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6 Transformative Experience Design

Abstract: Until now, information and communication technologies have been mostly conceived as a mean to support human activities – communication, productivity, leisure. However, as the sophistication of digital tools increases, researchers are starting to consider their potential role in supporting the fullfilment of higher human needs, such as self-actualization and self-transcendence. In this chapter, I introduce Transformative Experience Design (TED), a conceptual framework for exploring how next-generation interactive technologies might be used to support long-lasting changes in the self-world. At the center of this framework is the elicitation of transformative experiences, which are experiences designed to facilitate an epistemic expansion through the (controlled) alteration of sensorial, perceptual, cognitive and affective processes.

Keywords: Transformative Experience, Complex Systems, Virtual Reality, Neuroscience, Art

6.1 Introduction

I have experienced several transformative moments in my life. The first that comes to my mind occurred when I was as young adolescent, as I watched the movie "Dead Poets Society". Another transformative moment occurred when I was in my twenties, as I first surfed the web using the then-popular Netscape Navigator browser. In both circumstances, I felt that I was discovering new truths about myself and new purpose in life. These experiences deeply affected my perspective on the world, changing my values and beliefs. Simply put, after these experiences I was not the same person I had been before. Retrospectively, I can say that without these milestone experiences, I would probably not be the person I am today.

How do transformative experiences occur? Do they play a role in our personal development? And if they do, can we design technologies that support them?

Throughout time and across cultures, human beings have developed a number of transformative practices to support personal growth. These include, for example, meditation, hypnosis, and several techniques to induce altered states of consciousness (Tart, 1972). However, other media such as plays, storytelling, imagery, music, films and paintings can also be regarded as possibile means to elicit transformative experiences (Gaylinn, 2005).

In the rest of this chapter, I will introduce Transformative Experience Design (TED) as a new conceptual framework for the design of self-actualization experiences. In the theoretical introduction, I draw on the existing literature to argue three key

theses that are central to the development of TED. First, a transformative experience is a sudden and profound change in the self-world, which has peculiar phenomenological features that distinguish it from linear and gradual psychological change. Second, a transformative experience has an epistemic dimension and a personal dimension: not only it changes what you know, it also changes how you experience being yourself. Third, a transformative experience can be modelled as an emergent phenomenon that results from complex self-organization dynamics. In the methodological section that follows, I build up on these conceptual pillars to explore possible principles and ways in which transformative experiences may be invited or elicited combining interactive technologies, cognitive neuroscience and art.

6.2 Transformation is Different From Gradual Change

Most experiences of everyday life are mundane and tend to be repeated over time. However, in addition to these ordinary moments, there exists a special category of experiences – transformative experiences – which can result in profound and longlasting restructuration of our worldview (Miller & C'de Baca, 2001). The characteristics of these experiences, which can take the form of an epiphany or a sudden insight, are reported to be remarkably consistent across cultures. Their phenomenological profile often encompasses a perception of truth, a synthesis of conflicting ideas and emotions, and a new sense of order and beauty. A further distinguishing feature of a transformative experience is a perception of discontinuity between the present and the past self, in terms of beliefs, character, identity, and interpersonal relationships. By virtue of this radical transformation of the self-world, the individual can find new meaning in life, turning his view in a totally new direction. Despite the abundance of historical, anthropological and psychological evidence of the occurrence of transformative experiences across cultures, these moments represent one of the least understood mechanism of human change (C'De Baca & Wilbourne, 2004).

William James pioneered the exploration of transformative experience while examining the phenomenon of religious conversions. In his work *The Varieties of Religious Experience* (James, 1902), he distinguished two types of conversions: a volitional type, in which "the regenerative change is usually gradual, and consists in the building up, piece by piece, of a new set of moral and spiritual habits" (p. 189), and a self-surrender type, unconscious and involuntary, in which "the subconscious effects are more abundant and often startling" (p. 191). According to James, the self-surrender type is characterized by an intense struggle toward an aspiration that is perceived as true and right, as well as a resistance to its actualization; this struggle is eventually resolved when the person "surrenders" (i.e., stop resisting).

Abraham Maslow introduced the term "peak experience" to describe a moment of elevated inspiration and enhanced well-being (Maslow, 1954). According to Maslow, a peak experience can permanently affect one's attitude toward life, even if it never

happens again. However, differently from James, Maslow noted that peak experiences are not necessarily mystical or religious in the supernaturalistic sense. To investigate the characteristics of peak experiences, Maslow examined personal interviews, personal reports and surveys of mystical, religious and artistic literature (Maslow, 1964). This analysis generated a list of characterizing features of peak experiences, including disorientation in space and time; ego transcendence and self-forgetfulness; a perception that the world is good, beautiful, and desirable; feeling passive, receptive, and humble; a sense that polarities and dichotomies have been transcended or resolved; and feelings of being lucky, fortunate, or graced. After a peak experience, the individual may have enjoy several beneficial effects, including a more positive view of the self, other people, and the world, as well as renewed meaning in life. Maslow contended that peak experiences are perceived as a state of great value and significance for the life of the individual and play a chief role in the self-actualization process. According to Maslow, self-actualization refers to "the desire for self-fulfillment" or "the desire to become more and more what one is, to become everything that one is capable of becoming" (1954, pp. 92–93). Maslow considered self-actualization to be the universal need for personal growth and discovery that is present throughout a person's life (Maslow, 1962b). He argued that self-actualization is the apex of the motivation hierarchy, and it can be achieved only after the lower needs – physiological, safety, love and belongingness, and esteem needs – have been reasonably satisfied (Maslow, 1962a). As he noted: "When we are well and healthy and adequately fulfilling the concept 'Human Being' then experiences of transcendence should in principle be commonplace" (p. 32). Maslow (1954) identified the following key characteristics of self-actualized individuals: accurate, unbiased perception of reality; greater acceptance of the self and the others; nonhostile sense of humor; spontaneity; task centering; autonomy; need for privacy; sympathy for humankind; intimate relationships with a few, specially loved people; democratic character structure; discrimination between means and ends; creativeness; resistance to enculturation; and peak experience. He argued that peak experiences can help people to change and grow, overcome emotional blocks, and achieve a stronger sense of identity and fulfillment. According to Maslow, peak experiences can be triggered by specific settings and activities, such as listening to music, being in nature (particularly in association with water, wild animals, sunsets, and mountains), meditation, prayer, deep relaxation, and physical accomplishment (Maslow, 1964).

A common characteristic of peak experiences is that they often involve a heightened sense of *awe*, a multifaceted emotion in which fear is blended with astonishment, admiration and wonder. Despite the fact that awe is not included as one of Eckman's basic emotions (Coghlan, Buckley, & Weaver, 2012; Ekman, 1992), this feeling has been regarded as a "foundational human experience that defines the human existence" (Schneider, 2011). In a seminal article, Keltner and Haidt (Keltner & Haidt, 2003) identified two prototypical elicitors of awe: *perceived vastness* (something that is experienced as being much larger than the self's ordinary frame of reference) and

a *need for accommodation*, defined as an "inability to assimilate an experience into current mental structures" (p. 304). Accommodation refers to the Piagetian process of adjusting cognitive schemas that cannot assimilate a new experience (Piaget & Inhelder, 1969). According to Keltner and Haidt, accomodation can be either successful, leading to an enlightening experience (associated with an expansion of one's frame of reference); or unsuccessful (when one fails to understand), leading to terrifying and upsetting feelings. Keltner and Haidt suggest that nature, supernatural experiences, and being in the presence of powerful or celebrated individuals are frequent elicitors of awe; however, human arts and artifact – such as songs, symphonies, movies, plays, paintings and architectural buildings (skyscrapers, cathedrals, etc.) are also able to induce this feeling. According to Keltner and Haidt, awe is more likely to occur in response to highly unusual or even magical or impossible objects, scenes or events, or in response to products that provide the spectator with novel ways of viewing things. Shiota, Keltner, and Mossman (Shiota, Keltner, & Mossman, 2007) found that awe is elicited by different kinds of experiences, the most common of which are experiences of natural and artistic beauty, and of exemplary or exceptional human actions or abilities. Keltner and Haidt believe that the study of awe has important scientific and societal implications, since its transformative potential can reorient individuals' lives, goals, and values. Furthermore, these authors hold that a better comprehension of how awe is induced could be of help in defininining new methods of personal change and growth (Keltner & Haidt, 2003).

The feeling of awe has often been found to be associated with sudden personal transformation, which William Miller and C' de Baca have defined as "quantum psychological change" (Miller & C'de Baca, 2001). These authors have described two types of quantum changes: insightful and mystical (Miller & C'De Baca, 1994; Miller & C'de Baca, 2001). Insightful changes are described as breakthrough of internal awareness, such as those occurring in psychotherapy. These are "a-ha" experiences in which the person comes to a new realization, a new way of thinking or understanding. Insightful transformations grow out of life experiences, in that they tend to follow personal development. In contrast, mystical quantum changes – or epiphanies – have no continuity with "ordinary" reality and are characterized by a sense of being acting upon by an outside force. The person knows immediately that something major has happened, and that life will never be the same again. According to Miller and C' de Baca, although insightful and mystical transformations are qualitatively different experiences, they both usually involve a significant alteration in how the person perceives him- or herself, others and the world.

As recent research has suggested, not only positive events but also psychological trauma and suffering may bring about genuine transformations of the individual. In particular, Tedeschi and Calhoun (Tedeschi & Calhoun, 2004) introduced the concept of Posttraumatic Growth, to refer to positive changes experienced as a result of the struggle with major life crises; such changes include the development of new

perspectives and personal growth, the perception of new opportunities or possibilities in life, changes in relationships with others, and a richer existential and spiritual life.

6.2.1 Transformative Experiences Have an Epistemic Dimension and a Personal Dimension

As we have seen, transformative experiences differ from mere psychological change; specifically, all transformations involve change, but not all changes result in transformations. A transformative experience can completely alter one's relationship with the self-world: the individual builds up a new worldview, and this new perspective supports lasting change.

In psychological terms, a worldview (also world-view) has been defined by Koltko-Rivera (Koltko-Rivera, 2004) as "a way of describing the universe and life within it, both in terms of what is and what ought to be" (p. 4). A worldview is at the heart of one's knowledge: it encompasses a collection of beliefs about the fundamental aspects of reality, which allow us to understand and interact with the physical and social world. According to Koltko-Rivera (2004, p. 5) a worldview includes three different types of beliefs: existential, evaluative, and prescriptive/proscriptive. Existential beliefs describe either entities thought to exist in the world (e.g., "There exists a God or Goddess who cares for me personally") or statements concerning the nature of what can be known or done in the world (e.g., "There is such a thing as free will"). Evaluative beliefs are judgments of human beings or actions (e.g., "Those who fight against my nation are evil"). Finally, prescriptive/proscriptive beliefs are values, intended as descriptions of preferred means or ends (e.g., "The right thing to do in life is to live in the moment"). According to Mezirow's Transformative Learning Theory, a learning experience is transformative when it causes the learner to restructure his or her perspective towards more functional frames of reference (Mezirow, 1991). As he notes: "Perspective transformation is the process of becoming critically aware of how and why our assumptions have come to constrain the way we perceive, understand, and feel about our world; changing these structures of habitual expectation to make possible a more inclusive, discriminating, and integrating perspective; and finally, making choices or otherwise acting upon these new understandings" (p. 167). In Mezirow's theory, a disorienting dilemma can help this process by inducing the learners to examine, challenge and revise his assumptions and beliefs. For Mezirow, a disorienting dilemma is ususally triggered by a life crisis or major life transition (e.g. death, ilness, separation or divorce), but it can also result from "an eyeopening discussion, book, poem, or painting or from efforts to understand a different culture with customs that contradict our own previously accepted presuppositions" (p. 168). Mezirow identified three types of reflection that can occur when we face a dilemma: content reflection, process reflection, and premise reflection. The first two are involved when we reflect on the content of an actual issue (i.e., "what are the

key issues to examine?") or on the process by which we solved a specific problem (i.e. "how did I get here?"). These areas of reflection result in the transformation of meaning schemes, which is a common, everyday occurrence. In contrast, premise reflection concerns the relevance of the problem itself (i.e. "why did this happen?") and involves a critique of the presuppositions on which our beliefs have been built. According to Mezirow, premise reflection can bring about the most significant learning, as it results in the transformation of one's meaning structure.

The philosopher Paul (Paul, 2014) argues that transformative experiences have an epistemic dimension and a personal dimension. Epistemically-transformative experiences are those that allow an individual to grasp new knowledge, which would be inaccessible to the knower until he or she has such an experience. For example, if you have never seen color, you cannot know "what it is like" to see red; similarly, if you have never heard music, you cannot know "what is like" to hear music. However, Paul points out that not all epistemic experiences hold the same transformative potential, as not all of them are able to change our self-defining preferences or worldview. In Paul's example, tasting a durian for the first time is epistemically transformative, as the taste experience of the durian is revealed to the individual and allows him or her to gain new subjective knowledge. On the other hand, it is unlikely that this new taste will radically change the individual's perspective on life. According to Paul, there is another type of experience that can really change who a person is; these are called personally transformative experiences. For example, Paul notes, the experience of having a child is not only epistemically transformative, it is also personally transformative. This experience not only provides new knowledge about what is like to have a baby but can also change a person's values, priorities, and self-conception in ways that are deep and unpredictable. For Paul, personally transformative experiences can be of various natures, such as "(experiencing) a horrific physical attack, gaining a new sensory ability, having a traumatic accident, undergoing major surgery, winning an Olympic gold medal, participating in a revolution, having a religious conversion, having a child, experiencing the death of a parent, making a major scientific discovery, or experiencing the death of a child" (p. 16). In particular, Paul notes that "If an experience changes you enough to substantially change your point of view, thus substantially revising your core preferences or revising how you experience being yourself, it is a personally transformative experience" (p. 16). Thus, according to Paul personally transformative experiences can change our worldview; that is, they can change not only *what* we know but also *how* we experience being who we are. In this sense, transformative experiences are potential sources of epistemic expansion, because they teach us something that we could not have known before having the experience, while at the same time changing us as a person. As Paul notes: "Such experiences are very important from a personal perspective, for transformative experiences can play a significant role in your life, involving options that, speaking metaphorically, function as crossroads in your path towards self-realization" (p. 17). Paul argues that transformative experiences are also philosophically important, as

they challenge our ordinary conception of major life-changing decisions as rational decisions. Rational decision-making models assume that when we choose a course of action, we try to maximize the expected value of our phenomenological preferences. However, Paul contends that, since we don't know what it will be like to have the experience until we have it, then it follows that some life-changing decisions – like whether or not to have a child – cannot be made rationally (Paul, 2015): "The trouble comes from the fact that, because having one's first child is epistemically transformative, one cannot determine the value of what it's like to have one's own child before actually having her" (p. 11). Thus, in reality, the kind of epistemic discoveries related to what it is like to be a parent (in terms of emotions, beliefs, desires, and dispositions) are made only upon entering parenthood. Paul's claim regarding the irreducible subjective dimension of transformative experiences is analogous to Nagel's (Nagel, 1974) famous thought experiment regarding whether it is possible to know what it is like to be a bat. According to Nagel, regardless of all objective scientific information that we can obtain by investigating a bat's brain, it is not possible to know how it *feels* to be a bat, since we will never be able to take the exact perspective of a bat. In Nagel's own terms: "I want to know what it is like for a bat to be a bat. Yet if I try to imagine this, I am restricted to the resources of my own mind, and those resources are inadequate to the task. I cannot perform it either by imagining additions to my present experience, or by imagining segments gradually subtracted from it, or by imagining some combination of additions, subtractions, and modifications" (p. 220).

Although Paul's argument is philosophically controversial (Dougherty, Horowitz, & Sliwa, 2015), it nevertheless supports the idea that transformative experiences have the potential to extend our (subjective) epistemic horizon, which is hedged-in by our unactualized possible selves. Of course, one might disagree that having a transformative experience is the only means to know how that experience feels. For example, it could be argued that it is possible to rely on imagination and assess the way that we would react to the transformative event. However, the bulk of empirical evidence shows that people are not good at predicting their own future feelings, an ability known as "affective forecasting" (for a review, see (Dunn & Laham, 2006)). For example, young adults overestimate how happy they will feel in the event of having a date on Valentine's Day, and overestimate how unhappy they will feel if they do not have a date (Hoerger & Quirk, 2010; Hoerger, Quirk, Chapman, & Duberstein, 2012). A possible explanation that has been raised to explain this biased affective prediction is that people tend to overlook coping strategies that attenuate emotional reactions to events – a phenomenon known as "immune neglect" (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). According to Epstein's (Epstein, 1994, 2003) Cognitive-Experiential Self Theory, humans operate through the use of two fundamental information-processing systems, a rational system (driven by reason) and an experiential system (driven by emotions), which operate in an interactive and parallel fashion. The rational system, which has a short evolutionary history, is based on logical inference and operates in an analytically, relatively slow and affect-free fashion. Encoding of

reality in this system involves abstract symbols, words and numbers, linked together by logical relations. In contrast, the experiential system has a much longer evolutionary history and is present in both humans and non-human animals. It processes information automatically, rapidly and holistically, creating associative connections that are closely linked to emotions such as pleasure and pain. In the experiential system, encoding of reality occurs in metaphors, images and narratives. Drawing on Epstein's theory, it has been proposed that when people engage in affective forecasting, immune neglect emerges because the rational system fails to appreciate the important role that the experiential system plays in shaping emotional experience (Dunn, Forrin, & Ashton-James, 2009). Because of the fundamental difference by which these two systems operate, as Kushlev and Dunn (Kushlev & Dunn, 2012) efficiently summarize, "trying to use the rational system to predict the outputs of the experiential system is a little like asking a robot to analyze a poem, and a diverse array of affective forecasting errors arise from this fundamental mismatch" (p. 279).

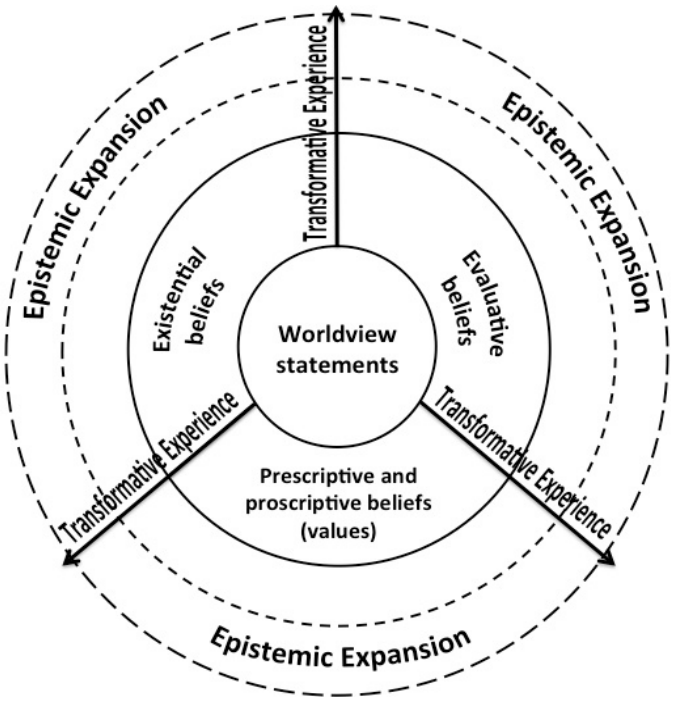

Figure 6.1: A conceptual representation of the process of epistemic expansion driven by transformative experience (adapted from Koltko-Rivera, 2004)

6.2.2 Transformative Experience as Emergent Phenomenon

The review of previous research on personally transforming experiences suggests that, in spite of commonly held assumptions, psychological change is not always the result of a gradual and linear process that occurs under conscious control (C'De Baca & Wilbourne, 2004; Miller & C'De Baca, 1994). Rather, under certain circumstances, enduring transformations can be the result of epiphanies and sudden insights. But how do these transformations occur? The theory of complex dynamical systems (Haken, 2002, 2004; Prigogine, 1984; Scott Kelso, 1995), which has been applied across disciplines as diverse as physics, biology, ecology, chemistry, political science , may offer an useful framework to address this question. From the perspective of complexity theory, humans, like all living organisms, are open, self-organizing systems that attain increasing levels of complexity and adaptation through the continuous exchange of energy and information with the environment. Dynamic systems evolve in complexity through the generation of *emergent properties*, which can be defined as properties that are possessed by a system as a whole but not by its constituent parts (Haken, 2002, 2004; Prigogine, 1984; Scott Kelso, 1995). These emergent phenomena are the result of feedback loop mechanisms that affect the system's equilibrium state, either amplifying an initial change in a system (positive feedback) or dampening an effect (negative feedback). Perturbation studies in dynamic systems research have revealed that an important predictor of transition is a type of discontinuity called critical fluctuations (Bak, Chen, & Creutz, 1989; Hayes, Laurenceau, Feldman, Strauss, & Cardaciotto, 2007). When the system has a stable or equilibrium structure, the fluctuation is usually very slight and can be offset by the negative feedback effect of the structure. However, even a single fluctuation, by acting synergistically with other fluctuations, may become powerful enough (i.e., a giant fluctuation) to reorganize the whole system into a new pattern. The critical points at which this happens are called "bifurcation points," at which the system experiences a phase transition towards a new structure of higher order (Tsonis, 1992). When seen through the lens of complexity theory, a quantum psychological change may occur when the person perceives an inability to assimilate an experience into current mental structures following an event that is experienced as being much larger than the self's ordinary frame of reference (as in Keltner and Haidt's model of awe). During this critical fluctuation, the system is destabilized but also open to new information and to the exploration of potentially more adaptive associations and configurations (Hayes et al., 2007). Interestingly, psychotherapists are starting to consider dynamic systems principles to conceptualize their interventions (Hayes & Strauss, 1998; Hayes et al., 2007; Heinzel, Tominschek, & Schiepek, 2014). According to Hayes and Yasins (Hayes & Yasinski, 2015), effective therapy involves exposure to corrective information and new experiences that challenge patients to develop new cognitive-affective-behavioral-somatic patterns, rather than to assimilate new information into old patterns. In the view of these authors,

destabilization of pathological patterns can facilitate new learning, a shift in meaning and affective response, and an integration of cognitive and affective experiences.

6.2.3 Principles of Transformative Experience Design

The theoretical framework introduced in the previous paragraphs has allowed us to identify key features of transformative experiences. As I move forward to explore how these concepts might be turned into design principles, it is important to stress a central tenet of TED: *transformative experiences cannot be constructed but can only be invited*. Although the term "design" is commonly used to denote a set of explicit rules for achieving a product (in this case, a transformative experience) a key assumption of TED is that no subjective transformation can be imposed or constructed using technology the way marble is modelled by a sculptor. Authentic transformation requires the active involvement of the individual in the generation of new meanings as well as the perception that the experience being lived is self-relevant. Furthermore, since any personal transformation has an inherent subjective dimension, it is not possible to know in advance how the experience will feel for the individual, before it is actually lived through. Rather, TED argues that it is possible to define some specific *transformative affordances*, which are theoretically-based design guidelines for inviting, eliciting or facilitating a transformative experience. To illustrate the framework, I will focus on four different but interrelated aspects of TED: (i) medium; (ii) content; (iii) form; (iv) purpose.

6.2.3.1 The Transformative Medium

In principle, a transformative experience could be elicited by various media – including plays, storytelling, imagery, music, films and paintings. However, I argue that a specific technology – immersive virtual reality (VR) – holds the highest potential to foster a transformative process, since it is able to meet most of the key conceptual requirements of quantum psychological change. As previously argued, transformative experiences are sources of epistemic expansion, however we cannot benefit from this epistemic expansion until these transformations have been actualized. In addition, mental simulation of our "possible selves" cannot offer much help, as the rational system (which we use to run the simulation) is essentially different from what we are trying to predict (the experiential outcome): that's why simulations and actual perceptions systematically diverge (Kushlev & Dunn, 2012). As Gilbert and Wilson (Gilbert & Wilson, 2007) argue, "Compared to sensory perceptions, mental simulations are mere cardboard cut-outs of reality" (p. 1354). What if we had a technology that could fill this "epistemic gap", enabling one to experience a possible self, from a subjective perspective? Could such a technology be used as a medium to support, foster, or invite personally-transformative experiences?

A VR system is the combination of stereoscopic displays, real-time motion-tracking, stereo headphones and other possible sensory replications (i.e., tactile, olfactory, and gustatory senses), which provide the users a sense of presence – that is, the perception of "being there" (Barfield & Weghorst, 1993; Riva, Waterworth, & Waterworth, 2004; Riva, Waterworth, Waterworth, & Mantovani, 2011). Thanks to these unique characteristics, VR can be used to generate an infinite number of "possible selves", by providing a person a "subjective window of presence" into unactualized but possible worlds. From this perspective, virtual reality may be referred to as an *epistemically transformative technology*, since it allows individuals to encounter totally new experiences from a first-person, embodied perspective. The ability of VR to allow an individual to enact a possible self from a first-person perspective has been effectively exploited in psychotherapy (Riva, 2005). For example, virtual reality worlds are currently used to expose phobic patients to 3D simulations of the feared object or situation, in order to help them to handle the unsettling emotional reactions (Meyerbroker & Emmelkamp, 2010).

However, I contend that beyond clinical uses, the potential of VR for eliciting epistemically transformative experiences is still largely unexplored. The possible uses of VR range from the simulation of "plausible" possible worlds and possible selves to the simulation of realities that break the laws of nature and even of logic. These manipulations could be used as cognitive perturbations, since, as previously noted, appraisal of uncanny events (such as seeing an object levitate for no reason), causes a massive need for accommodation. Hence, the experience of such VR paradoxes may offer new opportunities for epistemic expansions, providing the participant with new potential sources of insight and inspiration. Researchers are already looking at ways in which VR can be used to hack our ordinary perception of self and reality in order to observe what happens to specific brain or psychological processes when a person is exposed to alterations of the bodily self using multisensory conflicts. By virtue of this manipulation researchers hope to cast light on the neurobiological process underlying self-consciousness. However, the experimental paradigms used in these studies may offer new, powerful tools to provide people with sources of awe and therefore trigger the active process of assimilation/accommodation. For the present discussion, I will consider three kinds of transformative potentials that are unique to VR: (i) manipulating bodily self-consciousness; (ii) embodying another person's subjective experience; and (iii) altering the laws of logic and nature.

6.2.3.1.1 I Am a Different Me: Altering Bodily Self-Consciousness

VR is able to generate an artificial sense of embodiment, or the subjective experience of using and having a body (Blanke & Metzinger, 2009) by acting on three multisensory brain processes: the sense of self-location (the feeling of being an entity localized at a position in space and perceiving the world from this position and perspective), the sense of agency (the sense that I am causing the action) and the sense of body

ownership (the sense of one's self-attribution of a body, or self-identification) (Kilteni, Groten, & Slater, 2012).

Thanks to this feature, by using VR it is possible to alter body self-consciousness to give people the illusion that they have a different body. This type of manipulation uses video, virtual reality and/or robotic devices to induce changes in self-location, self-identification and first-person perspective in healthy subjects. By altering the neurophysiological basis of self experiences (*self as an object*), VR allows for experimenting with a different "ontological self" (*self as a subject*). For example, Lenggenhager et al. (Lenggenhager, Tadi, Metzinger, & Blanke, 2007) applied VR to induce an out-of-body experience by using conflicting visual-somatosensory input to disrupt the spatial unity between the self and the body. Riva (in this volume) has three possible strategies that can be used to alter bodily self-consciousness using virtual reality and brain-based technologies: (i) mindful embodiment, which consists in the modification of the bodily experience by facilitating the availability of its content in the working memory; augmented embodiment, which is based on the enhancement of bodily self-consciousness by altering/extending its boundaries; and (iii) synthetic embodiment, which aims at replacing bodily with synthetic self-consciousness (incarnation). Interestingly, VR is a technology that allows for not only simulating a plausible possible self, but even simulating the self-experience of another living organism, thus providing access to what Nagel considered impossible to access – that is, "what is like to be a bat". This potential of VR was already recognized by Charles Tart, one of the leading researchers in the field of altered states of consciousness and transpersonal psychology, at the very beginning of VR technology. In a 1990 article, Tart wrote (Tart, 1990): "Suppose everything that has been learned to date about ground squirrels, rattlesnakes, their interactions, and their environment could be put into a simulation world, a computer-generated virtual reality. To a much greater extent than is now possible, you (and your colleagues) could see and hear the world from the point of view of a ground squirrel, walk through the tunnels a ground squirrel lives in, know what it is perceptually like to be in a world where the grass is as tall as you, and what it is like when a rattlesnake comes slithering down your tunnel! What kind of insights would that give you into what it is like to live in that kind of world?" (p. 226).

6.2.3.1.2 I Am Another You: Embodying The Other

In the movie *Being John Malkovich* the main character Craig, a failed puppeteer, enters a portal into the mind of actor John Malkovich. After this discovery, Craig goes into business with a coworker with whom he is secretly in love, selling fifteen-minute "rides" in Malkovich's head. Suppose that you were able to enter someone's else body in this way: how would this experience change you? A potential of immersive VR as a transformative tool lies in its capability to render an experience from the perspective of another individual, by seeing what another saw, hearing what another heard, touching what another touched, saying what another said, moving as another moved,

and – through narrative and drama – feeling the emotions another felt (Raij, Kotranza, Lind, Pugh, & Lok, 2009). Thanks to the ability of VR of enabling social-perspective taking, different experiments have been carried out to test the potential of this technology for enhancing empathy, prosocial behavior and moral development. In one such study, Yee and Bailenson (Yee & Bailenson, 2007) observed that participants spending several minutes in a virtual world embodying a tall virtual self-representation were found to be prone to choose more aggressive strategies in a negotiation task compared to participants who were given short avatars. These authors called this phenomenon the "Proteus Effect", a reference to the Greek sea-god Proteus, who was noted for being capable of assuming many different forms. More recently, Ahn, Tran Le and Bailenson (Ahn, Le, & Bailenson, 2013) carried out three experiments to explore whether embodied experiences via VR would elicit greater self-other merging, favorable attitudes, and helping efforts toward persons with a visual disability (colorblindness) compared to imagination alone. Findings showed that participants in the embodied experience condition experienced greater self-other merging compared to those in the imagination condition, and this effect generalized to the physical world, leading participants to voluntarily spend twice as much effort to help persons with colorblindness compared to participants who had only imagined being colorblind. Peck et al. (2013) demonstrated that embodiment of light-skinned participants in a dark-skinned virtual body significantly reduced implicit racial bias against dark-skinned people, in contrast to embodiment in light-skinned, purple-skinned or no virtual body.

It should be noted that, although VR is one of the most advanced technologies to embody another person's visual perspective, this experience could be further enhanced by integrating VR with other kinds of first-person simulation technologies. For example, age simulation suits have been designed to enable younger persons to experience common age-related limitations such as sensory impairment, joint stiffness or loss of strength. Schmidt and Jekel (Schmidt & Jekel, 2013) carried out experimental study that evaluated the potential of a realistic simulation of physical decline to stimulate empathy for older people in society. The simulated impairments were rated as realistic, and a majority of participants reported a higher mental strain during the tasks. After the session, understanding for typical everyday problems of older people increased. In part, the simulation evoked fear and negative attitudes towards aging. I argue that the potential of these age simulators could be even further enhanced having participants wear these suits in immersive VR scenarios, in which the older person might interact in realistic ageing-related contexts and situations.

6.2.3.1.3 I Am in a Paradoxical Reality: Altering the Laws of Logic

A further opportunity offered by VR as a transformative medium is the possibility of simulating impossibile worlds – that is, worlds that do not conform to the fundamental laws of logic and nature (Orbons & Ruttkay, 2008). The simulated violation

of real-world constraints has been used to explore cognitive and metacognitive processes, yet this impossible-world paradigm could be also used to trigger the active process of assimilation/accommodation, which fosters epistemic expansion. Moreover, the manipulation of fundamental physical parameters, such as space and time, could be used to help people to grasp complex metaphysical questions in order to stimulate reflection on philosophical and metaphysical issues that are critical to understanding the self-world relationship. As Tart suggested, "A virtual reality could readily be programmed to accentuate change in virtual objects, virtual people and virtual events. Would the experience of such a world, even though artificial, sensitize a person so that they could learn the lesson of recognizing change and becoming less attached to the illusion of permanence more readily in subsequent meditation practice?" (p. 229).

Suzuki et al. (Suzuki, Wakisaka, & Fujii, 2012) developed a novel experimental platform, referred to as a "substitutional reality" (SR) system, for studying the conviction of the perception of live reality and related metacognitive functions. The SR system was designed to allow for manipulating participants' perception of reality by allowing participants to experience live scenes (in which they were physically present) and recorded scenes (which were recorded and edited in advance) in an alternating manner. Specifically, the authors' goal was to examine whether participants were able to identify a reality gap. Findings showed that most of the participants were induced to believe that they had experienced live scenes when recorded scenes were presented. However, according to Suzuki et al., the SR system offers several other ways to manipulate participants' reality. Authors suggest that for example, the SR can be used to cause participants to experience inconsistent or contradictory episodes, such as encountering themselves, or to experience déjà vu-like situations (e.g., repetitions of same event such as conversations or one-time-only events, such as breaking a unique piece of art). Furthermore, SR allows for the implementation of a visual experience of worlds with different natural laws (e.g., weaker gravity or faster time).

Time alterations and time paradoxes (i.e., the possibility of changing history) represent another kind of impossible manipulation of physical reality that might be feasible in virtual reality. For example, Friedman et al. (Friedman et al., 2014) described a method based on immersive virtual reality for generating an illusion of having traveled backward through time to relive a sequence of events in which the individual can intervene and change history. The authors consider this question: what if someone could travel back through time to experience a sequence of events and be able to intervene in order to change history? To answer this question, Friedman et al. simulated a sequence of events with a tragic outcome (deaths of strangers) in which the participant can virtually travel back to the past and undo actions that originally led to the unfortunate outcome. The participant is caught in a moral dilemma: if the subject does nothing, then five people will die for certain; if he acts then five people might be saved but another would die. Since the participant operates in a synthetic reality that does not obey the laws of physics (or logic), he is able to affect past events (therefore

changing history), but in doing so he intervenes as a "ghost" that cannot be perceived by his past Doppelgänger. One of the goals of the experiment was to examine the extent to which the experience of illusory time travel might influence attitudes toward morality, moral dilemmas and "bad decisions" in personal history. The epistemic value of the experience, if successful, is that the subject would implicitly learn that the past is mutable. In particular, the authors speculated that the illusion of traveling in time might influence present-day attitudes – in particular possibly lessening negative feelings associated with past decisions and giving a different perspective on past actions, including those associated with the experienced scenario. Findings showed that the virtual experience of time travel produced an increase in guilt feelings about the events that had occurred and an increase in support of utilitarian behavior as the solution to the moral dilemma. The experience of time travel also produced an increase in implicit morality as judged by an implicit association test. Interestingly for the present discussion, the time travel illusion was associated with a reduction of regret associated with bad decisions in the participants' own lives. The authors also argue that this kind of epistemic expansion (the illusion that the past can be changed) might have important consequences for present-day attitudes and beliefs, including implications for self-improvement and psychotherapy; for example, giving people an implicit sense that the past is mutable may be useful in releasing the grip of past traumatic memories in people suffering from post-traumatic stress disorder.

6.2.3.2 Transformative Content

Transformative content refers to the content and structure of the designed experience. To understand the nature of transformative content, it is important to emphasize that from the perspective of complexity theory, a transformative experience is conceptualized as a "perturbation experiment", which attempts to facilitate a restructuration of meaning and beliefs by exposing the participant to experiences that induce destabilization within stable boundary conditions. As I will argue, this goal can be achieved by presenting the participant with high emotional and cognitive challenges, which may lead the individual to enter a mindset that is more flexible and open to the exploration of new epistemic configurations.

In the TED framework, such transformative content is delivered through a set of *experiential affordances*, which are stimuli designed to elicit emotional and cognitive involvement in the designed experience. Here, I will introduce two types of experiential affordances: (i) emotional affordances; (ii) epistemic affordances.

6.2.3.2.1 Emotional Affordances

Emotional affordances are perceptual cues or stimuli that are aimed to elicit a deep emotional involvement in the user, i.e. by evoking feelings of interest, inspiration, curiosity, wonder and awe. Previous research has shown that emotions of awe can be

elicited by presenting participants with multimedia stimuli (e.g. images) which depict vast, mentally overwhelming, and realistic scenarios (Rudd, Vohs, & Aaker, 2012). To further elucidate the concept of *emotional affordance*, consider a recent study by Gallagher et al. (Gallagher, Reinerman, Sollins, & Janz, 2014), who used mixed-reality simulations in an attempt to elicit the experiences of awe and wonder reported by astronauts in their journals during space flight and in interviews after returning to the earth. Based on these reports, the authors created a virtual simulation (the "Virtual Space Lab") resembling an International Space Station workstation, which was designed to expose subjects to simulated stimuli of the earth and deep space (including physical structure plus simulated visuals). During and after exposure, researchers collected and integrated first-person subjective information (i.e. psychological testing, textual analysis, and phenomenological interviews) with third-person objective measures (i.e. physiological variables), following the "neurophenomenology method" (Gallagher & Brøsted Sørensen, 2006; Varela, 1996). Findings indicated that, despite some limitations, the Virtual Space Lab was able to induce awe experiences similar to those reported in the astronauts' reports. Thus, as noted by the authors, findings show promise for using a simulative technology in a laboratory when eliciting and assessing deeply involving experiences such as awe and wonder, otherwise very difficult to investigate (because unfeasible or too expensive) in real-world contexts.

6.2.3.2.2 Epistemic Affordances

In TED, emotional affordances have the goal of providing novel and awe-eliciting information, which can trigger the complementary processes of assimilation and accommodation, and by the virtue of the complex interplay of these processes, drive the system to a new order of complexity. However, in order to provide the participant with the opportunity to integrate new knowledge structures, it is necessary to present the participant with *epistemic affordances*, which are cues/information/narratives designed to trigger reflection and elicit insight. Epistemic affordances might be either represented by *explicit* dilemmatic situations – e.g., a provocative or paradoxical question, like a Zen *kōan* – but they could also be conveyed through *implicit* or evocative contents, that is, symbolic-metaphoric situations (i.e. one bright and one dark path leading from a crossroads). For example, going back to the Virtual Space Lab' study, Gallagher and his team demonstrated the feasibility of inducing awe within a simulated environment, which individuals previously had only in extraterrestrial space. In TED terms, this may be regarded as an instance of emotional affordance. Now assume that a designer would like to add to the Virtual Space Lab experience an epistemic affordance. To do that, the designer should create a dilemmatic situation to allow the participant not just to experience the same feeling of awe of an astronaut, but also to an opportunity to develop new insight. For example, such epistemic affordance could be resembled by the "floating dilemma" faced by *Gravity*'s main

character Stone (played by Sandra Bullock), which represents a metaphor for a life that's in permanent suspension. From this perspective, an epistemic affordance could be also the simulated situation itself, to the extent it is able to provide a (virtual) space for self-reflection and self-experimentation.

6.2.3.3 The Transformative Form

The form dimension of the TED framework is different from the transformative content, in that it is less concerned with the *subject* of the experience that is represented, and more concerned with the *style* through which the transformative content is conveyed/delivered. Thus far, I have identified two components of form: (i) cinematic codes; (ii) narratives.

6.2.3.3.1 Cinematic Codes

In cinema, it is possible to enhance the emotional and cognitive involvement of the spectator in the storyline using audiovisual effects, such as lighting, camera angles, and music. For example, it is well known that the inclusion of a music "soundtrack" plays a key role in heightening not only the dramatic effects but also the faces, voices and the personalities of the players. As noted by Fischoff (Fischoff, 2005), "Music adds something we might call heightened realism or supra-reality. It is a form of theatrical, filmic reality, different from our normal reality." (p. 3). Thus, a key challenge related to the form dimension of TED is to examine the possibility of adapting/reinventing the cinematic codes with the specific objective of inducing more compelling VR-based transformative experiences. The potential of translating the cinematic audiovisual language to the context of interactive media has already been extensively explored in the video game domain (Girina, 2013). This attempt has led to the development of specific games, such as adventure and role-playing games, which make massive use of the expressive potential of cinematic techniques.

6.2.3.3.2 Narratives

In addition to the possibility of taking advantage of cinematic audiovisual codes, a further component of the form dimension is the creation of a dramatic and engaging *narrative* or story. In his lecture "Formal Design Tools" at the 2000 Game Developers' Conference, Marc LeBlanc introduced a distinction between *embedded* and *emergent* narrative (LeBlanc, 2000). Embedded narrative is the story implemented by the game designer; it includes a set of fixed narrative units (i.e. texts or non-interactive cut scenes) that exist prior to the player's interaction with the game and are used to provide the player with a fictional background, motivation for actions in the game and development of the story arc. In contrast, emergent narrative is the story that unfolds in the process of playing – that is, the storytelling generated by player actions

within the rule structure governing interaction with the game system. In TED, both embedded and emergent narratives may play a key role in facilitating a transformative experience. Embedded narrative can be used to provide a context for enhancing the participant's sense of presence in the simulated environment. As previous research has shown, a meaningful narrative context can have a significant influence on the user's sense of presence, providing a more compelling experience compared to non-contextualized virtual environments (Gorini, Capideville, De Leo, Mantovani, & Riva, 2011). Emergent narrative, on the other hand, can be employed to influence the way the transformative content/story is created, making the story experience potentially more engaging (i.e., both attentionally and emotionally involving) for the participant. Further, since emergent narratives allow the participant to interactively create the narrative of the experience, they generate feedback loop mechanisms, which in turn can trigger the complex self-organization dynamics that facilitate transformations.

An example of how cinematic codes and emergent narratives have been used in combination with immersive virtual reality to support positive psychological change is provided by EMMA's World (Banos, Botella, Quero, Garcia-Palacios, & Alcaniz, 2011), a therapeutical virtual world designed to assist patients in confronting situations in which they have suffered or are suffering a stressful experience. EMMA's World includes five different evocative scenarios or "landscapes": a desert, an island, a threatening forest, a snow-covered town and a meadow. These virtual worlds have been designed to reflect/induce different emotions (e.g., relaxation, elation, sadness). However, the type of scenario that is selected is not pre-defined according to a fixed narrative; rather, it depends on the context of the therapeutic session and can be chosen by the therapist in real time. The goal of this strategy is to reflect and enhance the emotion that the user is experiencing or to induce certain emotions. The control tools of EMMA's World provide also the possibility to modify the scenarios and graduate their intensity in order to reflect the changes in the participants' mood states.

Another important component of EMMA's World is the Book of Life, a virtual book in which patients can reflect upon feelings and experiences. The goal of the Book of Life is to represent the most important moments, people and situations in the person's life (related to the traumatic or negative experience). Anything that is meaningful for the patient can be incorporated into the system: photos, drawings, phrases, videos. This last feature of EMMA's World allows it to exemplify a further design principle of TED: *personalization*. This concerns the possibility of including personal details of the participant in the immersive experience, with particular reference to autobiographically-relevant elements (e.g., videos, photos, music, song lyrics) that have an important personal meaning and therefore are able to elicit emotions (e.g., nostalgia) related to the intimate sphere of the participant.

6.2.3.4 The Transformative Purpose

The central tenet of TED is that it is possible to design technologically-mediated transformative experiences that support epistemic expansions and personal development. However, since the outcome of a personally transformative experience is inherently subjective and therefore not predictable, the idea of transformative design might seem contradictory in itself. Nevertheless, there is another, more open-ended way in which one might define the purpose of a (designed) transformative experience, which places more focus on the transformative process than on the transformative outcome: that is, considering an interactive experience as a space for transformative possibilities.

6.2.3.4.1 Transformation as Liminality

Winnicot (Winnicott, 1971) described a "potential space" as a metaphorical space that is intermediate between fantasy and reality, an area of experiencing which opens up new possibilities for imagination, symbolization and creativity. According to Winnicot, potential space is inhabited by play, which has a central importance in developmental processes. Winnicot believed that engaging in play is important not only during childhood, but also during adulthood: "It is in playing and only in playing that the individual child or adult is able to be creative and to use the whole personality, and it is only in being creative that the individual discovers the self" (p. 54). A closely related concept is "liminality", intended as a space of transformation wherein the human being is between past and future identities. The notion of liminality (from the latin term *limen*: threshold, boundary) was first introduced by the ethnologist Arnold van Gennep (Van Gennep, 1908/1960) to describe the initiation rites of young members of a tribe, which fall into three structural phases: separation, transition, and incorporation. Van Gennep defined the middle stage in a rite of passage (transition) as a "liminal period". Elaborating on van Gennep's work, anthropologist Victor Turner (V. Turner, 1974) argued that, in postindustrial societies, traditional rites of passage had lost much of their importance and have been progressively replaced by "liminoid" spaces. There are defined by Turner as "out-of-the-ordinary" experiences set aside from productive labor, which are found in leisure, arts, and sports (e.g., extreme sports). These liminoid spaces have similar functions and characteristics to as liminal spaces, disorienting the individual from everyday routines and habits and situating him in unfamiliar circumstances that deconstruct the "meaningfulness of ordinary life" (V. Turner, 1985).

The metaphors of potential space and liminality/liminoid space provide a platform for further elaborating the purpose of transformative design as the realization of interactive systems that allow participants to experience generative moments of change, which situate them in creative learning spaces where they can challenge taken-for-granted ways of knowing and being. From this perspective, interactive transformative experiences may function both as potential spaces and liminal spaces, offering participants novel opportunities for promoting creativity and personal

growth. However, as open-ended "experiments of the self", such interactive, transformative experience may also situate the participants in situations of discomfort, disorientation and puzzlement, which are also turning points out of which new possibilities arise.

6.2.3.4.2 The Journey Matters, Not the Destination

To reach this goal, TED can take advantage of the ability to integrate the language of arts. Indeed, art provides a vocabulary that is rich, multisensory, and at the same time able to elicit experiences of dislocation, evocativeness, ambiguity, and openness that can be effectively combined to generate powerful liminal spaces. As noted by Preminger (Preminger, 2012), art can contribute in several ways to the design of transformative experiences. First of all, the immersive and holistic nature of the experience of art is supportive of cognitive and emotional involvement, which in turn can enhance learning. Second, art can be a vehicle for more efficient access to and modification of brain representations. Third, the evocative nature of some artworks requires the experiencer to use internally generated cognitive processes (i.e. imagery, introspection, self-representation, autobiographic and prospective memory, and volition), which allows for enhanced immersion and identification. In addition to these characteristics, which are common to art domains where the induced experience involves mainly perceptual and cognitive processes, interactive arts (including games) can also involve motor functions and behavioral control in dynamically changing environments, which can further enhance the transformative potential of the designed experience.

An interesting example of how arts can be combined with interactive design to create emotionally-rich, memorable and transformative experiences is provided by the games developed by computer scientist Jenova Chen. Chen believes that for video games to become a mature medium like film, it is important to create contents that are able to induce different emotional responses in the player than only excitement or fear (Chen, 2009). This design philosophy is best exemplified in the critically-acclaimed video game *Journey* (Chen, 2012), a mysterious desert adventure in which the player takes the role of a red-robed figure in a desert populated by supernatural ruins. On the far horizon is a big mountain with a light beam shooting straight up into the sky, which becomes the natural destination of the adventurer. While walking towards the mountain, the avatar can encounter other players, one at a time, if they are online; they cannot speak but can help each other in their journey if they wish. The goal of the game is to take the player on an emotional and artistic journey that evokes feelings of spirituality and a sense of smallness, wonder and awe, as well as to foster an emotional connection with the anonymous players encountered along the way (Pantazis, 2010). To achieve this, the game uses a very sophisticated visual aesthetics, in combination with music that dynamically responds to the player's actions, building a single theme to represent the game's emotional arc throughout the story. A further

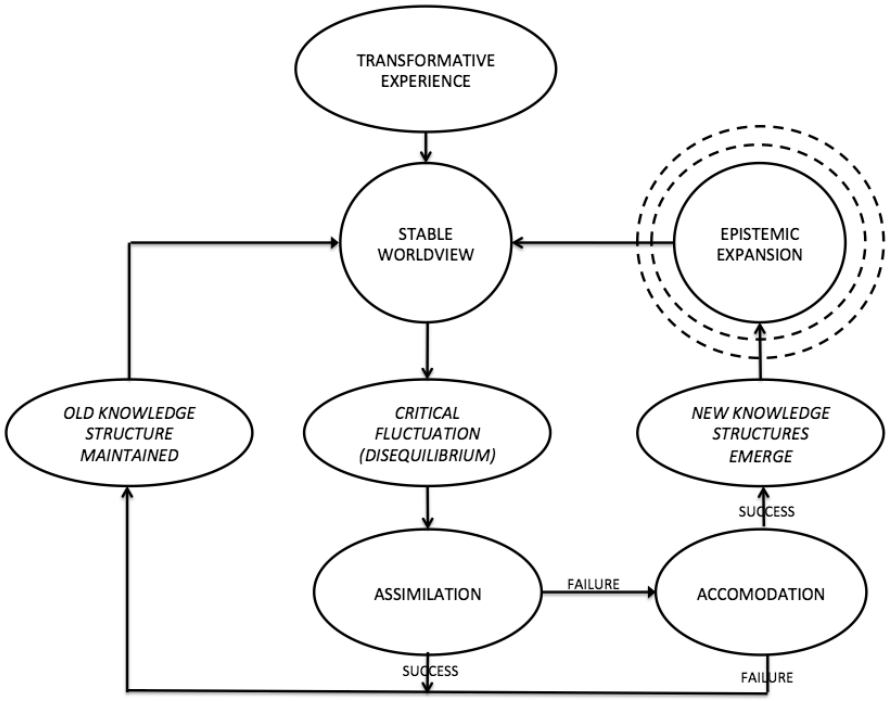

Figure 6.2: A possible schematization of the transformative process. The exposure to novel information (i.e. awe-inducing stimuli) triggers the process of assimilation. If integration fails, the person experiences a critical fluctuation that can either lead to rejection of novelty or to an attempt to accommodate existing schema, eventually generating new knowledge structures and therefore producing an epistemic expansion

relevant feature of *Journey* for the TED framework is that, unlike conventional games, its goal is not clearly set, as it places greater emphasis on enjoying the experience as it unfolds during play.

6.3 Conclusion: the Hallmarks of Transformative Experience Design

This chapter aimed at providing a first framework for Transformative Experience Design, which refers to the use of interactive systems to support long-lasting changes in the self-world. In particular, the goal of this chapter was two-fold: (i) to provide background knowledge on the concepts of transformative experience, as well as its implications for individual growth and psychological wellbeing; and (ii) to translate such knowledge into a tentative set of design principles for developing transformative applications of technology.

The central assumption of TED is that the next generation of interactive systems and brain-based technologies will offer the unprecedented opportunity to develop

synthetic, controlled transformative experiences to foster epistemic expansion and personal development. For the first time in its history, the human being has the possibility of developing technologies that allow for experimenting the "Other-than-Self" and, by doing so, exploring new means of epistemic expansion. This Other-than-Self encompasses a broad spectrum of transformative possibilities, which include "what it is like" to be another self, another life form, or a possible future or past self. These designed experiences can be used to facilitate self-knowledge and self-understanding, foster creative expression, develop new skills, and recognize and learn the value of others.

Although the present discussion is largely exploratory and speculative, I believe this initial analysis of TED has some significant potential. First, the analysis of transformative experience can inspire new applications of VR that go beyond gaming and therapy to address issues related to personal development and self-actualization. Furthermore, the analysis of the characteristics of transformative experience has intrinsic scientific value, since it can promote a deeper understanding of this complex psychological phenomenon at multiple levels of analysis – neuropsychological, phenomenological, and technological. Finally, the further development of TED may also contribute to redefinining our conceptualization of information technologies, from tools of mass consumption to potential means to satisfy the highest psychological needs for growth and fulfillment.

However, a caveat is necessary before this research moves forward. I believe that the study of how to use technology to support positive transformations of the self should not be considered a deterministic, technologically-centered perspective on human personal development. The final aim of transformative design, as I see it, should not be confused with the idea of "engineering self-realization". Rather, I hold that the objective of this endeavour should be to explore new possible technological means of supporting human beings' natural tendency towards self-actualization and self-transcendence. As Haney (Haney, 2006) beautifully puts it: "each person must choose for him or herself between the technological extension of physical experience through mind, body and world on the one hand, and the natural powers of human consciousness on the other as a means to realize their ultimate vision" (ix, Preface).

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