold a certain number of expectations is testified by the fact that we react with surprise when faced with certain, unexpected events. Surprise is in fact an effect of unfulfilled expectations (Casati & Pasquinelli, Submitted; Davidson, 2004; Dennett, 2001).

Different types of expectations

In virtue of the role played by expectations in believability, it seems to be important for VR designers to identify the expectations held by the users. In considering the conditions that are relevant for the judgment of believability, we must then take into account the existence of different kinds of knowledge ad relative expectations.

In certain conditions, for instance, the VR experience involves scientific knowledge, as it can be the case for training and simulation for medical applications. Another type of knowledge which certainly seems to be involved in most applications is the so-called *commonsense knowledge*. Two types of commonsense knowledge can be described: Commonsense knowledge of the type of naïve, qualitative or folk physics makes reference to the aspect of the world as most of the people think about it, rather than to the world as physicists think about it. This form of commonsense knowledge is expressed by beliefs (eventually by theories) and generates explicit expectations, as it is the case for scientific knowledge; contrarily to scientific knowledge it is not necessarily correct or justified. The second type of commonsense knowledge is a very general form of knowledge generating a wide set of expectations. These expectations do not make reference to some form of belief or theory but are based on the existence of connections between perceptual experiences or between motor actions and perceptual experiences. Selection and learning from experience are at the origin of this kind of knowledge and relative expectations (see Stein & Meredith, 1993). As expressed by the label "commonsense" the previous type of knowledge is largely shared by human beings. But any human being can acquire new knowledge through local experiences, study, and practice. Local knowledge depends on a more local context than commonsense knowledge and it is not necessarily widely shared. Additionally, three types of knowledge can be distinguished, according to the type of learning through which they are acquired: symbolic, iconic and enactive knowledge. Time for the acquisition of new knowledge varies with the type of activity but it is plausible that the acquisition of new perceptual and motor connections and the eventual modification of early acquired and shared connections will require more time for taking place, if even it can possibly take place. It

seems possible, in any case, that suitable training plays an effect in producing new connections as those described in the second form of commonsense knowledge, thank to the existence of neural plasticity (see Bach-y-Rita, 1982; Benedetti, 1991). Finally, the interaction with the virtual world can be the occasion for the user to acquire new symbolic, iconic and enactive knowledge, and, through suitable training, to develop new perceptual and motor connections, hence to give rise to a large set of new expectations. It is important to understand which are the most suitable instruments for producing new learning acquisition at different levels when this is desirable and how to exploit the different acquisitions, for instance in order to supply to VR systems limitations.

Activated and deactivated expectations in VR

The case of the experience with fictional, virtual and artificial worlds is a special one. As a matter of fact only certain expectations are in cause in these kinds of mediated experiences. Other expectations are necessarily deactivated. The judgment of believability, then, does not depend on expectations in general but on some specific expectations that are activated by the context and the contents of the experience. In the context of the interaction with virtual worlds mediated by enactive interfaces expectations can be activated and deactivated at three levels: narrative, perceptual and motor-perceptual or interactive. Implicit knowledge and related implicit expectations based on the possibilities of action, on the rules of perception and on motor-perceptual connections are then particularly relevant for the experience with enactive interfaces.

The deactivation of expectations is connected to the notion of suspension of disbelief. Two different questions arise that have a theoretical interest for the understanding of cognition and a pragmatic interest for VR designers: Which are the factors that influence the suspension of disbelief, that is, the deactivation of certain expectations? Which expectations can be suspended? It is plausible that certain expectations will be more reluctant to de-activation than others. It is plausible that commonsense knowledge will produce expectations that are more stable than those produced by local acquisitions and that perceptual and motor connection will give rise to expectations that are more stable than expectations based on certain beliefs.

The other aspect of the triggering of believability consists in the respect of the expectations that are activated. This aspect presents two conditions: the possibility of activating certain expectations and the coherence between the experience proposed and the expectations that are activated. As for the suspension of disbelief, the first question entails the theoretical and pragmatic problem of which expectations can be activated and how. The context and content of the experience seem to play an important role both in the activation and de-activation of expectations. A study on volatile expectations (that is, on expectations that are activated in special conditions but do not need to be present all the time in the mind of the subject) in non-mediated experiences suggests that the subject's intention to act might be another activating factor for expectations because the intention to act retrieves expectations that are relevant for the task (Casati & Pasquinelli, Forthcoming).

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