

Doctoral Dissertation

博士論文

**Philosophical consideration of the treatment of
Posttraumatic Stress Disorder in Virtual Reality:
Trauma and formation of self-narrative
in Virtual Reality context**

(バーチャルリアリティにおける

心的外傷後ストレス障害治療の哲学的考察：

バーチャルリアリティコンテキストにおける

トラウマと自己語りの形成)

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Introduction

This research focuses on “virtual selves” created in virtual spaces (e.g. Social Network Services (SNS)). The major claim of the research is that experience gained in the virtual space can be transferred to real life (Georgieva, 2011b) as real life experience and therefore does not require physical presence to certain places by which it reduces dangers that can be present in real environments. Therefore, the research suggests that treatment methods via Virtual Reality (VR) utilize characteristics of a transfer of experiences that the virtual selves make in VR. With these characteristics it is then possible to answer the diversity of problems that are causing Posttraumatic Stress Disorder (PTSD). Therefore, the effects of the VR treatment on the patient’s mind, and the philosophical concept of creating a life story, can be analyzed as interrelated. The research question arising from these considerations then, is “How to look at trauma in order to explain the usage of VR for treatment?” The research tries to define what PTSD is through the prism of Marya Schechtman’s narrative account and explains the disorder as a break in the life story. The proposal the research makes is to review this as a shift in the normal storyline one creates about his or her life rather than as a complete breakdown. With this concept in mind it might be possible to explain how re-living traumatic events and creating new stories (happening during therapy with cognitive restructuring for example) in VR aids the treatment process in the search for meaning (Bauer & Bonanno, 2001) in life events. With the utilization of VR’s flexibility, it is possible to obtain the freedom to create and change a narrative with the help of a therapist who guides the restructuring of meaning and with this creates the overall effectiveness of the therapy. Considering the findings of Schechtman and other philosophers who argue in the field of self-narrative (Dennett, 1992; Strawson, 2004), as well as researchers on online spaces (Turkle, 1995; 2005; 2011) and VR (Wiederhold & Wiederhold, 2008; Wiederhold, 2010; Rizzo et al., 2002; 2006; 2009c; 2010) the focus of this study will be to discuss the virtual environments as a possible medium to

experience narratives and utilize those narratives as better stories to aid the patients in the therapeutic process of self-constitution and recovery from PTSD.

A. Background

My research interest ranges from the construction of the self-image in virtual spaces (e.g. SNS) (Agger, 2004) to Cybertherapy as a treatment method, which uses VR to treat various anxiety disorders, including PTSD. I explore the notion of “virtual reality” and its effect on human health (Rizzo et al., 2002) and look at it through a philosophical prism to see how it can serve as a “playground” (Turkle, 1994; Turkle, 1995) to try out and learn possible new experiences and to create one’s life story.

B. Definitions

The research proposes an explanation of the notions of virtual space, virtual environment, VR and virtual self from a philosophical point of view and discusses these in the context of the philosophical concept of self-narrative (Markham, 1998; Bouchard et al. 2010; Mantovani & Riva 1999; Schechtman 2011). Also, it looks into the essence of PTSD and its types (discussing two significantly different types, namely soldier PTSD and natural-disaster PTSD) from a philosophical perspective while considering trauma as a form of discrepancy with the personal story one has been creating in his or her lifetime before the traumatic event. In relation to this, it focuses on the previously discussed concept of transfer of experience (Georgieva, 2011b) from the virtual space to the real life in the form of life experience. Finally, it will attempt to discuss the versatility of the virtual space and the different ways therapists take advantage of its effectiveness in the treatment of PTSD.

To describe the terms used in the text and their relation, I would like to introduce the Figure 1. Below I will introduce a detailed proposal for their content.

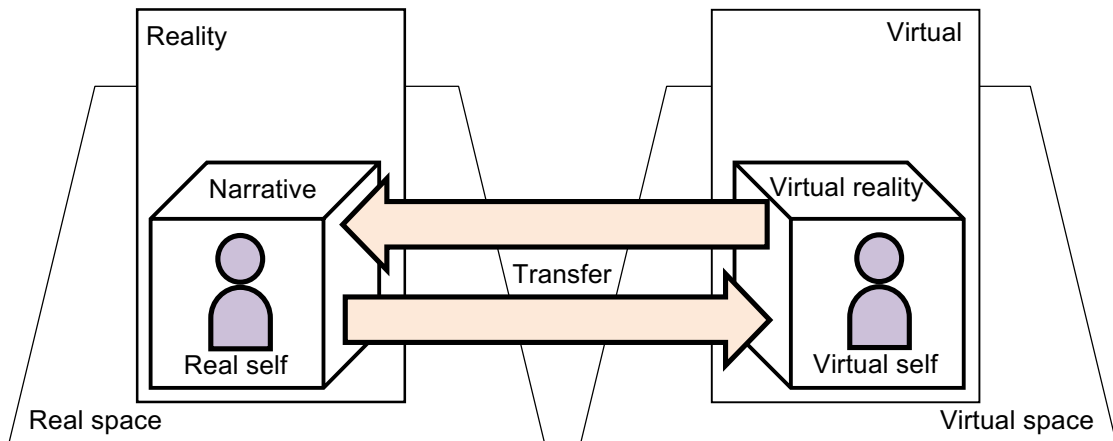


Figure 1. Terms and their relation

First of all, let us define the main terms used in this dissertation. To begin with the terms related to the concept of the “virtual”, it is necessary to define what virtual space, virtual environment, VR and virtual self mean. The concept of the “virtual” and its relation to the real as well as its comparison with the concept of “cyber” (as in cybernetic for example) will be explained in detail later in the text (Chapter 1, Section 1.1).

In previous research (Georgieva, 2011b) the terms virtual space and virtual self were used mainly in reference to the spaces which enable communication over the Internet such as SNS and the self-images that people create there respectively (such as online user profiles). The computer games or VR used for Cybertherapy were also included in the consideration there. However, in this work, a broader definition of the “virtual spaces” will be adopted to allow understanding of the full range of virtual spaces that are developed and available to use. Although different research uses different terms, here the term virtual space should be considered the broadest term in which virtual environment (virtual world) and VR (as technology) are contained.

To explain in detail, the virtual environments would be some kind of virtual spaces designed for specific purpose, for example for simulation of war environment (e.g. virtual environment for soldier training). Such virtual environments would sometimes represent not separated environments, but fully interconnected worlds such

as the one created in the interactive online game called Second Life (Schechtman, 2012).

On the other hand, VR is a technical term that can describe the most advanced way of creating and representing virtual spaces. Some authors see the VR technology as the virtual space and discuss it in the context of the terms “presence” and “immersiveness” (Steuer, 1992) while others talk about virtual worlds and virtual environments that allow users to experience “being there” which in the broadest meaning adopted here would mean the virtual space (Schroeder, 2008).

In other words, virtual spaces and virtual environments are represented through the VR technology and all fall in the category of virtual spaces. However, in comparison to VR, there exist less advanced virtual spaces such as SNS, computer games and the like. Here the term virtual space is adopted as broader since it can contain all other virtual environments and is also one construct. This means it is a counterpart of the real space or any non-computer generated reality.

In the dawn of the development of computer-simulated reality, Ivan Sutherland discussed “the ultimate display” (Sutherland, 1965) as a “room within which the computer can control the existence of matter” (ibid., p. 508). Today, such advanced version of VR technology is still not realized, as Sutherland’s suggestion means sitting on a chair in that room would be possible. However, his idea shows in what way VR and virtual space present possibility for creation of new reality. For example, he claims that in such space it is not necessary to represent anything that exists in the real world, but rather it is possible to create new kinds of things. Such notion of the virtual space confers well the idea of its relation to reality and the possibilities in front of it. To continue the definition, the virtual space can represent real as well as imaginary environments and could possibly create a new simulated reality of not yet developed kind.

Now let us try to define the term virtual self.

Virtual self is the self-image or self-representation created by a real person (a “real self”) in any of the possible virtual spaces. This virtual self can take the form of an online account, profile, avatar, character or personality in a computer game, an online 3D environment, an SNS and so on. The virtual self is the real self’s representation in the virtual space and as such it can have many forms and levels of complexity. For example, an icon of an online account is a substitute for one’s identification while an online profile with longer history of online experiences is similar to a picture album or a

diary from the real life although in a more sophisticated and realistic form (e.g. a Facebook profile with person's biography, pictures, daily posts, comments on other profiles and posts, etc.). The virtual self forms a story of the self in the virtual space that is the story or the narrative of the virtual self. In fact, that is the narrative of the real self realized in the virtual space and hence having more options than the real self (e.g. one can communicate with people all over the world at the same time at no cost or one can have a character in an online game in which the character represents him or her as an assassin allowing him or her to experience killing other "users"). How the virtual self relates to the real self is a subject of continuous discussion and some researchers suggest the virtual self is not a copy or extension of the real self, but rather a projection of the real self's characteristics (McCreery, 2012). Whether this is true or not is not the purpose of this dissertation. The definition adopted here is that the virtual self, more or less, copies and serves as an extension of the real self. Moreover, as its extension it provides the real self the opportunity to change its characteristics through the experience in the virtual space by learning skills and eventually transferring these experiences, as well as stories created in the virtual space, into the narrative of the real self. This transfer could be the process that happens during treatment in the virtual space.

In this dissertation, the idea of transfer of experience from the virtual self to the real self is a part of the proposed hypothesis and is based on the previous discussion on the matter of virtual space and virtual self (Georgieva, 2011b). This term means that experiences and skills obtained in the virtual space can become, of course, experiences and skills of the virtual self, as well as the real self. Although this claim might seem obvious, compared to the real space experiences, the virtual space experiences give a lot more freedom. For example, one can communicate with people who do not speak the same language without any language barrier and can achieve that communication simultaneously with the other participants. One can experience being a person from the opposite sex in an online game and gain knowledge about people's behavior which otherwise he or she could not learn. Moreover, knowing that the space is "virtual" allows one to experiment and "feel free" to try things one would not try in real life (e.g. speak to strangers).

The definition for transfer of experience also utilizes the philosophical concept of narrative (Schechtman, 2011) considering that the virtual self is a copy or an extension of the real self since the narrative of the real self is affected by the experiences in the virtual space and the narratives created in the virtual space are transferred as real self's narratives. For example, one can argue that the experienced in the virtual space

remains only a part of the game one has played and does not affect the real world experiences and narratives, however, research (Kramer et al., 2014) shows that any experiences in the virtual might have strong effect on the emotions and behavior, as well as the narrative of the real self (Schechtman, 2012). This connects to the idea of immersiveness and the sense of presence that are specific for the virtual space (Grigorovici, 2003). Its immersiveness creates such a sense of presence that affects the real self as if it had these experiences in the real world.

Finally, let us look at the definition of PTSD this dissertation adopts.

PTSD is a mental disorder affecting many people around the world. There are various events that cause the disorder. These events include traumatic experiences connected with fear for one's own life or the life of others, physical and/or psychological assault or abuse, etc. PTSD is not a modern disorder; it can be observed throughout human history, for example in the case of soldiers who suffer from the disorder as a result of their war experiences (Zoladz & Diamond, 2016). There are many events that differ from war that also cause severe trauma and prolonged suffering often diagnosed as PTSD. According to Maercker and Perkonig (2013) the correct classification of stress-related disorders could help the efficient treatment of each of the types of the disorder which are present. The authors differentiate between PTSD, Complex PTSD and Prolonged grief disorder as separate disorders that are usually considered part of PTSD. Defining what kind of events cause PTSD and what types of PTSD there are is a major work to be done in support of the treatment endeavors for PTSD.

This dissertation sees the PTSD as a discrepancy in the line of the life story people create as their formation of self or in other words as break in the self-narrative. There are various ways one can interpret the interruption caused by the traumatic experience and if one has been suffering from many other situations causing disturbance of the narrative, he or she might be prone to develop PTSD. In addition, there might be people who are more vulnerable to traumatic experience in the sense they might find it difficult to incorporate the explanation for the trauma in their life story. In this sense, the disorder is presents an important field for research of the ways people create and recover their selves through narratives.

C. Hypothesis

On the basis of the findings from the study of the virtual self, created in online communication, I formulate a hypothesis about the possibility to transfer virtual experiences to real life experiences thus achieve treatment.

The hypothesis is as follows.

It is possible to assume that it is easier to perceive changes, happening in the virtual space through the virtual self, and making it faster to adapt and learn from experiences in virtual reality, rather than through exposure in real environments. In connection with narrativity; if trauma is considered as a disturbance or a break in the narrative of the self, then therapy in VR serves as a facilitation technique which helps to interpret and accept that disturbance into the narrative's unity (MacIntyre, 2013) and continue creating one's narrative in a healthy way. This interpretation therefore, helps us to restructure the existing narrative or form a new narrative with added meaning. This can be achieved through gradual exposure in the adaptable VR where people might find it easier to learn and play with the opportunities to change or form their personal characteristics since this change or forming is considered easier to happen in the virtual spaces as they are perceived as experimental playground (Turkle, 1995).

The aim of this dissertation is to confirm whether the above hypothesis can serve as an explanation of the utilization of VR in PTSD treatment and then be put in narrative context and sound plausible in the attempt to explain why VR has become an option which deserves sufficient attention among the various treatment techniques for PTSD. The close observation of two very different types of PTSD, occurring in two very different life experiences (military personnel and ordinary people affected by natural disasters) could show discrepancies between the way trauma and its severity are perceived in the two cases and potentially confirm the hypothesis about explaining PTSD through changes in the narrative one possesses.

D. Methodology

To support the hypothesis, two surveys (Georgieva 2011a; Georgieva, 2016) on online activity were employed to describe how people perceive themselves and how they evaluate their experiences in virtual spaces. The results from these surveys showed

that people more or less transfer their experience from the virtual space to the real self by getting affected by positive and negative stimuli online, in computer games, 3D environments and VR.

However, these are empirical results, and they should be analyzed in the philosophical framework regarding the construction of personal identity online (Schechtman, 2012). In addition, the various literature on the subject of virtual spaces, their effect and the treatment of PTSD will be also analyzed for the research. Supposing that the experiences in VR are transferred to the real self, then it can be plausible to argue that with this transfer a reconstruction of the real self is possible through reconstruction of the self-narrative in story-making environments like the virtual ones. To support this hypothesis, the research will analyze PTSD and its two major types, as well as their treatment methods in the aforementioned narrative context and explore how recreating one's story possibly leads to successful treatment results (e.g. Mert & Vermetten, 2011; Seibt & Nørskov, 2012).

E. Limitations of treatment in VR

VR poses risks for addictive behavior in its users (Schoenfeld & Yan, 2012; Zhou, 2010). In addition, prolonged experience in VR simulation can provoke a condition known as cyber sickness (Bruck & Watters, 2009). Accordingly, it is possible to imagine that if VR creates an intriguing and highly immersive story, then participants can face more challenges when necessary to separate what is “real” from what is “unreal”, compared to the narrative creation in non-virtual worlds as in imaginal exposure for treatment of traumatic disorders. These and other limitations related to therapy, as well as the methodological limitations will be discussed to answer in what way VR is suitable for treatment in the context of restoration of self-narrative; also in what way it can present dangers in the context of the fast-paced digitalized lifestyle. For example, moral questions connected with the usage of robot soldiers and fears of domination of artificial intelligence (AI) over the human race can show how a mismatch between the initial idea for utilization of technology and possible reality could happen.

Supporting the effectiveness of therapy in VR should consider what dangers there are in connection with the utilization of VR, especially when handling healthcare problems. The emphasis on soldier treatment in VR is creating an attractive image of VR in society without fully realizing whether this treatment method could fit all types of

patients suffering from PTSD. For example, VR could be effectively used for treatment of fear of heights since it provides sufficient safety to perform the treatment in comparison to other possible exposure methods. However, it should be considered whether the amount of exposure won't make the person too well adjusted and somewhat fearless in a harming way. This concern especially applies to soldiers who become too immersed into trainings and start seeing real war reality as some form of a game (Protevi, 2008). More research is necessary to define which health conditions are best treated in VR. Since the focus here is the self-narrative, the subject of analysis will be PTSD as a disorder that affects one's story in a very thorough way.

1. Social media (SNS) as a medium for the creation of the virtual self and the online experiences

In this Chapter, by observing the development of online media and the human presence in it, the analysis will try to detect what changes happen in the notions of self and reality throughout the history of Internet and VR. Here the works of Sherry Turkle will describe older concepts of virtual selves. More current tendencies will be analyzed by introducing the works of Floridi, 2012; Kosinski et al., 2013; Kramer et al., 2014; Levy, 2002; Linares et al., 2011; Mantovani & Riva, 1999; O’Brolcháin et al., 2016; Rodogno, 2011; Schechtman, 2012. Results from two surveys performed in 2011 and 2016 will be included too.

1.1. Defining “virtual” and “cyber”

In Section B of the Introduction a definition of the way the term virtual space is used in this research was made. Let us now look at the idea of the “virtual” itself from a philosophical perspective.

The era of information technology introduced new terms, which began to be used for describing the newly created online environments – the terms “virtual” and “cyber”. These terms began to refer to the experiences people have in the online environments, created by computers (e.g. “I have met him virtually”). Although the origin of these terms can be sought further back in time, it is the beginning of the Information Age that marks their usage in the specific context related to the computer technology and VR that is considered common nowadays, and whose meaning this dissertation would like to utilize. Authors in various research areas like philosophy,

sociology and psychology use these terms to describe the changes in everyday life that Internet and computer technology have brought about (Chalmers, 2003; Kokswijk, 2007; Turkle, 1995, 2005, 2011; O’Brolcháin et al., 2016).

Authors of science-fiction novels such as William Gibson describe the idea of the “virtual”, and Gibson is the first person to use the word “cyberspace”, most famously in his novel “Neuromancer” (1984). The meaning he puts behind the term “cyberspace” there is related to the computer networks which connect worlds made of information. Here is how Gibson describes the cyberspace in the above novel: “Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts... A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding...” (Gibson, 1984, p.51).

This “nonspace” constructed in the mind is a poetic abstraction which conveys a message about the way people perceive the online and the virtual worlds – as artificially simulated, but also sufficiently realistic in the human perception. Here I would like to employ this idea, although not borrowed from a philosophical discourse, and explain how it gives an important implication about the common understanding of the terms “cyber” and “virtual”. Why is it necessary to borrow a concept from literature for the discussion here? This is due to the notions of “cyber” and “virtual” having been part of the everyday culture for decades, have influenced the paradigm in which several generations of users think about technology and its connection with human life in general (Turkle, 2011).

To start with defining the meanings in a linguistic context, by a definition from a contemporary dictionary, “virtual” has two main meanings: “very close to being something without actually being it” and “existing or occurring on computers or on the Internet” (Merriam-Webster Dictionary, 2016). “Cyber” on the other hand generally refers to “of, relating to, or involving computers or computer networks (as the Internet)” (Merriam-Webster Dictionary, 2016).

It is evident that the term “cyber” is more or less strongly connected with the computer, while the term “virtual” still holds its non-computer related meaning. I will later look over the philosophical concepts created around these terms and will search for their connection with this inceptive idea of “cyberspace” described above. I would like to point that the usage of the term “virtual” regarding the space in which people get immersed in (the space where people “meet virtually”) and the personas (the virtual

profiles) they create there is a broader term which also conveys a more philosophical understanding than the term “cyber” which is usually connoting “cyberspace” as a pure computer simulation. The notion of “virtual” elicits a meaning of something being “in essence” and being “intelligible” even though not actual. This meaning corresponds very well with the way the Internet, the computer simulations and the VR began to be perceived by their users and even though these environments are becoming more or less an inextricable part of everyday reality now, they still embody the same initial essence of an abstraction. That is why a philosophical concept of the “virtual” will enable this study to argue in an adequate framework adjusted to the way treatment utilizes the “virtual” in Cybertherapy, namely by seeing it as an abstract space offering many possibilities in front of the human mind.

The above discussed meaning of the terms has been a subject of philosophical consideration, especially considerations regarding the metaphysics of the “virtual” (Heim, 1993). One common perception about the term “virtual” is that it is opposed to “real”. In other words, this is the idea that the “virtual” is “not real” (e.g. a virtual agent in a simulation) or at least not part of the physical world and its objects (i.e. trees, beds, computer hardware, etc.). However, in the computer and Internet context this “virtual” entity has its own physical representations like “profiles” (e.g. pictures), “agents” (e.g. animations), “rooms” (e.g. simulated environments), etc. and can affect the physical world. Virtual images seem real to the user. For example, a facial expression in a good 3D animation “looks just like real” and thus can evoke emotions such as joy or sorrow in the viewer. On the other hand, things represented in the virtual world seem “simulated” and “artificial” even if they are resembling convincingly real events. For example, even well-mastered animated imagery might still provoke in user with less experience in the virtual such emotions as the ones described in the concept of the “uncanny valley” (Mori et al., 2012), which claims that artificial faces that are closely resembling human faces will have reverse effect on the affinity people have towards these artificial images. The balance between game-like and too realistic simulations can have diverse effect on people experiencing these kinds of simulations (e.g. compelling or repelling).

Finally, to employ another view of effect of the virtual and give an example with its application area of research on trauma and healthcare, it is possible to give the following example: one can see a disturbing image such as deceased person on the news on TV or online and consequently develop PTSD symptoms. That is the reason why researchers connect visual stressors in media to PTSD onset (Galea et al., 2005).

However, what is important to note here is that what happens usually is that the users who perceive the virtual information disregard its strong effect (e.g. “this is only a video”) and underestimate the effect on their mental health. In addition, there is different degree of vulnerability which determines the outcome of seeing distressing images (e.g. comparing a soldier and a civilian).

Increased stimulation from virtual images can bring about lack of focus and attention deficit (Yoo et al., 2004). In addition, “virtual” is also associated with the notion of “artificial” hence not real. This adds to the lack of awareness about the strong influence that representations and simulations can have. It is necessary to consider one additional point, namely that “virtual environments, compared to classical advertising media, provide users with a higher level of presence, more perceptual and psychological immersion” (Grigorovici, 2003, p. 191). “Virtual” spaces are more immersive, however considered “simulated” and “unreal”, hence safer than real spaces. This specific combination of influence of the “virtual” on the users is what would be discussed in more detail in this analysis.

1.2. The notions of virtual space and virtual self

In the Definitions part of this dissertation a simple introduction of these terms was made.

Various researchers have attempted to grasp the essence of the virtual spaces and their effect of the human self. I will make a brief introduction of various works on the topic and start with the concept framework of this dissertation.

In order to employ the concepts of “virtual” and “cyber” and discuss them in the context of VR therapy, it is necessary to clarify what in particular is understood by the notions of “virtual space”, “virtual environment”, “virtual self” (also similar virtual self and different virtual self), “virtual reality” (VR), and “Cybertherapy”. A basic definition was made in the Introduction. Here I would like to introduce the following definitions used in the second of the two surveys which were performed for the study (Georgieva, 2011a; Georgieva, 2016), namely the one in 2016, which states that:

- a) “This survey is designed to address your online behavior when you are using different Internet media like SNS (Social Network Services), applications, and so on. The questions concern activities performed both on computers and

handheld devices (smartphones, tablets, and so on), and do not make any difference between those.”

- b) “This survey is designed to address your experiences in virtual spaces. By “virtual spaces” we mean any simulated spaces that represent real or fictional worlds—for example, like the ones in 3D simulations, computer games or virtual reality.”

(Georgieva, 2016)

These descriptions show two main understandings about virtual spaces – the “type a” being the simple software applications allowing different activities online (e.g. communication in SNS such as Facebook) and the “type b” being the more complex environments which are simulated versions of alternative realities (e.g. fantasy worlds in computer games or exposure environments in PTSD treatment) in which people get immersed. Although between these there is no great difference in the technical realization as environments made with computer software, the way they influence human perception of reality differs greatly. In the beginning of the Internet usage, the environments of “type a” became popular and extensively used; however, nowadays the “type b” virtual spaces are becoming stronger and their influence on future tendencies (e.g. VR in business) is on the rise. I would like to discuss and utilize this difference later in the process of explaining why the VR could possibly enable the construction of new stories and perspectives about one’s self.

What I would like to draw the attention to here is the fact that the two types of environments, namely “type a” and “type b” from above, are having similar strength of their effect on human thinking and behavior. I would like to give example with the results from the surveys in 2011 and 2016 (Georgieva, 2011a; Georgieva, 2011b; Georgieva, 2016; Georgieva, 2017) that show that more or less people get affected by what happens online and in the virtual worlds, even though these are separate from the real world. For example, on the question “Has your online activity helped you overcome problems in real life?”, 83% answered “Yes” (Georgieva, 2016) and on the question “Can you say you have been/are addicted to some kind of virtual environment - game, website, service etc.?”, 53% answered “Yes” (Georgieva, 2011a). Of course, the effect of social media has been confirmed in recent years in other studies (Kramer et al. 2014). The attempt of the surveys performed between the 5-year period, is to show what the understanding of both “type a” and “type b” virtual spaces is and how well people distinguish between them, how they evaluate their influence and how attached are they to these virtual spaces.

In addition, the previously mentioned studies of the immersiveness of VR (Grigorovici, 2003) show that what is considered as “virtual” can have strong impact on human perception, sometimes beyond the expected. Studies on game addiction (Schoenfeld & Yan, 2012) and game-provoked aggression (Anderson et al., 2010), as well as the surveys performed to support this study and the above mentioned study of Kramer et al. (2014), show that the virtual spaces affect human emotions, perceptions of self and others, and additionally provoke addictive behaviors.

The first, “type a” virtual spaces are seemingly less influential due to decreased immersiveness; nevertheless, their effect proves to be sometimes life-changing and generally influencing self-image (Cooper, 2011). Then it is necessary to note that the much more immersive ones, namely the ones described as “type b”, are having the power to change perception, teach new abilities (Mitchell et al., 2007), or even induce cyber sickness (Bruck & Watters, 2009) lasting fairly long after the experience. To describe it in a different way, it is possible to make a hypothesis that what is experienced in the virtual is transferred to the real as real-life effects, experiences and skills (Georgieva, 2011b). This hypothesis will be discussed further in the course of the considerations in this paper when analyzing how Cybertherapy works.

Let us return to the image of the cyberspace that Gibson creates in his works (as referenced in the beginning of Section 1.1.), which has been replicated many times in other science-fiction works such as novels, movies, and so on. Similar abstract imagery of the online world and its various environments (e.g. websites, SNS, reality simulations, games, etc.) is used outside of fiction as part of an everyday terminology for different activities (e.g. virtual chat, Cybertherapy). This terminology is used to describe the experience in the virtual spaces created on the Internet as forms of additional to the physical spaces one experiences in offline reality. In these spaces people have learned to create profiles as self-expressions or self-representations (or “personas”) while utilizing and participating in the various forms of the spaces. Now let us consider how exactly this process of creation happen and how people define themselves in the mentioned two types of spaces.

Let us consider one possible case, in which a hypothetical person can have the profession of a medical doctor, the family role of a father and the personal hobby of a golf player in “real life”, while in the “cyber” world to maintain the “virtual” character of a king in a medieval game, a person looking for an extramarital affair in an online chat, and a therapist in an online counseling forum. It is difficult to say that this person has six or more different personalities; however, if these are considered as “personas”

(as some form of “masks” which people use and swap according to various occasions), this case sounds plausible and still, his online and offline representations are quite different. Moreover, if the “virtual” space was not offering flexibility to play different roles, the person discussed here would not have the chance to experience so many self-representations and choices to create his own profiles. In Schechtman’s words, this is the “opportunity to experience vicariously an authentic part of [a] personality through the actions of [an] avatar” (Schechtman, 2012, p. 333). In the example described in this paragraph, the medical doctor has the option to express further one feature from his “real life” role – medical therapy – while at the same time he finds a medium to realize a desire of his hidden “face” – to search for a different partner from his current one in “real life”. These two cases can be linked to the idea of “similar” and “different” selves people create online (Georgieva, 2011b). These concepts will be discussed later in the text.

What is important to emphasize here is that such kind of various “virtual” roles or personas, which people started creating together with the advance of information technology and the development of online worlds, were initially very experimental (Turkle, 1995), but not completely different from the self-narrative and the life story of each person or from their “real life” ones. As Schechtman says, the “character someone develops or portrays in a fictional context or game is an expression of something that is authentically part of [that character]” (Schechtman, 2012, p. 332). It is possible to imagine that in one case these roles (for example the therapist role) are continuations of real professions or capabilities, while others are showing a “persona”, which only few people know (the online “cheater”) or even an image only the creator associates with his own self (the “ruler” in the game), perhaps not even really identified as part of the self, but as a “try-out” of one option or idea of the self (Turkle, 1994), a “slightly fictionalized version” of the self (Schechtman, 2012, p.332), or a form of a virtual self as a project under development. However, all these “faces” have meaning in the story that was created by the person who holds them as a story of his own life, online and offline. It seems there is no significant “difference between the way an avatar’s narrative impacts a user’s on the one hand and the way in which a character’s narrative can impact an actor’s or author’s on the other” (ibid., p. 339). Virtual spaces possess the same influential ability as other mediums; however, their impact level is higher due to their characteristics.

Similarly to Turkle (1994), Kolko (1999) discusses the virtual spaces in the context of identity play by mentioning the “fluidity of on-line identity” (ibid., p. 177)

and by defending the possibility to experiment with one's identity in the virtual spaces. This, being a relatively old study, shows again the initial tendency to experiment with the different virtual self. However, as the author mentions, the "virtual worlds are more than playing fields" (ibid., p. 187), sensing the coming times of change when the virtual space would become a routine part of everyday life, as discussed in the current research. Kolko supports the idea that there is nothing virtual about the virtual or that it is not so distant and secular, but rather similar in effect to the "telephone conversation" (ibid., p. 12) for example. It is a subject of a great debate to discuss in what way the virtual space differs from other media or spaces where people project their selves such as books, movies and the like. One certain characteristic, though, is the level of immersiveness and presence is much higher in the virtual spaces and especially in the "type b" discussed in this Section in comparison to all other media.

In the context of the above considerations, understanding how the virtual spaces were perceived initially will help analyze their continuous effect and show how they have become natural parts of everyday life now; it could also well illustrate the idea of the shift from the "type a" to "type b" spaces and from different to similar virtual self, as supported in this research.

To continue with differentiating virtual spaces from other media I would like to introduce in more detail Steuer's research (1992) in which he defines VR as medium (software) similar to TV and telephone and as a collection of machines (hardware). However, afterwards, the author discusses VR through the prism of human experience, namely presence that is achieved through perception of the virtual surroundings as mediated by "automatic and controlled mental processes" (ibid., p. 75). Steuer defines major characteristic of the sense of presence to be its vividness and interactivity, distinguishes between presence (induced by the perception of being in a natural environment) and telepresence (induced by mediated environment rather than immediate physical environment) and gives a truly exhaustive classification of the media technologies, including such ones as 3D films, email and so on. Steuer refers to mediated presence as providing the experience of "being there" and creating a perception of the mediated worlds "as if they were real". He has unitary view of all virtual spaces, similarly to the adopted here concept of virtual space that includes not only VR, but other computer-generated spaces such as SNS or games.

Following the same concept of presence in the virtual spaces, Slater & Wilbur (1997) talk about its immersiveness and presence and explain that the experience in the virtual space is "the sense of our self being in a place" (ibid., p. 606). They describe the

immersiveness characteristics through four keywords: inclusive, extensive, surrounding, and vivid. As for presence, they talk about “virtual body” that the real self identifies with. They also mention that while in the virtual space, “[t]he more the “plot” line potentially removes a person from everyday reality, and presents an alternate self-contained world, the greater the chance for presence” (ibid., p. 607). It is possible to see how the concept of story line in the virtual space has a major role in supporting the strong effect of presence on the person immersed in it. Slater & Wilbur connect the concept of plot with interactivity, namely with the ability to exert influence on the virtual environment with one’s own presence. This can be considered a major point for the successfulness of therapy in VR since one becomes active agent (or as Slater & Wilbur note, that one has autonomy) and owner of the story (i.e. not a passive victim as during the traumatic experience). Of course, the discussion of therapeutic usage of presence will be made later in this discourse.

To include a much more recent study, Kolb (2006) claims that “[r]eal events happen in real places in virtual spaces” (ibid., p. 70). These spaces do not need to be physical and offer a new area of possibilities or as explained in Kolb’s words “the flexibility possible in the virtual spaces may bring a sense of freedom and experimentation” (ibid., p. 75). It is possible to say that however changing, the virtual spaces remain the same as with their effect on the human self. Even though the way the virtual spaces are used have changed significantly during their development and popularization, the effect on the human self has been remaining significant and the introduction of the more immersive spaces like VR only strengthens this tendency.

To continue, Elsaesser (2014) compares narrative and game scenarios claiming that narrative is linear and historical while VR could bring about experimentation by simulating costly or dangerous environments. It seems that with the advance of virtual spaces their application gets highly profiled and the purpose for their utilization gets clearer. Elsaesser differentiates between the purposes of VR utilization such as training and education, visualization and art and other media’s utilization purpose. An important point of his research is that the virtual “may even create a modality, a temporality, and a tense, which the visual does not know at all, but which brings the virtual closer to language, rhetoric, and formal logic than one might initially suppose” (ibid., p. 300). As Elsaesser puts it, “[v]irtual reality, then, when set up in opposition to the experience of cinema ..., is the fantasy of tactile, haptic, body-based sensations, rather than its virtual realization, for the relation of VR to the body is still metaphoric, even though the effects are experienced as real, and the relation of VR to reference is via an interface, which

functions like a symbolic language, which our mind and body ‘translates’” (ibid., p. 302). The virtual is actually bringing a new type of experience for the human mind and body which is still to be understood well. The researcher also discusses a possible contradiction in the utilization of VR since computers connect more to automatedness rather than to interactivity. The author also distinguishes between narration and navigation and concludes that the virtual spaces shift is “from play station to workplace, and from narrative to database” (ibid., p. 307). The discussion about the shift from the virtual spaces of the “type a” to the virtual spaces of the “type b” and the shift from different to similar virtual self seems to be a very substantial one and its thorough analysis should be the subject of future work. Moreover, the navigation feature is being well developed in VR simulations now; however, the narration in which the authorship of the person being immersed in VR is still yet to develop (e.g. this is the reason why VR cinema is still a difficult to realize since there must be endless choices and ending stories prepared for viewing “VR movies”).

To summarize, a unified terminology is necessary when addressing issues regarding the virtual spaces, their effect and their utilization in practices like therapy for example, as well as their development in time. To explore how the terms “cyber” and “virtual” have evolved and in what way people perceive the online spaces, the mentioned two surveys were conducted in 2011 and 2016 as an aid to the analysis of the virtual spaces and their effect on the human self. Their results present a limited sample and therefore cannot be used as a representative data. Nevertheless, some interesting results provide feedback for future work.

As mentioned, these surveys have common topics regarding the way people present themselves on the Internet – as persons, more or less similar or different from their “real life” self (i.e. the “similar virtual self” and “different virtual self” discussed in previous research (Georgieva, 2011b)). For example, in the first survey from 2011 73% of the respondents replied to the statement “You think that people pretend, play with their self-representation and tend to be different from their real selves while being online.” with “Agree” (Georgieva, 2011a). Additionally, the majority (80%) replied with “Disagree” about the statement “You can say that the difference between yourself online and offline is significant.” (Georgieva, 2011a). This discrepancy shows both an expectation that people are not sincere online and, on the other hand, they feel that online people can be themselves. In the second survey from 2016, a similar claim, “You can say that the difference between yourself online and offline is significant.” was most frequently answered “Neither disagree nor agree” by 44% of responders (Georgieva,

2016). This presents an overall tendency towards being more “similar” to the real self when representing one’s virtual self.

Now let us make a brief analysis: Why and how does this change happen?

1.3. Changes in the virtual self

Self-representations on the Internet have changed over the time. Starting with anonymous profiles or people using nicknames, the beginning of virtual communication implied that one is free to choose among options and create a self, different from the one he or she has as a social persona, known to everyone in the “real world”. As Schechtman describes people in online worlds, they “have relatively few constraints on player identity and activity and no well-defined goals or rules” (Schechtman, 2012, p. 330). Various types of people – for example, frequent and savvy Internet users such as hackers, together with completely ordinary people using the Internet, were enjoying the possibility to “hide” their usual “face” and experience multiple ways for creative experimenting with their self-image since the online worlds emerged (Turkle, 1994). This is the moment when people were able to “take advantage of the opportunity to explore and express elements of personality that they cannot or do not express” in real life (Schechtman, 2012, p. 332). However, in the history of online activity the effect of human presence in the virtual was divergent and people now are more or less becoming similar to their “official” offline self (Georgieva, 2011a; Georgieva, 2011b; Georgieva, 2016; Georgieva, 2017) or, let us say, the social persona whose narrative they hold on to in their lifetime (Schechtman, 2011). Even though small shifts to experiments with anonymity were happening again (e.g. social media tendencies for smartphone applications with anonymous profiles, developed around 2013-2014), nowadays people tend to keep their online persona similar (Kosinski et al., 2013) or even better or idealized as mentioned in the surveys (Georgieva, 2011a; Georgieva, 2011b; Georgieva, 2016; Georgieva, 2017) than the self-image they have “offline”, especially compared to previous periods when anonymity and experimental work on the self were more popular (Turkle, 1994).

To further develop the idea of narrative self in the virtual by talking about similar and different virtual self, I would like to argue that even though currently there is such tendency like the mentioned above, the opportunity to experience a different aspect of the self-story in the virtual is happening on a smaller scale (for example while

presenting oneself in social media as being a bit more open or communicative) and also helping the process of treatment where the virtual environment is utilized for healthcare. This process probably is aided by the memory that most of the virtual spaces users have of their own experimental periods as they began using these environments decades ago or by that image for the “virtual”, but also very realistic, immersive space, described by Gibson and entangled in the culture resulting from the Information Age. A specialized study on new users (e.g. Millennials or people born after the early 1980s (e.g. Bergman et al., 2011)) could bring new insights about such people who do not have initial experience of the period of experiments in the virtual space when people tended to create many new and different virtual selves. Unfortunately, here the research is limited to the survey participants which include people from several undifferentiated age groups (Georgieva, 2011a; Georgieva, 2016); therefore, evidence for younger users only (i.e. Millennials) cannot be utilized.

To summarize, with the findings from the research performed so far (Georgieva, 2011a; Georgieva, 2011b; Georgieva, 2016; Georgieva, 2017) I would like to argue that there were two main tendencies – the one of the “different virtual self” and the one of the “similar virtual self”, which characterized the development of self-image and persona people create on the Internet. These are of special importance since they are connected to the main concept of this analysis – namely, to consider whether the creation of different self-representations in the virtual spaces is a form of creation similar to the one done when self-narrative is formed. If this is true, then considering how to correlate this creation of self-narrative to the possibilities for treatment of the self in the virtual space and more precisely to the idea of the transfer of the effects of the virtual on the real self, will provide important reflections regarding the way real self-narrative or life story is created and the way people could possibly recover from trauma. The addition that this study proposes to the narrative account is that people create on purpose similar or different virtual self and this differentiation could have special application in treatment since if the self is similar it might correct some minor features connected with its life story, while if the self is different it might try and experiment with completely new experiences in the virtual. This conscious choice is one new feature of the self that exercises its narrative possibilities in the virtual. How this could happen in therapy would be discussed later here.

Therefore, I would like to employ the already introduced in the Definitions part set of terms when arguing about the above proposal. These include the terminology regarding the “cyber” and “virtual” spaces or environments; the types of selves that

people create there, namely the two general types of the “similar” and the “different” self, and the idea of treatment in the virtual spaces, commonly referred to as “Cybertherapy”. I would also like to employ the previously mentioned concept of “transfer of experience” from the virtual world to the real world which is usually achieved through gaining of experience and learning new abilities, changing the self-image; or to borrow a philosophical perspective, re-telling the self-narrative in therapeutic or educational practices performed through the usage of computer technology.

1.4. Narratives and virtual selves

Now, I will position the narrative concept from philosophy in the context of the virtual environments and the human experience in these environments. According to Schechtman’s description of narrative (Schechtman, 2011), it is constituted to explain the occurrence of different events in human life. The explanation of the events in human life can have temporal and causal characteristics and helps people put order to what often is a set of events, which they do not have power to change (e.g. a sudden disaster, as it will be discussed later in connection with PTSD). That is why people constitute themselves as selves by understanding their lives as narrative in some understandable form and living according to that construct (ibid.). This experiencing and interpretation of the present happenings as not isolated moments, but as part of an ongoing story aids the human experience of a process that can be defined as self-development through various forms of life experiences. However, this study wants to point out that it is obviously difficult to change the course of life according to one’s idea of life story. For example, one can do his or her best to impress his or her superiors at work, but nevertheless not to get the desired promotion. In the same way, this person can get relocated and get the desired promotion even though this doesn’t match the initial plan (the story, including promotion only, without relocation), and still not to match the person’s idea of how life should go. In such cases human coping mechanisms help to rearrange the ideas about the story and find new purpose, etc.

How it is possible to connect these conclusions with the virtual spaces and VR in particular? First of all, in virtual spaces people have more options to experiments and form their self-image and life story (Turkle, 1994; Schechtman, 2011). How does this happen? Even though some environments (let us say games) are not part of the story people have created in everyday reality (such story can be found in the

business-oriented SNS like LinkedIn), they offer the opportunity to experience some kind of narratives that more or less affect the “real self” and teach skills, form mental self-images, help for coping with stress, and so on. The survey performed in 2016, although not being representative since it is with a rather small size, shows that people use virtual spaces, generally SNS, to induce certain feelings of comfort and satisfaction (e.g. watch something funny, look at photos to reminisce pleasurable moments, etc.) (Georgieva, 2016).

Of course, this can be connected with addictive behavior towards these environments, when pleasure is triggered by constant checking of the site, waiting for attention, expectation for obtaining pleasurable reactions, etc. (Schoenfeld & Yan, 2012). However, within healthy limits, virtual environments like SNS allow users to elicit positive emotions quite easily, and sometimes more effectively than performing similar actions outside of the virtual space (e.g. merely because more people can see changes made to one’s online profile and in general activities are done and happen faster). This research supposes that the speed and easiness experienced in the virtual spaces aids the treatment work in Cybertherapy. This topic, however, will be discussed later when analyzing the treatment methods of PTSD, without forgetting the fact that virtual spaces can be deceiving too (i.e. in providing or supporting false beliefs).

What I would like to emphasize here is that virtual spaces offer a medium which is easier to manipulate and utilize for creation of narratives. This applies not only to fictional spaces such as the medieval virtual game discussed in Section 1.2., but also to the “official” ones, like SNS where people re-create their self-image into a profile which for example appears like an extended business card in the case of the LinkedIn (professional networking site mentioned in this Section). That is why regardless of the medium, self-creation can be supported in virtual space; however, it is obvious that some environments offer more options, immersiveness and effect on the real self, like the VR for example. VR, then, can be utilized for more major cases such as treatment, rather than the simple improvement of self-image often happening online as for example in SNS where one is presenting better version of him- or herself through positive content (i.e. motivational quotes, beautiful pictures and the like). Being a higher level virtual space as described in b, VR is meant for more “serious games” (Susi et al., 2007) like training and treatment. But before discussing treatment, let us look into the idea of trauma and the way it develops and affects the human self and its narrative ability since the concept of break in one’s narrative leads us to one specific traumatic disorder – PTSD.

2. Causes for the PTSD onset and classification of the PTSD types

Here will be analyzed the causes for the PTSD onset and their connection with the classification of the PTSD types (Kolassa et al., 2010; Galea et al., 2005.). It is necessary to summarize the origins of the disorder and the reasons for its onset in order to find how they relate to the personal story people create about themselves. The efforts to connect the personal stories of the people suffering from PTSD with the circumstances that lead to the development of PTSD might facilitate the design and the execution of treatment in the context of the idea about the recreation of the personal life story. The essential characteristics of the disorder are closely related to the circumstances, surrounding the traumatic event. Each type of PTSD is caused by events that are specific for this type of PTSD, i.e. a sexual assault causes sexual assault-related PTSD and differs from PTSD caused by non-sexual assault. Since there is significant variance in the causes of the disorder, the treatment should address them accordingly. PTSD and its effect on the mind is an important theme that will be discussed in a philosophical framework (Jovanovic et al., 2013; Suvak & Barrett, 2011; Bauer & Bonanno, 2001).

2.1. Description of the causes and risk factors for the PTSD types

The onset of PTSD has usually a traumatic happening – an event which becomes a cause for the onset of the disorder. The causes for the PTSD onset are generally described as follows: traumatic events and/or events that evoke fear or helplessness, as well as events of witnessing injury or death (Javidi & Yadollahie, 2012). Such events are for example war, sexual violations, car accidents, loss of loved ones. Other factors which are usually mentioned as part of the causes for the onset, but should be defined as part of the risk factors for the onset of the disorder, might include genetic factors such as

2. Causes for the PTSD onset and classification of the PTSD types

inherited mental health risks (Mehta & Binder, 2012) or factors such as having relatives suffering from depression or anxiety disorders (Xian et al., 2000). Among the factors can be also included the personal characteristics or physiological changes of an individual such as increased vulnerability or loneliness which can affect the probability of the disorder's onset (Bromet et al., 1998). In addition, research shows that reduced volume of certain brain areas such as hippocampus and medial prefrontal cortex can be associated with PTSD (Shin et al., 2006).

It is necessary to distinguish between the factors which correlate with or might influence the onset of PTSD and the events that directly influence and typically cause PTSD (e.g. a terroristic attack). The factors which correlate with or might influence the onset of the disorder are not necessarily present in all PTSD cases (e.g. it is possible that a healthy person who does not meet criteria such as changes in the brain or history of family disorders can still develop PTSD if exposed to shocking or near-death experiences). The factors that directly influence the disorder (i.e. the traumatic events) though will have high probability to disturb the mental health of a person exposed to them and this person's accumulation of risk factors will increase the probability to develop PTSD. In the context of the narrative idea, events (happenings) are more difficult to get integrated in a consistent story rather than inherited mental condition for example.

Considering the duration of the disorder, there are three main types: acute PTSD (symptoms lasting up to 2-3 months after the trauma); chronic PTSD (symptoms lasting more than 3 months after the trauma); delayed-onset PTSD (symptoms manifesting 6 months after the trauma) (Bonanno, 2004).

In one comparative study mentioned in Chapter 1, Section 1.1. (Galea et al., 2005) disasters causing PTSD are divided into two types depending on their cause: 1) human-made or technological disasters and 2) natural disasters. The first type may include accidents like pollution or fire. In this type, a major group of PTSD is also included – i.e. war-related PTSD occurring in post-war time or in peace time for veterans and for professional soldiers. This type is found to be very challenging for the therapeutic practices and a lot of research is being conducted in order to investigate war-related PTSD. However, the second type also deserves interest and the fact that research on therapeutic techniques utilizing VR is very limited should be analyzed carefully.

A significant amount of financial support is put on research of war-related PTSD in the United States of America. The USA is one of the main countries that supports the

advance of VR technology since major American companies work in the development of VR products (e.g. Oculus VR, LLC, part of Facebook, Inc.); also in the USA the training and treatment of soldiers in VR environments is becoming a mainstream practice. It is necessary to consider whether such increased interest for various applications of VR is not a result from the excitement over a new trend in technology rather than careful consideration of a possible new frontier for healthcare. In this sense, in the attempt to defend the choice of VR as treatment medium, in addition to the analysis of the effects of the application that the virtual spaces have, it would be beneficial to also discuss the factors surrounding the development and the acceptance of the virtual spaces (for example the entertainment-related factors for their popularity) as they present the desire of people to explore new medium for representing oneself and one's story.

It is also interesting to discuss why efforts to treat soldiers (and utilize VR) are developed in a very different way in the USA and in other countries researching this. This could be connected with an idea that each country has different moral concepts and politics towards killing permissibility and this topic will be discussed later in Chapter 4 when I am going to talk about the soldier PTSD and the idea of vulnerability caused by the inability to accept killing into one's moral framework (life story).

2.2. PTSD definitions and symptoms characterizing the disorder

Post-traumatic stress disorder (PTSD) is an anxiety disorder affecting many people. It is a wide-spread phenomenon caused by various factors and events as discussed in the previous Section and it is also characterized with different sets of symptoms.

Re-experiencing of the traumatic event (intrusions), avoidance of trauma-related stimuli, and hyperarousal are usually described as symptoms of the disorder. Sometimes dysphoria, the state of unease, is also included in the symptoms of PTSD. Avoidance can be described as consisting of active avoidance and numbing and these sometimes get divided into two distinct types of symptoms. On the other hand, the dysphoria can be described as a combination of numbing and hyperarousal (Olf et al., 2008).

To describe these symptoms in details, I will start with re-experiencing. Re-experiencing usually means reliving the traumatic event after its end. This reliving can happen anytime and is usually accompanied by the same feelings as those

2. Causes for the PTSD onset and classification of the PTSD types

experienced during the traumatic event such as fear or helplessness. This re-experiencing of the events includes nightmares and flashbacks (feeling like experiencing the event again even though there is no obvious reason for this reminiscence). Re-experiencing can be also caused by events that work as triggers (i.e. events that remind of the trauma and trigger a negative response in the traumatized person). Sometimes association between events and stimuli can provoke symptoms of PTSD. This specific of the symptoms will be discussed later (Chapter 4, Section 4.6.). Avoidance can be connected with avoiding public places or activities which can be associated with the traumatic events. Avoidance can be also connected with the act of avoiding to seek medical help related to the psychological state affected by the trauma. Dysphoria generally includes negative feelings towards other people and the world as a whole, also the process of forgetting elements from the traumatic event. Hyperarousal usually means that trauma affects the ability to sleep and concentrate, and also makes the traumatized person too alert and stressed even in the case of non-threatening stimuli.

Researchers also mention the effect of rumination (Claycomb et al., 2015) as a type of PTSD symptom which is characterized with intrusive thinking about past experiences that is usually negative in its content. It is specified by the fact that the traumatized people ruminate about the circumstances and reasons for the traumatic event rather than the content of the event itself and with this increase further their distress related to the trauma.

Kolassa et al. (2010) discuss how the occurrence of several traumatic events affects the severity of the disorder. The authors propose to consider the possibility of accumulation affecting the onset of PTSD. Such possibility is of particular interest to the research here too. To put this concept into the narrative paradigm adopted here from Schechtman's philosophy, if various events disrupt the narrative one creates about himself or herself, then retelling the own story becomes more difficult. It is much easier to fit one discrepancy in a storyline than to add various changes and keep the story meaningful. Of course, it is possible to suppose some people are bad narrators and cannot find easily meaning in multiple negative events and hence create a new plausible story of their life. However, sometimes what happens to one person may exceed the "imagination" a typical narrator has, for example by being too large accumulation of traumatic changes over time. In such case the possibility for PTSD onset becomes much higher and trauma much more complex.

Other researchers, Yufik & Simms, perform a meta-analysis of number of studies in order to look at the structure of the PTSD symptoms (Yufik & Simms, 2010).

2. Causes for the PTSD onset and classification of the PTSD types

The PTSD symptoms are generally divided in clusters some of which include such events and sensations as “actual or threatened death or serious injury to self or others” and “intense fear, helplessness, or horror” (ibid., p. 2). In addition, there are the symptoms related to the re-experiencing of the traumatic event (or intrusions), the symptoms of avoidance of trauma-related stimuli, and the hyperarousal symptoms. However, not all of these symptoms are present in all of the PTSD cases; also there are typical PTSD cases with typical sets of symptoms which are stronger for one type of PTSD compared to another type of PTSD (e.g. hyperarousal might be typical symptom for combat-related PTSD, while avoidance for sexual assault PTSD). It seems plausible to consider that actual threat for life or witnessing of death differ greatly from having intense feeling such as helplessness or fear. The first might provoke reaction and self-protection while the second might make the person be exposed to these emotions while being completely perplexed or numb. In this sense, the two types of PTSD I am going to discuss here, namely combat-related or soldier PTSD and natural disaster-related PTSD, differ greatly in their symptoms and consecutively, in their essence.

What the researchers from the above study hypothesize is that hyperarousal and re-experiencing symptoms may be more typical for the periods immediately after the trauma occurred and symptoms characterized by emotional numbing may be experienced after a significant amount of time has passed after the trauma. This can be analyzed from the point of view I adopt here, namely the concept of life story people create to explain their own reality. If I try to give an example, it seems that at the beginning when the trauma occurred, the shock of the sudden change in the course of one's life provoked reactive states, characterized with hyperarousal and the like. However, when time passes and the person feels unable to control his or her life narrative the way he or she was used to, then helplessness, locking into one's self, or the mentioned emotional numbing become more specific reactions and states of the traumatized person. In the same way, after a combat one is still in aggressive state and might seek revenge for example, while later to ruminate about injury or loss of fellow soldier. Similarly, after a natural disaster, the struggle to survive and protect relatives might be replaced later by shock or despair caused by the surrounding destruction. Considering the context of the symptoms and imagining the story behind each case might help the design of the therapy, especially if it is done in VR where various options for adjustment of the treatment scenario are available.

What should be noted as additional consideration and basis for future work as presented in the study by Yufik & Simms is that there might be other symptoms which are still not defined in the DSM criteria for PTSD such as “dissociative symptoms, substance abuse, emotional dysregulation” (ibid., p. 15) which could actually help for the understanding about what happens after the trauma that sets the path for prolonged PTSD.

Now, how to differentiate between the different types of PTSD?

2.3. Connection between the disorder causes and characteristics

In this Section it is necessary to take into account the idea that PTSD is related to personality and coping abilities, as well as psychological predisposition (comorbidity) or physiological predisposition to PTSD (brain activity and thinking patterns).

Let us explore an example of a young girl who is kidnapped and kept tortured in captivity for years before returning to her parents. If she had peaceful life with prospects for successful future this life story of hers will get completely shaken and whatever story she will try to create in her mind about what happens will be not adequate enough to the gruesome reality she experienced. In such cases reconstruction of the narrative in therapy seems very difficult, merely impossible if the initial idea is that therapy helps patients retell their life with the trauma in a more meaningful way. On the other hand, if for example a young boy has had a difficult childhood, having divorced parents, living in poverty, and so on, and has learned to cope with adversities, similar events might be less traumatic to this boy. The mental preparation the second kid has will facilitate a therapy for retelling the kid’s life story. Still, it seems that in any case if too many traumatic events accumulate, the effect on the health of that child will be fairly negative. That is why background story and accumulation effect should be considered in different prisms when analyzing the causes and the types of PTSD.

It seems that a life spent in fear (as it often happens in the cases of a lifetime PTSD (Kolassa et al., 2010, p. 172)), together with the lack of understanding and support for the cumulative or complex type of PTSD, will leave some patients unable to reach possible healthy state even after well-directed therapy. In this sense, the current study tries to discuss how the different PTSD-provoking events build on trauma and why different PTSD types need to be addressed differently, with the major consideration that trauma is a form of a break in the narrative of one’s self where accumulation has its

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own strong impact. A focus on the context of the trauma in one's personal narrative should be made to understand why accumulation affects the people suffering from PTSD. For example, one traumatic event might not cause PTSD first, but combined with second traumatic event, it might lead to both being cause of PTSD and resulting in a PTSD with complex characteristics.

In this line of thought, Jovanovic et al. (2013) emphasize that inhibition of fear is impaired in PTSD which is a result from both civilian and combat traumas. Their study shows that PTSD patients can cognitively identify dangerous and safe cues, but would still experience the same level of fear to both types of stimuli. This leads to the necessity for consideration of the physiological reactions that are symptoms of PTSD which can override the abilities for cognitive restructuring. As mentioned in the previous paragraph, if people have more traumatic experiences accumulated in their lifetime it will be easier for them to develop PTSD. In addition, in regard to their personal context, one type of trauma might affect more strongly one type of people rather than another. For example, the will of the first young girl's mentioned above in this Section is to react peacefully to stressful stimuli, but when she sees something reminding her of the captivity time after she is released, she wouldn't be able to control her reaction of fear and would exhibit PTSD symptoms in such situations. However, the boy from the second case would not react to some stressful stimuli which are already habituated and integrated in the life story. If such cases are considered from therapeutic perspective, it seems that treatment on experience level should first start with introducing stimuli in adaptable environment like VR to make the patient get used to the traumatic cues and then work on transforming the meaning of the traumatic events and build resilience through new or rearranged life narrative and self-image. The detailed discussion on the design of treatment is a subject of analysis later in the text.

To continue, Jovanovic et al. present in their findings that there are patients who are able to learn safety cues, but who still do not apply the learned skills in novel situations. This seems a serious concern to create a debate around the whole concept of Exposure therapy combined with CBT, often utilized for PTSD treatment, and the narrative reconstruction that is proposed here. If there are cases when one cannot apply what has been learned in the treatment, or in other words, cannot transfer the experience as hypothesized here, such cases deserve careful observation and require reconsideration of the whole idea of transfer of experience and formation of self-narrative in the virtual space.

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To focus on how different events are connected with the different types of PTSD, I would like to employ Ehrenreich's (2002) concept that trauma cannot be considered the same for each type of PTSD since the term "trauma" is used to describe the emotional responses to traumatic events with vast difference in content, severity and impact. Motor vehicle accidents, natural disasters, war, chronic physical abuse or torture can have very different meaning from psychological and moral perspective. In this sense using a single construct to describe responses to such a wide range of truly challenging experiences is considered implausible according to the author. I would like to take this point of view and consider further the proposed idea that the different causes for some disastrous events can have completely different outcome for the form of the trauma. For example, a person who has suffered loss of relatives or housing during a flood will have completely different perspective on his traumatic experience compared to a victim held captive and sexually assaulted for a long period of time. The characteristics of the first person's symptoms will differ greatly from the second in terms of self-perception and perception about the others. In addition, the existence of feelings like guilt, shame, helplessness or horror will differ in their intensity and duration for the two persons. Comparing many examples of PTSD cases can only bring understanding of the necessity to see each case as separate story that needs to be addressed under the broad naming of PTSD.

Furthermore, considering a quite large comparative study by Kilpatrick et al. (2013) which claims that it is difficult to assess PTSD symptoms when most individuals have experienced multiple traumatic events and that the probability of PTSD increases with greater exposure to traumatic event, it is important to differentiate each traumatic event, its cause and consequences in order to grasp fully the traumatic background a person could have.

As Ehrenreich points out, the theoretical and empirical knowledge of PTSD has expanded and even though PTSD is collectively viewed as one anxiety disorder, it consists of very different types of sub-disorders which are defined by the content of the events causing them, the actors in these events and the roles of the persons experiencing the events. Considering this context will help to create a personalized treatment and answer the needs of each one of these people facing enormous psychological challenges as it will be discussed in the part of this study analyzing treatment of PTSD.

Continuing with his view on the diversity of PTSD, Ehrenreich claims that studying distinct PTSD cases can convey a lot of information about the individual resilience and story behind the trauma. In others words, as obvious as it may sound,

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each person's case is different. On the other hand, it is necessary to see that there is also collective trauma and traumatic events can sometimes bring both personal and collective traumas. In order to successfully detect the reasons for the onset of the disorder it is important to specify the individual and the collective aspect and then to consider to which type of PTSD the observed case of trauma victims belongs to.

Different causes such as war, assault or natural disaster will lead to different type of PTSD – a prolonged, acute or delayed for example. They will also be affected by the various factors behind the personal history of the victims in these three cases – whether these victims were vulnerable, had history of substance abuse or had history of depression and anxiety disorder in their family history. Although these factors (for example history of abuse or disorder) can contribute to the development of PTSD, it is the individual context in which the person experiences the trauma that matters for the understanding of the type of trauma he or she has. For example, a person who was able to recover from previous trauma through his or her own psychological resilience can have such history of trauma, but might not develop PTSD the next time stressful events happen to him or her.

What seems necessary to understand is whether the cause of the trauma is a person (people) or nature, whether the traumatic event had physical or only psychological nature, whether the person suffered some injury or only felt immense fear or helplessness. In this way, many factors could influence the onset of PTSD and the classification of such events might not be robust. For example, if we have a victim of psychological abuse then this victim will be avoidant in the same way as victims of physical abuse, however, in a somewhat different way. Altogether, these two hypothetical victims might still differ from a third victim that has not suffered any abuse, but still has developed PTSD caused by a person (e.g. witnessed killing of someone else). Further analysis of this is necessary and this research is not focused on the causes and the reasons for the onset, but rather on the ways to integrate these into a meaningful narrative that can help recover from any kind of trauma.

An interesting study by Benight & Bandura (2004) presents findings of diverse studies on self-efficacy in relation to different traumatic experiences. These studies analyze potential contributors to traumatic recovery. They all point “perceived coping self-efficacy” (ibid., 1130) as a factor for post-traumatic recovery in the sense that the person who recognizes that he or she is having self-efficacy in order to cope with trauma does in result cope better than those who do not perceive themselves as having self-efficacy and recognize such ability in themselves. The authors emphasize the fact

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that perceived low self-efficacy would result in decreased coping after traumatic event. In relation to the vulnerability concept and self-narrative concept discussed in this dissertation, this consideration shows that perceived and learned vulnerability (low coping ability) is integrated in the narrative of the person who suffers from PTSD. In other words, the people who suffer from PTSD do not believe they possess the ability to overcome various painful events since in their own world the trauma, especially if accumulated, has made them too vulnerable and less able to cope with traumatic events that newly occur. This also means that there might be people who would become stronger after trying events and in the same way there are people who would become much more vulnerable after having serious difficulties in their lifetime. The first would perceive that they can cope with trauma while the second would think they “cannot take anymore” the severity of their experiences and would react in less resilient way to new stressful experiences. Benight & Bandura also characterize the key features of the traumatic stressors as “perilousness, unpredictability, and uncontrollability” (ibid., p. 1130) and add “unpreventability” (ibid.) as feature of natural disasters. This differentiation between the types of traumatic stressors leads to the various causes of the disorder and again connects to the multiplicity of its types.

The authors claim that the main themes of research work should focus on the causes and the processes in the course of PTSD. Among these are mentioned prevalence rates and “temporal course” (ibid., 1130) or duration of the disorder, vulnerability factors, psychological processes like fear conditioning and dissociation, information processing and memory biases, neurobiological changes caused by the traumatic event.

The most interesting concept about self-efficacy is based on the idea of exercising control as foundation of human agency and the belief that one can achieve certain desired results through own actions (or one is the author of his or her own story). However, when people believe certain circumstances are unmanageable they view their reality as charged with danger. In contrast, the self-efficacy serves as a regulation of stress and anxiety and creates opportunity to manage adverse situations in a healthy way. Moreover, thought control is considered biggest factor in creating perceived self-efficacy and in handling stressful events. As the researchers define, “a robust sense of coping efficacy is accompanied by benign appraisals of potential threats, weaker stress reactions to them, less ruminative preoccupation with them, better behavioral management of threats, and faster recovery of well-being from any experienced distress over them” (ibid., p. 1133). In this sense, the causes of PTSD onset might be sought also

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in the personal characteristics of the people exposed to trauma and this concept is considered as a main subject of interest when analyzing the causes of PTSD here.

Regarding the connection between trauma causes and types the research of Ditlevsen & Elklit (2012) show that the disorder types are related to the specific causes. For example, sexual assault is far more common cause for development of PTSD in women than men and it often causes PTSD combined with depression or substance abuse. Earthquakes, floods, and so on are under the same event type (natural disaster) because they all present natural occurrences which are outside the control of man. They lead to trauma which is connected with the loss of property or lifestyle and might lead to different comorbidity or prevalence in men and women. Combat, war, terrorism are events which more often include men than women and subsequently will expose such people to PTSD risk. However, the type of PTSD they have is similar since it features one main characteristic – watching or taking part in the killing of other people which is considered to cause one of the most severe types of PTSD. Trauma related to health problems like disease or loss of close person will evoke completely different reaction in the traumatized person who might need time to process the events, but will not feel guilt or remorse as in the case of killing people in war.

What is important to note in these attempts to connect trauma causes and PTSD types is that the type of event (natural or man-induced, violent or not, etc.) will bring about different reaction in people according to their gender, predisposition, and most importantly, history in the sense of medical history, accumulation of traumatic events and, as this dissertation would like to propose, the way people see the event in their own story about themselves. Moreover, whether they identify with the person they have become or they try to escape that person, whether they feel like still owning their life story or feel that they are “helpless” in their life – these factors define in what way they perceive their self-narrative through the prism of trauma. For example, a person suffering from natural disaster PTSD might not try to dissociate with himself or herself after trauma, while a victim of sexual assault or a soldier who has killed many people might want to detach themselves from the persons they feel they have become in their own stories. This will affect the way their trauma develops and will require careful consideration about what kind of trauma each specific PTSD case presents.

Regardless of the various causes of PTSD which might result in many different types of the disorder, it seems that the victims of the trauma have features which allow traumatic experiences to affect them in different degree. In this sense, it is necessary to

analyze risk factors and groups in order to understand the onset of the disorder which analysis will continue in the next Section.

2.4. Philosophical analysis of the risk factors and the reasons for the PTSD onset

I would like now to take a brief look at what type of risk factors there are for the development of PTSD. The risk factors influencing the development of PTSD are such combinations of features which if present will make someone more prone to develop PTSD. If there are more risk factors present in one person's characteristics of mental health, then there is higher probability that the occurrence of traumatic event could lead to the development of PTSD in that person. In other words, the same causes for PTSD might result in PTSD in a person with more risk factors present than in a person with less risk factors present. For example, having mental health problems such as depression will make a person exposed to natural disaster easily develop natural-disaster related PTSD compared to mentally healthy individuals experiencing the same disaster.

To describe the concept about the influence of risk factors on PTSD onset, I will first analyze the findings of psychologists who review the available views regarding what is confirmed as risk factors for the onset of the disorder.

Vogt et al. (2007) investigate various literature on PTSD to show the risk factors for the development of the disorder. They claim it is difficult to say there is a "single cause" (ibid., p. 146) of PTSD and that probably PTSD might have "multiple causal pathways" (ibid.). They work on finding the clusters of risk factors that influence the development of the disorder. The researchers classify the risk factors in 3 categories: psychosocial, genetic, and biological. Then, they focus on the first category and more specifically as these factors are observed in adults suffering from PTSD. Here in addition to the influence of the traumatic event as a cause, the risk factors connected with prior experiences and post-trauma circumstances influence the overall onset of the disorder. A main characteristic of the event is the degree of its severity and the existence of "life threat" (ibid., p. 147) experienced by the person exposed to the event.

Other factors from their literature review include factors such as injury, interpersonal nature of the traumatic event, being involved in the event rather than just being a witness, subjective distress, and finally they emphasize dissociation at the time of the trauma. Dissociation is a common response (coping skill) to trauma when people

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separate their identity or memory from the trauma in order to protect themselves from falling into even worse psychological state. It can happen during the traumatic experience to help the person “preserve” their psychological integrity and not completely “give in” to the traumatic event (e.g. during sexual assault). This, however, can be also a reason to increase the traumatic effect since dissociation affects the sense of identity a person has and changes the importance he or she puts onto certain memories. It is possible that such person loses his or her sense of identity due to such dissociative processes evoked through the traumatic experience and this could lead to increased possibility to develop not only PTSD but other mental health disorders. In the context of the narrative identity and life story analyzed here, it is evident that trauma reaches exactly the level of formation of memories as part of the human self-formation and in the same way it should be addressed on the similar level – namely, on the level of identity and memory one holds as life story.

Previous trauma and family history of mental disorders influence the onset of PTSD according to the research presented by Vogt et al. In addition, the lack of social support and the existence of additional stressors contribute to the development of PTSD symptoms. However, Vogt et al. put emphasis on the fact that not the accumulation of factors but the association of the factors with certain factors from the context of the narrative a person has (in other words, the pathways or connections between these factors) are what causes some people to be much more “vulnerable” than others. In connection to this, one of the biggest debates in the context of PTSD research concerns the precedence of PTSD and depression. It seems depression can both precede and follow PTSD, and it is not clear which causes which first, or rather it is not clear whether the traumatic event itself can necessarily cause both depression and PTSD. Moreover, it is possible that PTSD and existing depression to overlap and create a more severe type of PTSD.

To continue describing PTSD, the above researchers also mention a factor of great interest, namely the so-called posttraumatic growth. This is a coping mechanism different from the one known as resilience that some people exhibit and whose main feature is the ability to achieve personal growth in difficult and trying times. Vogt et al. mention that just like PTSD can cause negative effects on some people, it can also bring about positive influence on the personal integrity and knowledge and therefore result in personal growth. This theory deserves a detailed analysis in the research here since it relates to the idea of self-creation in the form of life narrative. What is important to note though is that in the opposite sense posttraumatic growth cannot necessary get

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connected to PTSD (i.e. some people might achieve posttraumatic growth without developing PTSD first). Posttraumatic growth seems to be a healthier way to deal with the negative effects of trauma on self in individuals with such attitude towards life. For example, since childhood some people will find ways to channel negative things into positive categories (e.g. “I lost my toy, but I can play with the other one”), while others will find even small disturbances unbearable (e.g. “I lost my toy and I don’t want to play with any other toy ever”). These people build their individuality and life story based on these coping mechanisms and later in life would seem more or less resilient, depending on how they are used to interpret events.

Moreover, the peritraumatic dissociation is an important factor pointing towards the onset of PTSD according to the study of Vogt et al. Peritraumatic dissociation is the state in which people can happen to be immediately after the trauma – a state including amnesia, altered perceptions or depersonalization. It is a very interesting fact to be observed in many posttraumatic cases since it affects exactly the main constituents of identity – memory, personality, perception of reality. It seems acceptable to say that exactly these characteristics of a person are tightly related to trauma and exactly they have great importance in the theory about personal narrative. This gives a ground for analyzing further the possibility to see trauma as an interruption of one’s self-narrative.

Vogt et al. focus on a different side of the problem – they look at the combination of different pathways that affect the onset of the trauma. The combination of risk factors which might be incomprehensibly specific for each person would result in traumatic disorder in this person and in healthy outcome in another. In such sense personal characteristics are definitive factor for the PTSD onset. The authors connect lower IQ with increased probability for PTSD onset. On the other hand, they point that generally the analytical ability as part of the tested IQ is important characteristic for possible development of the disorder or simply put, people with higher inclination towards over-analyzing tend to be more sensitive and vulnerable. Even though the increased analytical ability can make someone prone to PTSD, I would like to argue that exactly the analytical ability aids the human inclination to search for meaning behind events and to order their line of occurrence in a logical sequence decorated as life story by words, labels and explanations for otherwise unrelated or abrupt events. In this sense, even though it might sound illogical, some people who are predispositioned to PTSD might be as well predispositioned to have ability to recover from it.

The fact supported by Vogt et al., namely that gender also plays role in the probability for PTSD onset, can be explained with the predetermined roles the two

genders have such as women being more vulnerable than men (as women are described as more prone to develop PTSD (ibid.)). Gendered point of view towards personal characteristics in reality can create limitations in the focus of attention towards one's gender and also lead to biased descriptions and stories about one's own objective condition. For example, this could happen in the case of such soldiers who might be more vulnerable than other soldiers and who get stigmatized when developing PTSD, their narrative would sound like this "I am so strong, I am a soldier, why can't I control my fear and why I feel so weak. I am different from the other men who are real soldiers".

Gender roles and self-images should be carefully considered when analyzing the causes of PTSD and when designing the appropriate treatment designs. However, when such narrative as the above happens in one's head, the process of internalizing meaning aids the process of finding a "silver lining" in such events without staying focused on what happened and how it felt, or in other words without being "locked in the trauma" as often happens in the cases of PTSD. This effect of being "locked in" probably happens because of the above mentioned effect of the peritraumatic dissociation which disables the normal memory retrieval and dismissal of unnecessary or unproductive memories and hence creates limitations for one's identification with elements of reality which are important at present.

Let us discuss further what happens "in the mind" of the people faced with trauma in the next Section.

2.5. PTSD onset from neuroscience point of view of and as a break in the personal life story

This research proposes the use of the term break in the narrative when talking about PTSD on the basis of the consideration that trauma is a state in which the person cannot continue creating his narrative reality as he or she used to. Of course, terms like diversion or discontinuation can describe the state in which traumatized person might be; however, the idea of being halted, redirected from and altogether unlinked with one's previous narrative is necessary to fully explain how the people perceive and experience their reality during trauma. That is why "break" seems the best way to describe how such people could feel they are no longer their "usual" or "same" self; how they could feel "things will never be the same" or "things will never be as before",

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or how they could feel “locked in” the moment of trauma with various intrusive thoughts, sudden memories of the event triggered by the current reality, and inability to have perspective for the future.

The reason to avoid terms like breakdown lies from one side in the fact that the term break might imply a break in two parts for example which does not match what happens during trauma, and on the other side in the fact that breakdown leads to connotations about failure, collapse and malfunction which makes more or less the origin of the cause for such breakdown internal and the possibility for recovery – minimal. However, it seems that the term break brings less weight on the internal weakness or predisposition of the traumatized person and brings more importance on the fact that the external factors brought about the traumatic experience and as a result the disorder itself. It is important not to neglect one’s predisposition towards developing the disorder. Still, as the definition of the disorder itself shows, there has to be an event that brings about traumatic experiences since one does not develop PTSD without some happening that “breaks” their narrative line.

Of course, when talking about one’s narrative, it is necessary to consider that there are many separate cases and each case has its own specifics. One person might be able to continue his or her life in a fairly healthy way after trauma and still be diagnosed with PTSD; in this case the “break” might not be that significant. On the contrary, others might not be able to function at all and their “break” to be beyond the treatable condition. This consideration should be the first step in the design of the therapy, namely, how much the narrative should be re-structured, re-created or completely new narrative should be created; or, in cases when the break caused by the trauma is too significant – to find ways to help someone who might be unable to recover. This consideration might lie in personal characteristics some of which might be purely biological.

That is why now I would like to turn now to a neurological explanation of the multiplicity of PTSD and see how the brain processes of people affected by the disorder change.

Suvak & Barrett (2011) address the issues regarding PTSD by reviewing the disorder in terms of mental processes. They begin with the commonly shared idea that PTSD is a disorder which involves symptoms from various domains and whose symptoms are produced by combining several mechanisms. This heterogeneous characteristic of PTSD is explained by networks in human brain that correspond to the psychological content of the mind. In this way, the origins of the disorder can be

explained with a separate approach from the traditional fear-based approach in psychology.

The researchers focus on the features of the disorder, namely fear, helplessness and horror usually experienced by the victims in relation to the traumatic event. Exposure to threat can result in the development of the disorder, but not every reaction of fear leads to PTSD. According to Suvak & Barrett, PTSD patients also experience anger, sadness, guilt, and disgust; moreover, their memory and attention also suffer great changes as a result of the onset of the disorder. As discussed here, the memory is also connected with the ability to form a consistent self-narrative.

The common understanding in the neuroscientific paradigm is that the amygdala as responsible for the fear reaction in brain, gets hyper-reactive in the cases where people develop PTSD. This state of the amygdala is caused by the insufficient inhibition by areas of the prefrontal cortex. Explained behaviorally, this means that people who develop PTSD cannot help reacting in a fearful manner to stimuli which are not threatening in fact. Such model of top-down dysfunction is observed in other anxiety disorders. However, the two authors claim that this model of PTSD as a hyperactive fear syndrome is limited. In what way does this limitation occur? By focusing on fear and hyper-reactivity the model will fail to capture other parts of the disorder which create its elusive heterogeneity. In addition, reduced volume of several brain areas common in PTSD can show initial predisposition towards the disorder. This phenomenon, though, is not present in all PTSD patients so it cannot be considered a necessary factor for the onset and a broader view towards the volume of brain areas and the predisposition towards PTSD is necessary to answer the multiplicity of the disorder. Since behaviors and mental states are developed from the activity of networks in brain, then it is much easier to understand why there is such variance in the manifestation of the disorder.

Suvak & Barrett try to show with the review of other researchers that alteration in the amygdala do not necessarily mean increased fear response; moreover, they try to direct the attention to somewhat different feature this brain area has, namely that it helps in the process of adjusting one's behavior to changing reinforcement contingencies (ibid, p.6). They support the view that amygdala "is a key brain structure that is involved in evaluating an object for its goal relevance" (ibid.) and works in times of uncertainty when ambiguous signals are present. It seems obvious why it gets related to fear response in PTSD. PTSD patients tend to label as dangerous stimuli which are not actually threatening them. This exaggeration comes from the constant preparedness to meet same stressful stimuli as the ones during trauma since as discussed, they cannot

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escape the moment of trauma and cannot explain the chain of events in other terms besides the ones related to the traumatic event (or as often defined, they are “locked in” the trauma).

To further explain the role of amygdala in the process of forming of fear, the researchers see this preparedness of the amygdala to give meaning of certain stimuli and states as some tension in the body as whole, hence in the case of people with PTSD this tension gets explained by the brain as reaction for self-preservation from something dangerous and gets processed as fear or constant anxiety. The researchers describe the connection between action patterns and their explanation in cultural context as follows: “[f]reezing (or startle) is an innate action pattern in mammals that has been preserved in some form through natural selection, and freezing is part of the Western script for fear” (ibid.).

This concept about the Western tradition of explaining (telling stories about) events could possibly raise questions whether the culturally-conditioned categorizing of certain behaviors such as freezing or startle response is wrong in some cases. Such questions might suggest that freezing or startle are not necessarily connected with fear and therefore incorrect classification of such responses as fear responses can lead to wrong conclusions and generalizations about being stressed or scared. It is possible that such incorrect classifications are done in regard to PTSD, namely that PTSD necessarily means and directs only towards fear. To explain why such wrongful generalization could happen it is necessary to say that such generalization occurs because only one explanation (story) is being perceived as valid, i.e. startle response means fear and/or helplessness in front of some danger (e.g. evolutionary response to external threat such as predator). However, restructuring of such thinking patterns and giving new explanations (stories) could help escape the effect of the startle response and could help PTSD patients to stop reacting with fear when met with stimuli reminding them of the trauma (i.e. to perform a cognitive restructuring).

I would like to give example and analyze the case where people who enjoy riding rollercoasters experience genuine fear and still perceive the overall experience as pleasurable and afterwards do not develop traumatic responses connected to the ride. Of course, majority of people are similar to this type. Still, there is a different type of people who have less tolerance towards such fearful experiences and they generally do not reach the enjoyment level during or afterwards the ride. The explanation of the rollercoaster enjoyment with the needed levels of adrenaline is quite common. However, there is similarity between these two types and the case where people are more or less

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prone to PTSD. The first type of people will remain mentally strong during adversities and will increase their resilience along with gathering experiences, while others, in cases where it is even not expected to develop PTSD, may still exhibit PTSD symptoms and may have predisposition to remember the event with negative connotation.

Now, let us return to the analysis of Suvak & Barrett. They postulate that “[s]ensory cues are shaped into meaningful percepts by prior knowledge about the world that over time the brain has organized into categories” (ibid., p. 12). Putting this in the context of the case with the rollercoaster riders, the first type seems to successfully categorize the ride as safe even though fearful, and the second type seems to put the experience of the ride as an event that might be not safe, hence categorized as risky and scary. Why this happens? One possibility is that there was a prior experience which proved that something “seemed” safe and not scary, but there was something unexpected happening and destroying this model of the safe categorization. After that, the second type of people will be inclined to label similar events as potentially risky and to exhibit fearful symptoms where the first type will simply disregard or even enjoy themselves overcoming the adversities as in the case of the rollercoaster. The second type of people will be prone to develop PTSD and see danger in certain events and label those events negatively, feel anxious about (objectively seen) unproblematic situations and generally lead life with the expectation of something threatening.

If there are such types of people how could we help them? Let us discuss this in the next Chapter.

3. Description of the treatment methods for PTSD

The analysis here will observe the basic concept of Exposure therapy and will distinguish between methods using VR and other therapeutic options. Additional points of interest are the specifics of the Exposure therapy in virtual space – i.e. being gradual, safe, and flexible. The demerits of the VR methods will be analyzed too. The works of researchers such as Botella et al., 2010; McLay et al., 2010; Ready et al., 2010 will be used for the analysis.

3.1. Types of treatment methods

The treatment of PTSD is divided by two large groups: drug therapy and psychological therapy. There are many kinds of psychological therapy. For example, Behavioral therapy and CBT, Eye-Movement Desensitization and Reprocessing (EMDR), Relaxation training, Hypnotherapy, Group therapy, Psychodynamic therapy, and so on.

The treatment of patients with PTSD is a complex process and sometimes, even though it might seem counterintuitive at a first sight, it requires re-experiencing of the traumatic event in order to make the response to the memory of the trauma more bearable and reduce the neurotic symptoms connected with the event. Because of the complexity of the disorder, the treatment techniques differ depending on each case and two or more techniques are combined to answer the needs of the patients. For example, the mentioned in the previous paragraph CBT restructures the thinking (or in other words performs cognitive restructuring) and consecutively the behavioral patterns related to fear which are caused by the traumatic experience and often utilizes simulation of the traumatic events in a similar to the way the patient experienced them

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when trauma caused him or her to develop PTSD. When such simulation is done in VR the treatment method is often referred to as Cybertherapy; however, not all research on treatment utilizing this treatment method addresses it as Cybertherapy.

Majority of the treatment practices in Cybertherapy are based on the ideas of Exposure therapy. As mentioned in the previous paragraph, treatment of PTSD requires exposure to traumatic events and such treatment is referred to as Exposure therapy which consists of re-experiencing of the same stimuli as the ones experienced during the traumatic event. Those stimuli create stressful reaction in the patient, but the anxiety caused by them can be reduced by gradual and consistent exposure to similar in content, however reduced in strength stimuli and the patient can return to fairly normal state when facing similar stimuli, i.e. to achieve habituation and get closer to the normal life state before the trauma, without ignoring or burying the trauma in his or her memory.

To summarize, in its essence psychological therapy for PTSD often includes Exposure therapy. Exposure therapy can be done in real environments such as ones which are similar or the same as the one of the traumatic event or the so-called in vivo exposure. Exposure therapy can be also done in the patient's imagination, when he or she imagines the place of the traumatic experience instead of physically going to the same or similar place or the so-called imaginal exposure. Finally, Exposure therapy can be done in virtual environments – 3D worlds or VR simulations where the patient again experiences the same or similar to the traumatic environments and certain events occurring there. Exposure therapy is generally part of an overall CBT done in order to not only reduce the influence of stressful stimuli, but also restructure the response of the patient towards stressful stimuli and to help him or her change his or her behavior in a healthier way. For example, a survivor of a car crash will have difficulty returning to the place of the crash (i.e. real exposure) and will also find it difficult to remember and imagine the same place (i.e. imaginal exposure). That is why utilizing virtual simulation will help expose the person to similar to the car crash events so that person will be able to drive car again (initially in the Exposure therapy, consecutively in real life). In addition, the therapist might include CBT during or after the exposure in the VR in order to help the patient react in a less stressful way to dangerous situations during driving and gradually return to normal behavior on the road (if presumably this person was too stressed to drive again due to the traumatic experience).

In the context of this dissertation's main focus, self-narrative, it is important to emphasize that in addition to the Exposure therapy and the other psychological therapies, some researches utilize Narrative therapy. A study by Böttche, Kuwert & Knaevelsrud

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(2012) discusses the narrative therapeutic approach for treating PTSD patients. The researchers talk about distortion of the autobiographic memory in PTSD that results in “fragmented narrative of traumatic memories” (ibid., p. 237) and suggest that recovery should be achieved through reconstruction of these memories in coherent narrative. They discuss this approach in particular connection to older individuals with the presumption that such individuals already have their life story created and maintained for a long period of time. However, they observe the narrative therapeutic approach out of virtual reality context. This research would like to emphasize the importance of narrative restructuring and narrative self-recreation done in VR, regardless of the fact whether they are defined as Narrative therapy or simply represent Exposure therapy in VR combined with the typical for CBT cognitive restructuring. This kind of therapy would be best realized with added meaning creation that connects with the personal life story of the patient and gives him or her the ability to feel like an author of his or her story again.

Now, to look further into the different types of therapies, their specifics and their effectiveness, let us analyze some of the findings from the literature on the subject.

Botella et al. describe one treatment method meant for victims of diverse trauma (Botella et al., 2010). This treatment method utilized the so-called system EMMA’s World, which is unique with its flexibility to be applicable to different trauma types. The researchers start with a description of the controversial image of the Exposure therapy as a technique that might be considered as the cruelest one among the available therapeutic options. This is because Exposure therapy relies on exposing the patient to the same (and most stressful stimuli) as the ones experienced during the trauma. To describe the extent of this cruelty, it is possible to imagine that the following situations might apply to the way such therapy should be performed: for example, a soldier who has developed PTSD after seeing a friend killed on the battlefield should see that scene again; a car crash victim who have lost a limb during the accident should experience again the same scene; a sexual assault victim should meet again the person who caused him or her the suffering and disgrace. In other words, Exposure therapy evokes distress in patients and it does it on purpose. That is why as explained by Botella et al., there are researchers who question the “safety, tolerability, and humaneness” (ibid., p. 67) of this therapeutic method.

Here it is possible to ask whether VR exposure is justified if it is going to inflict the same pain as the one during the trauma. In the case of such traumatizing experiences such as sexual assault it seems unnecessary and ultimately cruel to do so. However, if the trauma is causing major disturbance and greater pain than the possibility to

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overcome its influence, the choice for treatment seems justified. Moreover, if the treatment does not necessarily lead to experience of the same pain (e.g. as necessary during habituation), then a “softer” treatment approach such as one directed to dysfunctional thoughts in environments different from the traumatic ones might bring about the necessary cognitive-behavioral results without exposing the patient to the same trauma. Nevertheless, how successful this will be and how necessary the facing of the trauma itself is should be matter of practical research combined with serious ethical considerations. This research suggests the narrative approach could add to treatment utilizing Exposure therapy by creating explanation and meaning of the traumatic events and in such way connecting with the narrative self-creation.

I would like to take a further look at the ethical side of this problem. It does seem unacceptable to forcibly expose someone who already suffers from serious traumatic experiences to the same or at least similar experiences in a prolonged and fairly influential manner. It sounds like a counter-intuitive and utterly ineffective way to help them. However, the purpose of this therapeutic method is to reduce the stressfulness of these types of experiences associated with the trauma and return the person to the normal state he or she had or should be in as a psychologically healthy person. It seems that the only way to recovery goes through the acceptance and reassessment of the traumatic events.

To argue more on the ethical part of this issue, it is obvious that the patients are conscious human beings who have the ability to choose for themselves, and even though their perceptions and world views might be altered by the trauma, they still have the right to reject such kinds of exposure to possibly the most unbearable stimuli for them. In this case, the therapist as a person who is specialist in the field of treatment of such disorders cannot achieve much since he or she must protect the safety and well-being of the patient in the first place. In such light, it might seem like Exposure therapy is not as adequate treatment technique as its concept claims to be. Nevertheless, it has become a major treatment option as part of the above mentioned CBT.

It is important to mention here that the role of the therapist in the treatment process is very important since the decision about the design of the therapy, especially the gradual exposure, and most importantly the consideration what kind of trauma (type of PTSD) each case presents and what kind of environments (similar or different as discussed previously in this Section) it requires – all lie in the capability of the therapist. Since the role this person has is very essential, it can be supported by considerations such as the ones this research tries to propose, namely to see from a philosophical point of view the self-narrative of the patient, to analyze what kind of self the traumatized

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person needs to re-create and what kind of story he or she should create and experience in the VR to best recover from the trauma. Of course, treatment utilizing VR might not be the only or the ultimate treatment method. It might add to other treatment methods results and give insights about the overall state of the patient and the possible treatment directions. This research does not claim that treatment in VR is the only one effective or universal method for therapy of PTSD. It is certain that it might not be suitable for a large group of people who are sensitive to VR and its strong stimuli or suffer from too severe trauma. Ultimately, it might be not the therapy of choice for the therapist who is the person with main responsibility for the treatment outcome. What is important for therapy utilizing VR is that it can be adjusted to work for each type of the disorder and for each type's varied needs (i.e. to be adapted according to the course of the therapy). Considering when to use VR in one whole therapeutic course is also very important as it might work well in the start (e.g. when habituation is necessary), in the middle (e.g. when it is necessary to practice some restructuring of negative thoughts and behaviors), or at the end (e.g. when relaxation techniques are necessary to be introduced to support the patient post-therapy). It is necessary to carefully consider the demerits of VR therapy and see how it can be combined with or chosen among other treatment methods (e.g. especially when preferred than in vivo exposure since in vivo exposure might be impossible or too traumatic).

It is possible to suppose that the VR is the most suitable treatment method for such patients suffering from PTSD as soldiers (or, for example, young people experienced in game-playing and virtual environments). This, however, is a limited view. Exactly such kind of people would have less strong response to stimuli experienced in the virtual because their level of "habituation" to the simulated worlds would be much higher. Conversely, people with less or no experience in VR would perceive exposure strongly, hence requiring careful monitoring, but would achieve faster results considering the effects of VR, which are going to be discussed in detail later in this Chapter (e.g. immersiveness, sense of easiness, etc.), would be affecting them in a greater extent.

In brief, in which case would it be preferable to choose VR as treatment method? Botella et al. point that there is a new environment for exposure which changes the essence of exposure itself and influences this ethically problematic part in the application of Exposure therapy. This is the utilization of VR for simulation of the events necessary in Exposure therapy. Exposure therapy utilizing VR is seen as more acceptable and helpful than the other traditional Exposure therapy methods such as

imaginal exposure because of its safe and gradual manner of exposure which suggestion I would like to describe in detail in the next Section.

3.2. Methods using virtual environments

Exposure therapy exposes patients to stimuli connected with the trauma to elicit emotional processing and acceptance; control over the reaction and memory; cognitive restructuring; establishment of anxiety management skills, coping and relaxation mechanisms.

As explained in the previous Section 3.1., exposure can be done in virtual as well as real environments. To explain in more detail this difference, it is important to note that the real exposure environment will be some place which resembles or is the exact place where the patients used to be involved in a traumatic situation. Imaginal exposure is used when the patients have to use their own imagination and create a mental image of the traumatic situation – a fairly difficult exercise which can potentially damage more their mental balance. In this sense, the usage of virtual environments is sometimes considered as safer (because the environments are physically safe and can be controlled by the therapist) and easier to create (since these environments are virtually designed), especially when in severe PTSD cases taking the patient to the same place as the one of the trauma can elicit more adverse reactions of fear than the virtual simulated places, and it might be impossible to answer the requirement to use imagination as in the case of imaginal exposure due to too vivid trauma image in the consciousness of the patient.

The creation of virtual environments for exposure is becoming more and more popular for above and other reasons, and one example of their popular usage is for training of soldiers in order to help them become more resilient to stress and better adjusted to the combat environment. In that specific case, the usage of the virtual environment resembles a game play for obtaining more skills in fighting an enemy and preserving own mental health. As described in Chapter 2, Section 2.1., this utilization of the virtual spaces in the form of training or a field for trying out one's skills is already elaborated in the military application of the virtual spaces. However, in the case of ordinary people who suffer from PTSD the experience of traumatic stimuli after the trauma is generally a very stressful process. Here it is important to remember that these people usually have the experience of utilizing the virtual spaces of the “type a” as described in Chapter 1, Section 1.2., and precisely that experience can lead them to get

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accustomed to the new type of virtual spaces i.e. the “type b” (for example VR) as described in Chapter 1, Section 1.2 in case they need to be treated in this second type of virtual spaces which have similar effect to the one the “type a” have, but are characterized as more advanced type of virtual spaces.

To emphasize again, there are different types of PTSD which are generated by different causes (as explained in Chapter 2, Section 2.1., events that are natural or artificial, also defined as human-made or human-made). That is why a therapy utilizing the specifics of the virtual spaces but designed to answer the sensitivity of the patients would be appropriate. It is possible to conclude that this general difference in the PTSD types requires variety of treatment techniques which can answer the specificity of each case and type of disastrous or traumatic event. The treatment in VR simulates traumatic events in detail in order to expose the patient to realistic but controlled cues connected to the trauma. Still, the safety of the therapeutic design in the virtual environment makes this realism more or less harmless.

Moreover, there is possibility to utilize VR for virtual relaxation technique that returns the patient to the basic (normal) perception of the environment previously associated with the traumatic event or at least gives the sense of protection and control of the own reactions in the secure virtual environment. This type of relaxing environment can be simulated in a very detailed and convincing way in the VR, but thanks to the fact this is a “virtual environment” it is possible to keep the image of a “not real” space in order to create sense of detachment in the patient.

To present an example, Hoffman (2004) introduces the usage of VR for a very broad scope of therapeutic practices. Beginning with patients with burn injuries, he points that the pain they go through in the recovery process is quite similar to the pain experienced during the injury itself. This leads the patients to desire for merely transporting their minds somewhere else. To answer this there comes the powerful immersive effect of virtual simulation distracting their minds from the pain.

Hoffman reports about a study with two burn injury patients, who first played Nintendo game while receiving the apparently painful wound care treatment of the injury and later in the research progress were immersed in a VR environment designed to distract them by 3D computer graphics with matching scenario. The mentioned scenario included a VR program which presented the imagery of spiders as it was originally created to treat spider phobia. The purpose of the program’s usage in this case was to serve as a distraction from the pain experienced in the reality replacing one simulation with another equivalent in strength (i.e. pain and fear). Later on, the scenario

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became more sophisticated and adapted to the needs of patients with burn injury, namely by representing a very cool and peaceful place which more or less could create sensations opposite to heat and pain, i.e. calmness and cool sensations. This adaptation of the created scenario shows that VR's flexibility can be directed to the exact purposes of each treatment with the help of software reprogramming.

In this way it is possible to see this type of VR simulations as a different option for the possibilities in front of VR, not only providing realism and safety, but also adjustment to various environments for various trauma cases. For example, as discussed, a very severe case of car crash would require first to teach the patient to be able to sit behind the wheel again, before exposing him or her to the stimuli that will be directly associated with the traumatic event (Riva et al., 2010) which is often referred to as gradual exposure. Such gradual adaptation of the software content is easily achieved in VR as presented in Hoffman's research.

An analysis of the role of VR in both exposure and relaxation therapy can help in the decision for applying of these two options to the specifics of the environments necessary to be represented and utilized in the therapeutic process. Considering the specifics of the virtual spaces, it is possible to suppose that in the case of Exposure therapy the patient has to experience the same event in similar way so that to fight with his or her negative emotions and stress (here it is possible to imagine the re-creation or the formation of the "similar self" as described in previous research (Georgieva, 2011a; Georgieva, 2011b; Georgieva, 2016; Georgieva, 2017)). Such "similar" environment for the "similar self" would be the closest in similarity to various environments in the real world and its realism is the factor for creating stronger reaction in the patient which of course with time will be handled and possibly overcome in the therapy. In contrast, the relaxation therapy should create again a realistic world, but this world may not be similar and connected with any experienced real world and in this sense to be "different" or fictional one (here it is possible to imagine the re-creation and formation of the "different self" as described in previous research (Georgieva, 2011a; Georgieva, 2011b; Georgieva, 2016; Georgieva, 2017)). The safer and more idealistic this environment looks, the better the patient can feel. In this way, it seems that what is necessary in therapy is that the "virtual selves" and "virtual spaces" get utilized according to the specifics of the therapeutic requirements.

Such an ideal situation would probably bring about great therapeutic results. However, therapy is still struggling to help PTSD patients. Therefore, before defending

the effectiveness of the methods using VR, it is necessary to see what problems might stand in front of these and other methods.

3.3. Demerits of the methods.

Let us analyze again the characteristics of the treatment methods and discuss their disadvantages.

The different treatment methods face different challenges: for example, imaginal exposure hinders successful therapy because patients avoid it; in vivo exposure poses a risk for the patients' safety; virtual environments are expensive, and their immersiveness (hence, possible addictiveness, causing cyber sickness, or lack of applicability to people unexperienced in VR) should be considered carefully.

Gerardi et al. (2010) observe various treatment techniques used for therapy of PTSD and other anxiety disorders and summarize the advantages and the cautions in the cases where virtual environments are used.

The researchers describe CBT that utilizes Exposure therapy as a treatment method of anxiety disorders which involves the patient to repeatedly experience the feared stimuli in a gradual manner. This exposure happens either in the patient's imagination or in vivo by creating a stage to resemble the event of the trauma. In some cases, the exposure can include physical presence at the same or similar to the place where the traumatic experience happened, depending on the available environments and the degree of severity of the disorder. That means in cases where the patient is too stressed from the experience he or she would not prefer returning there and also such return might be too damaging to the patient.

In the same sense, in imaginal exposure the patients might not be able to use their imagination to remember and re-experience trauma since by default they try to avoid the stressful stimuli and memories connected with the trauma. Researchers then see imaginal exposure as hindered by the patient himself or herself (McLay et al., 2010). It is possible to assume that if the patient manages to use his or her imagination to recreate the traumatic event it might lead to stronger aversive reaction, but if handled well it would also bring faster therapeutic results since the patients directly uses imagination and memory to reassess the problem which created discomfort in the first place. And as discussed, memory and its handling and organization plays a great role in the formation of self-image and self-narrative. However, this seems very difficult in

most of the cases since one of the specifics of PTSD is exactly avoidance of the trauma-related stimuli and high stressful reaction to any kind of memories connected with the trauma.

Gerardi et al. (2010) point that what is important during the therapeutic practice for PTSD is the achievement of emotional processing as an essential component of the Exposure therapy. To be able to have the chance of creating such emotional activation the therapist should reassess the stressful stimuli and gather enough information about them during the Exposure therapy. In other words, it is necessary to detect what meaning the patients puts behind the stressful stimuli. To achieve this, it is necessary to have enough time and stable environment during exposure to communicate with the patients and not to focus on keeping them into the exposure environment.

That is why, Exposure therapy in virtual environments is considered to be an alternative to the traditional exposure therapies. To summarize the positive sides of the virtual environment, these researchers say that it “allows the participant to experience a sense of presence in an immersive, computer-generated, three-dimensional, interactive environment that minimizes avoidance behavior and facilitates emotional involvement” (ibid., p. 298). Similar views about the merits of the application of virtual environments in treatment and the VR as a tool for healthcare can be found in the work of other researchers (e.g. Riva et al., 2010).

Now, what are the points deserving caution or the negative sides and the demerits of the VR technology utilized for treatment of PTSD? As mentioned in the Introduction, Section E, virtual spaces are highly immersive and hence addictive – sometimes it is hard to let go of the virtual experience, especially if it is more significant than the current reality which might be painful or blurred in the perceptions of a trauma victim for example. A special attention should be given to this feature of VR before introducing it broadly in healthcare and especially before making it part of the everyday entertainment as it happens in the recent developments in the technological world.

The undoubtedly important fact is that any kind of environments resembling reality or being fantastic are realizable with VR with less effort than the one necessary for real exposure or imaginal exposure (McLay et al., 2010). If a therapist has to perform such kind of exposures without VR simulations the options are not so many and the time spent in the process of designing and conducting the therapy might be too long. However, it should be noted that VR design is also time consuming when it has to be completely personalized to the needs of the patients – a fact that could additionally

prolong the treatment results especially in the cases where the available technology is limited.

Finally, there might be patients with limited or no experience in VR. Such patients might have natural resistance to technology and might experience additional doubt and fear when faced with the necessity to get immersed in VR. That is why considering what kind of technological savviness the patient has is an important step in the decision whether VR exposure should be used or not. Moreover, there might be cases in which exposure to the same stimuli as the ones during trauma is not a successful treatment approach. In such cases exposure for habituation in VR should be avoided; however, VR for relaxation or for adding some cognitive restructuring of unhelpful thoughts might be fruitful approach. This study suggests that using VR to add meaning and attempt telling a different story in relation to the trauma might have sufficient therapeutic effect in the context of the narrative self-creation discussed so far.

Still, there are several specifics of VR therapy that make it far advanced than the other treatment methods. Let us see what they are.

3.4. Characteristics of Cybertherapy

This dissertation discusses several characteristics of Cybertherapy and the other therapies utilizing VR such as VR Exposure therapy (referred to as VRET) and so forth. These characteristics can be summarized as follows:

- sense of presence/immersiveness
- flexibility/versatility
- safety
- control
- easiness

Let us analyze in what way these are applied to Cybertherapy and Exposure therapy utilizing VR (as discussed, it is an issue related to the naming of the therapeutic methods since some therapies which utilize VR do not define themselves as “Cybertherapy”).

In an early study Riva et al. (2007) talk about the specific of interactive media and VR to be able to elicit wide range of emotional responses. They claim that in the virtual environment they created (“anxious” and “relaxing” parks with stimuli inducing

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similar emotions), “on one side, the feeling of presence was greater in the “emotional” environments; on the other side, the emotional state was influenced by the level of presence.” (ibid., p.45). This dual relation between the essence of the virtual spaces to elicit emotions and the characteristic of feeling of presence that influences and emphasizes the effect of the virtual spaces (such as inducing emotions) is of particular interest here. The authors emphasize that the sense of presence is aided by the illusion of non-mediation which allows users to forget about the experience of technology and also the experience of external physical environment. In this way people “get immersed” without realizing it and without resisting it. This immersion is utilized in Exposure therapy in VR when stressful stimuli should be habituated. However, the gradual exposure will allow the patients to get used to the stimuli in a healthy way while some cognitive restructuring will help them overwrite the negative context of the memory trauma. It is a matter of design, but here, adding a positive meaning of the life story would possibly aid the overall treatment process.

Other researchers (Spagnolli, Bracken, & Orso, 2014) also try to validate the effectiveness of Cybertherapy through the concept of presence by conducting a literature review. They define the purpose of using VR, namely as facilitating “the achievement of a target psychological condition such as distraction, relaxation or proficiency in cognitive tasks” (ibid., p. 13) and/or support and motivation for performance, for example in such tasks as rehabilitative exercises. This definition differentiates very well the functions of therapy in VR from those of other therapies, and specifies that therapy in VR works to achieve some therapeutic tasks (in its function as an exposure medium) and to serve as facilitation to other tasks (in its function as a medium for trying out new possibilities). It is obvious that the researchers differentiate between immersive and non-immersive environments and distinguish between “type a” and “type b” virtual spaces as defined here (Chapter 1, Section 1.2.) claiming that they will not discuss online counseling for example; an example of the “type a” virtual spaces. Only mediated environments which include therapeutic intervention and increased presence were considered. Regardless of the fact they analyze only “type b” spaces (or VR), their comparative study presents very interesting results for this analysis since they define VR as a medium suitable for treatment of anxiety disorders. The authors define the advantages of VR usage to range from the ones that make it more applicable than in vivo exposure (e.g. when it is not possible to control the behavior of the patient or the environment is not accessible) to such as being capable of reaching more people in a reduced span of time with increased easiness and aids anonymity (as

anonymity might help more people consider therapy in the context of stigmatization fears surrounding PTSD).

It is interesting that the authors mention also “transfer of skills” (Spagnolli, Bracken, & Orso, 2014, p. 14) when talking about exposure choice which might get connected to the idea of transfer of experience discussed in the hypothesis here. Also, they connect presence with the expression “sense of being there” which has been discussed here as well (Grigorovici, 2003). They break down this definition of presence into “spatial presence, involvement, realness, social presence and reality judgment” (ibid., p. 26). They emphasize that the sense of presence can be achieved through several means - interactivity, realism, meaning creation and see it as a goal of Cybertherapy.

If Cybertherapy then is successful in inducing sense of presence while providing safety and gradual exposure and answering the needs of each PTSD case through its flexibility/versatility, then it presents a chance to perform therapy that exceeds the overall characteristics of the other therapies. Still, it seems that Cybertherapy alone cannot be efficient if it is not put into the context of the necessary procedures typical for any other Exposure therapy protocols and the therapeutic process is not aided by CBT to achieve maximum therapeutic results. As discussed here several times, adding meaning to the exposure and cognitive restructuring in VR, or in other words, utilizing some form of Narrative therapy, would further enhance the specifics of Cybertherapy and possibly justify its effectiveness. Whether this is possible and achievable in all treatment processes is a matter of separate research.

Now let us see how really it is possible to support the effectiveness of the therapy utilizing VR from a philosophical perspective.

3.5. Cybertherapy (therapies utilizing VR) in a philosophical perspective

In this Section an analysis of the way the virtual environments facilitate treatment will be made from a philosophical point of view by observing how the notion of reality changes and affects human experience. The Cybertherapy and the other therapeutic practices utilizing VR and online communication share the common effect of simulated reality on human mind. Let us discuss in more detail how this process happens.

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Michael Heim, who in his paper “Creating the Virtual Middle Ground” (1998) proposes that by 2015 “our daily lives doubtless will have assimilated the high-end VR that uses immersive head-mounted displays or lightweight goggles” (ibid., p. 15), appeals that VR should find its “middle ground” as part of everyday reality. His point is that VR makes the person immersed in it a “participant”, not just a “user”. Heim says that “[t]hrough active building, users achieve psychological immersion, which is why one software universe—that is, a collection of worlds based on the same set of programs—is called “Active Worlds”” (ibid., p. 16) when explaining how 3-D environment software affects people who use it. Heim suggests, though, that virtual worlds are not represented natural worlds; they are more like a “functional whole intended to parallel, not re-present or absorb, the primary world we inhabit” (ibid.). This functionality seems to be utilized for the treatment effect of Cybertherapy where completely realistic worlds would be too stressful for the patient, however too artificial ones would not evoke the necessary reactions to stimuli and would not help in the process of overcoming the trauma.

In other words, the virtual world has to remain “virtual” as described in Chapter 2, Section 2.1., which was discussing the difference between the terms used to describe the space that are “not real”. The virtual world also needs “playfulness” (ibid., p. 17) in order to engage, but not to scare. The balance between fantasy and realism seems to be the main feature of a successful simulation, regardless of the fact whether it is utilized for entertainment or treatment. Heim’s view is really precious for this emphasis on the idea that virtual worlds are not simple distractions from the real world neither they are completely integrated into the real world. They are result of a harmony between realist’s and idealist’s self that can be found in every one of us. They can help someone to forget something from the real world (in the way games are immersive or therapy detaches from painful stimuli) or they can help someone to remember or recreate something from the real world (as for example when cognitive restructuring is done in therapy). Although the time he presents these views is already far from the present day, his views are relevant and explanatory for the VR as we see it today – not yet fully a part of the everyday life as he describes.

To argue a bit further on the idea of the effect of simulated reality, it seems that the therapy in VR connects the real and the virtual (realizing the process of transfer of experience mentioned before (Georgieva, 2011b)) and by this it could answer the necessities for various therapeutic techniques in different disorders’ cases. Moreover, therapy utilizing VR represents one special element of interest for the research, namely

when the patient experiences something virtually and transfers that experience to the real world as obtained skill or narrative. Possibly such characteristic of the Cybertherapy can be seen as a good option for addressing the variety of PTSD treatment cases.

This leads us to the discussion of the next Section, namely how Cybertherapy and PTSD types match.

3.6. Problems of the experiences in virtual spaces and VR

The flexible virtual environments can provide a gradual and safe exposure thereby providing a potentially faster treatment process too. However, these same environments can also bring about different problems, for example cyber sickness as described in the Introduction, Section E.

Cyber sickness is explored in researches investigating the application possibilities in front of VR, as well as studies on the limitations of VR itself. Kiryu & So (2007) study the sensation of presence and cyber sickness in applications for rehabilitation. These two phenomena – presence and cyber sickness seem closely related according to the researchers. The influence of visual and vestibular stimuli on cardiovascular responses are studied in order to present how VR technology expands sensory effects as well as physical activities. The authors focus on developing regular exercise practices in VR which will bring about necessary therapeutic effects without the negative influences that shouldn't be neglected when utilizing VR.

VR simulations induce various sensations through multi-sensory stimuli; however, these can be “inappropriate to each other or slightly different from those experienced in the real world” (ibid., p. 1) and “could evoke symptoms of cybersickness, even though such stimuli would excite the users and increase their sensed feeling of reality” (ibid.). It seems that the experience in the virtual environment can be “stimulating”, in the sense of exciting, and at the same time, somewhat “sickening” to the people experiencing different events in it. This twofold effect might be the reason why VR is utilized for therapy in the first place. The mixture of positive and negative effects resembles a real situation such as the one experienced during trauma. For example, a person in the military can feel very “alive”, active and stimulated during combat and at the same time to feel scared, furious or disgusted from the experience. In the same way, a person surviving a disaster might feel a rush of adrenaline when trying

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to save his or her life while at the same time feeling horror as a consequence of the extreme situation.

Let us return to Kiryu & So and their analysis of cyber sickness. They claim that “[p]reventing unpleasant situation is a key point for sustaining sufficient effectiveness and motivation” (ibid., p.4). This means that soldiers experience the VR simulation in the same way they meet the adversities of war reality. This desire to overcome obstacles leads the soldiers active and motivated to escape from the same sensations they are having during the combat. Similarly, a person escaping from disaster is alert and reasonable in his or her actions meant for survival. In other words, the soldier wants to complete the mission, stay alive and unharmed and end this stressful situation as soon as possible and as effective and safe as possible; in the same way the person running from disastrous tsunami for example tries his or her best to stay alive and unharmed, possibly help other people around and reach safe ground as soon as possible. Therefore, their motivation to survive can be realistically triggered in a VR simulation. However, when these people are experiencing simulation of similar events in VR environment, the “[m]ismatch between the visual and vestibular systems can disturb the autonomic nervous regulation and lead to symptoms of motion sickness” (ibid.). This means that besides the fact that VR therapy enables a lot of processes to happen faster in the virtual environment, exactly the features of the virtual environment itself bring additional stressors that could be neglected, especially in the beginning of the VR experience when the new stimulating experience provokes some kind of euphoria. In this sense, the main feature of the VR therapy, namely as a useful tool for shortening the therapeutic process in an effective way, may also bring a new set of problems that are completely absent in the case of all other therapeutic practices available for PTSD (i.e. imaginal exposure and so forth).

How do the authors presented in this Section discuss this problem? They mention that in future some kind of personalized evaluation procedures of sensory systems (i.e. visual and vestibular systems which mismatch brings about the cyber sickness) have to be developed in order to practically utilize VR for rehabilitation. This means that VR should be developed in a special way when addressing patients since their sensitivity could be higher than “normal” users who utilize VR for entertainment for example. Such careful engineering of the VR tools is necessary to answer the needs of the end users and VR as a new phenomenon might be suffering from overgeneralization since separate cases such as therapeutic ones are addressed in the same environments as the ones used for gaming purposes for example. Whether such

diversifications of the VR environments and their purposes are completely necessary could be another topic to be analyzed in connection with the two types of virtual environments discussed here previously (“type a” and “type b” from Chapter 1, Section 1.2.), and the types of the virtual selves created there (the similar and the different virtual self from Chapter 1, Section 1.2.). The gradual introduction and habituation of VR should be the first step when considering introducing VR therapy for users who are less experienced in experiences in virtual mediums.

If VR creates such problems related to the fact it simulates reality, then it might be necessary to consider VR and PTSD in the context of the reality concept in general.

3.7. PTSD and its connection with reality perception

PTSD is characterized with changes in thinking and brain function. It can include distorted image of reality. Experience in VR presents different reality setting. It is necessary to question treating one reality distortion with another substitute for reality. Addiction to experiences in VR should also be considered here.

Van den Hout et al. (1996) discuss dissociation in connection with trauma. As discussed in Chapter 2., Section 2.3., dissociation is the process of forgetting essential elements of events that happen around a person suffering from trauma. Van den Hout et al. add to that understanding the effect of doubt in the real happening of things, or in other words – in reality as a whole. They say that persons with autobiographical memory problems can have difficulty distinguishing whether an event truly happened or was imaginary. As in narrative theory autobiographical memory is closely related to the concept of one’s self identity (if accepted that there is such) it is obvious that trauma overthrows the essential feature of human self to form and maintain a consistent and meaningful story about life events in the memory or that it generally affects the integrity of one’s life narrative.

Van den Hout et al. claim that this results from inability to perform normal reality monitoring which is essential for healthy persons. The state in which people with trauma fall after the stressful events makes them prone to disregard the environment and the events around them and to perceive reality in distorted way or sometimes to completely disregard reality (e.g. a person affected by natural disaster who has lost his quality of life and has developed PTSD might also turn to substance abuse and drift away from reality if his or her condition stays untreated). The reason for such behavior

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is rooted in the way people feel after the trauma – namely, that they perceive reality as ultimately changed and sometimes unbearable. It is also known that people suffering from trauma suppress memories of the traumatic events in deliberate ways. Such memories can uncontrollably appear in the consciousness when some cue reminds the traumatized person of the traumatic events. This, however, will lead to even stronger need to suppress remembering and consecutively increases the inclination to “delete” memories and perceive reality and their own life story as much different from those of normal people.

As Van den Hout et al. claim, the reason for such dissociation can be sought in the fact that memory works in connection with emotions. A positive emotion associated with an event will lead to forming of stronger memory of the event and respectively negative emotions usually associated with traumatic events will lead to attempts to forget the event and the associated with it painful experience. Quite often victims of traumatic experiences (e.g. physical assault) have blank spaces in their memory because such deletion appears to protect the person from too strong emotions associated with the trauma. However, events experienced after the trauma that resembles or reminds of the original can provoke the subconscious reaction (even though the person reports no memory of the traumatic event) of the traumatized person and trigger symptoms of traumatic disorder (e.g. watching a physical assault scene on the TV).

Considering these specifics of memory in relation to trauma, treating people in VR seems a task with certain risks. VR replaces reality with a simulation which resembles the “real” reality and evokes similar bodily (brain) reactions to the people who experience them. It was shown so far that the effect of such experiences on human mind, memory and self-image is quite strong therefore a careful consideration of the limits in front of the attempts for reality and narrative adjustments should be made before devoting the treatment process entirely to VR exposure. Moreover, as discussed in the Introduction, Section E, virtual spaces are addictive and provoke desire to escape from reality into a safer and comforting environments where control over the events is possible (to certain extent). Designing a convincing and immersive virtual simulation can be also a trigger for a desire to replace that painful reality with a much more soothing simulation.

Of course, in the case of simulations which recreate traumatic events an inclination to stay in such environments will not be so strong. However, if the virtual environment differs from the traumatic event and aims at relaxation for example, then this environment presents a challenge for the person who has to return to the stressful

reality after the relaxation session in the same way a person being on a long vacation feels depressed when having to return to work for example. Such stress from the switch between realities (or the stress from the necessity to return to the “real” reality), especially in the case of different reality in the virtual exposure, should be analyzed and reduced in order to reduce inclinations for over-attachment to the virtual experiences.

Now, how the reality problem connects with the narrative concept discussed here?

3.8. Traumatic experiences as discrepancies between the narrative and the reality perception

Considering the different way people create their life stories and experience reality, it is necessary to make a suggestion about the difference between the traumatic experiences in the different types of PTSD (soldier PTSD resulting from war experiences and the disaster-related PTSD).

In addition, considering the problems discussed in the above Section, it is necessary to say that trauma seems to affect the way reality is perceived and memories are formed. In the context of the narrative concept of Schechtman (2011), it must be added that trauma hinders the autobiographical narratives created through memories, also facts and ideas created and maintained by the owners of narratives and all the people related to them with their own narratives. Since trauma cannot be integrated as necessary or meaningful event in one’s autobiographical story it affects negatively the person’s integrity and self as a whole. Why does trauma have such characteristics? Trauma usually occurs during an unexpected event that disturbs severely the person’s psychological condition. In this sense, it is experienced as unnecessary and not meaningful event. For example, a devastating disaster which destroys years of efforts (e.g. one’s house, etc.) or a sickness which hits a very young person (e.g. child suffering from cancer) seem completely pointless and utterly saddening. Exactly this feature of trauma makes it a challenging event that most of the people find difficult to integrate in their life story as charged with certain meaning; they also fail to manage fighting the desperate state in which they fall as victims of PTSD.

The above discussed issues present the difficulty to manage trauma in the case of civilians; in the case of soldiers though, trauma is considered as a quite probable outcome of what they do for living – fight in war, harm and kill other people while

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trying to protect their and other people's lives. In this sense, a mental preparedness, a place for the presence of trauma in their life story exists; however, they still develop and suffer from PTSD – being victims of one of the most common type of traumatic disorder that is war-related or soldier PTSD.

Now, let us discuss this problematic case of PTSD first.

4. Soldier PTSD: a specific PTSD, characterized by severe symptoms

Soldier PTSD is considered one of the most severe types of the disorder. War veterans affected by it often have difficulty adapting to non-war reality and the rates of suicide prevalence (Greden et al. (2010)) are increasing due to lack of efficient ways to detect and treat the disorder, as well as additional problems surrounding war-related PTSD such as stigmatization of the soldiers who suffer from the disorder. In this sense, it is necessary to understand why war-related PTSD is affecting so many people and how to define the characteristics of the disorder. Here several topics will be analyzed: vulnerability and predisposition to trauma; building of resilience and necessity for learning through experience; stress coping techniques for training and their utilization for non-military purposes. The findings of Tworus et al., 2010; Stetz et al., 2010; Rizzo et al, 2006, 2009b, 2010; Bouchard et al., 2010; McMahan, 2005; Protevi, 2008; Wilson, 2008; Hill et al., 2006; Mert & Vermetten, 2011; Susi et al., 2007 will be included in the analysis.

4.1. Soldiers' training as preparation for war and the PTSD onset

When discussing a very widespread and complicated PTSD case as the one of war-related PTSD, it is necessary to seek for various types of underlying conflicts. War is an event where people kill other people. This reality of war differs greatly from everyday reality. With such standpoint, I would like to analyze the specificity of soldier PTSD and its moral issues.

Many soldiers face various difficulties during and after their service. To understand the reasons for their emotional wounds, an analysis of the contradiction in the essence of war can give clues about the way the soldier trauma develops. If killing

other people is considered acceptable when done in the name of defending one's nation, the war should not create feelings like guilt. Still cases show that soldiers cannot forget their actions during war. It is necessary to investigate how the internal conflict or tension between the need to follow one's duty and the natural understanding that killing is bad, are having their influence on soldiers PTSD. It is possible that the justification that killing is acceptable during war is superficial and therefore the PTSD onset is inevitable. The other possibility is that the justification is plausible, but some people are weak or sensitive and cannot completely accept the killing of enemies.

If the soldiers' combat training is successful, then they should be able to overcome the contradictory nature of war. But since there are cases of PTSD, it seems that their training fails them in doing so. In such case, the PTSD treatment of soldiers should require more advanced methods for recovery from this (Hill et al., 2006; Wilson, 2008; Stetz et al., 2010). It seems that accepting the idea for human vulnerability and acting to support it might help soldiers. Therefore, both soldiers training and treatment should deploy tools to maintain and recover the healthy humane spirit in the war context. Analyzing the moral nature of humans and the way human mind reacts to stressful environments like war can give answers how to treat complicated cases such as soldier PTSD.

Let us begin with detailed analysis of the problems in the onset of soldier PTSD. There is a moral dilemma connected with the permissibility of killing people. This dilemma is part of the essence of war and the notions for "just" or "unjust war" (McMahan, 2004). It is possible to make such claim because the essence of war is not humane; it is justified for better purposes of killing "the bad" in order to establish the order of "the good". Hence, it is important to understand and accept the contradictory essence of war that is killing of people in order to defend one's nation (Rodin, 2004). This contradiction needs to be overcome in order to allow the soldiers to successfully complete their assignments without being disturbed by such conflict. Consequently, I have to clarify in what sense the war essence is contradictory and how this contradiction is resolved.

The contradiction in war is a moral dilemma in a sense that it causes psychological tension which needs resolution. The killing in war needs to be justified morally to enable soldiers do their job. Ideally, soldiers need to deliberately follow their duty by choosing a relatively good option – to kill enemies in order to defend their cause, country and fellow soldiers. Such choice is morally better one. But if the killing is justified as moral for the case of "just war" why soldiers still develop PTSD, especially

when they kill other people? A possible answer is to say that there is a problem in the justification itself. Therefore, there can be two possible accounts for this justification:

Account 1. The justification of killing in war is not real.

It is possible to suppose that when the justification is superficial in its meaning as a result the soldiers' PTSD onset becomes inevitable after they kill people in war. In such case the contradiction of having to kill people in the name of a cause has essential nature, but the justification of this killing is superficial. If so, then this makes the soldiers generally not accept the killing they are supposed to do and develop PTSD. This happens exclusively when the conflict is considered unfair and the enemy is not real danger (Stahl, 2006). Clearly, killing in war is done to defend one's nation, which on the other hand needs to be justified as a higher order purpose. But this justification can be superficial or prima facie justification, not a real one in its essence. For example, the justification might be that a country needs to lead a war in order to defend its borders and resources when actually there is not such threat or there is a solution different from war that can solve this country's problems. In such sense, if the country leads war, it would use a superficial justification for that war and the killing in it. In the context of self-narrative, this justification might be not actually internalized story, but an imputed narrative accepted only on a surface level, not as one's "own" story. As a result, soldiers will accept the justification for killing on a superficial level without completely identifying their core beliefs with it.

Account 2. The justification of killing in war is real.

But in the same way, it is possible that such justification can be elaborated and there can be rational and morally justifiable reasons to try to stop certain enemy. For example, if no other solution than war can stop an enemy from hurting more people than the ones that might die on the war field, then it would be possible to justify such war and the killing in it. So the second account is that the justification of the killing in war can be plausible, namely, killing other people who are enemies and present danger has its merits. This, of course, is based on the idea about the greater good that in this case is defending one's country in a "just war". So in this case the justification of killing of people in war is genuine and the greater necessity of self-defense makes the soldier able to accept the morally challenging duty as his or her own cause and not as an imputed reason. In the context of self-narrative, here the soldiers accept the narrative created around war.

4. Soldier PTSD: a specific PTSD, characterized by severe symptoms

Then, on the basis of these two accounts, what could be the real state of the justification of killing in war? In the first one, the justification of killing in war can be superficial, but it is still present in order to enable the soldiers to perform their service. In such case, it is possible to imagine that they perceive their duty as essentially morally wrong and act upon a superficial justification by accepting it on a shallow level.

Therefore, they naturally develop internal pressure which might result in PTSD. But if that is the case, it is possible to suppose many soldiers will not be able to perform their duty at all and PTSD will be the expected result of any military service. Although there are many PTSD cases, especially in controversial places of conflict (e.g. the Iraq War), the history shows that in other cases soldiers are able to maintain a healthy mentality during service and after it, especially when they protect the good and stop the evil. So it is possible to say that the justification of the killing in these cases is real and the soldiers' acceptance of this justification is basically achieved on every level. If soldiers perceived their duty as imposed by others they can develop certain anger and frustration towards those more powerful others and this can create a tension which disturbs the mental balance. But since this does not happen so often (in case it is happening often it would result in many soldiers not following their orders), it seems that the contradiction in war is resolvable. Then, it is possible to ask why soldiers still develop PTSD, even though they are provided with the real justification that killing enemies is morally acceptable.

I would like to take the position explained in the Account 2 above and analyze further why the soldiers develop traumatic symptoms even though they can perceive the justification as plausible and are able to believe it solves the moral dilemma of killing in war. If it is possible to accept the moral justification of killing in war as real, it is necessary to seek the problem elsewhere. One possibility is to search in the soldier's characteristics.

Here I would support the view, as explained previously, that the moral justification of killing can be made plausible and killing enemies to defend one's country becomes permissible in one's mind, but soldiers still develop PTSD. This can point towards the possibility of a case where soldiers are too weak in the sense of psychological vulnerability and they cannot cope with the fact that they kill people in war, although this is justified killing and they understand and accept it.

In this sense, the problem should be sought in the personal features which hinder the functioning as a soldier. Actually, such problem of soldier vulnerability must show that the acceptance of the killing justification analyzed here is not so important. What is

relevant is how the emotional processing of killing as a morally charged act is overwriting the rationalized idea that for the given cause killing is permissible. Of course, there might be cases where soldiers do not understand or accept the moral justification. But they are separate cases. It is more important to focus on the paradoxical case where soldiers well understand and accept the justification of killing in war, but still cannot put up with the act of killing afterwards. The problem of regretting the killing even if it is permissible is what interrupts the healthy military service. Such problem seems to be initiated by irrational feelings, but altogether it is so naturally human to feel this way. As a deeper and more complex problem in the war's moral issues, this can be possible explanation of the PTSD occurrence in military. It can be connected with the personal specifics of each soldier and by this it can explain the occurrence of severe PTSD among some soldiers while not necessarily among majority of them.

The speculation here is that such soldiers who develop PTSD have accepted the moral justification of the killing, but when they had to do it in reality, it caused them to suffer and generated negative emotions which usually evoke the most complex PTSD cases. It is possible to see that as an explanation of the contradiction problem in war this is plausible because it is a phenomenon of trauma caused by deep vulnerability and feelings of rejection directed to one's self. This might mean that the way such soldiers formed their "self" and its story is not matching the concept of killing in essence.

Other researches on the subject seek the causes for the "moral injury" of soldiers (Sanford, 2013) in the general moral dilemma in the war essence (May, 2007; Resch, 2009). Terms like "moral trauma" and "moral knowledge, revenge, reconciliation" (Summerfield, 2002) are used to show what is necessary to be addressed in the recovery process.

The main claim of this analysis is that the problem of killing in war is a form of mental conflict or tension that, if not overcome, can become one of the reasons for the PTSD onset in soldiers. But the specific case of Account 2 requires facing the problem of soldiers' vulnerability that is caused by the essence of their job which although justified by higher ideals, can trigger their humane reaction to killing and cause them a significant traumatic stress.

Now, to further place the soldier vulnerability and the problem of killing in war in the philosophical prism of the narrative identity (Schechtman, 2005) it might be possible to further explain the whole perspective of the problem. Soldiers have created a story about themselves as people who are morally justified to kill since they have

chosen to become soldiers. Moreover, their image of themselves includes the idea they are strong enough to endure the adversities in war. However, their real mental preparedness not always matches this narrative about themselves as the “tough and morally right men”. Here a conflict will arise when actual stressful events will show them they are not exactly what they have been telling themselves all this time while preparing for war and becoming soldiers. It seems their narrative preparedness does not match their real mental readiness – a really challenging case for the whole narrative concept. However, if most of the soldiers are deceiving themselves with false beliefs about being strong enough to face the adversities of war, then the whole war concept and agenda seems wrong. So it is possible to say that such extreme case is not plausible, but more likely there exists a discrepancy between the narrative of the soldiers and the harsh reality they can face in war or in other words, war presents a reality which is quite difficult to imagine and perceive as it is in reality. That is how more or less severe PTSD arises in soldiers – according to the level of discrepancy between the image of themselves and the real experiences they have. Some of these soldiers might be prone to form a more idealistic narrative of them thinking they are fearless heroes that will succeed in battlefield, but their real actions and experiences differ due to their vulnerability feature. These soldiers when observed from a psychological perspective should be more prone to trauma and should be generally vulnerable since they tend to create idealistic narratives which are more difficult to realize in actual life events.

With this arises an important topic related to the above suggestions – how to reduce the soldiers’ vulnerability? The stress originating from war creates circumstances which cause accumulation of stress. Soldier training is done to help them master the ability to cope with that stress and to avoid its accumulation, as well as to form realistic expectations regarding the traumatic essence of war. However, additional problem of innate psychological vulnerability could affect the mental balance of the soldiers and eventually to cause them to develop PTSD.

Let us explore a case where a soldier understands correctly the justification of the killing in war, as presented in Account 2, accepts it fully, and acts on it by killing enemies in combat. As a result, this soldier feels regret and guilt which in summary are traumatic feelings connected with the killing. If I take a further look on the possibilities of such character traits, it seems easy to suppose that there are soldiers who are less vulnerable and do not react strongly to the killing in war while others, who are more vulnerable, feel too disturbed by the thought of having killed other human beings. It is possible to assume that soldiers in the first case will not develop PTSD easily while in

the second one the soldiers' vulnerability trait is acting as a psychological predisposition to PTSD.

If this is true, then the soldiers in the first case need to be trained for getting used to the war environment and that will be enough for them to avoid PTSD. On the other hand, the second case seems to present a great difficulty because the training, at least as it is typically done, does not address the human psychological vulnerability, but more likely tries to make the stress reaction less damaging in war. A necessary consideration should be the following: if vulnerability is an essential part of narrative, then it must be considered whether such soldiers should take part in war-related activities or not; moreover, it must be considered how it could be possible to detect such special vulnerability in soldiers. Therefore, considering there can be different degrees of psychological vulnerability in soldiers, the training should be conducted to match the three possible types of such vulnerability, or as follows:

- A) For soldiers who are relatively not vulnerable training might not be necessary.
- B) For soldiers who are normally vulnerable, training is necessary so that they will not develop PTSD afterwards.
- C) For soldiers who are too vulnerable. In their case even though they can have military training their psychological vulnerability is so strong that it can trigger PTSD. In such cases the problem is not the training, but the soldiers' personality traits. Therefore, the available training seems not effective enough to answer their needs.

I would like to focus on the case C) in the next Section.

4.2. Problems to be addressed in soldiers' training and treatment

The problems that are addressed in soldiers' training and treatment should be accompanied with a consideration that is important for this study, namely that both can be performed in virtual environments. It is considered that the characteristics of the virtual spaces such as safety and flexibility make them an appropriate environment for mental preparedness and coping with stress (e.g. Rizzo et al., 2006).

As noted in the above Section 4.1., soldiers' vulnerability may cause them to generally perform poorly in war environment and to eventually develop PTSD. The training of soldiers should focus on overcoming this, if possible. In other words, a successful training should provide exposure to non-humane experiences which will not

only prepare the soldier for the war reality, but hopefully help to preserve the mental balance afterwards. That is why soldier training focuses on stress management and desensitization (Bouchard et al., 2010). These abilities are meant to become automated during the combat so that smooth execution of the operation is achieved. With training less stress should be experienced during performance, but also after the war – when memory of the combat events starts to play its role. Some researchers see training for desensitization (i.e. becoming less sensitive to stressful stimuli by exposure to such stimuli) as one method to successfully prepare soldiers for the battlefield (Protevi, 2008), but claim this process is considered to be aiming at hindering of the “proto-empathetic identification” (ibid., p.405) of soldiers as humans that means they might start lacking any kind of humane feelings. On the other hand, it is possible to ask whether the experience in training can really reduce the effects of this human trait characterized by sensitivity towards killing other humans exactly because of seeing the “enemy’s corpse... “as someone that could have been me”” (ibid., p.413) that is generally identifying with the enemy on an empathic level and perceiving oneself as not different from the others. In such cases where soldiers have temporarily accepted a non-internalized story they would easily develop PTSD when faced with reality and when identifying with others’ experiences.

Despite the possibility to have such overly sensitive soldiers who are not susceptible to training, it is necessary to observe again the problem from narrative point of view and analyze how it can be related with training in different environments and with different methods. If narrative can be restructured in training, even sensitive people can change their explanation of the traumatizing feelings they might have regarding the horrible happenings in war. Moreover, training in virtual environment can simulate the severity of war to the necessary extent so that the soldiers could experience what they can actually face during combat. With this they can see whether they have too unrealistic image about their own vulnerability, as well as about the essence of war, killing, and the overall traumatic reality they would face as soldiers.

If training is addressing this contradiction it must help soldiers perform their duty without fear, remorse or guilt. The stress resilience is taught to soldiers in various ways, some including virtual environments in the form of games (Bouchard et al., 2011). This helps soldiers consider war in a not so serious way and become insensitive to traumatic experiences in war, but too much insensitiveness can also be harmful. It seems that the option to delete the humane emotion temporarily in order to enable the soldier to kill others is possible. But it is also possible to suppose that this will not work after

some time when recollection and analysis of the war events evoke more humane feelings, in the way mentioned previously. So a suggestion is that training should not delete completely the humane emotions in soldiers (as supported by Protevi's considerations above (Protevi, 2008)). It should preserve their sensitivity as moral creatures and lead to healthy understanding of the killing as necessary in war while accepting one's own vulnerability as natural. In this way training should help soldiers accept the way they react upon killing, in case their own vulnerability is too strong. Whether this can help them escape the PTSD onset, though, could depend on their vulnerability degree, as presented so far.

Then, could the advanced features of virtual spaces facilitate successful training of soldiers? Although they help in various ways to create more training opportunities, they cannot fully prevent the impact of the innate human vulnerability which responds to the contradiction in war discussed here. For analyzing this topic, it will be necessary to explore literature on the subject that is showing successful rate of soldiers' training (e.g. Loftin et al., 2004). The special case where soldiers regret the killing after they have done it needs attention and analysis to find ways of coping with this issue.

The idea of the soldiers' vulnerability should be part of the training aims; then, advanced technological environments like the VR can create scenarios matching these needs (Gonçalves et al. 2012) even after the service is over. Here again it is possible to see the connection between the scenario creation and the self-narrative discussed in this analysis. Seeing the whole challenge in war as some kind of story and perceiving oneself as an actor might help in externalizing traumatic experiences. Forming a stronger mental health image (e.g. thoughts like "I am strong, I can cope with this even though it is very stressful, because this is not what I am, what I believe in", etc.) in a training environment will help transfer the same thoughts during similar experiences in real environment during combat and afterwards.

However, there are other factors which may interfere with the training and preparation of soldiers for the discussed contradictory essence of war. One of these factors is the image of "strong men" which most of the soldiers hold and expect the fellow soldiers to hold. This image includes the expectations that soldiers, compared to normal non-military involved people, are stronger, tougher, physically and mentally durable men. They are supposed to remain such in any situation even though they expect many provoking, shocking and extraordinary difficult events to happen in combat. So their own self-image and expectation can get shaken when war events disrupt their mental health. Moreover, the pressure from the fellow soldiers to remain

“strong” is additional stressor and can worsen one’s already fragile mental balance. This image of “strong men” meets the phenomenon of stigmatization when soldiers develop traumatic symptoms and become “marked” as incapable of keeping their “strong” soldier image.

The stigmatization phenomenon has varied forms, but it usually occurs during PTSD when soldiers refrain from asking for help because of fear to destroy such image (Bouchard et al., 2011; Gonçalves et al., 2012). The difficulty of speaking freely about mental problems is another issue surrounding military service and the PTSD patients as a whole. Actually, as discussed in Section 4.1., accepting one’s vulnerability is very important and it can become one step forward to recovery, as commonly shared in the psychological assessment of PTSD.

In addition, the importance of self-narrative is a major point to emphasize here. If soldiers are prone to creating too unrealistic narratives about themselves, they should rearrange these narratives in training in storytelling environments like VR which could offer plentitude of stimuli and scenarios (e.g. “I am vulnerable, but that’s OK”). Moreover, seeing the soldier’s role as a form of a story or a game might help detaching from the overall negative influence war has. However, this should not lead to hiding the real feelings and the real mental preparedness the soldiers have towards the war filed.

Another point of view can be to ask whether the training itself is limited in preserving the soldiers’ mental health. It seems that the training should help soldiers overcome their weakness, but it may fail doing so and then PTSD will be inevitable in some cases. If the training is limited by factors typical for VR like the ones presented in the Introduction, Section E, and generally by the fact that it addresses the soldiers stress management skill, but neglects the acceptance of their own vulnerability, then it surely will fail in certain cases. Consecutively, there will be soldiers who develop PTSD. However, in narrative-checking scenarios as VR soldiers might realize their own preparedness and level of vulnerability and eventually decide not to pursue such career if they are too vulnerable, or their superiors might decide depending on these factors to send them to the appropriate assignments and save them from too challenging tasks.

Here it is necessary to realize the essence of the training’s failure, if there is such. As said above the killing in war can be justified, but too vulnerable soldiers cannot be trained enough to avoid trauma and they necessarily develop PTSD. In this case training has only a limited effect but does not fail for the soldiers who are not too vulnerable. It is important to introduce treatment of PTSD which must overcome this malfunction presented in the case of the soldiers from the type C) described in Section 4.1.

Therefore, this leads to necessity for more advanced PTSD treatment since inevitably severe cases of PTSD arise (Tworus et al. 2010). In this study's view, the treatment performed in VR might be the best option, considering the concept of narrative creation of self-identity and addressing each soldier's personal predisposition towards vulnerability and mental capability to cope with stress through the VR settings, and eventually leading them to recovery by restructuring their life story after developing war-related PTSD.

Now, let us summarize what can be the causes for PTSD onset in Soldiers.

4.3. The multiple causes for soldier PTSD

Considering the emphasis on the idea of human vulnerability as a character trait, it is possible to say that soldier PTSD can still have multiple causes for its onset even though one type of people is more vulnerable than other.

In the context of the discussion about the causes and the types of PTSD this study makes it is necessary to see what causes the soldier PTSD can have. The causes for soldiers to develop PTSD may vary depending on the events that they experience during war – some of them might get injured and this can lead to physical disability that changes their life forever. It is possible to suppose that this type of trauma will be related to self-image problems and problems with adjustment to new environments and new lifestyle. Another possible case is to have a soldier who witnesses other people being injured. Especially if these people are close friends to the soldier, this traumatic experience will be connected with sense of loss and shock from seeing people get hurt or die.

Still, these cases are differently charged from the cases where soldiers have to kill other people, particularly when they do not have other option but kill people who are not directly related to the war activity (e.g. innocent women or children from the enemy side). This act must be much more charged with overall remorse and shock, rather than personalized suffering. The subtle differences between traumatic experiences should lead the treatment process in finding separate techniques for explanation and addressing of trauma and help the therapeutic efforts to completely diminish the effects of the different traumas. Having one unified definition of soldier PTSD could be used as a clarification of the different reasons for the development of the disorder, however it seems that the treatment of PTSD related to war should question whether any action of

taking human life (and the people responsible for that action) could be justified and also how one's life story would change in result of such action and such agents.

Analyzing further the PTSD onset in soldiers, I would like to see its philosophical nature in the next Section.

4.4. Philosophical consideration of soldier PTSD and the problems of war-related PTSD

As discussed so far, killing in war context causes psychological tension and needs resolution. Soldiers need to deliberately follow orders by choosing a relatively good option. That is kill the enemy to defend their nation. Such choice is a moral one and as such, can give them reasoning to integrate traumatic experiences as meaningful in their own narrative. Soldiers' vulnerability as a character trait can easily lead to stigmatization, especially when this vulnerability is manifested in front of fellow soldiers; then again this often leads to increased vulnerability. How should this problem can be addressed in treatment?

First of all, acceptance of one's own vulnerability will make soldiers' predisposition to change the hard-shelled idea that they are strong and nothing should hurt them. Moreover, understanding that war is very severe environment and most people will be traumatized by it, and accepting that such trauma can occur, could be a form of preparedness to meet the trauma rather than to try escaping from it. Finally, training to be resilient of the stress which inevitable occurs in war can help soldiers become what they are in the first place – a type of people who are exposed to much more trauma than ordinary people.

Still, if training fails in the case of too vulnerable soldiers and they still get traumatized by having to kill other human beings, no matter that these are enemies and the act is a self-defense, then treatment is the only option for help. Here again, acceptance of the vulnerability is very important. Realizing that to be weak is fine and learning how to recover from the war reality is the necessary direction in PTSD treatment. The purpose of the treatment then is to try to return the too vulnerable soldiers to a normal sensitivity. As being too sensitive, being too insensitive can create different problems.

Considering the “strong men” image and stigmatization problem discussed so far, it must be said that the usage of virtual spaces and generally game-like environments

appeal to men (big percent of soldiers being male or pertaining manly appearance and characteristics) and with this makes their application in treatment easier. Also, simulation environments can be adjusted to prevention of PTSD onset by considering the vulnerability of each person. Then, if these virtual reality training and prevention techniques are applied to all soldiers, the problem of stigmatization could be partially solved.

Greden et al. (2010) introduce a soldier-oriented program called “Buddy-to-Buddy” which “uses military culture to change the stigma culture; peer-to-peer appears to be a powerful approach to addressing stigma and associated barriers” (ibid., p. 95). The researchers also mention mental health literacy among the families of soldiers as crucial part of the reintegration of soldiers after assignment. In the context of narrative creation, it seems that the life story soldiers hold about themselves should be understood and shared among the military personnel and among their families and relatives to support them in the process of recovery in case they lose sight of the right direction or in other words, become unable to create any further meaning in their current narrative in the context of war.

Now if soldier training achieves its purpose, soldiers would be truly invincible and, of course, would not develop PTSD. What can this bring about?

4.5. Problems of soldier resilience

The problem of creating too resilient soldiers can be connected with some ethical issues regarding the idea of perfect soldiers.

Seligman & Fowler discuss in their paper “Comprehensive Soldier Fitness and the Future of Psychology” (2011) the ways soldier resilience should be designed. They summarize that trauma preventive technique should lead to making “people who kill for a living feel better about killing and help them do a better job of it” (ibid., p. 86). Such statement, although directly related to meaningful actions towards reducing soldier PTSD, sound more or less morally questionable. While soldiers are people who kill for a living, terrorists are not much different from them and generally define themselves through the acts of killing in the same way soldiers’ resilience and preparedness are described by the discussed authors. It seems, though, that as in the case of terrorists who blindly follow an ideology which dehumanizes and rejects all basic human norms, defining all soldiers under the same “killers” naming is quite unfair and shocking. Even

though these soldiers did choose to become soldiers and eventually “killers”, it seems doubtful they find such limited view as their own and see killing ability as their major characteristic. Unlike the case of terrorists, killing for soldiers is meant for saving more people, or to defend a better, just cause.

Dehumanization of soldiers is a subject of critical research such as the one of Power (2007). He describes the usage of games for training as “an attempt to create a modern version of the noble war fantasy” (ibid., p. 271). The militarization of popular culture influences the understanding what is acceptable in the process of creating a perfect soldier. According to such view, soldier training transcends into the hyperreal field of mechanization of the people’s lives involved in war and the creation of perfect soldiers who lack fear. Whether such scenario is possible though should be a subject of further discussion.

In this dissertation, the main focus remains on helping soldiers as human beings who suffer rather than inflict suffering. That is why I would like to continue with the therapy for soldier PTSD in the next Section.

4.6. Examples of Cybertherapy for soldier PTSD

There are various types of literature presenting research on VR treatment results for soldiers. Let us begin with examples from previous research that focuses on Exposure therapy for PTSD utilizing VR. Most of these researches include authors such as Rizzo, Rothbaum, Difede, and others.

To begin with one pioneering work, let us discuss Rothbaum et al. (2009) who introduce a research on the successful treatment of the first known Vietnam veteran to undergo therapy in VR as an alternative for imaginal exposure. The researchers present results with 45% success in reducing symptoms typical for the disorder immediately after finishing VR Exposure therapy and after 6 months at post-treatment assessment. The treatment method analyzed in the research is based on the principles of Exposure therapy which include “repeated reliving of the trauma with the aim of facilitating its processing” (ibid., p. 263). This formulation implies that the process of repetition is expected to work not only for reducing traumatic symptoms, but also for creating meaning in the patient’s experience, i.e. the “processing” of the trauma. Such expectation could match the discourse of this dissertation regarding the life story and its

meaning which appear to be disturbed by trauma and which consequently require explanation and search for new meaning through therapy.

When introducing the reasoning behind the usage of VR, Rothbaum et al. claim that the emotional response to the sound of helicopters is considered one of the strongest reactions that veterans have when faced with stimuli related to soldier PTSD. Using real helicopters to perform Exposure therapy for veteran soldiers was confirmed to be a challenging task due to the fact it requires ensuring the availability of the machines and presents the necessity for piloting them; the latter being a difficult task which some soldiers cannot perform, especially in the cases of severe PTSD that causes their strong reaction to combat-related stimuli (such as piloting helicopter again) and makes them psychologically unstable. Therefore, utilizing VR exposure (or VRE as the authors define it) proves to be a practical solution for this problem as defended in the research of Rothbaum et al.

The utilization of VR for the purpose of replacing costly and physically challenging tasks is one common example for the achieved effectiveness when choosing VR as treatment alternative. Diminishing obstacles in front of the smooth realization of the treatment and subsequently starting the treatment process early enough is usually connected to higher possibility for successful results in the overall course of the PTSD treatment. As Rothbaum et al. define it, “[a]dvantages of VRE include conducting exposure therapy without leaving the therapist’s office, exactly controlling exposure stimuli, and exposing the patient to less risk of harm or embarrassment” (ibid., p. 264). In addition to reducing the time for realization of the treatment, it seems that VR exposure facilitates the treatment process through providing increased control for the therapist and increased physical security and relief for the patient. These features of the treatment of PTSD in VR through exposure methods, namely safety and security, are commonly detected in various research as presented here previously (Chapter 3, Section 3.2.).

The commonly identified characteristic of providing safety and control is an important part of the justification for the choice of VR as treatment environment and VR exposure as treatment method for PTSD. However, it is necessary to build understanding how much increased safety could help successful treatment and to what extent it is necessary in the full course of the treatment. Naturally, in the beginning of the treatment the patient is too vulnerable and a sufficient safety during exposure would facilitate the treatment. Yet, when certain results have been achieved and the patient is stable enough, a treatment environment which is perceived as safe might present too

low-intensity stimuli compared to original situation in which there were stimuli with increased intensity and severity when the trauma occurred. This might interfere with the effect of gradual adjustment and achievement of normal reaction to realistic and stressful environment. For example, if the exposure never provides a similar experience to the near death experience that the soldier had during service, which experience caused the development of PTSD, then the successful return to healthy state and acceptance of what has happened during the traumatic experience might not be achieved through Exposure therapy.

Therefore, it is important to emphasize that it is necessary to adjust the level of safety and the intensity of the exposure during the advance of the therapy. Such adjustment is possible due to the flexibility of the therapy in VR, since VR can be modified to match the needs of the treatment (as discussed previously in Chapter 3, Section 3.2). If in the beginning it might present only hints for the traumatic stimuli, in the end it might recreate almost the same experience as the one during war, without the real threat for life that was present during war. One might argue that knowing there is no real threat to the patient's life during the exposure can make him or her not "truly" engage in the experience, and hence not "truly" recover. However, the research results show that VR elicits sufficient immersion in the person experiencing it even though not being completely "real" (Grigorovici, 2003). This immersiveness feature would be sufficient premise to create the experience that what is happening during exposure is "real" or at least it can affect the mind of the immersed person in the same way "real" events do.

Rothbaum et al. emphasize that "exposure therapy is aimed at facilitating emotional processing" (Rothbaum et al., 1999, p. 266). Considering PTSD as an anxiety disorder, it seems that increasing the level of realism and consequently the intensity of the immersion could bring about stronger reactions in the patients, but also possibly help them internalize better the narrative that therapy would like to introduce as part of the treatment process. That means that not only reducing reactions to trauma-related stimuli, but also getting accustomed to stressful ones and moreover, introducing new stimuli and meanings related to the traumatic experience can be all realized in VR. Therefore, in addition to Exposure therapy, cognitive restructuring can be achieved in the same environment. As Rothbaum et al. describe, "the fear structure must be activated and modified" (ibid.). This is achieved through the process of habituation and possibly extinction which reduces fear and anxiety related to the trauma.

In addition to the idea of a different scenario in the VR exposure to help reevaluating the trauma episode, this dissertation tries to propose that it is also necessary to find ways to incorporate its meaning into one's life story. Therefore, in addition to the reduction of stressful reactions, it is necessary to be able to modify the negative content associated with trauma and add to it a healthier explanation and meaning in a consistent narrative. If such kind of experience could be achieved in VR and it should be more creative and should transcend the mere habituation means of exposure by proposing a different view onto trauma and a view about what life can be after it. In connection to the idea that victims of PTSD cannot process correctly the present and are "locked in" the past (Chapter 2, Section 2.4.) this seems to be plausible approach which does not only count on exposure, but also builds preparedness to lead normal life after trauma which could be achieved through therapy in a story-like environment.

Let us return to the presented study. The treatment method Rothbaum et al. describe include the following sessions types: introductory (information gathering, explanation of emotional processing, teaching breathing relaxation, familiarization with VR), VR exposure (including war-related stimuli), VR exposure plus triggered memories (in addition to the war-related stimuli the patient is asked to describe memories triggered by the exposure), VR exposure plus imaginal exposure (the patient remembers the most traumatic memories) done with the active participation of the therapist who was able to view simultaneously the patient activity in the virtual environment and perform therapeutic advice to achieve maximum effect of the therapy. To include therapist control and guidance during the session did not interfere with the immersiveness effect of the therapy while it allowed to have on-the-spot adjustments and possibly better treatment results. It seems that being able to have the patient fully engaged (unlike imaginal exposure where traumatic memory disturbs the recollection process) in a safe environment (unlike real exposure where it is difficult to stop the exposure and detach from the environment) while having the chance to navigate the treatment in real time is a combination of merits that make VR such a promising tool for the treatment of PTSD.

Rothbaum et al. emphasize that a "comprehensive treatment program" (Rothbaum et al., p. 269) that combines other treatment methods could bring about best results since in their understanding of treatment in VR the main purpose is habituation rather than restructuring of a narrative. In this sense only the specifics of the environment they find effective (such as immersiveness) seem applicable to the analysis on the effectiveness of the VR application in therapy; however, the possibility to use VR

as a storytelling medium for forming new narrative can be sought as new form of treatment methodology.

The research of Rothbaum et al. also presents a distinction between VR and multimedia systems or interactive computer graphics display with the implication that the sense of presence differs in each of these virtual environments. This dissertation presents a broader definition of virtual space which includes VR as well as other computer-generated spaces. Research such as the one Rothbaum et al. introduce confirms that VR has many advantages in therapy. Indeed, it seems that VR is best fit to provide the highest degree of feeling of presence and immersion and in result it could possibly bring the best therapeutic results for treating PTSD in the case of Exposure therapy (see also Rizzo et al., 2010).

Less immersive spaces such as video games or SNS also fall under the category of virtual space according to the definition adopted in this dissertation and are considered as examples of transfer of experience (Georgieva, 2011b) that is generally specific for all the virtual spaces, as well as examples of formation of a desired self-image (Schechtman, 2012). VR, though, is characterized with the possibility to offer acquisition of skills through repetitive actions in highly immersive environment resembling real life events which is part of the essence of Exposure therapy. In this way VR enhances the general feature of transfer of experience typical for all virtual spaces. In other words, the difference between the more advanced virtual spaces (i.e. VR) and the less advanced virtual spaces (i.e. computer games, SNS and so forth) can be sought in the level of immersion and impact on the person immersed in them. However, all virtual spaces have similar effect of enabling transfer of experience although present in different degree in each virtual space. Therefore, the factor of immersiveness distinguishes VR from the other virtual spaces and creates its high impact for the formation of new skills, self-images or life stories in people. In this sense it is possible to argue that affecting human mind and health is most efficient during experience in VR, but it is worth considering that the other virtual spaces are also efficient in different degree in such tasks. These considerations could help in the explanation why VR is utilized in therapy and why it is considered effective.

A newer research by Rizzo et al. (2009a) investigates clinical data for the treatment outcome for military personnel in a VR exposure setting. The researchers point out that CBT and Prolonged Exposure (or PE; a form of long-term Exposure therapy) seem to be the most successful methods in reducing PTSD symptoms in military personnel. The PE is based on “emotional processing theory, which posits that

PTSD involves pathological fear structures that are activated when information represented in the structures is encountered” (Rizzo et al., 2009a, p. 278). Treatment should address these “fear structures” so that they no longer lead to emotional response of fear in the PTSD patients. It is obvious that these structures are specific for each patient and only the patient can explain how these structures are formed during trauma (i.e. what was traumatic about the event) and eventually process them to reduce their negative impact.

As explained in the study by Rizzo et al., “PTSD typically is guided and encouraged by the clinician gradually to imagine, narrate and emotionally process the traumatic event within the safe and supportive environment of the clinician’s office” (ibid.). It seems necessary for that narrative restructuring to happen when the person perceives the same situation in a low-threat context. Of course, this is the initial requirement for treatment; later, the integration of stressful stimuli should increase as the patient undergoes gradual exposure and introduction to “real-time trigger stimuli (visual, auditory, olfactory, and tactile)” (Rizzo et al., 2010, p. 117-118). As defined by the researchers presenting their work on the topic in different research, it is necessary not only to mentally imagine the traumatic event, but also to narrate about it. The recollection and articulation of the events might help not only to look at them from a more objective and distanced point of view, but also to see them as a part of a continuous story that still has not ended and can be interpreted differently. Such view onto trauma as a part of one’s narrative can help to overcome the most negative sides of the traumatic events and to find ways to continue telling one’s story in a healthier way. As narrative is part of the human ability to explain events (Schechtman, 2011), then narrative explanation of the traumatic events serves as a self-treatment that only the patient can achieve. In this sense, it seems the role of the therapist is to guide the patient while explaining and narrating a story that will bring therapeutic results.

In addition, Rizzo et al. describe that what the patient has to do is to “de-condition the learning cycle of the disorder via a habituation/extinction process” (Rizzo et al., 2010, p. 278). This description of imaginal exposure, though, implies that such exposure often is not successful due to the fact that the patients’ “inability to emotionally engage (in imagination) is a predictor for negative treatment outcomes” (ibid.). To change one’s viewpoint towards the trauma and to acquire a new narrative explanation of the traumatic events one must first feel less threatened (in a safe VR), however conditioned to do so (exposed to stimuli in a VR with sufficient realism), without the necessity to remember the traumatic events which causes mental struggle

between the desire to forget trauma and recover from it (as usually happens during imaginal exposure). In this sense, Exposure therapy in VR in a prolonged manner can lead to processing of the traumatic memory achieved through narration and habituation done “by immersing clients in simulations of trauma-relevant environments in which the emotional intensity of the scenes can be precisely controlled by the clinician” (ibid.). This gives a very clear idea how the treatment process happens in VR. It is aimed at controlled and repeated exposure to simulated stimuli which the patient associates with trauma and consequently at building a healthier response and adjustment (habituation) to all stimuli related to trauma and its context.

However, it seems also necessary that the meaning of the traumatic events is also assessed in therapy and that the treatment outcome reaches further from the achievement of habituation. As mentioned earlier, under the therapist control the patient narrates about the traumatic event as part of the treatment process for PTSD. This narration should not only assess what kind of memories the patient has, but also what interpretation of the events he or she has and what weight he or she puts on these events. In the same line of thought, the patient presents his or her account of the events or his or her story.

Let us imagine that for example he or she was not injured on the war field but witnessed a fellow soldier being heavily injured. In such situation thoughts such as “It could have been me” or “I wish I could have done something to prevent it” or even “I wish it was me and I died instead of seeing this horror and remembering it my whole life” could possibly arise. Then, the treatment should not only bring habituation of the feelings associated with the horror of physical injury, but also with the moral dilemma of killing (or injuring another human being) in war (discussed here in Chapter 4, Section 4.1.). To achieve processing of the meaning that events during war have, one should explain his or her own position, feelings and beliefs in these events and put them back together in a story that makes sense since the events of war tend to make life events meaningless (e.g. “Why was I born healthy when now I’m injured and disabled?”). In such case, the simulation of events in VR should not only bring reduction of stress, but also a psychological relief, understanding of the events and adding of own meaning to these events to make them less negative or to find a positive meaning among the negative ones.

For the purpose of creating such meaning the VR simulation should be not only similar to the events during war (as during exposure for habituation), but also associated with them and differing from them with an added meaning (interpretation) for the

patient (similar but modified environment). For example, the therapy can present the chance to have different endings of the same event or having the chance to say something or do something at the end of one simulation of the original event which was not possible to do in the real event when the trauma was formed. In such a way, the person suffering from PTSD could achieve a sort of closure to the story which was left open and reduce the risk of returning to the traumatic narrative long after the events have ended. Rizzo et al. (2010) consider the treatment in VR in a narrative context and this tendency is confirmed in other research work in the field (Gerardi et al., 2008). It would be interesting to discuss in future this account in connection with the idea of similar and different virtual self this study presents.

There is one other feature of this research presented by Rizzo et al. (2010) and it connects to the recent tendencies for changes in the usage of virtual spaces and technology discussed later here (Chapter 6, Section 6.1.). The researchers imply that in the current “digital generation” less stigmatization will be put on the people who count on technology for fighting their mental disturbances. In order to have the patients perceive the treatment environment as credible one the clinicians who Rizzo et al. present surveyed the participant’s attitude towards technology and its role in healthcare and received favorable results regarding the overall use of technology in treatment. Such analysis of the positive features of the therapy using VR is common for the research lead by Rizzo (Rizzo et al., 2006; Rizzo et al., 2009b; Rizzo et al., 2009c).

What is interesting about the presented research from 2009 (Rizzo et al., 2009a) is that the software of the VR used for the treatment was in fact “recycled” from virtual environments which were previously prepared for a computer game (presented in a similar fashion by Hoffman (2001)). Rizzo et al. (2010) use the term VRET (Virtual Reality Exposure Therapy) to define the method used in the study which aimed at confirming the feasibility of using VR exposure for treatment of PTSD. The pace of exposure was “individualized and patient-driven” (ibid., p.280) and also included imaginal and in vivo exposure. Recounting (narrating) of the traumatic episode was not necessary in the beginning, while later it was triggered together with increased stimuli during the exposure. When recounting happened the patients were asked to remember the events and retell them in the first person account, “as if” they are happening again in detail. This narrative recounting was supported by the therapist and later an audiotape of this exposure was played to the patient to create a “continual exposure” (ibid.). What the researchers plan as their future work is to find what characteristics of the patients make them more prone to recover. Such endeavor would connect to the discussion about

solder vulnerability in this dissertation (Chapter 4, Section 4.1.) and could give suggestions how the personal story and self-image relate to trauma.

In another research from Rizzo et al. (2009b), the prolonged Exposure therapy in combination with CBT is presented as appearing to have the “best-documented therapeutic efficacy” (ibid., p.376). This is achieved because this combinative therapeutic method allows “precise control of stimulus conditions” when done in VR (ibid.). Two definitions often used for Exposure therapy in VR and mentioned by the researchers in this study are “graded” and “repeated” (ibid.). They are commonly used when describing the specifics of VR in other researches (e.g. Riva et al., 2010) and are supported by the current research.

Moreover, as Rizzo et al. have posited later that “the VR technology provides the capacity for clinicians to deliver specific, consistent, and controllable trauma-relevant stimulus environments that do not rely exclusively on the hidden world of the patient’s imagination” (Rizzo et al., 2009b, p.377) when describing how VR exposure serves the treatment more successfully compared to imaginal exposure. How exactly does this happen? Such “advanced form of human-computer interaction is achieved via the integration of computers, real-time graphics, visual displays, body-tracking sensors, and specialized interface devices that serve to immerse a participant in a computer-generated simulated world that changes in a natural way with head and body motion” (ibid.). Such advanced form of utilization of VR shows how it could serve the purposes of the therapy for PTSD. The VR environment allows the clinician to utilize “behavioral tracking, performance recording and physiological monitoring” (ibid., p.378). In addition, vibrations, sounds and the like increase the immersiveness of the exposure and make the environment as realistic as possible and by creating the sense of presence.

Important view that Rizzo et al. (Rizzo et al., 2009b) defend in this paper is that the symptoms of PTSD represent a normal response to traumatic events. In such sense, it becomes problematic when the condition lasts in time and is not treated. However, the initial stressful response seems to be a necessary reaction everyone has and its meaning is to protect the person from future similar threats that can trigger PTSD. For example, if one experiences life threatening situation he or she will avoid similar situations in future remembering the fear for his or her own safety and life that he or she experienced. In this sense, trauma teaches preventive skills and the triggering of PTSD might depend on either one’s vulnerability or, differently explained, one’s inability to integrate successfully trauma into his or her life story.

To add to the above account regarding the stressful reaction as a natural protective and preventive mechanism, Rizzo et al. (2009b) claim that “majority of trauma victims naturally recover” (ibid., p.378) and therefore “PTSD can be viewed as a failure of natural recovery that reflects in part a failure of fear extinction following trauma” (ibid.). The suggestion of Rizzo et al. is that there are actually people prone to recover faster and in a natural way while others lack this characteristic and are prone to developing PTSD regardless of their initial stressful reaction or the intensity of symptoms. This corresponds to the above and the previous discussion about soldier PTSD in this dissertation (Chapter 4, Section 4.1.).

To go further and support this Rizzo et al. claim that “conditioning processes are involved in the etiology and maintenance of PTSD” (ibid.) and these conditioning processes play role in the “acquisition of fear and avoidance behavior” (ibid.). In particular, this happens when generalization capability creates stressful reaction to stimuli which are similar but not completely identical with the traumatic ones. Through such generalization people exposed to trauma might react to stimuli which resemble the ones experienced during the traumatic event long after the event itself. Again, if one cannot process and integrate correctly the fear response it would remain a main response to any similar to the traumatic events. Moreover, associative thinking might make one react to similar situations with the same stressful response without realizing the reason for that behavior and integrating it in a meaningful explanation. For example, if we imagine a victim of physical abuse attacked in a park, then not only visiting parks, but outside greenery as a whole might provoke feelings of nausea or sweating as natural PTSD symptoms. Of course, radical generalization of stimuli “reflected in the belief that the world is a dangerous place” (ibid., p.379) would make one inapplicable of normal life; it is still unclear, though, to what extent traumatic symptoms are triggered by interrelated stimuli and how much vulnerability and sensitivity to context influences the triggering of PTSD symptoms.

In the matter of fact, the above characteristic of the PTSD symptoms can be connected with the successful application of VR for therapy since not exactly identical stimuli can still evoke reaction with sufficient strength and serve the purpose of Exposure therapy.

The treatment of soldiers suffering from PTSD has many challenges; however, it is still a major focus of treatment endeavors worldwide, especially in the case when VR is utilized. In contrast, a very different type of PTSD, namely the natural disaster-related PTSD, has been overlooked as a major type of PTSD and efforts for the disaster

4. Soldier PTSD: a specific PTSD, characterized by severe symptoms

recovery outnumber the attempts to treat people suffering from the disorder after a disaster, especially in the case of VR utilization. What is the reason for that, do natural disaster victims need treatments such as Exposure therapy and what might be the place of VR in such efforts are questions the next Chapter will try to answer.

5. Characteristics of PTSD resulting from natural disasters

The analysis here focuses on the prevalence of the disorder and the predisposition of certain populations to develop PTSD. Psychological, philosophical and religious markers of PTSD resulting from natural disasters are discussed as they can explain the specifics of this type of PTSD. In addition, the necessity for unification of environmental and psychological recovery is emphasized in the context of the analysis of natural disaster-related PTSD. The influence of media during news coverage of natural disasters and its relation to the occurrence of PTSD is seen as an additional and often disregarded as important factor for the onset of the disorder. In connection to the media influence on human perception of events happening worldwide it is important to consider the possibility of the virtualization of the events that leads to detachment from reality of what has happened and lack of understanding of the impact some events might have (e.g. feeling as in a movie while watching coverage on terroristic attack or natural disaster news). The findings of the following and other researchers will be analyzed in the context of these considerations: Galea et al., 2005; Novick, 2005; Gonçalves et al., 2012.

5.1. Prevalence and specifics of natural disaster-related PTSD

Certain populations are at high risk for the natural disaster-related PTSD. The lack of intentional act and agent of this act that characterizes natural disaster-related PTSD creates difficulty to rationalize disastrous events. Religious and superstitious beliefs as well as frustration and helplessness can result from this type of PTSD.

Is it possible to completely accept the narrative account in regard to this type of PTSD? What could be the original consideration this research proposes in connection to

natural-disaster PTSD? This research proposes a philosophical explanation of the PTSD and the exposure therapy in VR through the narrative account. It also tries to give a narrative explanation of the character of the different traumatic events by seeing how the patients would interpret or discern between them as an act of God or intentional ones for example. This discrimination between the essence of the action would create very different narrative patterns formed around actor or a story, having different explanations and meaning. For example, a story about tsunami that killed innocent children might not provoke anger towards the nature that caused the disaster, while the negligence of someone who didn't react correctly during disaster would change the whole narrative weight regarding the responsibility, agency and intentionality of the event.

It is important to emphasize the fact that PTSD onset is due to very different factors and the disorder itself has many different levels. In Chapter 2, some classification of the types of PTSD was made, but it seems very important to distinguish between the cases of PTSD resulting from natural disasters and PTSD related to war experience of a soldier, since they seem to present cases on the extremes of different scales. As discussed in Chapter 4, soldier PTSD is connected with the problem of the moral justification of killing other people and soldier image of string men. Natural disaster-related PTSD is quite the opposite: innocent and non-violent people are exposed to uncontrolled power of nature that kills people without reason and order. In the natural disaster-related PTSD killing itself cannot be justified and there is no one to be blamed for it.

To provide a clarifying example, a victim of a natural disaster might consider the disastrous event as “an act of God” or “just fate”; a result of the way the natural world order has changed and developed regardless of one's deeds or necessities, or simply the collective efforts and expectations of life (i.e. the narratives people had about life before the disaster). On the other hand, in the case of PTSD connected with war experiences, or similarly in the cases of PTSD caused by some violent action (like robbery, kidnapping, sexual assault, etc.), the stress and the negative impact on the patient are inflicted by a human force, by the actions of a real person. In the case of intentional actions inflicted by a human the patient (or the victim of these actions) supposedly can have a very different stance towards the problem that caused him or her to suffer from PTSD (Botella et al., 2010). It seems also that such intentional actions resulting in PTSD are usually creating severe PTSD cases the treatment of which being often complicated and difficult. On the other hand, looking again at the case of natural disaster, this type of PTSD sometimes cannot be addressed in therapeutic counseling at all since there is no

direct force which is “responsible” for the resulting pain, stress and disastrous way of living. The victims might say, “It cannot be helped; it just happened that way” and they cannot channel negative emotions, stress and pain to any agent. The lack of explanation for the events and of agents to blame can lead to lack of meaning or to self-blame, and this, in the context of personal narrative, creates the biggest problem in explicating, restructuring and finding of meaning in the life story. In this sense, both human-made and natural disasters present very challenging cases of PTSD, nevertheless being very different in nature.

Galea et al. (2005) report in an extensive study that a large percent of people is in lifetime exposure to natural or human-generated disasters. The researchers say that “[c]lassifying a traumatic event as a disaster is not always straightforward, and the distinction between individual traumatic experiences and disasters may be unclear.” (ibid., p.79). This implies that some traumatic events are often not classified as disasters if they affect only few people. However, some events which cause great changes in environment might not directly affect people and cause loss of life but can be classified as disasters. It is possible to assume that distinction between personal disaster and natural disaster affecting many people is easy to make on the basis of the people affected. Natural disasters have great impact on whole populations and hence are undoubtedly type of events which might cause PTSD. However, the amount of people affected in one natural disaster probably depends on their own resilience, previous (personal or not) disasters or accumulated PTSD-inducing experiences (e.g. assault, etc.), as discussed previously here (Chapter 2, Section 2.3.).

However, as a separate type of PTSD, it is difficult to define what personal disaster itself is (e.g. whether natural death of a close relative which again is an “act of nature” is included in the definition or only type of disastrous event such as fire in one household). It seems difficult to define which events are necessarily causing PTSD in the case of limited number of people affected by the same traumatic event. In such cases while some people will recover from the disaster quickly without treatment interventions, others will suffer from PTSD and will have difficulty recovering even after prolonged and careful treatment procedure. It is necessary to address the level of predisposition to PTSD onset as a physiological or psychological feature of each person and also to consider the interpretation of the events people have shared as a group (e.g. claims like the “this is the biggest disaster we have faced so far”), a problem which is a topic of separate discussion here.

In addition, if we consider the concept that people hold a narrative ideal about how their life is developing, a confirmation of this narrative and understanding how much the disaster has caused the person to depart from his or her story can help the therapist in the design of the treatment procedure. In a systematic review Gonçalves et al. (2012) claim that even though there are “struggles with personalizing exposure for individuals with different traumas” (ibid., p.1) therapy in virtual environments yields many benefits and “facilitates the emotional engagement of patients with PTSD during exposures to the multiple sensory stimuli..., bypassing symptoms of avoidance and facilitating control on the part of the therapist” (ibid.). If VR can offer such flexibility it might be adapted to some severe cases of PTSD by changing the therapeutic strategy during the course of the intervention. For example, if certain exposure environment doesn't work for the benefit of the patient or is filled with too many stressful stimuli, then some options in front of the people who design the therapy are to create new features, downgrade the intensity and so on.

According to different research from Novick (2005), survivors of natural disasters “reported nightmares, insomnia, guilt, despair, depression, and hopelessness” (ibid., p.2). Although the PTSD onset in war-related PTSD is characterized by some of these symptoms, it must be noted that soldiers are generally strong people who are trained to survive in harsh environments, although their ideal image can get shaken too as discussed previously (Chapter 4, Section 4.2.). However, “ordinary” people who are met with disastrous events without any training or resilience preparation might have much more difficulty imagining a strategy to escape from trauma and restructure their narrative. If one has never imagined a real tragedy to happen, the sudden and total change in the surrounding environment (e.g. from a peaceful farming village to a radiation exclusion zone) can be a fact too difficult to assimilate and hence to lead to feelings of hopelessness and despair, also lack of purpose in life.

Novick cites the above mentioned study of Galea et al. to distinguish between the early-onset PTSD that is usually resolved quicker and the long-term persistence of the disorder in an untreated state. That is why, “understanding who is at risk for long-term PTSD and exploring PTSD patterns and trajectories can yield benefits in developing early intervention strategies” (ibid., p. 2). Early intervention also relates to easier cognitive restructuring and narrative change, before the facts of the traumatic reality become a part of what the person identifies with and hence influence his or her motivation and capability to change. However, researchers (Wiederhold & Wiederhold, 2006) claim that some type of PTSD such as natural disaster-related PTSD might not

necessarily require interventions such as psychological debriefing (used to mitigate acute stress) following the traumatic event.

Then, in what way should natural disaster-related PTSD be considered for treatment intervention? Let us discuss this in the next Section.

5.2. PTSD resulting from natural disaster as a collective disaster

War-related trauma is where various research and treatment efforts are usually focused. It seems that natural disaster victims do not receive enough attention because environmental recovery is misconstrued as psychological recovery. Let us discuss this problem in detail.

When discussing non-war PTSD and focus on natural disasters it is important to mention that what differentiates this type of PTSD from the other types is that many people are affected and stigmatized as a group (e.g. they need to be relocated, they suffer from some sickness related to the disaster as in the case of Chernobyl disaster in 1986) and the trauma is both personal (depending on own coping abilities, previous trauma accumulation and so forth) and spread throughout the group. In cases of people in one family when only one person is affected, even if the other members are separate and not affected, the trauma will naturally reflect on the whole family and complicate the overall recovery. That is how disasters spread and change the way people lead their lives, whatever the disorder is labeled, only as a personal trauma or as PTSD resulting from natural disaster or from combat – the two major disorders which are discussed here.

The reason for this is that peoples' narratives include the narrative of others, close to them. When one person suffers from trauma, this affects the narrative of the others, and they have to restructure their own story (e.g. "Dad is behaving strange recently, we have to help him get back to normal", "I have to accept her; she has changed after the accident", "I cannot live there anymore, I have to leave my family behind", etc.). In a sense, a true therapeutic approach should treat the whole story of the person, including how he or she sees himself or herself in the context of his or her life, family and personal history (as discussed in Böttche, Kuwert & Knaevelsrud (2012)).

Now, when we talk about natural disasters, this problem seems twofold: in the case of personal disaster, one should cope on his or her own, with or without the help of his or her family since quite often it is a matter of survival rather than cooperation;

however, in the case of natural disasters victims, mutual support actions are quite common since people tend to behave in a protective and humane way when everyone is facing similar adversities together (even the following example is possible: when a person is not able to help someone survive the disaster he or she might develop PTSD). Desire to unite efforts will facilitate the overall recovery speed and quality of the group affected by a natural disaster, however it is possible to expect that each individual in the group experiencing the trauma from natural disaster will have different level of PTSD onset; some will be more affected, while others who are originally resilient enough will remain with almost intact condition of their mental health. The consideration of this is very important when addressing trauma in the context of natural disasters affecting many people and resulting in many different PTSD cases which differ in their level of severity. However, having to treat people with similar origin of the PTSD cause would be best achieved in a similar type of exposure environment that could be easily created in VR.

In this context, it is necessary to summarize what are the main problems in natural disaster-related PTSD which will happen in the following Section.

5.3. Essence of natural disaster-related PTSD

An analysis of the essence of the unintentional action, perceived as not charged with responsibility and the idea of nature's unpredictability can be discussed as possible combination that serves as a trigger for inability to trust in everyday safety and for losing willingness to be active in life and hope for restoring of one's personal story. Unlike soldier PTSD, in the case of natural disasters the expectance for occurrence of traumatic experience is much lower and the shock from disturbance in the life story is more sudden, hence this type of PTSD deserves more attention as having more irreversible effects on unprepared civilians. Moreover, the fact that soldiers can return to "normal" life and their families after duty helps them restore their mental balance and life story. The victims of natural disaster cannot escape the reality they are faced with and often need to relocate and face more adversities related to adjustment, separation or bullying for example. This creates a big distinction between the two disorders and quite often the grim reality of natural disaster victims is not a subject of sufficient analysis.

To provide some data here let us see what Krug et al. (1998) discuss in relation to suicides after natural disasters. The researchers collected data regarding suicide rates

36 months before and 48 months after a single type of disaster (e.g. flood, hurricane, and earthquake) in the United States. Their results show that suicides increase among populations experiencing severe disasters (e.g. floods, hurricanes, and earthquakes compared to disasters with less damage such as storms or tornadoes). The researchers mention not only PTSD but many other diverse effects on human health that result from the experience of natural disasters. These effects are for example substance abuse and domestic violence. Factors connected with the fearful experience of the disaster are mixed with other adversities resulting from it such as “disruption of the social fabric of community life” (ibid., p.373). However, although not receiving enough attention, suicide is the one effect that is found common with another type of PTSD, subject of analysis here, namely the PTSD resulting from war. The reason for increased suicide rates in the case of natural disaster victims, though, differs from that of war veterans because natural disaster victims have lost the day-to-day ability for social contact and their basic environment included in their idea of their own life story is disrupted, sometimes forever (such as stigmatization for the possibility of being exposed to radiation for example). Moreover, recurring types of disasters (e.g. floods) do result in increased suicide rate since the possibility to “believe” in safety and continuation of “normal” life is lost.

Lack of predictability and lack of responding site (a government, an enemy force, etc.) might result in creating hopelessness and lack of meaning in any action directed towards recovery, which combined with the possibility for more similar events to occur (e.g. aftershocks) would make people experiencing natural disasters give up the essential ability to create meaningful narrative about one’s own life and live fully in the present reality.

Therefore, it is necessary to put a clear distinction between the PTSD types and realize that treatment efforts should first work on detecting that distinction. Let us analyze further this problem.

5.4. Difference between combat-related and natural disaster-related PTSD in narrative context

In the case of combat- or war-related PTSD veterans can return to non-military reality while natural disaster victims’ reality is damaged and the ordinary way of living is disrupted so recovery of internal and external reality is necessary.

As discussed in Chapter 4, Section 4.5., soldiers are entitled to killing and they generally affect negatively other people (i.e. enemies) “for a living”. They exist in the war reality while on service and behave according to its rules. However, once they finish their assignment, they can return to the normal reality and leave behind the role of “professional killers”. In a sense, their job is switching between roles and realities.

In contrast, the victims of natural disaster do not live in an extraordinary reality such as the war reality in their daily lives. They are entitled to only one narrative which can be badly disrupted by unexpected events. The disastrous event is what brings sudden and drastic change to their everyday reality and leaves them without choice or place to run away. In this way the both types of PTSD – war-related and disaster-related seem quite different, if not even opposite.

In the context of the self-narrative creation discussed here, soldiers do have the choice to create their image during training and service and also can return to their essential normal self and story back from the war field. Natural disaster’s victims are deprived from their basic ability to create a life story and forced to accept a much less preferred one, sometimes for the rest of their life. In addition, the development of PTSD might make one even less able to see a different reality or option to change his or her current state and create a more preferable one. In this sense, the case of natural disaster PTSD seems much more challenging to treat.

Then, what should be the philosophical explanation of the problems to be treated in natural disaster-related PTSD?

5.5. Philosophical consideration of the problems to be addressed in natural disaster-related PTSD

When analyzing natural disaster-related PTSD it might be necessary to see trauma and anxiety as socio-cultural problem and natural disaster-related PTSD as a happening that is connected with anonymous forces (“acts of God”).

Let us analyze the problems present in non-war-related PTSD separately from war-related PTSD since as discussed, war-related PTSD arises even though soldiers receive special preparation for trauma through training and so on. The non-war-related types of PTSD usually include an unexpected and catastrophic change in one’s reality and idea for life story ahead in the future. Such changes result from events that are more or less connected with fear – something much less evident in the case of soldier PTSD.

Non-war PTSD basic characteristic seems to be constant fear for the future and doubt in the current reality. These perceptions are so strong that they can make the current reality seem illusory and/or absurd. I would like to give an example (even though not natural disaster-related) with the patient named Rosa who was suffering from PTSD after a car crash as described by Riva et al. (2010). As the authors cite the patient's feedback about reality, she perceived something that can be defined as "past which is always present" (ibid., p.62). Riva et al. approach is something I would like to support in this analysis as their treatment method of "Interreality paradigm" is similar to the idea of transfer of experience from the real to the virtual space as defined in the very beginning of this dissertation in the hypothesis definition (Section "C"). The researchers claim that the behaviors in the virtual world influence such in the real world and vice versa, and include various monitoring technologies to support the patients in their daily lives. Even though this is not a case of victim of natural disaster, it shows well the difference with soldier-related one, since such event as car crash changes all the reality surrounding the victim in an exact way as it happens with natural disaster victims. Therefore, a returning to present reality and transferring the exposure experiences as one's current experiences would give more chances to return the patient to a healthy state (in contrast with soldiers who need to fight their vulnerability more than their current reality).

Let us look further into the idea that people suffering from PTSD perceive reality as different from the reality they used to know and create as their life story before trauma. Trauma makes people suffering from it to see reality as an unreal or somewhat artificial reality (thinking patterns such as "things don't have meaning anymore", etc. would be common in such case). Such artificially sensed reality, though, can be simulated also in the virtual space, utilizing VR technology. It is possible to say that the virtually simulated reality resembles more the traumatized reality than the reality a healthy person perceives. It is possible that this is the reason why VR can be utilized for treatment and transfer of experiences in order to recreate and return to "normal", "real" reality.

If such thing is true then seeing people suffering from PTSD as "living in" traumatic reality will explain why they see everything in "depressed", "dark" colors. Usually hyper-adaptability makes them see reality as changed and also makes them accept that reality has turned into such worse, frightening, dreadful and somewhat "unreal" reality. A highly traumatized person who is not able to recover easily then is actually constantly prepared to exist inside an unfriendly, anxiety-inducing reality. Such "unreal" reality that traumatized people experience is also similar to the uncanny

imagery discussed of Section 2.1. in Chapter 2. For example, the experience of romantic loss when a person breaks up with a partner in a relationship is similar to the weird, unbelievable and negatively-charged reality of PTSD sufferer. That is why romantic relationship and trauma from the loss of such can be considered as triggers for traumatic disorder. The people who suffer from such loss see everything colored in a fundamentally new way – as a “reality without” their partner, a reality of missing and incompleteness. In the very same way, people who suffer from PTSD, and especially people who have lost members of their families, valuable possessions and roles in life such as houses and jobs, resemble the ones described above – as people who cannot recover their lost reality and the story about it.

Considering such perspective in the reality of natural disaster-victims, let us analyze how treatment has been done for this type of disorder in the next Section.

5.6. Examples of Cybertherapy for natural disaster-related PTSD

Let us briefly discuss what kind of research has been done so far on natural disaster PTSD and see which one utilizes VR. As mentioned previously, it seems much less research has been done for finding how VR exposure helps PTSD patients who have developed the disorder after a natural disaster. In addition to that, the research on treatment of natural disasters which utilizes VR is very limited in its scope for analyzing how VR enhances the treatment.

To present a relatively recent work, let us look at a study in which Dünser et al. (2012) discuss the usage of VR for treatment of earthquake-related PTSD. The researchers claim that in vivo and imaginal exposure have limited applicability to earthquake-related symptoms, while CBT has limitations in answering in a timely manner the therapeutic needs of the large number of people affected during a disaster. The researchers’ suggestion is that PTSD requires quick therapeutic response after the disaster to prevent further development of trauma and prolonged treatments such as CBT alone will not manage the demand from a disaster-stricken population. In the light of such circumstances, the fast application of VR therapy could answer the necessity of treating many people in an adequate time frame. In the study Dünser et al. also explore VR exposure as a method for increasing resilience to the traumatic stress that can occur in the context of disastrous events.

One of the main reasons therapy in VR is preferred according to Dünser et al. is that VR environments are easy to control. They also emphasize that there are no studies exploring the usage of VR exposure after earthquake and the following aftershocks. When they present the design of the exposure they suggest a full range of simulations to increase the immersiveness of the exposure, namely visual, audio and haptic feedback. In particular, the auditory stimulation would include the “rumbling sound” (ibid., p.2) of earthquakes and “infra-sonic frequencies (below 20 Hz) that are perceived through the body but normally cannot be heard by humans and have a role in producing feelings of panic” (ibid.). Designing the exposure in a way adapted to this type of disaster-related PTSD is of particular interest since this dissertation tries to see the differences between the types of the disorder and consecutively, future work could discuss the different treatment designs for the different types of PTSD. In such context, it seems plausible for the exposure to consider the specifics of the disastrous event that would evoke the strongest reaction of fear and therefore enable faster processing of the trauma and possibly obtain more effective treatment results.

One specific of the earthquake-related PTSD is that the people exposed to the disaster have to experience aftershocks which usually follow the main earthquake and remind of the stress and the trauma experienced in the beginning in an uncontrollable way. Creating resilience for the people exposed to natural disaster who can be met with the same disaster in the future will not only bring possible processing of the trauma, but also teach them to see their surrounding environment in a safer way. For example, internalizing the fact that aftershocks are natural consequence of a big earthquake and learning to react more calmly to them is a good way to recover from a disastrous event. However, this could be also considered as teaching these people to see the danger in a less serious (realistic) way and therefore as ultimately undermining their preparedness. A careful consideration of the balance of the needs for preparedness and resilience is necessary when defining how to prepare people to meet trauma with increased mental strength.

To continue with a different research, let us see what researchers say on VR in disaster-related context. Benedek, Fullerton, & Ursano (2007) analyze the treatment methods used in disaster-related PTSD and stress on the necessity for immediate intervention for the people exposed to disasters through psychotherapeutic approaches such as VR exposure. When they mention VR, they define the VR exposure as “progressive and guided re-exposure to traumatic recollections as part of the therapeutic

process” (ibid., p.64). They also describe thoroughly the treatment methods for PTSD and their possible application and effect in the therapy’s success.

To present another study, a systematic review on disaster-related PTSD treatment (Hong & Effert, 2016) mentions the efficacy of VR exposure and narrative-exposure therapy (Zang, Hunt, & Cox, 2013). The narrative approach there diverges from the means of Exposure therapy aimed at habituation and focuses on “constructing a narrative that covers the patient’s entire life” (ibid., p. 2). It seems that this tendency is common with other researchers (Böttche, Kuwert & Knaevelsrud, 2012).

Let us continue with research which is not directly connected to providing treatment of natural disaster-related PTSD in VR, however offering important insights on the application of technology in relation to disaster and preparedness.

A study which does not include VR but investigates the simulation of disaster for reducing the symptoms of PTSD deserves interest. Basoglu, Salcioglu, & Livanou (2007) present a study which measures the effectiveness of an earthquake simulator for reducing PTSD symptoms. Instead of focusing on habituation, the study claims that the participants were asked to “confront their fear until they felt in control” (ibid., p. 205). Such approach is much more interesting since one can imagine victims of natural disaster are much more vulnerable and much less prepared compared to soldiers as discussed in this Chapter. The earthquake simulation was meant to enhance the participants sense of control and this was reflected in the design of the simulator where they could decide when to start and stop the simulated tremors. When they focused on the sensory-related anxiety they were asked to focus on habituation; when they were remembering the experienced earthquake they were encouraged to articulate the sensation and were facilitated through that experience. It is easy to imagine that such simulation could be done in VR and hence result in increasing its effectiveness.

The researchers define their approach as novel since they base it on the idea that “conditioned fears and helplessness induced by repeated exposures to unpredictable and uncontrollable earthquakes are both mediators and prominent features of earthquake-related PTSD” (ibid., p. 211). Of course, exposure to one earthquake is a sufficient factor for development of PTSD. Accumulation of such events only increases the probability of developing a more serious condition. As a result, improvement of cognitive symptoms of PTSD was detected (e.g. such symptoms as “sense of foreshortened future, detachment, guilt” (ibid.)). Finally, the researchers suggest that “cases where fear is not the predominant feature, treatment could focus on cues that

trigger re-experiencing symptoms” (ibid.). This means that the design of the treatment should be really flexible according to the way the PTSD is experienced by the victims of disasters.

Wang, Wang, & Maercker (2013) illustrate a case of utilizing an Internet-based intervention for PTSD for people who do not have direct access to medical care or avoid seeking such, especially after natural disasters or in less urbanized areas. The authors mention lack of information about mental health care and fear of stigmatization as reasons to avoid seeking help and in such cases Internet can provide a good solution of these problems.

The introduced program consisted of “six modules of social support, self-talk, relaxation, trauma triggers, unhelpful coping, and professional help” (ibid., p. 2). It also utilizes “interactive components, such as pictures, audio segments, video segments, and self-tests, to offer educational information on trauma and provide trauma coping skills practice for its users” (ibid.). The participant's motivation to use the website introducing the program was estimated as high and contributed to the favorable results of the treatment. Although this study presents a case of utilizing a very simple virtual space (the “type a” from Chapter 1, Section 1.2.), it still shows the possibility in front of the virtual space in general, compared to the therapy in person. The motivation to use technology is much higher compared to the effort to meet people in person. On the other hand, this shows also one of the specifics of the virtual space, namely its easiness. People are used to utilize the virtual spaces and feel it is safer to rely on them than rather than on face-to-face communication when feeling challenged. The findings of this research can be connected to the idea of Turkle about the feeling of trying out and also the idea of anonymity of the different virtual self which allows one to feel not threatened and exposed.

Another study which connects to the idea of the virtual spaces – the one of Balfour & Donnelly (2013), discusses what the researchers call Urban Telepresence (UT) operational environment which allows remote participation in response to disastrous events. The technology is already deployed for providing situational awareness in military context (e.g. image of a battlefield). The researchers present this in the form of an augmented reality system with the purpose of providing a virtual operator to help personnel dispatched on the target environment in real time. Although the study does not present a treatment technique for natural disaster victims, it gives a good idea how to use technology in disaster preparedness context. Moreover, it discusses a different type of virtual space utilized for disaster preparedness that is not

generally covered here, namely the augmented reality. In the context of the discussion of virtual spaces, this is an entirely different topic which deserves separate interest. However, here I will only mention that the system presented by the researchers was built on the basis of a VR software which shows again that the VR flexibility allows its application in various healthcare options or the so-called recycling of VR (see Chapter 4, Section 4.6.).

Now, since the data on treatment of natural disaster-related PTSD in the context of VR and virtual spaces in general is very limited, I would like to discuss several other studies which give important implications on what is necessary to address in the treatment of this type of PTSD.

Echeburúa (2010) talks about prevention of PTSD after a disaster and introduces the so-called trauma sequelae which includes impact, recoil, and reorganization. These stages of trauma respectively include such psychological states as being vulnerable, having mood swings, and finally finding perspective. They claim that only small amount of people would develop PTSD and the task in front of disaster research is to find who are prone to develop PTSD. Such suggestion is supported in the discussion here as it was mentioned many times that psychological vulnerability might affect the onset of the disorder.

In a study from 2015, Botella et al. (2015) present an important consideration which this dissertation also supports, namely “[a]s stressors that cause traumatic events can differ (eg, wars, sexual assault, terrorist attacks, natural disasters, etc), each traumatic event would require a specific VR environment” (ibid., p.2535). Considering answering the diversity of PTSD is a relatively recent topic in the research on the treatment techniques for PTSD. This topic is often connected with the flexibility found in VR that could match various cases of PTSD. However, it is not clear whether the overall idea of flexibility that can be achieved through the experiences in VR didn’t influence the discussion about the possibilities in front of the treatment options for treating the disorder. Considering that there can be many possibilities to design exposure probably has led to the understanding that one unified “exposure” could not fit all the diversity found in the traumatic disorder. In this sense, the specifics of the VR are offering more than a treatment alternative; they are possibly provoking the discussion and the search of different views towards the human experience as a whole. Observing the reactions to the immersiveness has taught researchers that the virtual spaces have the characteristic of offering possibilities to see the world in a new way, as well as situations and events that have already happened in a possible new light. It can be a

fruitful topic to consider the possibility that through this re-experience one can transfer from the virtual space to the real space more meaningful and healthier images about himself or herself or the events he or she perceives as own “story of life”.

In relation to this, let us discuss further one interesting feature of common thinking which presents itself when people look back to past events. This process makes them find meaning in experiences previously not connected with special meaning. There are sayings from common psychology that “everything happens for a reason” and that if one could “connect the dots” this could be a way to explain the “chain of events” which happened in the past. Why does this explanatory process happen? Why people tend to explain events, attach meaning to them afterwards and isn’t this provoked by the storytelling, “meaning-finding” ability of the human mind? This dissertation would like to support the idea that finding meaning in events as a retrospective process is meant not only to process negative ones, but generally to interconnect the events in one meaningful story. That is why negative ones require explanation but explanations and meaning-finding for the positive ones serve as well in the overall narrative inclination people have. For example, being successful in one endeavor will lead to reflection afterwards what efforts made the person succeed and will be utilized in the next endeavor he or she has. This learning, explaining and narrative tendency is present across the whole life story of a person.

In a recent meta-analysis Erford, Gunther, Duncan et al. (2016) divide the therapeutic methods for treatment of PTSD to trauma-based and non-trauma based. The first approach relies on exposing the patient to stimuli which trigger reminiscence of the traumatic event. The researchers formulate the following approaches as trauma-based: Narrative therapy, in vivo exposure, prolonged Exposure therapy, and EMDR. EMDR in particular is defined as a method “using stimulation to help the brain beneficially reprocess previous psychologically disruptive information” (ibid., p. 13). The following methods are defined as non-trauma based: supportive therapy, interpersonal psychotherapy, meditation, and dialectical behavior therapy. However, in the results section of their study Bradley et al. claim that there is no significant difference in the usage of the two approaches as to the effectiveness of treatment results directly post-therapy and at the follow-up. In the context of the considerations of the above paragraph, utilizing a non-trauma based approach for treatment could bring up the same results. Therefore, having an exposure that is not related to the past experiences might also have positive effect on the person suffering from PTSD, including those who have developed the disorder after experiencing a natural disaster.

5. Characteristics of PTSD resulting from natural disasters

In this context, returning to the therapy of natural disaster-related PTSD in the context of VR, the consideration of Exposure therapy as habituation of negative stimuli related to stress could be seen as one-sided approach. It might be necessary to consider also simulating positive experiences related in some meaningful way to the traumatic event so that the person suffering from trauma could be able to perceive a useful explanation and create a story for the events which in result could possibly help putting an end to the state of being locked in the past. Therefore, considering experience of both negative and (possibly later on in the course of the therapy) positive stimuli in an Exposure therapy plus narrative reconstruction and creation of meaning might connect to the hypothesis of transfer of experience and narrative life story which this dissertation supports.

6. How the Cybertherapy works – a philosophical perspective on the effects of virtual spaces on human self in trauma context

The effect of VR on the self (the notion of self-image including one's self-narrative as the stories one tells about himself or herself) and on human thinking, behavior, and mental health is the main research topic here. Considering the idea that trauma changes the perception of reality it is necessary to look at the perspectives in front of the usage of VR for treatment of disorders like PTSD since VR can affect human thinking and behavior in various ways through such means as creating immersive experience, convincing story, and compelling content. Cybertherapy or VR experience as a method of treatment can help the patient return to a healthy state. However, it is necessary to confirm whether VR does not present any danger for the patient, for example by creating ideas of illusory reality, especially if the patient's mental health condition is too fragile or disturbed. Here it is also necessary to answer the question whether the therapeutic practices in VR could confirm the hypothesis about transfer of experience from the virtual to the real world. Taking the narrative stance from philosophy could enable explaining the role of VR as one of the storytelling tools humans have, and as a form of an aid to the patient to realistically experience a different narrative; also to see the treatment process as restructuring of the story, learning new storytelling by seeing it, experiencing it immersively, memorizing it (achieved through the effect of repetition in exposure), and acting on it (achieved through the trial effect of the experience of new things in VR setting). Here I will employ concepts from Chalmers, 2003; Heim, 1993; Wexler & Roff-Wexler, 2013; Bauer & Bonanno, 2001, and others to support the above considerations.

6.1. Philosophical consideration of the way the virtual spaces affect human self in relation to trauma

What is the connection between the virtual spaces such as SNS, Second Life, VR, and a disorder such as PTSD? Let us begin with analysis how the virtual spaces differ and evolve and how they influence the creation of the self-narrative.

It seems that an SNS such as Facebook for example is just an extension of real life and people are representing their similar self there. However, as discussed in the surveys performed for this study, people tend to experiment with their self and to create an ideal self. It is necessary to look through the history of the relation between virtual space and real life to detect how these entities connect and relate and in what way this could be important for the treatment of PTSD in narrative context. It is without a doubt that these environments are different in character. Tracing the evolution of the notion of the virtual is a large topic and deserves a separate study. Here it is possible to say that starting with the notion of cyberspace that was created as a notion from fiction, gradually the virtual interaction with the real became much stronger and the real life began being copied and simulated in the virtual. However, the effects of the experience in the virtual spaces have the same importance for the real self and their strength increases with the increase in immersiveness. That is why an analysis of the effects of the virtual spaces, starting with less immersive and ending with the most immersive could show that they have the common characteristic to affect the human self in a faster and more influential manner than they seem to.

Why the virtual spaces are connected with the treatment of PTSD then? Because they have strong effect on the human self and they offer a safe environment to simulate the narrative of the self or in other words to visualize the mental condition of the patient. Of course, the virtual spaces seem to have separate logic - the notion of cyberspace is an abstract idea while the VR offers an image of real events. Combining them in the definition of virtual spaces might seem too broad approach; however, here it is aimed at proving that they have similar characteristics of being perceived as “virtual” while having strong “real” impact on the self. The virtual spaces are offering an “as if experience” that once finished is perceived by the person as really experienced event in real life, or in other words, the effects of that experience are transferred to the real life

and real self. Moreover, as discussed in the survey's analysis in Chapter 1, the virtual spaces such as SNS offer the opportunity to create a "virtual self" and design and maintain it in the way the "real self" desires. This virtual self has some discrepancies with the real self and these elements of their interaction bring about fruitful results for the changes in the real self, if managed well.

For example, a person who is running a yoga classes on YouTube starts to affect millions of people online who change their lifestyle to a healthier one. This image created online by the yoga instructor might not have real origin since he or she did not influence so many people in the start but through the online image he or she presents, he or she as a real self starts to affect real life and people in real life. This virtual image might be slightly different from his or her real self – e.g. he or she might not be that healthy in real life; however, the striving to show and become such healthy person leads him or her to this better lifestyle and in the same way affects many other people. This might seem a too simplified explanation, but it shows that some goal is achieved through the characteristics of the virtual space; namely, by affecting many people and building the desire to create a better self. Of course, in the similar way a spread of negative image might be achieved through SNS, such as cyberbullying or negative propaganda.

To summarize, this is the common feature of the virtual spaces – to be able to transfer easily from the online reality a message or a meaning that is not yet fully realized but when perceived by the real self it is gradually realized as changes and narratives in real life. The simulated experiences are transferred as new narrative experiences gained from the virtual to the real life.

To analyze how virtual environments are connected with treatment then, it is necessary to see how the principles of Cybertherapy (utilized in the context of Exposure therapy and narrative reconstruction) work in the philosophical context of narrative identity discussed here. It seems that looking into therapy with VR can provide two important findings: understanding how the mind perceives reality can provide clues about the effects of the experiences in virtual spaces on health; learning how to change one's perception and behavior in reality through changes of the narrative in VR helps patients become better adjusted and more effective in the real world.

In Section 1.1. of Chapter 1 it was discussed how the cyberspace is described by William Gibson, however it is important to say that he is not a philosophy author, even though he presents a rather metaphysical perspective on the virtual space. In order to

introduce a view which is contemporary and relevant to the philosophical discussion, I will first turn to David Chalmers and his recent analysis of VR.

To explain why VR is becoming a new topic of research interest, it is necessary to mention that in the recent years it became more and more commercialized and products like the VR headset Oculus Rift for example became available for developers as well as regular consumers. As a result, the perception of what the application of VR can be has changed too. When VR was still developing trend it was considered as rather sophisticated to utilize and available only for the experienced in technology and simulation (such as the users of “type b” virtual spaces or Second Life for example). VR is gradually becoming a part of entertainment and social media, as well as healthcare which is the focus of the discussion here. It is possible to argue that in a similar way there exists a certain shift from anonymity and “different virtual self” to “similar virtual self” presented publicly online. In other words, the gap between the “type a” virtual spaces and “type b” virtual spaces, which were described in Chapter 1, Section 1.2., is getting diminished and this gets aligned with the process of utilization of VR which becomes increasingly social and public. For example, VR is becoming an embodied part of the SNS now (e.g. the SNS provided by Facebook introduced 360 degree videos in the platform’s “News feed”). Of course such videos cannot give total immersiveness as the one provided by a VR headset, however they prepare the users for different type of content and experience. This could mean that actually VR (or the “type b” spaces mentioned in Chapter 1, Section 1.2.) becomes integrated part of the virtual spaces of the “type a” which are characterized with more basic software realization. Facebook’s CEO Mark Zuckerberg introduces such shift from images to videos and from videos to VR as a revolution inside the social media technology (Digital News Project, 2016).

Now, to return, let us answer in what way does Chalmers focus on VR. He raises questions about the nature of the virtual such as the following: is the simulation of VR an illusion of an external reality or is it offering non-illusory experiences of a VR (Chalmers, 2015)? Chalmers tends to support the idea that the experience in VR is non-illusory since we employ the same knowledge of simulated reality as the one we employ when thinking about mirrors as non-illusory. The tendency to accept VR as part of the everyday reality as seen in its popularization in SNS, should be explained by the fact that VR offers realistic experience of presence. However, this understanding should be analyzed critically in order to integrate the significance of VR as part of the possible human experiences. This research will also make an attempt to analyze some of the

issues occurring from this shift in connection with the sense of realism and presence obtained from VR.

So how does Chalmers present his idea of VR? He addresses the matter regarding the nature of VR by an analogy with the experiences we have with mirrors. When we look in a mirror, we usually do not experience the illusion that there is someone on the other side of the mirror, but we have a non-illusory experience of someone on this side of the mirror who observes the reflections we understand and experience as a result of the “mirror-ness” of the mirror itself. In the same way it can be said that VR present an image, which is unreal but which resembles the real one and evokes feelings and actions, similar to the ones we have towards real objects, as we understand we are projected into the virtual world and acknowledge we get immersed in it. With mirrors we can put earrings while looking to the reflections of our ears in the mirror (identifying with the reflection in the mirror) and sometimes we also analyze our condition subjectively (e.g. “I look tired today”) through that identification with the image we see (otherwise being not conscious of that internal state such as fatigue). We acknowledge the image we see in the mirror is of us, as real as we can be, and even being a reflection, it has realistic status since all changes (movements, application of new things on the image) affect ourselves as well. Perhaps in a similar way when we look at our image we can project ourselves to this virtual image and reflect the condition of our real self onto this image on the basis of what we see in case we identify with it (for example as it happens in a study of avatar customization used in weight reducing program which showed that effects on virtual avatars cause changes in self-perception and motivate users to act on healthy behaviors (Waddell et al., 2015)).

It is possible to add that in the VR we are aware we are being introduced to a simulation and still the boundary between the simulation and reality dissolves when we get immersed into the experience with the passage of time (e.g. if we experience a game with simulation of flying between city skyscrapers, soon our bodily reaction to heights will make our palms sweat). In the same way, such process of transfer of experiences is utilized in Cybertherapy where scary images evoke the reactions necessary for therapeutic results without being real dangers. That is why, I propose that Chalmers’ account could be valid for VR but to some extent. It seems that first people are being offered a non-illusory experiences such as the one of the mirror but when gradually immersed in VR, the illusion of an external reality becomes more real and overwrites the feeling of being immersed in a “virtual” setting. In this sense I believe Chalmers’ account is useful to see all sides of VR experiences which per se have many different

levels of immersiveness and sense of presence (e.g. a person with fear of heights might know he or she is immersed in a simulation while walking on a glass floor on the 100th floor but his or her bodily reaction is as if he or she is within an external reality with sufficient realism causing extreme bodily reactions such as shaking, sweat and so forth). This consideration deserves further careful research as the VR content itself is developing very fast.

If Chalmers sees VR as a mirror and Schechtman claims that people construct their reality as a narrative, it seems that these views differ and it is necessary to justify how they can support the idea that people create their narratives in the virtual worlds. Let us consider that the reality is reflected in the fact that one suffers from PTSD. This is as true as, analogically, the fact that if the person suffers from the disorder he or she might look depressed, unhealthy and so forth when he or she experiences his or her own image in the mirror. However, if the person tries to change the image in the mirror, as it happens during therapy, he or she might return to a healthier reality and narrative since this image is not constant. However, as it is often discussed, PTSD patients do not perceive reality objectively and are usually “locked in” the trauma. Therefore, therapy should work to help them first perceive themselves objectively as in a mirror and then realize that reality can be changed through changing one’s own narrative in a virtual setting. Therefore, it should be said that the VR blurs the boundary between reality and illusion since it is realistic simulation of reality that feels “unreal” or “virtual”, however, when experienced for longer period, it turns to be “as if” real and leads to full immersiveness resembling real life events. In connection with this proposal, this research supports the idea that there is a transfer from the virtual to the real that happens through prolonged and repeated experience in the virtual.

Chalmers idea of the virtual implies that it has mirror effect on us and I accept this view partially, namely because as the mirror reflects it gives feedback about our condition and even though it is a reflection of the existing world it provides some sense of increased realism because it shows things that we might be not aware of before standing in front of it. However, the virtual has more “depth” than the mirror, in the sense that it makes us engage more deeply with what is happening in its simulated world since it is not a direct and correct reflection of the existing world, but a new “reality” that appears to be quite realistic and immersive. In the same line of thoughts, the experience in VR stays only “there” and differs from the experiences in real reality (e.g. we might experience dying in VR and still be alive in real life). However, the influence of the experiences in the virtual are transferred on the real self in a process that does not

imply direct effect but rather delayed effect. That is why the therapy might have effects that appear and last with some lag after the exposure since it takes time to internalize the experienced narratives and to reform the self in the therapeutically desirable way. For example, experiencing dying in the VR might seem as being “just a game” but might evoke feeling of frustration if interpreted negatively (e.g. when own game character dies and game is over) or feelings of freedom if interpreted positively (e.g. one fearful side of my self died in this game). This interpretation would be supported by cognitive restructuring from CBT when put in therapeutic context.

Now, in this sense a detailed distinction between the types of virtual spaces is necessary because this kind of transfer happens more easily in simpler types of virtual spaces and might not have the same effect as the one that can be obtained through therapy in VR. Moreover, the fact that some virtual spaces are similar to the real ones, or in other words they copy the everyday reality like SNS for example, makes this effect quite different from the effect that VR has on a patient who tries to habituate stressful stimuli or restructure unhealthy narrative patterns. In this sense, the proposal of this research to view the virtual spaces as one overall type of “virtuality” has its weak points but might also serve as a starting point to differentiate between and define the types and the influences the virtual spaces have on human life and self. The aim of the proposal for unified term “virtual spaces” was to trace the start of the role of the virtual as a playground to explore the self and experiment with one’s life story – a playground that was not available in the “real space” with such effect and measure before the birth of the “cyberspace”. However, the horizon that the VR proposes, as compared to SNS, computer games or even augmented reality, is a “space” for a whole new world, designed and experienced by and for the self, with increasingly advanced features, details and possibilities. This research tries to see the positive utilization of VR as such new frontier.

Then, if we consider that VR exposure starts with experience similar to the Chalmers’ view and consider that VR has mirror-like effect of both observing our self-image and transferring our self onto the image (as well as vice versa, transferring perceived changes made onto the image as changes onto ourselves as in the weight loss simulations mentioned in the previously in this Section), then let us analyze how we can look at the main problem here – trauma treatment – in the context of another philosophical concept, namely the concept that reality is a narrative construct (Schechtman, 2011) and how this narrative recreation happens later in the VR exposure.

Schechtman explains that “[h]uman brains are narrative-generating machines and selves are the protagonists of the narratives they generate” (ibid., p.397). Then, as this research proposes, if we look upon trauma it can appear as a break in the narrative of the self and if that is true, then for successful therapy it is necessary to understand how to interpret, explain, accept, and intertwine that traumatic happening into the narrative of human life or how to use the narrator’s ability to form a new narrative to explain the traumatic happening as a meaningful part of the human life story. It seems this can happen through VR where we tend to easily play with the creation of new features of the virtual self, as discussed in Chapter 1, Section 1.2., since it seems we believe it is just a “simulation”, a mirror, a reflection or a copy of the real life but we get drawn to it and so start changing ourselves while immersed in it. It seems that exactly in the virtual space we can check with the self if we “feel OK” or something is wrong and need to be fixed, just like we behave with a mirror, for example when we do our hairstyle or check our facial expression. In the same way in the virtual environment it is possible to identify with a virtual self and confirm through exposure to certain stimuli what a stressed person’s reaction to these stimuli is and in what overall mental health condition he or she is. However, this is not enough; it is necessary to further dive into the experience and start acting upon a scenario that is different from the reality (and that is managed by a therapist in the case of treatment) so that we can obtain some further results from the experience in the virtual.

If I continue further with the explanation from Schechtman and add accounts from other philosophers in the debate about the narrative self, “[t]he narrative of a life can be one with multiple subplots, digressions, and deviations from the main narrative stream; it need not be linear in a simple-minded way” (Schechtman, 2012, p. 342). In this sense, the unity of human life (McIntyre, 1984) can be seen as broken in PTSD as it affects the narrative of a “self whose unity resides in the unity of a narrative which links birth to life to death as narrative beginning to middle to end” (ibid., p.205). This, however, in the context of therapy as discussed here, should not be seen as an irresolvable situation and what is necessary is to make another narrative, or a fiction that works (Dennett, 1992) in order to create meaning out of the traumatic event. As this might be perceived as a fiction from Dennett’s point of view, it can serve as cognitive restructuring narrative which, when internalized, would help the patient create a new self in a new story. What Dennett says about the fact that the self is an “abstractum” (ibid., p.103) and the author of the narrative should not be associated with the protagonist could actually be utilized in therapy. If his view is analyzed further, this means that even though selves are constructions for merely keeping track of the history

of the body they can still be considered as constructs and addressed in the therapy with good therapeutic results. For example, such stance towards one's life story could help the person suffering from PTSD in the process of stepping out of the trauma and in the attempt not to identify with his or her image (protagonist) of a broken self and re-create a new and a more meaningful story (as a narrator), or to keep track of his or her life story in a new paradigm of explanation.

Even if complete separation of the narrator from the protagonist is not possible, it is possible to utilize the mirror association and consider that the stepping out would mean to internalize the fact the person looking at his or her reflection is the author of the narrative and the origin of the reflection, and as a result from such realization to understand and accept that he or she can make changes to this image just like we prepare ourselves every morning for the coming day by washing, putting on makeup, etc. Understanding the capability of being author or narrator can be achieved through self-reflection such as the one done with the help of mirrors. To some extent such self-reflection can be achieved through exposure when identifying with a virtual self-representation (avatar for example) or through observing and analyzing one's own reactions to stimuli since traumatized people sometimes cannot realize the fact they are more sensitive than other people to certain stimuli. However, therapy should not stop here; it should add more cognitive restructuring work to help the person re-create their damaged by the trauma self.

In comparison to the view of Dennett which claims there are no selves (*ibid.*), it is possibly to consider another view that claims that "there are genuine human selves whose self-conception and mode of life constitute their selfhood" (Schechtman, 2012, p. 398). Whether there is self or not from a philosophical point of view might have influence on the effectiveness of the therapy for PTSD because the patient associations with trauma will be more or less flexible (e.g. to escape from thinking patterns such as "I am damaged", "I cannot get back to my previous self" if he or she realizes there is no "true" self, only an idea of a "self"). However, here I would like to look at the therapeutic process from the VR point of view and leave the problem of existence of self aside. Schechtman herself says that for the development of the narrative approach to personal identity "a great deal of work needs to be done... and [what she proposes] is more of a research program than a final account" (*ibid.*, p.343). I would like to avoid supporting one single account since this could restrict consideration for all the possibilities in front of the therapy which is the main focus of this study. Accepting that there is a self that a person creates and that this self is an actor in the narrative is one

point of view that could be taken into therapy; another one is to accept there is such self as an actor and that there is a person that stays behind that self as an author of the narrative and this person's "self" can be treated through the acts of creating the narrative as an author and/or through changing the protagonist that this author associates with.

If I try to speculate what happens in the treatment process and borrow the idea for the creation of a new story of the self, it seems plausible that retelling and relearning a new story in VR is an effective and fast way towards recovery from disorders such as PTSD in the sense that it adds to our imaginative ability for storytelling, while offering flexibility of the medium for altering the storyline according to the needs of the patient with the advance of the treatment. I would like to hypothesize on the basis of Schechtman's concept for the narrative of the self we can see that we create "selves" and their stories in the virtual spaces as we "weave different subplots into a single narrative" (Schechtman, 2012, p.343). That is why it is plausible to try to treat these selves or these characters in such a story-telling and story-making environment as VR. Looking at the story as something linear and happening in the VR helps us to detach from the negative standpoint in reality acquired after trauma and to see this standpoint as a simulation or as a story that we can (re)view. Seeing this standpoint as a story could possibly help us to start feeling in control of the situation since it resembles the real situation in real life, but also offers direction and choice for us when presented in the virtual.

Now, if the idea of seeing one's life story as an editable narrative is to be employed in the explanation of therapy's workings and its success, it is necessary to explain further the narrative concept discussed here. Schechtman proposes a view of the self as narrative in form which she names "The Narrative Self-constitution view" (NSCV) (Schechtman, 1996). This NSCV is placed between the two positions discussed in this Section, namely the hermeneutics one and the one of Daniel Dennett. According to Schechtman's idea, "we constitute ourselves as selves by understanding our lives as narrative in form and living accordingly"; also "we experience and interpret our present experiences not as isolated moments but as part of an ongoing story" (Schechtman, 2011, p.398). This means that having narrative and being its author help us understand and constitute ourselves in the process we experience as "life". As discussed previously, this authorship standpoint is mainly important for the treatment of personal disorders.

In addition, it is necessary to say that there exists a certain background in any narrative, especially when considering narrative in the context of trauma. For example, Schechtman says that "[t]he experience of winning the lottery will, for instance, be a

different experience for someone immensely wealthy, someone who has lived a life of crushing poverty, and someone who has struggled unsuccessfully with a gambling addiction” (Schechtman, 2011, p.398). Considering this concept of the narrative’s background, it is possible to think that a girl victim of kidnapping (for example as mentioned in Chapter 2, Section 2.3.) will suffer greater trauma from the kidnapping if her life was luxurious and she was a spoiled kid rather than if she had an ordinary life mixed with trying experiences (which generally could make people more resilient) as the boy mentioned in the same place. Narrative’s background would be very important consideration when discussing the types of PTSD and their causes and when designing treatment programs.

Background is important for one more reason this research would like to stress on – the point of view one has towards his or her narrative story is influenced by many factors, some of which, if continuously traumatic, will make the person susceptible to constant traumatic iterations. For example, a drug addict became such because of certain family issues and the fact of being a drug addict makes him or her act in a deviant and cause different traumatic experiences to himself or herself, or to someone else related to him or to her, and so on. To show the connection between traumatic experiences, a research on women who are drug users shows the increased likelihood of history of violent trauma preceding the addictive disorder (Fullilove et al., 1993). Different research even claims that victims of trauma tend to compulsively repeat the trauma during their lifetime, including drug abuse after some traumatic events such as abuse in childhood (Van der Kolk, 1989). The narrative background put in trauma context could point to the fact that trauma affects people on a much larger scale than initially imagined; it could show trauma is cumulative and can be transferred from one person to another in the sense they share some mutual stories about themselves and their lives are intertwined.

To continue with Schechtman’s view, “[h]aving a narrative, and so being a self, on this view is primarily a matter of keeping track of this background and responding accordingly. The NSCV is like the hermeneutical view, then, in that it sees the self as real and constituted by a narrative” (Schechtman, 2011, p.398). Then, the Schechtman’s concept can accept a claim that the narrative explanations are not necessarily valid for one’s whole life. We employ storytelling logic to “describe, explain, and choose [our] own behavior” (ibid.) in certain cases, especially when necessary, as in the cases when facing difficult situations. It seems the same process can happen in VR, where we can play the role of creators of stories with our own design when desired. This means that

when new explanations are necessary we can re-write the story especially if this story is experienced as a game. That is why an explanation that one's story (image of life), in a sense, has ended when some traumatic event happened (e.g. a close relative passed away or the person was diagnosed with terminal disease) and this person had to retell it for many repeated times to make it fit in his or her own life story, matches what could be considered essence of the therapy. In other words, the traumatic happening can make sense finally when explained in a new narrative framework that "makes sense" for the person who experienced the trauma. As Schechtman says later, "[a]ccording to NSCV, the limits of a person are determined by the limits of a narrative, and the integrity of a single person consists in the unity of a narrative" (Schechtman, 2012, p. 336). When one's life story expands in a different direction, even if this direction might seem not desirable at first sight, this could offer new insights on the self and new opportunities to grow as a person. Still, this research wants to point that a traumatized person might not be able to perceive the above possibilities as a healthy narrative creator and that is why experiences in the virtual should remind the person of his or her narrative capability and help him recover through obtaining control over his or her life story.

How the above considerations could be applied in therapy design? Let us discuss this in the next Section.

6.2. The effects of the virtual spaces on human self and their application in therapy

It seems that therapy in VR can provide two types of important implications: understanding how the mind perceives reality could provide clues about the effects of the experiences in virtual spaces on health; learning how to change one's perception and behavior in reality through changes of the narrative in VR (through transfer of experience) could help patients become better adjusted and more effective in the real world.

Let us consider a separate point of view, namely a psychological study on trauma and resilience (Bauer & Bonanno, 2001) which claims that self-efficacy influences strongly mental health. Previously, (Chapter 2., Section 2.3.) I presented similar discussion on self-efficacy by Benight & Bandura (2004). However, Bauer & Bonanno's findings add more important points in the context of narrative we discuss here. The researchers' theory about self-efficacy shows that there exists a difference

between doing something and being able to do it. It is possible to argue that doing something includes being able to that thing in the first place; however, Bauer & Bonanno emphasize the single importance of self-evaluation of abilities (being able to do something) as crucial since overt evaluation of one's abilities leads to self-efficacy which on the other hand can be connected with higher chance to overcome adversities in life and build resilience. Self-efficacy is found to neutralize the negative effects of evaluation of behavior during trying times. Then, self-efficacy can have strong influence on the construction of identity and the creation of personal meaning which can be connected with the concept of self-narrative discussed here.

To describe further, the research of Bauer & Bonanno on the narratives created by people who have lost relatives showed that what people say they *can do* and what they say they *actually do* puts a great difference in their coping abilities. Narrative descriptions of self-efficacy seemed to help reducing the typically prolonged suffering after trauma. This concept of self-efficacy affected a subtler factor resulting from traumatic experiences, namely the factor showing that negative self-talk and devaluation of self-worth happens not only on the level of behavioral characteristics, but also on the level of the characteristics of the self (e.g. "I am such a loser", "Why am I always so weak", and so on). On the contrary, a narrative constructed around the idea of self-efficacy redirects the negativity from the self to the outside factors like events, actors, etc. Since this is a psychological view which accepts the existence of self, there are some restraints to fully employ it in the context of the discussions about the existence of self in the previous Section 6.1.; however, it shows something important about the unity of the person which probably has greater effect for the proposed idea of re-creation of the self-narrative through therapy in the virtual space.

In what way these findings are important? Bauer & Bonanno mention that accepting the idea that one "can do" something has overall beneficial effect on health since it directly relates to the constructs of "*control, mastery, abilities, and skills*" (ibid., p. 425). Now, how does this claim relate to the processes happening in the VR treatment? A possible explanation about how this process happens could be that in the beginning of the utilization of the virtual spaces they provide some security (as characteristic of being virtual), while later, with sufficient practice, they also provide the experience of some skill acquired through the simulated activities. Although this experience seems simulated, when necessary to be replicated as an action in real environment it might appear as already acquired (behavior, skill).

For example, if a victim of an assault attacked during nighttime on the street is experiencing a scary situation in the VR he or she can be afraid and can re-experience some traumatic stimuli but can think, “I can do this, I can go on walking through that dark street”, mainly because it is a part of his or her knowledge that this is VR and there is no “real” street. Continuing to experience these thoughts or narratives, the person would start to believe the simulated experience to be happening as own (part of her) experience and become better in coping with the traumatic feelings arising as bodily sensations (e.g. increased heartbeat, etc.). That is how with repetition in time (i.e. walking on a dark street in the virtual space) and increase of the level of realism (i.e. having sounds, people passing by, etc.), the person will start believing this simulated experience is a part of his or her own experiences and believing this will help her abilities to utilize this experience in real environments as well. Hopefully, this can result in a healthier behavior – not panicking in similar situations in real life, while remaining logical and self-protecting (i.e. not becoming overly self-confident, which supposedly might happen when too big expectations for one’s abilities are created through experiences in the VR; for example, such effects might occur as a result of overuse of gaming in the virtual space where gamers think they are as strong or skillful as their virtual character).

It seems that the handling of the problems which arise through traumatic experience can be explained through the narrative prism as a form of self-(re)creation. This self-(re)creation can be done in the VR as a storytelling tool which is able to aid the simulation of realistic experiences for the purpose of changing one’s narrative. As this research tries to point out, the process of transferring what is experienced and learned in the virtual to the reality as own ability, helps to realize the purpose of the treatment and makes the therapy in VR an important tool for helping people who have lost the meaning in their life stories, such as the people who suffer from PTSD. However, if this view implies that it is possible for someone to create any kind of life story and become whatever he or she wants is not plausible because the “narrative must be an intelligible story of a person’s life, that allows the narrator to achieve the structure of conscious experience and agential capacities that allow her to interact in the relevant way with other persons” (Schechtman, 2012, p. 336).

Moreover, the autobiographical memory and the social reality help in constructing the self-narrative. By restructuring the life story and learning new ways of storytelling by seeing, memorizing (through repetition), acting “as if” (in the VR setting), one could possibly obtain the skill to recreate his or her own life story.

Schechtman introduces one interesting view about narrating one's story, namely that by "pronouncements about what will happen next give him *reasons* to follow the course he has announced" (Schechtman, 2011, p.400). It is possible to imagine that the break in the narrative one experiences as trauma is evaluated as problematic because it is a digression from the logical expectations (and narrative explanations) of what should naturally happen next.

For example, when the process of going every day to school is disrupted by a big earthquake and tsunami and this process (going to school) stops for a certain period or the environment changes drastically (the school or even the whole village is covered in debris) the problem comes from the fact that this was not part of any possible story in front of the pupil going to school. On the other hand, if narrative preparedness such as "We live in an earthquake-prone region; any given day we may experience devastating earthquake" is used, the traumatic experience after a real event might be less damaging. Narrative is more or less created with narrating; a person cannot edit his or her negative and unhealthy narrations in a daily life routine. That is why, as this research proposes, an experience in VR where different narrations are exercised routinely could bring about healthier narrations in everyday life as well.

Even though people tend to accept possibilities for sudden disastrous event they cannot hold that mental preparation on daily basis. That is why when what is believed to be the natural course of life gets broken by unforeseen happenings we get traumatized (or react in unexpected ways as in the case of vulnerable soldiers) and fail in the attempt to continue the process of healthy creation of personal story we have had until that moment. It seems that failing to explain the happening as a story can be perceived as the moment of the onset of PTSD. However, if such pronouncements about the meaning of the traumatic events are realized in VR we can start realizing and controlling our storytelling ability again.

That is why by utilizing CBT which achieves the above by changing wrong beliefs about meaning of events (e.g. "Something bad is going to happen" to "I am safe here and now" or "He left me; nobody likes me" to "I am alone, but there are so many chances to meet new people") would aid the therapy in VR in the process of restructuring or replacing a narrative. CBT consists of instructions how to change unhealthy thinking patterns by detecting how the person during exposure reacts and explains the events happening there. Then, the therapist must help this process by correcting these patterns and supporting healthy behaviors during or after the therapeutic session.

In this sense, the process of telling one's story includes choices of the free will – to rewrite the story and direct it towards what one needs, and in the case of trauma – the will to continue creating one's own life after that trauma. Perceiving treatment as a form of gaining lost control over life's continuity is what could support the people suffering from PTSD. This is, so to say, a choice to support their unified self with “basic unified narrative that sits as an umbrella over a variety of different sub-narratives” (Schechtman, 2012, p. 343). Seeing trauma as one non-serving narrative and trying to create a better overall narrative to support their overall life story could be what treatment aims at. The people who suffer from trauma could understand that their traumatized self is just a character in one story which they can retell or explain differently. In that way they can create a self as expected in the desired results from the treatment; a self which has control over his or her life story.

Now, how to gain control over one's narrative in the virtual space and use that control in real life as well?

6.3. The transfer of experience from the virtual spaces and its effect on narrative

In order to understand in detail how recovery in therapy works, it is necessary to explain the connection between the considerations about the virtual spaces and the transfer of experience in the context of storytelling in VR, as part of the hypothesis of this dissertation.

The main points which were clarified so far and which this study wants to propose in support of the hypothesis about the self and its narrative re-creation in the virtual space are as follows:

1. *Virtual space is a medium to try out one's own self.* Researchers of the early effects of the virtual spaces such as Sherry Turkle have pointed out this feature of the virtual environments. The idea of trying out new possibilities (Turkle, 2011) and constructing of self-narrative (Schechtman, 2012) in the virtual space can be supported by the findings of the surveys performed for the study (Georgieva, 2011a; Georgieva, 2016). This study claims that people can recreate their self-images with the help of the experiences in the virtual space.
2. *Experience in the virtual space is safe, immersing, and realistic, hence having a strong effect on people's self.* For example, experiences like running

away from a scary enemy can be terrifying but still experienced as relatively safe; at the same time, it can be perceived as very immersive. Schechtman supports the idea that for the users of the virtual spaces these spaces “are involving experiences and actions as real as any other” (Schechtman, 2012, p.332). It seems that some actions can be easily realized in virtual environments since VR is experienced as safe and flexible and thanks to this, the VR experience creates special feeling of control and possibilities in front of the immersed self.

3. *People tend to create “virtual selves” in the virtual space, which are different from or similar to their real self.* This point is a result of the development of the virtual spaces and the acquired ability to try new possibilities in front of the self’s narrative ability through the experiences in the virtual spaces. In this sense, it is possible to claim the following: trying to build a different virtual self is a form of a game (as in soldier training), while building similar to the real self is a form of re-creation (as in treatment of natural-disaster trauma); both of these cases could be driven by the desire to build a better version of one’s self (Georgieva, 2011a; Georgieva, 2011b; Georgieva, 2016; Georgieva, 2017).

4. *With the advance of the development of the virtual spaces the similar type of virtual self is generally more common as a form of a counterpart to the self to build up on new features, abilities, skills.* It seems the online persona creates its online social representation to serve the purpose of self-introduction in the virtual world (Kramer et al., 2014). However, this online persona or virtual self is also a “canvas” for the changes made on it which affect the real persona or virtual self and its image in the real world (Turkle, 2005). The choice of creating more or less different or more or less similar virtual self can be utilized for the purpose of helping people who suffer from various traumas in the VR therapy.

5. *People can create their ideal image through the virtual self and accordingly re-create it in real life.* As observed in the surveys’ results (Georgieva, 2011a; Georgieva, 2011b; Georgieva, 2016; Georgieva, 2017), as well as in other studies (Turkle, 1994; Kosinski et al., 2013), people tend to create idealized images of themselves online. However, these are their desired images, or desired outcomes of some personal growth, and it seems people tend to try to diminish the gap between their real current image and their ideal image created online (which image itself is more like a future self to strive to become).

It is possible to see connection between these claims and the theory about the self-narrative that Schechtman presents (Schechtman, 2011; Schechtman, 2012). However, what this research brings about as new consideration is that trauma creates a great challenge for the narrative self as being a break in the narrative. That is why a guidance how to recreate the self and narrative re-creation in the VR is essential for treating people who suffer from such a break in their narrative unity.

6. *Experience and learned behaviors in the virtual are transferred to the real.* This is one of the main claims in the hypothesis this research makes, namely that what happens in the virtual, even though being simulated and as if “not real”, has strong impact on the self-perception, the beliefs, and the behaviors in “real life”. In general, “experiences and events in SL¹ can have a profound impact on the overall character of the RL² narrative” (Schechtman, 2012, p. 339). More concretely, certain actions, especially ones of learning (e.g. Loftin et al., 2003; Mitchell et al., 2007) when performed in a virtual setting can reflect situations and events from the everyday reality and thus have imminent influence on the way people act in real life in the future. How this effect happens, though, is more important, since there is certain delay in the transfer and the obtaining of the experienced meaning from the virtual to the real.

7. *Therapy in the virtual space works based on the above points by transferring learned positive behaviors, healthy self-images, and restructured narratives to the real person.* If the proposed ideas work the way described so far (1-7) then therapy can utilize them and restructure the self-narrative of a person to help him or her become a better self and create a better narrative adjusted to his or her experiences. This transfer is a gradual process which requires careful consideration of all the concepts discussed above and flexible design that adjusts to the therapeutic goal and timeline.

To summarize, this research investigates how the notion of the “virtual” changes with the technological advance and what different application it meets in real life while becoming part of the options for PTSD treatment. It is necessary to ask whether such considerations as the described above (1-7) can be gained from VR Exposure therapy

¹ Second Life.

² Real Life.

and generalized as effects from treatment in real life. Meta-analysis of studies applying behavioral assessments show that PTSD patients experience changes in brain, hence in their perception of reality (Suvak & Barrett, 2011). If a healthy person is able to control his or her narrative creation, for a person suffering from a severe trauma things appear as if they can never be changed and it might be quite difficult to try changing their narrative through therapy. It is possible to expect that in such case treatment techniques such as CBT will enable and add to the Cybertherapy effects discussed above. However, it is necessary to acquire results from actual clinical work that considers the hypothesis of narrative restructuring in VR in order to be able to ultimately confirm this hypothesis.

A further research should look upon the way the narrative from the virtual is transferred as a real life narrative and the way this transfer is effective as a treatment result. Studying the mechanisms behind obtaining experiences in the virtual should give more insights about how narrative recreation therapy works in VR as this study proposes. However, a detailed analysis of each type of experience (e.g. of creating similar self in a similar narrative or a different self in a different narrative) deserves a separate study with focus on recent treatment results since the field of utilization of VR in therapy is developing constantly and with a very fast pace.

The proposal for the term “transfer of experience” might be observed from a critical point of view as a weak approach to explain what happens between the virtual and the real self. It seems that the connection between these entities is stronger or closer than the one that might be expected when we use the term “transfer” since it applies some distance and time lag. I would like to defend the idea that there is a distance and time lag, namely that the virtual self quite often is idealized one as discussed previously here and in Chapter 1, Section 1.3., therefore it might take some processing time to affect the real self when discussing an overall narrative re-creation in the virtual. Of course direct effects of virtual spaces such as SNS might be quite immediate (e.g. seeing a disturbing news and feeling sad). The notion about “transfer of experience” implies one more sophisticated and prolonged narrative created in the virtual that might take some time to be absorbed by the real self. For example, the creation and maintaining of a SNS profile will take time to build the overall image of this virtual self, more or less similar to the real self. In such case the “transfer” takes time and could happen multiple times between the virtual and the real self. CBT utilizing VR would have much more delayed results since emotional processing and habituation would have to “arrive” in the real self as well, especially when real events are experienced (e.g. events that might serve as trigger for remembering trauma). It will be necessary to adjust what has been

learned in the virtual to the real world experiences as real world behaviors and narratives of the real self.

Now, it sounds plausible to discuss what “self” means in this sense. In a continuation of the discussion in Section 6.1., it is possible to say that there is a “self” that creates its narrative, or in other words, there is an author, a conscious human being that constitutes itself as a “self” through the narrative ability. This “self” identifies with a character that is the same character or hero as the one of a story we read or watch. This means the “self” can change and develop through the course of the story but it stays the same in the sense it is being one self designating one real entity – one person. Now, since this “self” is being created in the story, this means that there is a creator, an entity that is positioned higher than the self, or the author of the story. Of course, this is the person himself or herself as a biological entity that possesses nervous system, experiences, free will and so forth. Dividing that person from the “self” he or she creates is critical in the case of therapy since traumatized people identify strongly with the image they have created or experienced about themselves after trauma and cannot break the negative patterns this image forces onto them. CBT tries to affect these patterns and reach to the person who is the author of his story – the narrative that constitutes the “self” he or she identifies with. Therefore, in a sense, the character “self” is similar to the “virtual self” in the way that the person, the author of the story directs and forms its image in the narrative course. Consequently, the person or the author of the narrative is the “real self” that accepts the transferred from the “virtual self” effects of obtained images, experiences, narratives during exposure. However, arguing whether the author or the person possesses one true “self” should not be a subject of this study.

Let us see how it is possible to justify these considerations in the context of treatment processes in the next Section.

6.4. Possible processes happening during treatment in VR

Let us look closer at the reasons why Cybertherapy or therapy utilizing VR is preferred as a treatment technique and what kind of processes happen during treatment.

The experience in the VR can be transferred to the one in real reality by acquiring given skill through repetition and while in a special design setting. The effectiveness of those environments with special design can be sought in their specifics – namely speed, safety, flexibility, adaptability, proximity, and the like. VR presents the

possibility of controlling the “quality, intensity, duration and frequency of exposure” (Morina et al, 2015, p.18). The presented study focuses on disorders different from PTSD, namely phobias; however, it offers an extensive description of the characteristics of VR when utilized for treatment and these do not differ when utilized for other disorders. Studies that discuss PTSD in VR exposure context such as those of Krijn et al. (2004) and Powers & Emmelkamp (2008) show that experience in VR combined with cognitive-behavioral restructuring is an alternative to other exposure techniques and focus on the importance of presence for achieving faster treatment results. Powers & Emmelkamp emphasize that VR exposure offers gradual design and repetition, while being cost effective and applicable to different type of patients, including too anxious ones who cannot undergo in vivo exposure.

However, these merits pertain to the characteristics of the VR and the research on the utilization of VR should also consider carefully that depending on the reality perception of each patient, the process of treatment (and the capability for life story re-creation) will differ. Here it is necessary to speculate why still Cybertherapy should be used in different cases of patient trauma. For example, one consideration is that the VR usage in entertainment might be a clue to its utilization in healthcare since the perception about the virtual as a form of a game allows one to feel free to express and create a story different from the reality he or she is experiencing currently as “real world”. In addition, the memory of the experiences he or she has in virtual spaces (for example as a user who was creating a “better self”), as well as the perception that any form of story created for entertainment has somewhat happy ending or at least meaningful closure (as it is in books, movies and the like), creates the precondition for striving to improve his or her own story. In a sense, VR creates an attitude for reliving one’s life as a form of a personalized movie, since a movie’s story more or less gives sense of completeness and significance as people have learned through the history of cinematography for example. Of course, VR does not present a whole movie’s story but borrows the moviemaking features to help the patients feel as narrators or directors of their own life story or movie plot. Perceiving one’s life as such creates necessary distance from one’s life, as well as feeling of creative meaning which can serve well in the process of trauma therapy.

If the PTSD patients perceive themselves as owners of their story during exposure in VR, they should observe their own trauma objectively to restructure it. Let us discuss how this could happen.

6.5. **Meaning of trauma in narrative context**

On the basis of the considerations discussed so far it is possible to say that trauma changes the way reality is perceived: patients stop living in the present and get locked in the time of the stressful moment. The VR helps to switch back to the reality of the present day by internalizing meaning and processing the stress through cognitive restructuring that resembles creation of narrative.

To explain the reasoning behind these claims, let us return to the hermeneutical approach towards the selves that sees people as self-interpreting beings and analyze how different researchers see narrative through this approach. According to McIntyre, the narrative serves for ordering of the different intersecting stories and these stories are aimed at some end action (McIntyre, 1984). Such teleological nature of the narrative construction helps people process the various events in their lives. Another point of views such as Taylor's (1989) supports the claim that these stories are some kind of quests or frameworks, in which the self and the good are intertwined, or as Taylor says, "[t]he quest is thus always a quest for sense" (ibid., p.18). Even though presenting different functions of the narrative, these researchers see it as a way of creating explanation, closure and meaning. In other words, human's narrative function always presents the tendency to find "silver lining" in trying life events. A slightly different approach – the one of Ricoeur (1992) puts the discontinuities and differences in the narratives in contrast to the "sameness" (ibid., p. 3) of the character as not related to the identity of the self. It is possible to connect these discontinuities or differences to the way the traumatic events are experienced. In this sense, the break of the narrative in trauma can be used to create new meaning with the aid of therapeutic work that adds explanation to the reason for this break and explains this reason to the author of the narrative. In this way, the person might not see himself or herself as inevitably changed and dissociated with what he or she perceived his or her "self" or "identity" was but could find meaning into owning a different story about his or her life.

Finally, as discussed in Section 6.1., for Dennett the self is the center of the narrative gravity, but the narrator is not equal to the protagonists or characters in the narrative (Dennett, 1992). In this sense, this Dennett's view can offer more opportunities to differentiate oneself from one's traumatized self-image if the treatment design adopts such position as an explanatory model. The necessity to see how hermeneutical approach sees self-narrative is important in the context of therapy of disorder like PTSD since the way the patients interpret the traumatic event might differ greatly depending on what type of PTSD they suffer from, as continuously supported in

this study. The interpretation of the events might depend on people's own vulnerability, the fact whether they were active or passive during trauma, whether there was someone responsible for the trauma or not, and so forth.

If patients can see their traumatized self as a character in a story they have to dismiss, this could possibly help their recovery. It is still possible to ask whether in the case of PTSD treatment through narrative creation one should experience the story of a "different self" or a "similar self" as described in the hypothesis about the similar and different self in the virtual space. If the self created in the narrative experience is similar to the real self this might have different effect compared to a self which is different from the real self. A similar self would provide useful information about the traumatized self and its story. If the self is different it can provide a new perspective for how one can change and recover. It seems that in PTSD a similar self should be addressed to detect which areas of internal conflict are causing the trauma. In PTSD that needs to provide new experiences and perspectives the self created in the exposure can be different in a way that matches the therapeutic necessity. It seems that Schechtman's account of the experiences "of our doubles and alter-egos" (Schechtman, 2012, p.343) created in the virtual also considers such possibility to see the selves created in the virtual spaces as similar or different. However, Schechtman does not discuss what can be the purpose for creating a similar or different selves and such consideration would have great significance if it is put in the context of the choice of the treatment design when exposing PTSD patients to virtual experiences.

It is possible to question whether creating a different or similar virtual self during exposure in VR will create fiction or non-fiction narrative in the context of narrative creation. However, it is necessary to realize that all treatment that utilizes the restructuring of the story which the patient shares is more or less a fiction narrative as it is the interpretation of the way the patient sees the traumatic event and adds meaning to it; i.e. it is the subjective story with non-fictional and fictional elements (e.g. a thought like "I think he looked at me with anger" might be result of the psychological condition of the patient). That is why during cognitive restructuring that happens during therapy the therapist should create a new fictional narrative that brings a more rational (or less negative) and healthy narrative explanation of the traumatic events and the ways the patient feels about them. These narratives are based on reality but represent a "story" that is rather fiction-like than non-fiction-like. This process will help fighting thought patterns that are generally negative ones without "deceiving" the patient or "distorting" the realistic perception of the events.

To continue the narrative description of the life story it is necessary to say that intentions are considered to have causal and temporal order which order forms a narrative (Schechtman, 2011) and helps to identify actions according to it. However, it seems that in PTSD something different happens. In order to be intelligible an action must be directed towards some end (aim). Trauma, though, often is described as debilitating and utterly unintelligible. People who have experienced serious traumatic events quite often ask themselves what was the reason for these events to happen and perceive these events as completely meaningless and out of the natural order of their life (i.e. their story). On the other hand, a new narrative can have evaluative, normative dimension to explain things since to understand actions (McIntyre, 1984; Taylor, 1989) and to make sense of human agency (Ricoeur, 1992) our lives should be narrative in nature. That is why therapy should create a novel narrative in VR to explain and give meaning to the life stories of patients with traumatic experiences such as the PTSD patients.

As discussed in Section 6.1., according to Dennett's view (1992), the self being center of narrative gravity is a form of a useful fiction. The importance of this self is in the fact that selves are characters in the narrative that people create. Hence, there is a generator of narrative and role-player in the narrative. We cannot make distinction between these sometimes and that might explain why people who are more resilient can step out of traumatic event and see ways to cope with trauma, while others completely identify with the traumatized self and cannot escape or see another option in reality. It is possible to imagine that, again, the aid of the virtual spaces and their effect of creating a story might be utilized, especially in the latter cases of the too traumatized people. In such cases people cannot make distinction between the character they feel is being locked in the trauma and the real self who is the author. For such cases therapy has to separate the author of the story from the traumatic happening; possibly to utilize a "different" virtual self, and gradually create a new role to identify with and a new meaning of the life story; or to create an updated "similar" self, with new features in the self-narrative of the person.

As mentioned in Section 6.1., Schechtman defends a view of the self as narrative in form according to which people constitute themselves as selves by understanding their lives as narrative in form and living accordingly to that form. That is why people experience and interpret their present experiences not as isolated moments, but as part of an ongoing story. This background narrative dictates their ability to respond to different events, including trauma. That is why a consideration of the selfhood and the narrative

capacity one can possess is an important step in the analysis undertaken here. It seems thinking in narrative terms and offering narrative explanations would help in coping with the disruptions in one's self story since trauma is not a whole life story, but breach in the story's logic which requires explanation and certain (for example behavioral) change in life. It is possible to employ these views and to see traumatic disorders as several not intersecting narratives, whose protagonists don't connect with the narrator. Considering the fact that the narrative is used to keep track of the history of the body (Dennett, 1992), but is not a real construct could help seeing these narratives as possible subject of correction. Then, it is possible to suppose that in the context of treatment of trauma in VR, in order to connect with the protagonist one would like to associate with, or the story that matches their overall narrative, some adjustments to the self-story should be made and VR could offer a good medium for that overall reconnection with the narrator.

It is interesting to mention that according to Schechtman narrative capacity is important evolutionary and developmental milestone (Schechtman, 2011) and, as it will be discussed later, trauma might have similar purpose too. The narrative capacity helps in developing the sense of being extended over time and is used to separate us from the others; moreover, it is part of the autobiographical memory and takes part in forming the most complicated cognitive capacities one can have. In Schechtman view, "when a person is faced with what almost anyone would see as clear evidence of an anomaly in her narrative she either correct it or explain why it is not really anomalous" (Schechtman, 2012, p. 336). It is natural for a healthy person to seek for explanations and to be able and motivated to do so. However, this study supports the view that in cases of severe PTSD when the person is unable to find ways to do such sense-making search, consequently a reconstruction of the narrative and an offering of explanation (or choices for explanation through therapeutic consideration) could improve the cognitive imbalance and give a new start for creating self-narrative by the PTSD patients. In this sense, the narrative account serves as a compass for the idea of treatment in VR; however, the design of the treatment should consider the PTSD specifics from a philosophical point of view to match the explanations of the events in the story with the specifics of the author's narrative – i.e. the PTSD patient's life story.

For the above reason, let us consider more the idea of explanation and meaning in the context of trauma in the next Section.

6.6. Ways to address the reasons for the PTSD onset in treatment design

Cybertherapy for war-related PTSD and for PTSD resulting from natural disasters should address the reasons for the PTSD onset in these two types of traumatic disorder. It seems necessary to analyze the role of VR as a new tool to treat mental disorders and to observe its philosophical correlations with the narrative self-creation in the context of its usage in therapy for PTSD and its different types presented here by the war-related and natural disaster-related types. These two types of PTSD show very different characteristics and so they will possibly require the re-creation of the similar or the different virtual self (as presented in Chapter 1, Section 1.2.) in the VR according to the specific needs of the patients.

Through effective exposure in VR the narrative self reconstructs its story. To support this claim it is necessary to see how VR is effective for the narrative and what can be the reason for such effectiveness. If VR offers habituation to stimuli that are similar to the traumatic experience, then why should it be necessary to try developing different story in the VR that brings about a possible “happy end” to the overall narrative of the patient? One possible answer is that including such option would depend on the purpose of the treatment, the level of the therapy’s progress and the type of the disorder (i.e. in the case of this research - natural disaster- or war-related PTSD). For example, a new patient who is not used to VR and who has experienced a natural disaster would better begin his or her exposure treatment aimed at habituation that would gradually reduce the tension related to fears for another unexpected event. After achieving this, it might be possible to add some different meaning to the happening by adding “different” elements so that the person to see the story from a different angle (e.g. to say goodbye to people he or she could not say goodbye when the disaster took their life).

Then, for example, a soldier who is well experienced in VR exposure but has difficulty to accept his own actions in VR might have to retell his story in a different way to see himself as a person who is stronger mentally and to transfer this image to his own narrative. In addition, as discussed in Chapter 4, soldiers need to “come in terms with” the essence of their job (e.g. to realize and accept there is a just cause for their actions) so they must see a different angle of the story that is not a fiction but different interpretation or explanation. Such explanation would not be a deception but justification of the killing in war. Still, strong moral conflict with killing that might make them incapable of “coming in terms with” the essence of war would mean that in

the first place they were not suitable for soldiers. In this sense, simulations in VR can be used to detect certain moral stance in soldiers and hence help determine their predisposition to PTSD.

However, it is important also to realize that a different treatment design approach requires a different treatment design – the soldier PTSD might require creating a similar virtual self that experiences the exact same events on the war field, but acts with more courage and less vulnerability. On the other hand, a person affected by natural disaster and suffering from PTSD might require rebuilding his or her life story as a different one from the one he or she had so far due to the fact that the current living environment has changed due to the disaster in contrast with the soldier who usually is able to return to his or her home country and live life in his or her pre-war peaceful surroundings. Of course these are only hypothetical suggestions for the types of selves these people need to create in treatment and suggestions for the opposite case might arise (e.g. soldiers “play” the role of strong men so they have to form different selves in exposure, while “ordinary” people affected by disaster need to “return” to their usual, “similar” self). Regardless of what type of self should be created, these suggestions might be useful when considering the design of the treatment.

In any case, it seems that treatment of trauma should start with changes of the viewpoint towards a traumatic event and with building of new scenario about what has happened and what meaning it has for the person facing it. Treatment should consider these diverse factors in the PTSD onset, and address its multiplicity in a personalized way. Then, again, this might mean that from a therapeutic point of view it is necessary to consider the factors for the onset to start proper treatment and building knowledge of the complex story one has created through his or her lifetime could be seen as a starting point. Considering the existence of certain point of view people have towards life can help in the process of understanding and treating PTSD. One starting point is to learn how to see life as not threatening and to stop expecting the worse; to stop foreseeing danger in every next moment and to learn labeling the current mental states correctly or in other words, to live in the present. Labeling of the emotions the traumatized person perceives can diminish their strength and lead to more detached attitude and shifted perspective. This is the way to bring about different emotions such as acceptance, desire to change and live in the present.

Now, a consideration of one question should be done in this course of analysis of the treatment design: To what extent is trauma necessary to treat? A discussion about trauma and treatment should put a line between PTSD necessary to treat and stressful

experiences that can be naturally utilized for such processes like healthy learning for example. To what extent one traumatic experience is a real trauma and to what extent – a learning experience to build more resilient features? Of course such kind of considerations might sound extreme or cruel in certain context, however, the development process of a person includes variety of stressful and traumatic experiences which, if properly explained in the mind of the person experiencing them (and situated well in his or her life story), will possibly bring resilience, creativity and self-growth.

It is considered that quite often when people are asked whether they want to change anything about their life and about the decisions they have made in it, they usually say they wouldn't change anything. Such claims can be explained with the idea that these people already have created meaning of their own life story and changing it will dismiss their own deliberately developed meaning. On the contrary, wrongly internalized meaning (e.g. "I am a victim"; "Everyone is threatening me") in people who suffer from some kind of trauma and which are not treated for too long will create a wrong self-image in them. A close and detailed discussion with the person affected by traumatic experience should lead to decision about the necessity of treatment and the choice of appropriate treatment techniques, as well as the ways for development of healthy self-image.

In addition, PTSD treatment will be still a challenging task in a world with advanced technology since technology itself creates new problems like alienation (Turkle, 2011) or addiction (Georgieva, 2011a; Georgieva, 2016). Utilizing it for treatment should consider carefully the adequacy of the technique to the specific life story the person has and would like to create in the future. The main purpose of this study is to generally find the positive ways of technology and VR utilization as part of the possibilities to create better life for the contemporary man.

7. Trauma and resilience

Considering the findings about the perception of reality and the effect of the virtual spaces on the self-image, as well as their possibility of bringing recreation of self-image and life story as presented in Chapter 6, Section 6.3., here it is necessary to analyze whether these findings apply also to the process of building resilience in healthy individuals or to the process of PTSD prevention. If the hypothesis regarding the transfer of experience is valid, then people who do not suffer from PTSD should be able to become less vulnerable and susceptible to traumatic disorder such as PTSD during exposure in virtual spaces with preventive purposes. In particular, the ability to rationalize the events and react in a more distanced way can possibly help for the reduced possibility of developing the disorder.

In connection with this idea Bonanno's concept (Bonanno, 2004) of resilience and recovery might bring clarity onto the possibility for onset of PTSD in one type of people rather than another. He claims that there is one more factor – the one of “hardiness” which consists of “three dimensions: being committed to finding meaningful purpose in life, the belief that one can influence one's surroundings and the outcome of events, and the belief that one can learn and grow from both positive and negative life experiences” (ibid., p.25). The discussion about this factor could be further supported by creating resilience through consistent life story.

The works of Wiederhold (2010) and Riva et al. (2010) could also give an example of the necessity for preparation through the usage of technology and the importance of trying out of new flexible tools for building resilience. A deeper exploration of soldier training could show in what way they become stronger in the stress management they are trained into. Such stress management is done in virtual environments because of their safety and flexibility (Rizzo et al., 2006). In the same way, virtual spaces can be effective tool for training civilians in stress resilience and learning of adequate reactions to disastrous events. However, some researchers claim that the highly immersive virtual spaces are not adequate environment for preparedness

for some types of traumatic events such as sexual assault for example (Feldner, Monson, & Friedman, 2007).

Further research should try to support the major claim of this study and confirm that the virtual spaces enable people to learn and adapt easily to a new story and explanation of reality, so this feature can be used in possible prevention techniques too.

7.1. Remaining problems and future work

After observing the concepts of trauma, self-creation, and virtual reality from a philosophical perspective, this study should reach to several important questions. For example, is suffering an indispensable part of life? It can be considered as such in the sense that it teaches about reality and ways to protect oneself (for example building resilience through creating mental preparedness for similar traumatic experiences); in the sense that it serves the human mind in an evolutionary way (for example by creating neuroplasticity through teaching people to be less vulnerable and more adaptable to various life conditions); in the sense that it is part of the developing human knowledge by presenting ways to grow and transform pain into creativity (for example as supported in studies of creativity (Stoltz, 1997)).

To answer some of these questions, let us first look at the possible application of the findings resulting from the discussion about personhood and personal identity (Chapter 6, Section 6.1.) as this could be very important in relation to trauma and treatment of the people who face challenges for their psychological health.

Deciding that the self is an entity that is suffering would be rather different stance compared to the implication that there is no self and trauma is a sign that certain brain processes are simply not working normally (where restoration of the chemical balance of the brain would bring about the full recovery of the patient). In what way does this difference matter? Schechtman's account can serve for the explanation of cases such as the PTSD where usually patients do not have any psychological problems before the traumatic event (in this consideration the cases of PTSD comorbidity and the accumulation of trauma in some cases of PTSD should be considered as separate types). Such people would have been leading healthy lives if some traumatic events haven't entered their lives abruptly. For example, these are normal people who become victims of natural disaster or sudden physical assault (I would like to exclude here the cases of

soldiers since as it was discussed some of them might be too vulnerable to be exposed to the war reality). If such people didn't have any psychological problems or predisposition to develop PTSD, then why does trauma bring such changes to their mental health? Of course, again, it is possible to say trauma changes brain processes and leads to imbalance. However, the restoration of the balance through medication for example does not always result in recovery and psychological therapy like counseling, CBT, etc. becomes necessary. In this sense, this study claims that the narrative account can serve only as a starting point for the consideration of PTSD treatment in VR context.

To analyze further this problem, it is necessary to clarify that treating symptoms such as hyperarousal and the other typical for PTSD symptoms can work for the psychological health of the individual for the moment; however, when some unexpected trigger causes re-experience of the symptoms and relapse of the PTSD, it would seem like the patient was not treated as a whole, but only as an organism that lacks unity. In other words, learning how to cope with the stressful stimuli will have short-lasting effect if not internalized as part of one's nature and self-identification. That is, if that person has internal integrity to keep the treatment results lasting, then small triggers will not affect the therapeutic results. It is possible, though, that learning of ways to overcome trauma are affecting the coping abilities of such patients only on a surface level and their "self" was still locked in the trauma without being able to accept it and move on with his or her life story. Then, when a relapse occurs, it seems one part of the person has been neglected or in a state similar to the one of hibernation, and something triggered the negative response and returned the person to the traumatized mental state.

Issues regarding memory and its retrieval should be considered in treatment, as it is known that PTSD affects memory in very intricate ways. Research shows that treating only the physiological symptoms of PTSD does not result in recovery and the optimal approach to treatment of the disorder will include treatment of the core symptoms which are connected with the psychological condition of the patient i.e. anxiety, avoidance, numbing and the like (Davidson et al., 2010). However, a work on the self (if we accept there is such) and its wholeness as a multitude of experiences gathered in one's memory and one's image of personal history should be done to build the foundation of lasting treatment results.

In this sense, Schechtman's position on the person's life as a practical unity might answer why the treatment of PTSD is hindered by so many factors and especially easy to result in relapse after years of relatively healthy lifestyle (Perconte et al., 1989).

Schechtman sees the individual unity as a form or a collection of some entangled characters. Her position and viewpoint towards the person defined as patient could correspond to the explanation how trauma reaches on various levels. For example, a childhood trauma can cause the development of some personality characteristics which later become “part of” what the person is. However, it is possible that this person would not necessarily identify himself or herself with the traumatized image and hence would have limited knowledge that trauma formed him or her the way he or she is. Let us suppose the trauma caused the person to be extremely shy in public and this social anxiety was attributed to him or her as innate. This person might think he or she does not lack so much confidence, in contrast to the way people see him or her. Still, if a traumatic episode from the past is analyzed and treated this could possibly help and release the person from his or her social ineptitude or at least might cause some changes in his or her state and alleviate it. This could be valid especially if Schechtman’s theory is right and in addition, if the self-narrative helps construct our lives as more meaningful for ourselves. Finding explanation and meaning in events, even though being a result of one’s own narrative imagination, can still be considered beneficial to the person’s health. In this way working on traumatic episodes from the past could possibly release a person from some psychological problem or at least make him or her feel more comfortable integrating past episodes in his life story. What this study wants to emphasize is that this meaning can be designed according to a treatment idea which means that it might have fictional characteristics but still aim at some therapeutic result. It is the transfer of experience that will affect the real self in the necessary way even if the experienced in the virtual space was only a story that does not have relation with real events. Participating and experiencing a narrative specially designed to match one’s overall life story, that includes one’s own traumatic background, might still have the necessary effect on the person that holds the ownership of the life story.

On the other hand, it is possible to argue with the narrative account and claim that there are cases in which the person’s identity is formed and cannot be edited or restructured, probably because the moment of trauma goes too far back in time; also there is possibility that this person already identifies himself or herself so strongly with this image constructed by the past trauma that he or she would not want to change anything about this state he or she is in (e.g. “I am shy and that’s it, that’s how I am”). All of the cases described above seem plausible since it is possible to witness people recovering from old trauma and such who are never able to do so.

It seems in the same way some cases in which treating PTSD is delayed in time will usually result in prolonged and sometimes untreatable condition, while prompt intervention results in fast and sustainable recovery (Rauch & Cahill, 2003). The question here is how trauma should be considered – should the usual consideration of trauma as a destructive force be prevalent or should trauma be considered as a pattern which provokes behavior of coping with adversities by creating alternative meaning of life events? In addition, in the context of the connection between self-narrative and therapy I am focusing on, a possible question should be whether one's story should be re-constructed or simply explained in order to form understanding in the person who owns this story. This question deserves further analysis in future research.

What could be said here is that there are happenings in life which are difficult to explain. Finding meaning in such happenings might be very difficult or merely impossible: death of innocent child, incredibly cruel murder without clear motive, devastating disaster which leaves countless people helpless for a lifetime. There might be people who can find meaning in such events. There can be others who will always find it impossible to come in terms with what has happened. What is the difference between these two types of people? Is it a combination of vulnerability, predisposition to give up in front of traumatic events, lack of resilience and preparedness? Or is it an inability to put the trauma in the context of their lives as something that happened for some reason, but also something that has taught them profound things about themselves and the others around them? Then, are such coping mechanisms innate or learned?

To classify each separate PTSD case and answer these questions will be a challenging task since each case presents exceptions, special features and unforeseen obstacles, as well as accumulation of factors. However, trauma-free life is nearly impossible in today's world marked with terrorism, climate change and economical adversities. In this case, how can we perceive trauma and treat it or adapt to it so that we can go on with our lives in a healthy way? An understanding of trauma as part of life and mental preparedness for occurrence of various disastrous events is a good stance. Still, a stance towards life as necessarily dangerous could become a premise for creating personal limitations and constant anxiousness in people who are more susceptible to negative thought patterns. In this sense, it is necessary to build a healthy balance between realistic view towards life's adversities and freedom to expect the best possible outcome. A mental preparedness that has such balance can be taught through psychological counselling as well as exposure in virtual space for building resilience. Accepting that traumatic events might happen one day and adding to one's mental

preparedness the ability to internalize their meaning can be one possible stance towards the existence of trauma in life. In addition, the ability to interlace meaning of traumatic experiences in one's life story will make them not be seen as external enemy destroying the context of the story, but possibly will turn them into trying experiences from which one can grow better and more authentic about his or her self.

Let us explore an example of a person who has developed an irreversible mental sickness in childhood due to the acts of another person. Regardless of that fact, the mentally damaged person leads his or her life in complete peace with the person who was responsible for his or her damage, and even helps this person in some difficult and challenging situations in their life. Then, it is possible to say that this damaged person became what he or she is due to (or even thanks to) the initial trauma in his or her childhood. Maybe he or she would have never been compassionate and able to help if there was not trauma in his or her life. It is possible to suppose a "normal" reaction would be to have negative feelings towards the person who has caused the suffering. If the damaged person doesn't have such feelings, but holds only positive emotions and possibly forgiveness, then, we can say trauma sometimes teaches empathy and ability to sacrifice, as well as true understanding of trauma in life in general. Of course such cases might be rare occurrences and the gravity of trauma should never be underestimated. This hypothetical example here is to explore the possibility to connect trauma to possible relief rather than unsolvable end.

In this sense, it seems that any kind of treatment, being it CBT, Cybertherapy in VR and so on, should consider the personal context very carefully, determine whether the person has predispositions to trauma, accumulation of different traumatic experience in his or her lifetime, willingness to overcome trauma, inclination to internalize, explain, and give meaning to trauma and rebuild his or her life story anew. The treatment utilizing VR can help in the last part of this process when rebuilding is necessary. Mainly in the cases where human life is perceived as a form of a narrative, it is possible to add value to the traumatic events which inevitably happen in life in various forms. If human life is perceived as such it seems possible that victims of trauma could receive proper treatment while being seen as creators of a story which was interrupted and needs retelling, or at least a different point of view.

It is necessary here to also suppose a different case where the narrative theory of the self is not plausible for treating the cases of patients with PTSD. In what way it would not be suitable for treating patients with PTSD? For example, the fact that comorbidity causes the patients to be prone to PTSD will show that not the break in the

narrative of the self, but a basic psychological vulnerability causes the onset of the disorder. If we accept that psychological vulnerability caused someone to be more susceptible to trauma, then we can imagine this person was also creating his self-narrative in such way that he or she believed he or she is more vulnerable on a more or less conscious level. Maintaining a set of psychological characteristics as a conscious agent is also a part of the self-creation discussed in the narrative context. It seems plausible to look through the narrative prism when discussing trauma as it finds the importance of each person's individual life context, viewpoint and evolution. Still, opposing views might see the person as a fictional agent who does not have such strict control over his or her psychological states, especially control as a creator of his or her own narrative. As discussed in Chapter 4, Section 4.1. regarding soldiers' vulnerability, soldiers perceive themselves as strong men who are capable of coping with the stress of killing in war. However, when faced with real stressful events of war horrors, they develop PTSD. This shows they are more vulnerable than they imagine themselves in their story about being "strong", "durable", "tough" men. In this sense, holding misleading beliefs about own psychological stability or having such imposed on one's self can lead to hidden vulnerability and could possibly undermine the idea that people are authors that consciously and willingly direct their life stories and control their "selves" as agents with creativity and free will.

Supporting one of the two possible positions – the first one that narrative creation of the self is plausible and people build their life stories to make sense of the various events they face in their lifetime, or the second one that there is no real self which acts like director who explains the story after some events took place, but rather the consciousness creates this illusion in order to feel comfortable with the mixture of meanings we are surrounded on a daily basis – will have its demerits in the efforts to find a way to answer the multiplicity of traumatic experiences people have. This will also hinder the efforts for understanding the multitude of their personal characteristics that make people more or less prone to develop PTSD. A comprehensive approach that accepts both views and tries to find the best parts in each view to serve treatment seems to be the best choice when trying to address this issue.

Let us return to the way Schechtman creates her concept around the narrative. In her view, in order to understand the complexity of human personality and life, "we need to look not only at individual social interactions and practical activities but at the stable background structures that make these possible" (Schechtman, 2014, p. 113). The background of each person's narrative has great importance when observing the reasons

for trauma onset. The combination of interpretations of life events each person has is so individual that understanding why this person especially developed PTSD might be possible only for an experienced psychologist who can see the context of the big picture – or this person’s viewpoint on life.

Schechtman puts emphasis on social interaction in the process of development of each person’s life, starting from early childhood. In relation to the research of Vogt et al. (2007) presented in Chapter 2 it was mentioned how important it is to have social support in order to avoid development of trauma. Involvement in different social unities creates sense of belonging and aids the construction of story that explains one’s life. In other words, different agents help creating and holding up one’s story, as well as its relevancy. When someone faces difficulties the surrounding people who are closely related to that person and support him or her will usually provide something that can be described as connection with reality when he or she cannot control his or her own reality and also explain events from a more objective or at least an outside point of view, give support in times of doubt and generally go through the difficulties together with the person experiencing the trauma. On the contrary, a person locked in the trauma alone cannot realize his or her limitation in not being able to see the world as safe and rather sees the world broken into meaningless pieces or the reality marked by the trauma and inevitably changed while unable to return to “what was before” the trauma. It seems that the narrative ability is aided by the other narrators with whom people interact in their lifetime.

Another consideration is also important: quite often PTSD patients say “I just want life to get back to what it was before”. Although this sounds as a truly authentic desire to return to the pre-trauma perception of reality, as discussed trauma has changed the life one has in such a significant way that it is almost impossible to be able to achieve such return. However, this does not mean that spending a lifetime in an unpleasant version of reality distorted by trauma is the only option. It is possible to retell or reconstruct it in a way that makes new sense without disregarding the trauma, but also without accepting it as a decisive force controlling a person’s life story. Schechtman sees people’s lives as “homeostatic property clusters” (Schechtman, 2014, p. 197), which are constructed of equally relevant biological, psychological, and social characteristics. The prolonged formation of these characteristics done by the person himself or herself as well as the people surrounding that person creates what Schechtman calls “person life”. This view is very appealing and close to the idea of the multitude of characteristics human nature has and could be working concept when one

is challenged to think about the wholeness of human life and its adversities. Accepting that the course of one's life could bring about added mental strength might help in the recovery process.

It is possible to say that the view Schechtman has on the wholeness or the unity of the human life as presented above is a truly humanistic view that puts the person in a special context: "I do not have a moral son and an animal son and a psychological son — I have a single son who has all of these aspects and is important to me in all of these ways. Similarly, it would be absurd for a doctor to tell a worried husband that his animal wife survived the stroke, and perhaps his sentient wife, but probably not his moral or rational agent wife" (*ibid.*, p. 83). Seeing the person as a whole that is containing all the stories and their meanings in his or her lifetime could help seeing the true problems such person is facing when exposed to trauma. In this sense, I support Schechtman's view of the human life but would like to put emphasis on the role of the person as an active author who can change the narrative course if supported (e.g. through therapy) and respectively possesses the power to recover from trauma.

The problem of trauma and its occurrence in human life seems endless, as traumatic experiences never cease to occur. Seeing them in a bigger context, in a separate reality (such as VR) or as a part of a story might be a fruitful stance in the efforts to diminish their negative influence. This research does not provide solution for all the problems facing trauma and narrative, but proposes one tool that could help the work of understanding and treating trauma – VR.

7.2. Contribution of the research

It is possible to define the unique contribution of this research in the fact that it presents a philosophical perspective of the concept of traumatic experience as some form of disruption in the personal narrative and it discusses the problems of perception of reality and life story in the context of the possibility of healing the self with the help of experiences and self-narratives in the virtual spaces. The research could also give important considerations about what kind of changes stand in front of the contemporary human mind getting increasingly aided by and immersed in technology.

This research also proposes the idea that one view towards trauma in human life could be that traumatic experiences teach new skills about life and support personal growth rather than just destroy one's life story and mental health. In this sense, trauma

is necessary for the evolution of human mind in case it does not cause too severe impact on health; in cases it does so, it should be treated with the same point of view, namely to see the traumatic events as meaningful opportunities to learn and rebuild again one's life story.

I would like to add some very important consideration – if such position is taken and trauma is considered as necessary to help learning and self-development, then it is necessary to explain what kind of trauma is acceptable and more importantly, to what extent, with what gravity trauma would be part of the necessary experience and how much trauma is too serious or too prolonged. As mentioned in various studies on PTSD, immediate intervention for treatment of PTSD will result in less severe cases and will provide opportunity for complete recovery of the patients (Novick, 2005). However, when left unnoticed and unattended, trauma builds up, possibly creates comorbidity disorders and generally ruins lives, not leaving much space for therapeutic work.

It seems that trauma might play such kind of a role for the human life as the process of learning to walk which makes a toddler stronger while growing up – first by small steps the baby trips, stumbles, falls down, cries loudly, then gets quiet and finds strength and motivation to rise up again and continue walking until the next, maybe bigger fall, and so on. In the same way trauma might naturally teach self-protection and resilience, as well as growth. The next time the toddler will not cry that strong and possibly the time after the next, the toddler will trip, but will not fall down. Still, some of the cases where someone “falls” can be too damaging. Therefore, as natural as this analogy sounds, what a baby (or a patient) needs is support from a parent (or in grown-ups cases a therapist), and also self-support in the process of finding meaning, overcoming trauma, and learning to become stronger.

Nevertheless, seeing trauma as necessary part of life seems to be a very sensitive topic that deserves careful consideration and future work. What this dissertation would like to point out as a contribution is that the efforts for reducing the negative impact of trauma could bring about more positive actions and results for everyone since a person who is suffering from trauma would be much more susceptible to inflict himself or herself suffering to other people than a healthy human being. Working in the field of mental health is helping to build resilience and wellbeing not only for the people affected, but for everyone since we are all part of one big life story.

8. Concluding remarks

The philosophical analysis of Cybertherapy for PTSD can explain the effects of VR on human mind from a treatment perspective. The consideration seeing trauma as disruption of the self-narrative can explain the ways trauma could be addressed in the design of the treatment process and hence could lead to fruitful insights on new possibilities for successful therapy and application to different types of diseases. Moreover, the recovery processes happening in VR can give information not only about ways of supporting human health, but also new insights about how human mind works, perceives reality, and creates his or her life story in connection with various research topics in mental health and philosophy such as resilience and self-narrative. Finally, since PTSD has various causes and types a matching between its multiplicity and the flexibility of the virtual spaces through the concepts of transfer of experience and reconstruction of life story could support treatment efforts in the field of VR treatment.

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